APPENDICES

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APPENDIX 1: DOR's Comments to the Inception Report



Attn:

Mr. Robinson Shrestha,

Subject: About response for Acceptance of Inception Report

Dear Robinson San,

We refer to your letter dated June 3, 2021 regarding Request for Acceptance of Inception Report. We would like to appreciate the initiatives taken by JICA for providing technical assistance in conduting Data Collection Survey on Sindhuli Road and Capcity Enhancment in Nepal. We would like to express our views/opinions on following issues raised by JICA Survey Team as follows:

1. Consistency with the National Development Plan?

Dhulikhel-Sindhuli-Bardibas Road is a national highway and a strategic road which is one of the important roads to carry people and goods. This road connects the capital city of Kathmandu with Eastern region including Province No. 1 and many districts of Province No. 2. The importance of this road rises at the monsoon period when there is a frequent closure of the Prithvi Highway and Tribhuvan Highway . However, the width of the road is merely 3.5 m to 5.5 m width serving as a Feeder Road Standard which causes traffic congestion during emergency situations specially during monsoon season and festival season.

The policy documents formulated by the Government of Nepal in connection with the National Development Plan are 15th National Plan (FY 2019/20 – 2023/24), National Transport Policy 2058, Five Years Strategic Plan (2073-2078), Priority Investment Plan (2014-2021). Among these policy documents, Five years Strategic Plan specifically emphasizes on upgrading all strategic roads to 2 or more lane roads. In addition to this, there is an allocation of Budget for Detailed study of the Tunnel at Khurkot-Chiyabari section of this road. Surface improvements and maintenance have been planned and done so far on Sindhuli Road with the financial assistance from the World Bank. Besides these, National Transport Policy 2058 has stated that priority should be given for roads with higher traffic density and with higher economic returns. Based on above mentioned policy documents, the development of Sindhuli road is of utmost importance for National Development.

2. Roles / responsibilities of next-generation Sindhuli Road?

Approximate traffic density of the Sindhuli Road is 4000 vehicles per day currently. Perceiving traffic safety of this road, the government of Nepal has restricted the movement of Buses and other long vehicles along this route. The distance from Kathmandu to Bardibas is shorter by around 155 Km through this route and hence once the route expands to two lane road, almost all vehicles heading towards Eastern Region are likely to use this route and traffic density of the route will hike sharply. Beside this, the provision of Tunnel, would certainly reduce travel time and hence the next generation Sindhuli Road in the coming days would certainly play a vital role in the economic development of the country.





Ref. No:

Development Cooperation Implementation Division

3. Relation / Demarcation with the other projects (Fast Track, Dry ports ...)?

The Government of Nepal has invested in the development of a fast track which connects Kathmandu to Nijgadh (76 Km) and it will approximately be completed after 7 years. There is a maximum probability that Fast Track will be utilised by vehicles opting for toll roads and not by common vehicles. However, the target traffic of fast track will be the traffic generated from Parsa, Bara, Rautahat and Makwanpur districts. Although there is a probability that few traffic may be diverted through this route, there is a less probability that many public vehicles and freight vehicles will use the fast track being a tolled road. The current target road user group of Eastern Region including a few districts of Province No. 2 are more likely to use Sindhuli Road even after the completion of Fast Track, Dry Ports etc.

4. Expectations for improvement

Being a highly prioritized road, the government of Nepal wishes to upgrade the Sindhuli road to double Lane standard road and construct a tunnel along Khurkot-Chiyabari section of this route. However, this program demands allocation of a huge budget and GoN wants to request JICA to kindly provide technical assistance in the Consulting services of Detailed Design along with financial assistance for upgradation of Sindhuli road and Construction of Tunnel (double lane standard).

Thanking you. Sincerely yours,

Ram Hari Pokharel, Deputy Director General APPENDIX 2: Minutes of Meeting with DOR

Data Collection Survey on the Sindhuli Road Capacity Enhancement in Nepal

MEETING MEMO			
Meeting On:	Data Collection Survey on the Sindhuli Road Capacity Enhancement		
Purpose:	Enhancement on understanding on the status of Data Collection of Sindhuli Road		

Date:	Started:	Adjourned:	Venue:
August 30, 2021	11:00 AM (NST)	12:45 PM	Virtual Meeting
Attendees:		Mr. Ram Hari J Mr. Rabindra I Japan Side: Nakamura Ayu Saito Gaku (JIG Sakimoto Taisl Mr. Robinson S Mr. Junichiro O Mr. Junichiro O Mr. Junichi Iwa Mr. Junichi Iwa Mr. Yasufumi Mr. Madan K. Mrs. Radha San Note: Mr. Kesh	pa: Director General, Department of Roads (DOR): Pokhrel: Deputy Director General: (DOR, DCID) Lal Das : Project Manager of Sindhuli Project Office: Ako (JICA, Nepal Office) CA Headquarter) hi (JICA Headquarter) Shrestha (CTII): Team Leader Ogawa (CTII): Deputy Team Leader Takeuchi (OCG): Highway Planning II/Geologist fomura (CTII): Tunnel Planning/Slope Management asaki (CTII): Traffic Demand Forecast Iseki (OCG): Construction Planner Shrestha: National Staff ndha: National Staff hab Sharma (Joint-Secretary MOPIT) and Mr. Sagar Gyawali connect from the link provided (technical problem)
Topic/Agenda:		 Outline of th Why Sindhu Approach fo Basic Conce 	ili Road needs to be Improved/upgraded (needs) or Formulating "Sindhuli Road 2.0 Plan" opt Formulation
0.5	00 1 00	7. Request for	r Formulating "Sindhuli Road 2.0 Plan" Comment and Confirmation

DOR: Department of Roads, DCID: Development Cooperation Implementation Division, DDG: Deputy Director General

CTII: CTI Engineering International Co., Ltd., OCG: Oriental Consultants Global Co., Ltd.

MINUTES HIGHLIGHTS:

Topic	Session Highlights and Discussions	Responsible Person/Office
Presentation from Survey Team	• The Team Leader, Mr. Shrestha thanked all the attendees from Nepal for providing time for the meeting despite of the national holiday in Nepal and further well-wished all the attendees for better health and prosperity on the occasion of the Krishna Janmastami.	
 Changes in the Environment Surrounding Sindhuli Road 	• Explanation was provided on the major completed and on- going road projects having relation with the Sindhuli Road (Slide-1). This was followed by an explanation on the contribution and the outcomes of the Sindhuli Road after its opening and then the new needs for or new expectations of the road (Sindhuli Road No.2) - a wider, smoother (horizontal), flatter (vertical), faster but safer road to cope with the rapid increase of traffic volume.	

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Торіс	Session Highlights and Discussions	Responsible Person/Office
• Outline of the Survey	• As provided in Slide-2.	
 Why Sindhuli Road needs to be Improved/upgraded 	 Following reasons were explained for improvement needs; 1) Current traffic volume exceeds 1.5-lane capacity (Slide 19-20). 2) NDPs and MOPIT Strategy Paper mention dualization of all SRN roads. 3) The road will be pliable by all types of vehicles (further enhance socio-economic activities) 4) Further enhance socio-economic activities of northeastern regions through strengthened connections with the Mid-Hill Highway and Madan Bhandary Highway. 5) The Sindhuli Road is the only road that connects two Asian Highways and will contribute bringing the SAARC countries closer through trade, culture and economy. 6) Secure redundancy during disasters (disruption of traffics). 	
 Approach for Formulating "Sindhuli Road 2.0 Plan" 	 Here, the presentation explained that the formulation of the Sindhuli Road 2.0 Plan will be done in three steps; Step 1: Justifications/Needs for why Improving Sindhuli Road is desirable which is the being done currently Step 2: Examination of Methodology for Enhancement of Road Function Step 3: Determination of Stepwise Improvement Scenario 	
Basic Concept Formulation	 An example of basic concept formulation of Sindhuli Road 2.0 Plan: Role, Function, Level of Service, Target Year was explained. 1. Target Year: 2041 2. Number of Lane: 2-lane or more for all sections 3. Road Classification: Class III, National Road 4. Design Speed: Section I : 40 ~ 60 km/h (Rolling - Mountainous) Section II ~ IV : 30 ~ 40 km/h (Mountainous - Steep) 5. Target Vehicle: Width 2.5m *Nepal Standard (W2.5mxH4.75mxL18.0m) 6. Level of Service as of Target Year LOS: D or above 7. Design Standards: Nepal Standard and Japanese Standard 8. Improvement Concept: Stepwise Improvement Scenario (This means to improve the Sindhuli Road step by step, or section by section.) 9. Relation and Demarcation with Fast Track: Sindhuli Road will continue to function as; Redundancy route for logistics and transportation connecting between Kathmandu and India Logistics route connecting Kathmandu, eastern area (Province No.1) and Terai region 	
 Approach for Formulating "Sindhuli Road 2.0 Plan" 	 The presentation continued with explanation of the approach steps for formulating the Sindhuli Road 2.0 Plan. First of all, setting of improvement options, goals and target year will be done and after that Stepwise Improvement Matrix will be prepared showing applicable improvement options and the timeframe, which will be compared and evaluated. The final output (a list showing selected improvement methods and/or a Project Implementation Diagram) will be prepared (refer to the last Slide). 	

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Торіс	Session Highlights and Discussions	Responsible Person/Office
Comments/Views and Confirmation	 The floor was then open for comments/views suggestions, questions etc. Mr. Shrestha requested for MOPIT's / DOR's policy/plan with regards to the perspective of the Sindhuli Road and sought for opinion/advice on the proposed basic concept for Sindhuli Road 2.0 Plan and on the "Stepwise Improvement Scenario". He also asked for DOR's estimate with regards to construction of tunnels and roads in Nepal. Mr. Thapa stated Sindhuli Road (SR), when JICA began to study in 1980s was also a game changer. After completion and handing over of the SR to the GON to till date, some sections of the road is already saturated, and 	
	 date, some sections of the foad is already saturated, and needs to be widened. Large vehicles are prohibited because of accidents and traffic jams. Longer vehicles over 32 seats are prohibited during daytime because of narrow curves, narrow bridges and floodways. SR linked eastern region of Nepal, so it is the gateway to eastern part of Nepal to Kathmandu. Widening (Double lane) will yet be another game changer, so improvement is imminent. Mr. Thapa also mentioned that the GON requests for Japanese assistance in widening the Suryabinayak-Dhulikhel road to the 4-lane standard and also informed feasibility study Report of Koteshwor intersection will soon be submitted to JICA/ DOR. Mr. Thapa requested for shortening the target completion year to 10 years instead of 20 years as it is very long duration. Mr. Thapa agreed with the stage wise improvement plan, but the timetable should be shortened. Mr. Thapa added that GON has planned to widen the SR and JICA team who were supporting for maintenance in phase II, led by Sinkai san provided 4-5 ways and alternatives to widen the SR. Mr. Thapa expressed about the budget allocated to SR widening which was Nrs.250 million but due to pandemic GON is not in the position to allocate that budget. Mr. Thapa cleared about the cost of 2 lane road as per his experience which might cost Nrs.50 million per Km. and cost for construction of tunnel might be 2-3 billion NRs. per Km. 	
	 Mr. Thapa thanked JICA for supporting and studying on the widening the BP highway and also thanked for good progress in first road tunnel (Nagdhunga Tunnel) and look forward for similar progress would happen in BP highway as well. Mr. Shrestha pointed out that the cost for tunnel shown in 	
	the Slide is for per meter and not per kilometer (correct cost is 4-5 Million NRs. per meter) and said cost for road construction in mountainous region may reach to NRs. 250 million per Km. With regards to the target year, he said he will discuss this with the DOR.	
	 Mr. Shrestha requested provision of the road map prepared by the JICA maintenance project team for widening road in Sindhuli road maintenance project. Mr. Thapa replied it is filed in the DCID and instructed Mr. Pokharel to provide it to the Team. Mr. Das explained about the current scenario of SR road. 	
	He suggested that current scenarios are to be mitigated to reduce the obstruction on the road due to the flood in causeways and landslides. Accident Scenario are also	
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Tonic	Session Highlights and Discussions	Responsible
Topic	 Session Highlights and Discussions increased because of the geometry problem and sight distances and need to be minimized sooner. Mr. Das suggested that extension of road should be done in phase wise and asked to shorten the time schedule to avoid increase of material and transportation cost. Mr. Thapa shared the idea provided by Sinkai san on widening the SR for spot widening rather than whole SR. Mr. Thapa added that Sinkai san had assured for continuous support, guidance and suggestion on maintenance of the quality during construction. Mr. Thapa informed about the 4 number of 2 lane standard with 7.5m carriage way bridge construction project, among which 3 are designed by JICA team which will replace the existing causeways and the project would start after monsoon. Mr. Shrestha requested to provide the information regarding the bridges for their reference and Mr. Das agreed on that. Mr. Pokhrel asked about the Khurkot Chiyabari Tunnel Construction and said he didn't see it in the presentation. Mr. Shrestha clarified that tunneling is definitely one of the improvement options for Section II. The Survey will study all conceivable methods for all sections and the optimum improvement methods will be proposed. Mr. Thapa informed that because of the pandemic, GON is not able to have sufficient budget on SR and seeking for the loan from JICA for the project. 	Responsible Person/Office
• The Way Forward	 Mr. Saito requested Nepal team to be in touch with consultant team for constructive progress of the project. Ms. Nakamura asked the JICA Team to briefly explain the purpose and plan of their Nepal visit on 8th September. Mr. Shrestha replied that 6 members will arrive Kathmandu on 8th September and leave on 30th September (10 days quarantine). The Team will be divided into three groups: 1st group will collect data through interviews and meetings, 2nd group will conduct site visits and supervision of the geological conditions especially in section II of SR and 3rd group will collect data on construction planning from various offices. Mr. Shrestha told the Interim Report is scheduled for submission to JICA by end of September 2021 and the contents of the ITR will be explained to the DOR. 	
Conclusion	 Mr. Shrestha concluded with thanks to all the attendees and will visit on Nepal on 8th September. 	

Review and Confirmation: Prepared by: JICA Survey Team

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Mr. Robinson Shrestha Team Leader ЛСА Survey Team

Mr. Ram Hari Pokharel Deputy Director General DCID, DOR APPENDIX 3:

Minutes of Meeting with MOPIT

Data Collection Survey on the Sindhuli Road Capacity Enhancement in Nepal

MEETING MEMO		
Meeting On:	Data Collection Survey on the Sindhuli Road Capacity Enhancement	
Purpose:	Prospect of the Sindhuli Road Capacity Enhancement Survey	

Date:	Started:	Adjourned:	Venue:
December 10, 2021	1:45 PM (NST)	2:55 PM	Virtual Meeting
Attendees:	• • •	Nepal Side:	
		Mr. Keshab Sh	arma (MoPIT) - Joint Secretary:
		Mr. Ehara Yos	hiki (JICA Nepal Office)
		Mr. Sourab Ra	na (JICA Nepal Office)
		Mrs. Radha Sa	ndha (CTII National Staff)
		Japan Side:	
			kashi (JICA HQs)
		Mr. Saito Gakı	
			Taishi (JICA HQs)
			Shrestha (CTII) (Survey Team Leader)
			Dgawa (CTII) Deputy Team Leader
			omura (CTII) Tunnel Planning/Slope Management
			awada (CTII) Highway Planning III/ Tunnel Design
			Akira (CTII) Environmental & Social Considerations
		Mr. Yasufumi	Iseki (OCG) Construction Planning
Topic/Agenda:		1. Survey Outl	
			and Sindhuli Road- Current Overview and Future Direction
		•	ing (Estimated Construction Cost)
		4. Points to be	Discussed/Confirmed
Presentation Ha	ndouts	Presentation sl	ides were shared with the attendees before hand

MOPIT: Ministry of Physical Infrastructure and Transport, JICA: Japan International Cooperation Agency CTII: CTI Engineering International Co., Ltd., OCG: Oriental Consultants Global

MINUTES HIGHLIGHTS:

Торіс	Session Highlights and Discussions	Responsible Person/Office
• Self-introduction	• The meeting was convened by self-introduction of the attendees. The attendees of the meeting are as listed above.	
Presentation from Survey Team	 Team Leader, Mr. Shrestha thanked all the attendees and for sparing time for the meeting despite of busy Schedule and began the presentation. Mr. Shrestha explained that the presentation consists of four agendas - the first three agendas will be conducted by the consultant and last one will be conducted by JICA Headquarters. Mr. Shrestha outlined the topics covered by the presentation as mentioned below (for details please refer to the presentation slides in Appendix-1): a) Survey Outline b) Trade Route and Sindhuli Road- Current Overview and Future Direction c) Survey Finding (Estimated Construction Cost) d) Points to be Discussed/ Confirmed 	

	Topic	Session Highlights and Discussions	Responsible Person/Office
•	Survey Outline	• Survey title, survey objectives, target areas and relevant authorities of the survey were briefly explained.	reison/onice
•	Trade Route and Sindhuli Road- Current Overview and Future Direction	 Mr. Shrestha explained the followings; India is Nepal's biggest trade partner and the current trade route from India to Kathmandu is only the Birgunj - Narayangarh-Mugling-Kathmandu road (Westward Route). Sindhuli Road is restricted to large vehicles and is already approaching saturation, while Kathmandu-Terai/Madhes Fast Track (Fast Track) is under construction 5 years from now: Fast Track is assumed to be completed and opened to traffics, most traffics to KTM currently using the Westward Route and Sindhuli Road will be diverted to the Fast Track as it becomes the fastest and shortest route. Sindhuli Road will temporarily see reduction of traffic volume. 10 years from now: Capacity enhancement of the Sindhuli Road is completed and becomes able to accommodate all type of vehicles. This is expected to revert traffics diverted to the Fast Track and further attract traffics. The current traffic demand forecast is based on a simple analysis that considers only the socio-economic framework and the traffic volumes counted under this Survey. For a more precise forecast, a detailed analysis 	
•	Survey Finding (Estimated Construction Cost)	that considers the development of the road network in and around the Sindhuli Road and willingness to pay survey of the Fast Track etc. need to be undertaken.Mr. Shrestha explained the followings: in stepwise about the basic concept of capacity enhancement of the Sindhuli road and the share of methods for road function enhancement	
		 through the graph. Capacity enhancement methods were studied that consisted of simple widening to bypassing (including provision of tunnels) based on the concepts agreed with the DOR Rough estimate projected the total construction cost at approximately 80 Billion NRs. (cost reviewed after the meeting is approx. 75.4 Billion NRs.) Estimated completion year of capacity enhancement of the entire section is likely to be 2033/34 (critical construction pe), provided that the implementation commences in 2026/27. The period until 2026/27 is considered to be required for surveys and designs. 	
•	Points to be Discussed/ Confirmed	 Mr. Sakimoto thanked Mr. Shrestha and asked Mr. Sharma for need for clarification in the presentation. Mr. Sharma thanked Mr. Shrestha for the presentation and thanked all the participants of the meeting and provided the following remarks:- Fast Track will not be so much problematic to the Sindhuli Road in future because ICDs are being 	

Topic	Session Highlights and Discussions	Responsible Person/Office
	 developed in the eastern region. Traffics from these areas will follow the Sindhuli Road. Also, the road is going to be tolled (Only tunnel section in the Sindhuli Road is assumed to be tolled) and vehicles unaffordable or unwilling to pay will prefer using the Sindhuli Road. The target year for completion of the enhancement measures needs to be shortened. Survey and design 	
	 period could be squeezed 3 year and construction to 7 years so that completion can be realized by 2031/32. Mr. Sakimoto thanked Mr. Sharma for the remarks and asked him about the priority and designation of Sindhuli Road in the road network. Mr. Sharma replied that all national highways are 	
	proposed to have 2 or more lanes. This applies to the Sindhuli Road as it is also a highway. Traffic is already saturated even under restricted traffics. After capacity enhancement, heavy vehicles will be permitted that will significantly increase the traffic. Tunneling will further shorter the route. It is thus in one of the major priorities.	
	• Mr. Sakimoto asked Mr. Sharma to list the importance of the roads in the priority order and asked about the importance of development of the Sindhuli Road.	
	 importance of development of the Sindhuli Road. Mr. Sharma explained that the first priority is the widening of the East-West highway. Prithvi Highway (KTM- Pokhara) is second, as Pokhara is the tourist area and international airport is being constructed there. Improvement of the route is being done from Muglin to Pokhara under the ADB assistance and from Muglin to Nagdhunga under the WB. Nagdhunga to Kathmandu stretch is already widened. This will be followed by development of the Postal Road (Hulaki road, parallel to the southern border), which is expected to complete in 2 - 3 years. Mid-hill Highway will be completed within 3 years. Some north-south corridors are still in construction which connects India and China. For connecting Kathmandu to Indian Boarder, Fast Track will be the first priority followed by the Sindhuli Road. These routes are important because they connect Kathmandu to the Terai and ultimately to the Indian Boarder. Mr. Sakimoto asked about the budgetary plans for the enhancement of the Sindhuli Road. Mr. Sharma confessed that Nepal is seeking for donor supports from foreign and soft loans for the capacity 	
	 enhancement of the Sindhuli Road. Loan from Japan is preferable and attractive because the interest rate is almost nil and has longer grace period. Even if there is no resource then the government should finance in such important project. According to Mr. Sharma 80 billion NRs for 10 years shouldn't be a problem but opined suggested to have a meeting with the Ministry of Finance, as coordination with the MOF and in earlier projects. Mr. Sakimoto asked about loan from the Japanese Government for Section II for making the tunnels and if Nepal government wanted to make tunnel in section III 	

Торіс	Session Highlights and Discussions Responsible Person/Office
	 then the cost might be more than the estimated and should be borne by Nepal. Mr. Sharma said assistance from Japanese Government will be necessary for improvement of Section II and Section III as these sections apply sophisticated slope protection. It would be difficult for Nepal to apply similar slope protections as well as dismantling process for
	 widening of the road. Mr. Sharma asked if there was any previous discussion(s) with the MOF, Nepal and suggested to have another round of meeting/discussion with/including the MOF to share the project outlines, tentative cost estimates
	 financial study of the project and seek its perspectives. Mr. Hibino told he had a discussion with the MOF and provided a long list of candidate projects including this project on the Sindhuli. He added there was no clear feedback from the MOF and did not go into the details. He expressed 40 Billion NRs (cost for tunneling) is very big amount as a loan at this moment. Recent loan pledge from the GOJ was 10 Billion NRs. and the next one that is coming is 15 Billion NRs. and conveyed that Japan side is not confident to seek for the loan.
	• Mr. Sharma thanked Mr. Takashi and assured that he will talk with Finance Secretary of MOF and update JICA Nepal within couple of days about their response on this topic. He opined that the loan is not for a single year, so he is optimistic about the proposal (loan). He further elaborated that Nepal is still an underdeveloped country and therefore requests, both personally and institutionally from MOPIT, the Japan Government for continuous support as usual. He pointed out that this is not a new project but capacity enhancement of the Sindhuli Road (a Japanese Road). There would be a legacy or ownership in Japan also and as such there is high expectation that the
	 GOJ will show flexibility in the ceiling for loan. Mr. Hibino thanked Mr. Sharma and requested for updates on the response of MOF.
	 Mr. Sakimoto asked if there is any further comments or questions. Mr. Sharma iterated necessity for having meetings in physical and discuss the matter and assured to talk with MOF.
Conclusion	• Mr. Shrestha thanked the attendees and concluded the meeting.

Review and Confirmation: Prepared by:

Confirmed by:

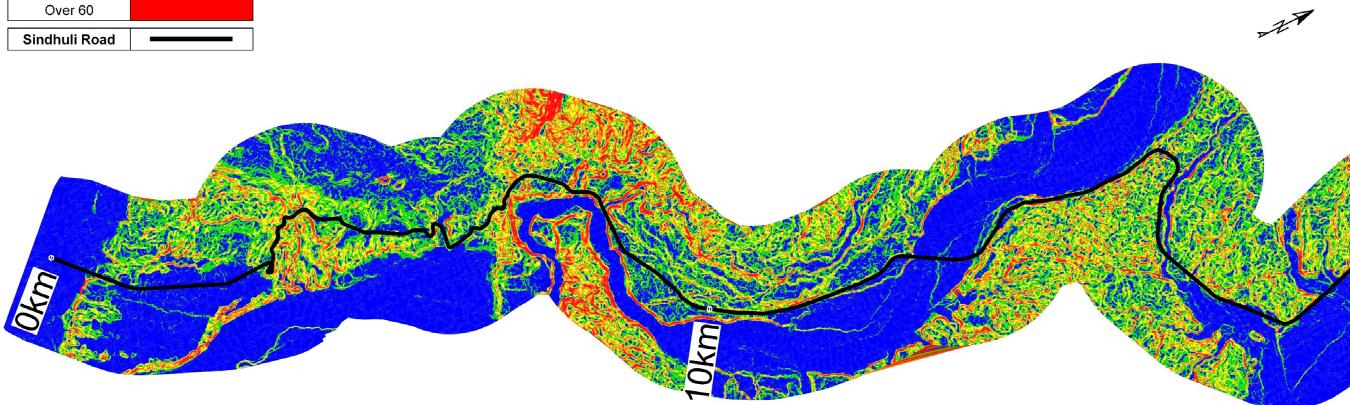
Mr. Robinson Shrestha Team Leader

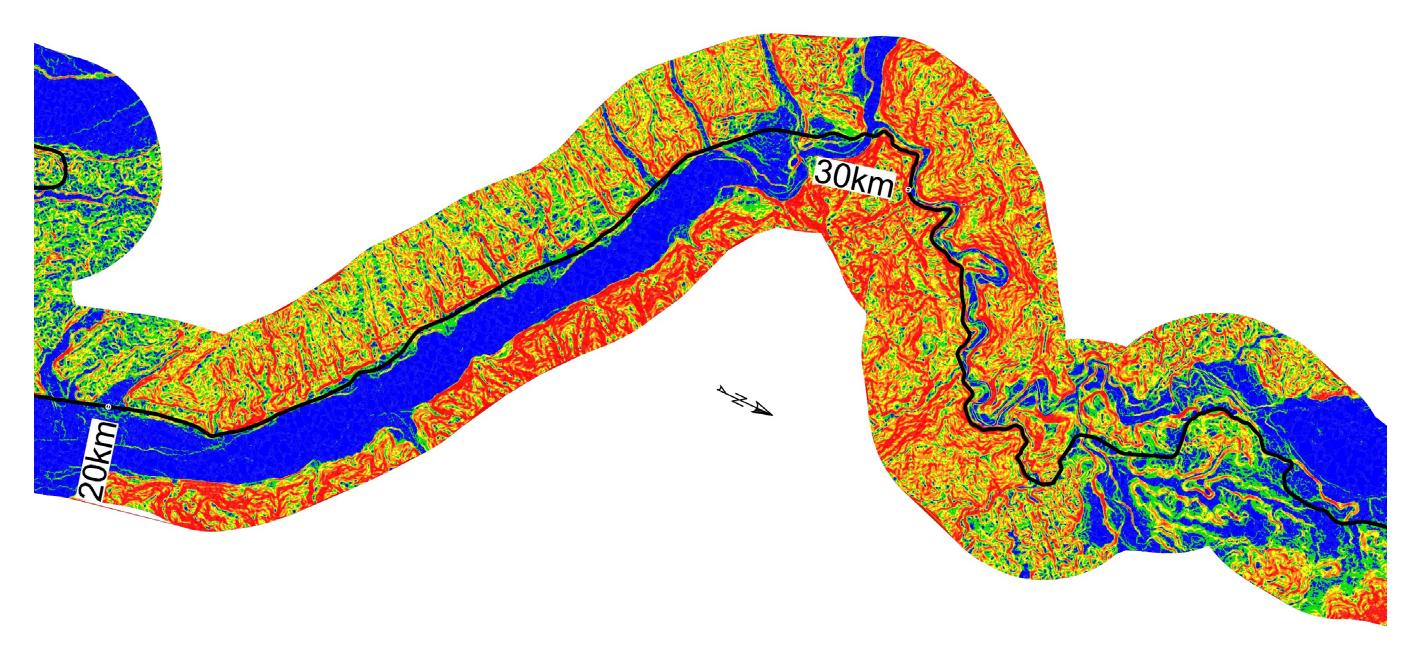
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APPENDIX 4: Ground Slope Distribution



Gradient (%)	Color
0 to 10	
10 to 25	
25 to 40	
40 to 60	
Over 60	
Sindhuli Road	

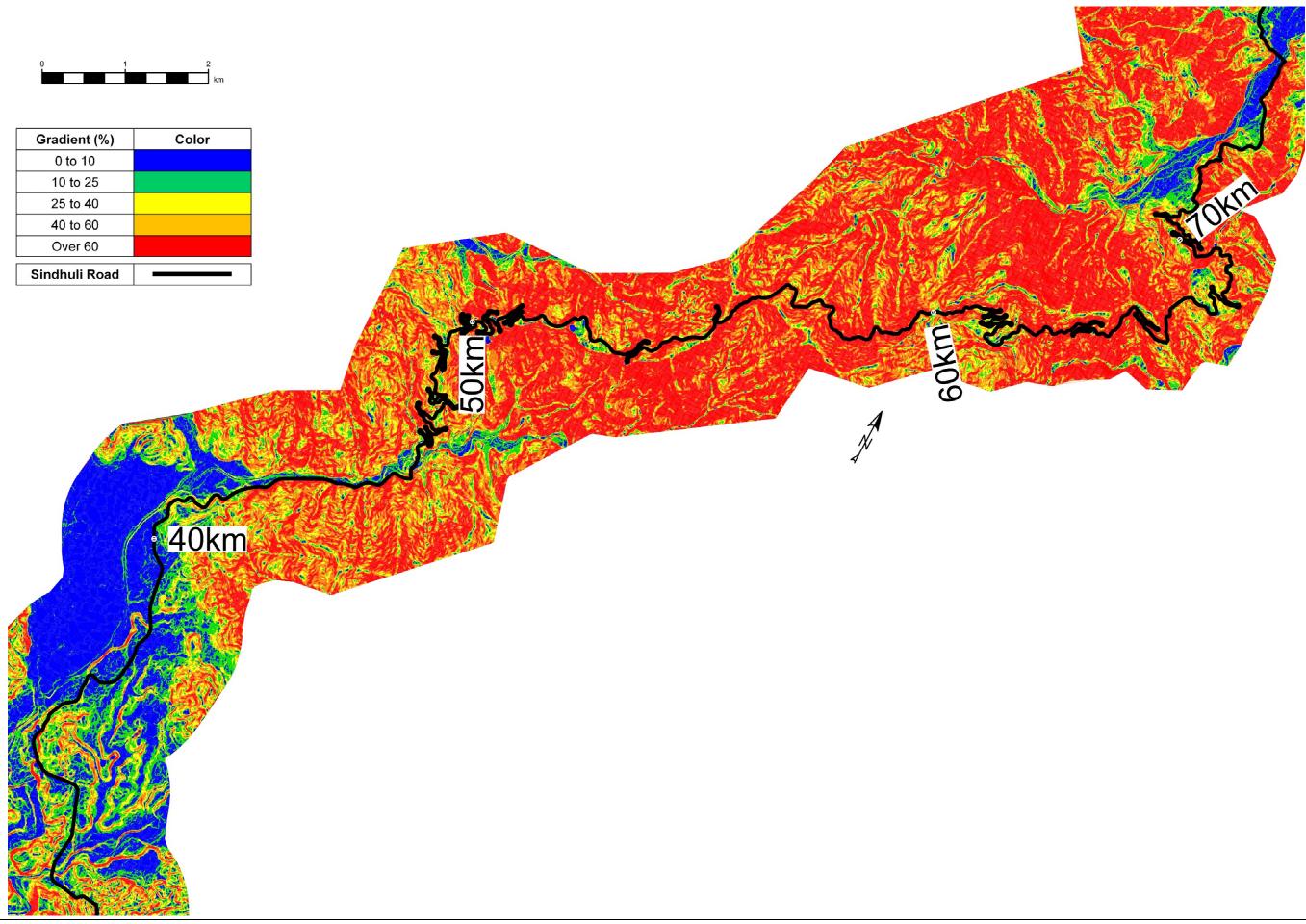


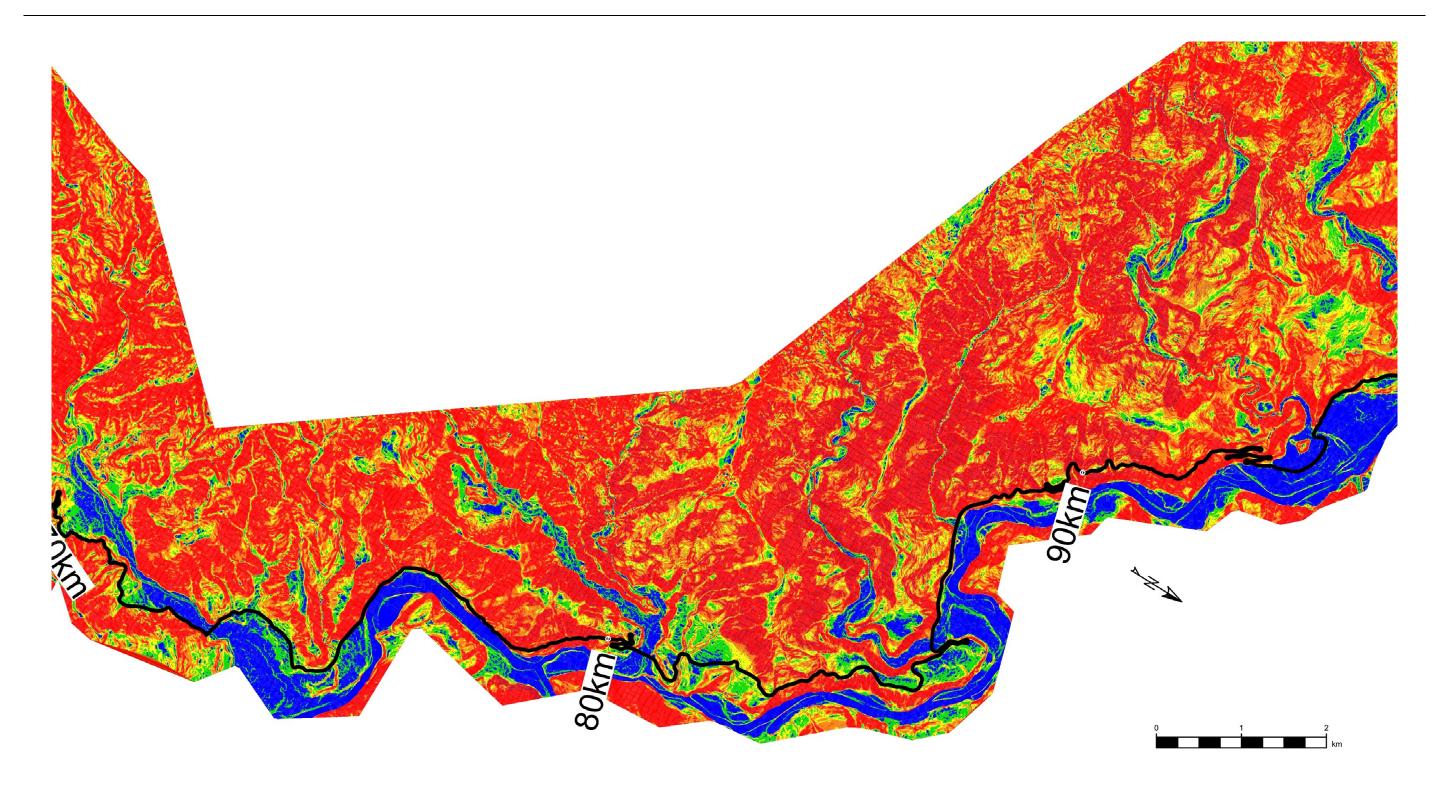




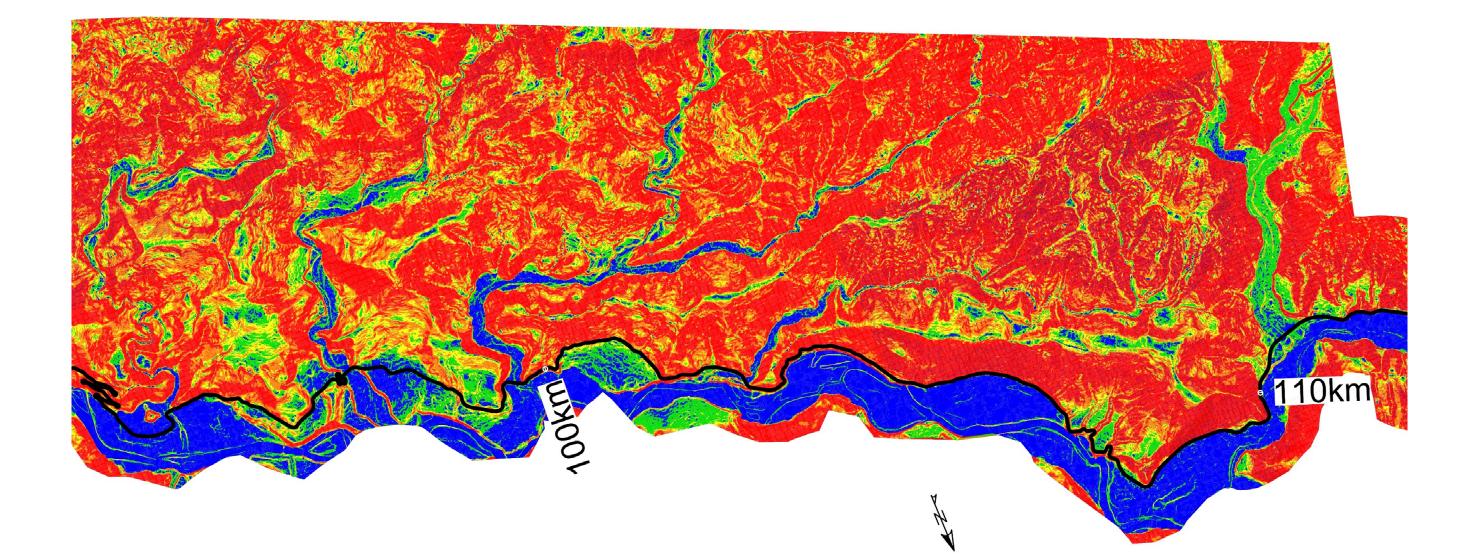
Gradient (%)	Color
0 to 10	
10 to 25	
25 to 40	
40 to 60	
Over 60	
Sindhuli Road	





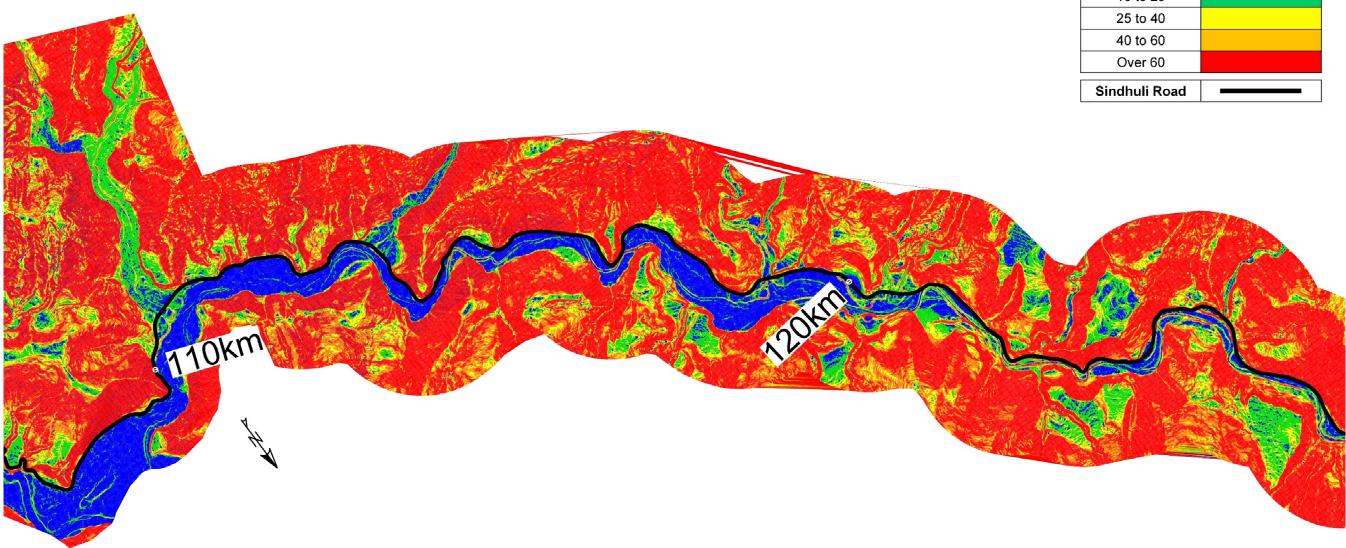


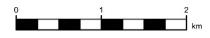
Gradient (%)	Color
0 to 10	
10 to 25	
25 to 40	
40 to 60	
Over 60	
Sindhuli Road	





Gradient (%)	Color
0 to 10	
10 to 25	
25 to 40	
40 to 60	
Over 60	
Sindhuli Road	

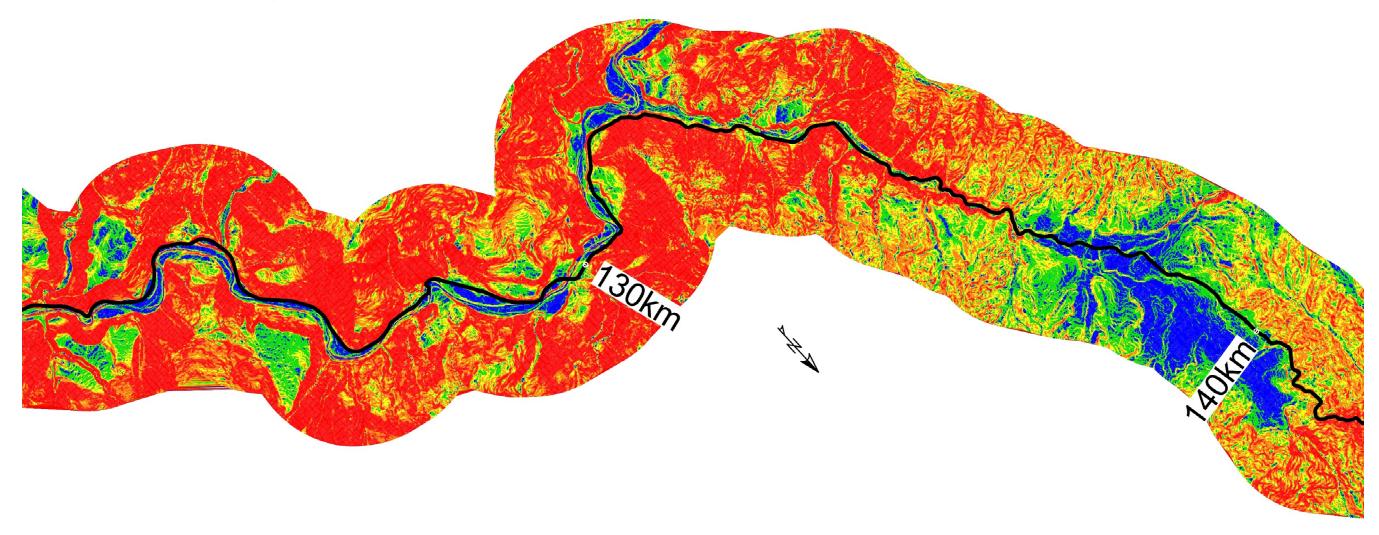


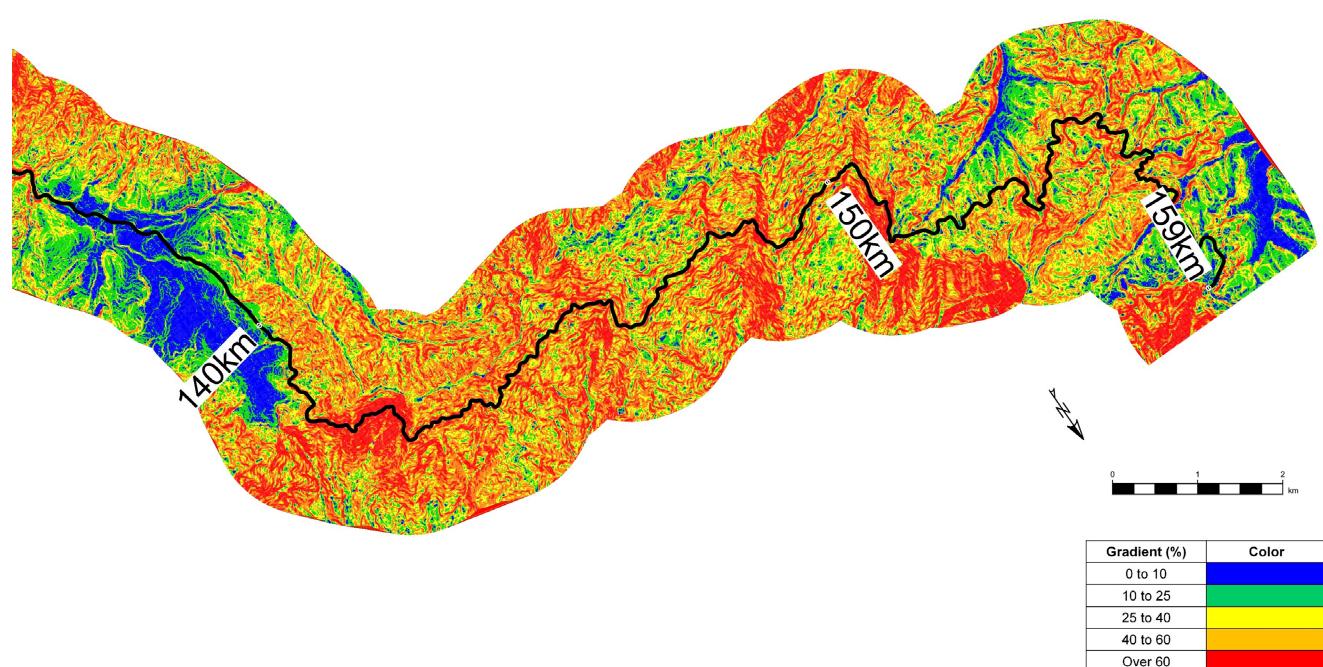


Gradient (%)	Color
0 to 10	
10 to 25	
25 to 40	
40 to 60	
Over 60	
Sindhuli Road	



Gradient (%)	Color
0 to 10	
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25 to 40	
40 to 60	
Over 60	
Sindhuli Road	





Gradient (%)	Color
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25 to 40	
40 to 60	
Over 60	
Sindhuli Road	