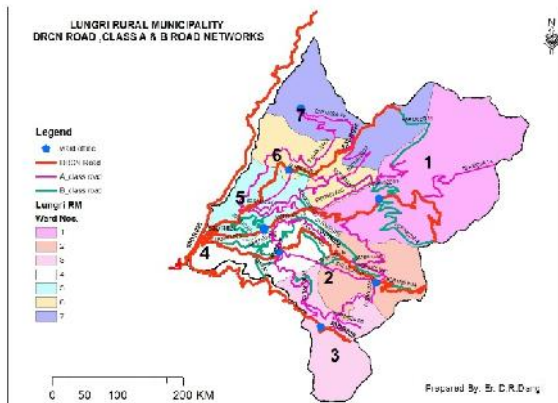




PREFACE / ACKNOWLEDGEMENTS

This RMTMP Report for Lungri Rural Municipality has been prepared on the basis of *RMTMP Guidelines* prepared by the Versatile Engineering Services team in close coordination with Lungri Rural Municipality.

The consultants' would like to express its appreciation to the officials from Versatile Engineering Services team and Lungri Rural Municipality. The Versatile Engineering Services Team Leader Er. Prabin Thapa, Transport/GIS specialist Er. Dillee Ram Dangi, Socialist Mr. Yam Bahadur Khatri and Surveyor Mr. Sandip Chaudhary are highly grateful for the support.

Last but not the least we are very grateful with the Chariman of Lungri Rural Municipality Mr. Durga Bahadur Khadka and Vice Chairman Bhimkala Budhathoki, Chief Executive Officer Mr. Chandra Kanta Paudel, all the Chairmen of seven wards and other staffs of Lungri Rural Municipality as well as all the local peoples of Lungri, who directly and indirectly contribute during this study and field survey.

EXECUTIVE SUMMARY

Lungri municipality is the rural municipal Rolpa District of current Province no. 5. It is named after the beautiful river Lungri which flows through this rural municipality. Its center is situated at Kilachaur, which was headquarter of previous Badachaur V.D.C.

Lungri Rural Municipality has area of 135.23 sq. km and population of 23631. This Rural Municipality has 7 wards which is formed by combining previous 5 VDCs i.e. Badachaur, Gumchaal, Haarjang, Panag and Sirpa. It is surrounded by Pyuthan District in the east, Sunil Smriti Rural Municipality and Sunchhahari Rural Municipality in the West, Sunchhahari Rural Municipality in the North and Pyuthan and Sunil Smriti Rural Municipality in the South.

Situated at 1300 to 2000m above mean sea level this Lungri Municipality has cool and tropical weather.

People with magar caste is major population of Lungri Municipality. Beside Magar people of Bramin, Chhetri, Gurung and Dalit Caste also reside here.

Rolpa district is located in Rapti zone of the Mid-Western Development Region of Nepal. The lowest elevation point is 701 m and the highest elevation point is 3639 m from the mean sea level. As a result of the elevation differences, the district has three different types of climate: tropical up to 1000 m, sub-tropical from 1000-2000 m and temperate above 2000 m. The annual rainfall is about 1836 mm and temperature varies from 3.6°C to 31.2°C. Subsistence agriculture farming, mainly foreign employment is the main source of occupation and livelihood of the majority of the population. Due to low level of agricultural production, the majority of the households face acute food shortages for a large part of the year.

The Lungri rural municipality inventory identified just over 249.60 km of roads, including 77.40 km of road identified in DRCN. In coordination with the Lungri Rural Municipality and seven wards of this rural municipality, 41 roads with total length of 172.20 km were identified and the existing DRCN roads of 77.40 km are already identified by DTMP, Rolpa. All of the Rural and DRCN roads are earthen fair-weather roads.

Road Class	Total length	Black Top	Gravel	Earthen
District road core network	77.40		10	67.40
Rural Municipal roads	172.20			172.20
Total	249.60		10	239.60

ABBREVIATIONS

DCC	District Coordination Committee
DOLIDAR	Department of Local Infrastructure Development and Agriculture Road
DOR	Department of Road
DTICC	District Transport Infrastructure Coordination Committee
RMTMP	Rural Municipality Transport Master Plan
DTMP	District Transport Master Plan
DTPP	District Transport Perspective Plan
GIS	Geographical Information system
GPS	Global Positioning System
GON	Government of Nepal
MoFAGA	Ministry of Federal Affairs and General Administration
SWAp	Sector Wide Approach
VDC	Village Development Committee

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1. INTRODUCTION

Lungri municipality is the rural municipal Rolpa District of current Province no. 5. It is named after the beautiful river Lungri which flows through this rural municipality. Its center is situated at Kilachaur, which was headquarter of previous Badachaur V.D.C.

Lungri Rural Municipality has area of 135.23 sq. km and population of 23631. This Rural Municipality has 7 wards which is formed by combining previous 5 VDCs i.e. Badachaur, Gumchaal, Haarjang, Panag and Sirpa. It is surrounded by Pyuthan District in the east, Sunil Smriti Rural Minicipality and Sunchhahari Rural Minicipality in the West, Sunchhahari Rural Minicipality in the North and Pyuthan and Sunil Smriti Rural Municipality in the South.

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Rolpa district is located in Rapti zone of the Mid-Western Development Region of Nepal. The lowest elevation point is 701 m and the highest elevation point is 3639 m from the mean sea level. As a result of the elevation differences, the district has three different types of climate: tropical up to 1000 m, sub-tropical from 1000-2000 m and temperate above 2000 m. The annual rainfall is about 1836 mm and temperature varies from 3.6°C to 31.2°C. Subsistence agriculture farming, mainly foreign employment is the main source of occupation and livelihood of the majority of the population. Due to low level of agricultural production, the majority of the households face acute food shortages for a large part of the year.

Rolpa district is located in Rapti zone of the Mid-Western Development Region of Nepal. It is border with Rukum district to the North, Baglung and Pyuthan to the East, Dang to the South and Salyan to the West. The district has 51 VDCs, 11 Ilakas and 2 constituency areas; the total area of the district is 1879 sq. km. The district lies in Mid-Hills. The lowest elevation point is 701 m and the highest elevation point is 3639 m from the mean sea level. As a result of the elevation differences, the district has three different types of climate: tropical up to 1000 m, sub-tropical from 1000-2000 m and temperate above 2000 m. The annual rainfall is about 1836 mm and temperature varies from 3.6°C to 31.2°C. Subsistence agriculture farming, mainly foreign employment is the main source of occupation and livelihood of the majority of the population. Due to low level of agricultural production, the majority of the households face acute food shortages for a large part of the year.

According to the National Census 2011, the total population of the rural municipality is 23631 comprising 13127 female (55.55%) and 10504 male (45.45%) residing in 4402 households. Lungri Rural Municipality has an average population density of around 174.75 people per sq. km. The average family size is 5.36. Life expectancy of the people is 52 years. The average literacy rate is about 45% (62.59% female and 26.71% male are literate). Lungri Rural Municipality has a multi ethnic composition with Magar, Chhetri, Kami and other. The common language is Nepali (81.55%) followed by Magar (18.17%) and other (0.28%).

Although accessibility to Lungri is limited, this is improving rapidly. The Rural Municipality center is at Kilachaur which was the headquarter of previous badachaur V.D.C. The nearest market place is Sulichaur which is 5km from the Municipal center Kilachaur. Sulichaur is about 25km from Rolpa District headquarter Libang and 80km from Bhalubang of Dang District.

2. RURAL MUNICIPALITY ROAD CORE NETWORK (RMRCN)

This chapter gives an overview of the existing roads in Lungri Rural Municipality, distinguishing between Class A and Class B of the core network of the Rural Municipality. It goes on to identify those roads that make up the rural municipal core network (RMRCN) that will form the basis for this RMTMP. The rural roads are classified as Class A and Class B Roads.

2.1 TOTAL ROAD NETWORK

Lungri Rural Municipality has identified road network of 249.60 kilometers, including 77.40 kilometers of DRCN identified by DTMP and 172.20 kilometers of rural roads identified by Lungri Rural Municipality. Most of the roads have an earthen surface, only few kilometers of DRCN is graveled. A map of the total road network in Lungri district is shown in Figure 2 at the end of this chapter.

Table 2.1.1 Total road length (km)

Road Class	Total length	Black Top	Gravel	Earthen
District road core network	77.40		10	67.40
Rural Municipal roads	172.20			172.20
Total	249.60		10	239.60

2.2 DRCN ROADS

Rural Municipality has four DRCN roads identified by DTMP, Rolpa district totaling 77.40 km. The Badachaur-Pati Gumchal-Pang Road connects Rural Municipal Center Kilachaur to badachaur which then connects to Sulichaur by Ruinibang-Badachaur-Gumchal-Harjang Road. 10 km of Ruinibang-Badachaur-Gumchal-Pang Road is graveled and the remaining all the roads of this rural municipality are earthen.

Table 2.2.1 DRCN identified Roads

Code	Name of Road	Length
53DR026	Ruinibang-Badachaur-Gumchal-Harjang Road	21.1
53DR027	Domai-Kilachaur-Pati Gumchal-Lalubang-Chheudar-Pang Deurali Road	21.5
53DR028	Dhulewodhar-Namja-Narneta-Gothechaur Road	19.8
53DR029	Sulichaur-Tebang-Pawang-JutungKhola-Mainabare Road	15
Total		77.40

2.3 RURAL MUNICIPALITY ROAD CORE NETWORK

As part of the preparation of this RMTMP, the Rural Municipal Road Core Network (RMRCN) was identified with Rural Municipality and each Ward. This RMRCN is the minimum network that allows all ward center to be connected with the district headquarters and nearest market center, either directly or through other wards. In the selection of the RMRCN roads, account was taken of the road conditions and the existing traffic levels. The identified RMRCN roads were subsequently provided with road codes according to national standards.

The resulting Rural Municipal Road Core Network in Lungri Municipal is shown in figure 3 at the end of this chapter. The RMRCN selected from existing rural roads covers 7 wards out of Lungri Rural Municipality. The RMRCN consists of 41 rural roads with a total length of 172.20 km and new roads are created for joining unlinked wards which is considered as RMRCN that consists of 7 ward roads with extension of length 118.99 km. Therefore, all together (existing and new roads) 249.60 km length of RMRCN is obtained. RMRCN roads are some currently earthen roads and some of to be constructed proposed road (see Table 2.3.1). A complete list of the RMRCN roads and their characteristics is provided in Table 2.3.2.

Table 2.3.1 Total road length (km)

Roads	Length	BT	GR	ER
DRCN	77.40		10	67.40
RMRCN	172.20			172.20
Total	249.60		10	239.60

Table 2.3.2 Rural Municipal Road Core Network (km)

S.N.	Code	Description	Total length
1	53RM02A01	Airport-TalloSewar-Beri-TalloGumchal-Harjang-Salmaja Road	14.00
2	53RM02A02	Thulonamja-KaKhola-Malepatla-Tasibang Road	6.50
3	53RM02A03	BistaPokhara-Purano Bojyang-PateGumchal-Gargare-BhaisaChhope Road	6.70
4	53RM02A04	Simgitha-Jutung-Narneta Road	6.10
5	53RM02A05	Lalubang-Alibang-Eipe-Darkhani-Bhaibang-Bakhrehkor Road	9.00
6	53RM02A06	Beunre-Aunlesari- Road	4.40
7	53RM02A07	Salbisauni-Purano Bojyang-Timurga Road	5.40
8	53RM02A08	Kaphaldhik-Beunre-Sinden Khola-Purnagaun Road	8.20
9	53RM02A09	Gumchal-Fulbarsana-Gargare-Dhaukhola-Aalibang Road	7.10
10	53RM02A10	BojyangKhola-Saldanda-Kunjari- Road	5.10
11	53RM02A11	Bhumaitala-Panchkhai-Gatekhola-Cheudar Road	6.55
12	53RM02A12	Pachkhai-Asarekafal-Rajthar-Jaunlepokhara Road	2.90
13	53RM02A13	BojyangKhola-Libanggaira-Purnagaun Road	4.10
14	53RM02A16	Pang Pokhara-Lali-Ririp Road	7.40
15	53RM02A17	Dhunga Uchalne-Harjang Road	6.20
16	53RM02A18	Dhunga Uchalne-Dangbase-Machhena Road	0.64

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17	53RM02A19	Tallo Gumcha-Uppallo Gumchal-Patla ChaukiGhar-Khara Road	5.26
18	53RM02A20	Beri-Adharbhut Vidhyala-Kalimati-Darakanda-Matadhara Road	6.15
19	53RM02A21	Gajala-Khanibang-Bistapokhara Road	3.15
20	53RM02A22	Bistapokhara-Tunital	3.46
21	53RM02A23	Alibang-Daukhola-Gargare Road	2.50
22	53RM02B01	Pachkhai-Dulepati-Chhap Road	1.80
23	53RM02B02	Gothalna-Dhanekharka Road	2.40
24	53RM02B03	Daibang-Majhuwa-Alibang Road	4.60
25	53RM02B04	Jogithar-Rajthar-Popake Road	1.50
26	53RM02B05	Dandagaun-Kunjari-Panikhola Road	2.70
27	53RM02B06	Swamirukh-Thulo Namja-Hasandhara Road	2.20
28	53RM02B07	Airport-Garmi-Gajabang-Kilachaur Road	3.80
29	53RM02B08	Dhajaphalne-Garangja-Upalokharke-Libang gaira Road	2.90
30	53RM02B09	Phulbarsana-JanjyotiMaVi-Chidepani Road	1.20
31	53RM02B10	Airport-Pipalchaur-Balle Road	2.80
32	53RM02B11	Bhumaithala-Panchkhai-Tengna-Ponghadhara Road	4.60
33	53RM02B12	Chandikhola-Kaddar Pokhara-Deurali Road	9.10
34	53RM02B13	Libang Gaira-Saldanda-Chiura rukh Road	2.10
35	53RM02B14	Eipe-Bhaisachope-Dhungauchalne(new)	4.80
36	53RM02B15	Panikhola-Okhalkhope-bhumethala	0.62
37	53RM02B16	Sahakari 4-Sunilsmriti-Pabang (New)	1.40
38	53RM02B17	Chaite bisuna-Sivaji Than	0.55
39	53RM02B18	Gajabang-Salghari (New)	0.45
40	53RM02B19	Timurgha-gasala (New)	0.57
41	53RM02B20	Dhajaphalna-Sanonamja Road	1.30
		Total	172.20

3. RURAL MUNICIPAL TRANSPORT PERSPECTIVE PLAN (RMTPP)

This chapter looks at the required interventions regarding conservation, improvement and new construction of the rural municipal road core network. It provides a complete list of all works required in the RMRCN, which together form the Rural Municipal Transport Perspective Plan (DTPP). For the works forming part of the RMTPP, chapter 4 will subsequently provide cost estimation, while chapter 5 will rank the works according to priority and chapter 6 will select those priority works that can be carried out in the next 5 years and thus form part of the Rural Municipal Transport Master Plan (RMTMP).

3.1 CONSERVATION

Conservation refers to the actions required to repair a road and keep it in good and passable condition. For RMTMP planning purposes standard costs per kilometre for each maintenance type are applied to the entire rural municipality road core network, whereby for certain maintenance type's distinction is made according to the surface type of the road. Identification of the actual maintenance requirements of each road is made annually in the ARMP. Conservation activities include:

1. Emergency maintenance - Basic repairs aimed at removing landslides and repairing damage to the road that inhibit the proper use of the road and make it impassable. This mainly takes place during and after the rainy season. A provisional lump sum is reserved for the entire rural municipality road core network based on the network length. Allocation to specific road sections is based on the actual need for clearing landslides or repairing washouts and cuts in the road.
2. Routine maintenance - General maintenance of the road aimed at preventing damage by ensuring the proper working of the different road elements (retaining walls, drainage system, carriageway, etc.) and cutting vegetation. This is carried out each year on a more or less continuous basis. Routine maintenance is required for the entire rural municipality road core network. The specific requirements for routine maintenance are determined on an annual basis through the road condition survey and defined in the ARMP.
3. Recurrent maintenance - Repairs of minor damage to the road surface and road structures to bring them back to good condition. This is generally carried out once or twice a year. Recurrent maintenance is required for the entire rural municipality road core network, whereby distinction is made according to the surface type. The specific requirements for recurrent maintenance are determined on an annual basis through the road condition survey and defined in the ARMP.
4. Periodic maintenance - Larger repairs to the road largely aimed at renewing the road surface through re-gravelling, resealing or overlays. It is generally carried out with several years interval. Although periodic maintenance is only required for specific sections of the rural municipality road core network, a lump sum allocation is made for the entire rural municipality road core network based on average annual requirements, distinguishing between different surface types. The specific periodic maintenance

requirements are determined on an annual basis through the annual road condition survey and defined in the ARMP.

The length of roads to be included under each conservation type for the first year is indicated below. This is basically the entire rural municipality road core network in as far as it does not require rehabilitation.

Table 3.1.1 Conservation requirements

Code	Emergency maintenance (km)	Routine maintenance (km)	Recurrent maintenance (km)	Periodic maintenance (km)	Rehabilitation (km)
53DR026	21.1	21.1	21.1	21.1	21.1
53DR027	21.5	21.5	21.5	21.5	21.5
53DR028	19.8	19.8	19.8	19.8	19.8
53DR029	15	15	15	15	15
53RM02A01	14.00	14.00	14.00	14.00	14.00
53RM02A02	6.50	6.50	6.50	6.50	6.50
53RM02A03	6.70	6.70	6.70	6.70	6.70
53RM02A04	6.10	6.10	6.10	6.10	6.10
53RM02A05	9.00	9.00	9.00	9.00	9.00
53RM02A06	4.40	4.40	4.40	4.40	4.40
53RM02A07	5.40	5.40	5.40	5.40	5.40
53RM02A08	8.20	8.20	8.20	8.20	8.20
53RM02A09	7.10	7.10	7.10	7.10	7.10
53RM02A10	5.10	5.10	5.10	5.10	5.10
53RM02A11	6.55	6.55	6.55	6.55	6.55
53RM02A12	2.90	2.90	2.90	2.90	2.90
53RM02A13	4.10	4.10	4.10	4.10	4.10
53RM02A16	7.40	7.40	7.40	7.40	7.40
53RM02A17	6.20	6.20	6.20	6.20	6.20
53RM02A18	0.64	0.64	0.64	0.64	0.64
53RM02A19	5.26	5.26	5.26	5.26	5.26
53RM02A20	6.15	6.15	6.15	6.15	6.15
53RM02A21	3.15	3.15	3.15	3.15	3.15
53RM02A22	3.46	3.46	3.46	3.46	3.46
53RM02A23	2.50	2.50	2.50	2.50	2.50
53RM02B01	1.80	1.80	1.80	1.80	1.80
53RM02B02	2.40	2.40	2.40	2.40	2.40
53RM02B03	4.60	4.60	4.60	4.60	4.60
53RM02B04	1.50	1.50	1.50	1.50	1.50
53RM02B05	2.70	2.70	2.70	2.70	2.70
53RM02B06	2.20	2.20	2.20	2.20	2.20

Code	Emergency maintenance (km)	Routine maintenance (km)	Recurrent maintenance (km)	Periodic maintenance (km)	Rehabilitation (km)
53RM02B07	3.80	3.80	3.80	3.80	3.80
53RM02B08	2.90	2.90	2.90	2.90	2.90
53RM02B09	1.20	1.20	1.20	1.20	1.20
53RM02B10	2.80	2.80	2.80	2.80	2.80
53RM02B11	4.60	4.60	4.60	4.60	4.60
53RM02B12	9.10	9.10	9.10	9.10	9.10
53RM02B13	2.10	2.10	2.10	2.10	2.10
53RM02B14	4.80	4.80	4.80	4.80	4.80
53RM02B15	0.62	0.62	0.62	0.62	0.62
53RM02B16	1.40	1.40	1.40	1.40	1.40
53RM02B17	0.55	0.55	0.55	0.55	0.55
53RM02B18	0.45	0.45	0.45	0.45	0.45
53RM02B19	0.57	0.57	0.57	0.57	0.57
53RM02B20	1.30	1.30	1.30	1.30	1.30

3.2 IMPROVEMENT

Improvement refers to actions required to improve a road to bring it to a maintainable all-weather standard. It includes the following actions, which for Lungri Rural Municipality are described in more detail in the subsequent sections.

1. Rehabilitation - Significant repairs required to bring a very poor road back to a maintainable standard. This does not include any changes to the original surface type.
2. Gravelling - Placement of a gravel layer to make it all-weather and ensure that the road remains passable during the rainy season.
3. Cross drainage - Placement of suitable cross-drainage structures with the aim of making the road all-weather and ensuring that the road remains passable even during the rainy season
4. Protective structures - Placement of retaining walls and lined side drains to avoid excessive damage to the road during the rainy season and bring it to a maintainable standard.
5. Blacktopping - Placement of a blacktop layer in roads with traffic volumes exceeding 50passenger car units (PCU) to reduce damage to the road surface
6. Widening - Increase of the road width in roads with traffic volumes exceeding 500 passenger car units (PCU) to ensure the proper flow of traffic.

3.2.1 REHABILITATION

No rehabilitation needs were identified in the rural municipality road core network.

Table 3.2.1 Sections of the rural municipality road core network requiring rehabilitation

Code	Description	Total length (km)	Gravelling (km)
Total		0.00	0.00

3.2.2 GRAVELLING

As the entire rural Municipal road core network needs to be brought to an all-weather status, gravelling of the road surface is required for all the earthen sections in the DRCN. For Rolpa this concerns the total of 238.64 km of RMRCN roads.

Table 3.2.2 Sections of the rural municipality road core network requiring gravelling

Code	Description	Total length (km)	Existing Width (m)	Earthen (km)
53DR026	Ruinibang-Badachaur-Gumchal-Harjang Road	21.1	5.5	
53DR027	Domai-Kilachaur-Pati Gumchal-Lalubang-Chheudar-Pang Deurali Road	21.5	5.5	
53DR028	Dhulewodhar-Namja-Narneta-Gothechaur Road	19.8	5.5	
53DR029	Sulichaur-Tebang-Pawang-JutungKhola-Mainabare Road	15	5.5	
53RM02A01	Airport-TalloSewar-Beri-TalloGumchal-Harjang-Salmaja Road	14.00	3.5	
53RM02A02	Thulonamja-KaKhola-Malepatla-Tasibang Road	6.50	3.5	
53RM02A03	BistaPokhara-Purano Bojyang-PateGumchal-Gargare-BhaisaChhope Road	6.70	3.5	
53RM02A04	Simgitha-Jutung-Narneta Road	6.10	3.5	
53RM02A05	Lalubang-Alibang-Eipe-Darkhani-Bhaibang-Bakhrekhor Road	9.00	3.5	
53RM02A06	Beunre-Aunlesari- Road	4.40	3.5	
53RM02A07	Salbisauni-Purano Bojyang-Timurga Road	5.40	3.5	
53RM02A08	Kaphaldhik-Beunre-Sinden Khola-Purnagaun Road	8.20	3.5	
53RM02A09	Gumchal-Fulbarsana-Gargare-Dhaukhola-Aalibang Road	7.10	3.5	
53RM02A10	BojyangKhola-Saldanda-Kunjari- Road	5.10	3.5	
53RM02A11	Bhumaithala-Panchkhai-Gatekhola-Cheudar Road	6.55	3.5	

Code	Description	Total length (km)	Existing Width (m)	Earthen (km)
53RM02A12	Pachkhai-Asarekafal-Rajthar-Jaunlepokhara Road	2.90	3.5	
53RM02A13	BojyangKhola-Libanggaira-Purnagaun Road	4.10	3.5	
53RM02A16	Pang Pokhara-Lali-Ririp Road	7.40	3.5	
53RM02A17	Dhunga Uchalne-Harjang Road	6.20	3.5	
53RM02A18	Dhunga Uchalne-Dangbase-Machhena Road	0.64		
53RM02A19	Tallo Gumcha-Uppallo Gumchal-Patla ChaukiGhar-Khara Road	5.26		
53RM02A20	Beri-Adharbhut Vidhyala-Kalimati-Darakanda-Matadhara Road	6.15		
53RM02A21	Gajala-Khanibang-Bistapokhara Road	3.15		
53RM02A22	Bistapokhara-Tunital	3.46		
53RM02A23	Alibang-Daukhola-Gargare Road	2.50		
53RM02B01	Pachkhai-Dulepati-Chhap Road	1.80	3.5	
53RM02B02	Gothhalna-Dhanekharka Road	2.40	3.5	
53RM02B03	Daibang-Majhuwa-Alibang Road	4.60	3.5	
53RM02B04	Jogithar-Rajthar-Popake Road	1.50	3.5	
53RM02B05	Dandagaun-Kunjari-Panikhola Road	2.70	3.5	
53RM02B06	Swamirukh-Thulo Namja-Hasandhara Road	2.20	3.5	
53RM02B07	Airport-Garmi-Gajabang-Kilachaur Road	3.80	3.5	
53RM02B08	Dhajaphalne-Garangja-Upalokharke-Libang gaira Road	2.90	3.5	
53RM02B09	Phulbarsana-JanjyotiMaVi-Chidepani Road	1.20	3.5	
53RM02B10	Airport-Pipalchaur-Balle Road	2.80	3.5	
53RM02B11	Bhumaithala-Panchkhai-Tengna-Ponghadhara Road	4.60	3.5	
53RM02B12	Chandikhola-Kaddar Pokhara-Deurali Road	9.10	3.5	
53RM02B13	Libang Gaira-Saldanda-Chiura rukh Road	2.10	3.5	
53RM02B14	Eipe-Bhaisachope-Dhungauchalne(new)	4.80		
53RM02B15	Panikhola-Okhalkhope-bhumethala	0.62		
53RM02B16	Sahakari 4-Sunilsmriti-Pabang (New)	1.40		
53RM02B17	Chaite bisuna-Sivaji Than	0.55		
53RM02B18	Gajabang-Salghari (New)	0.45		

Code	Description	Total length (km)	Existing Width (m)	Earthen (km)
53RM02B19	Timurgha-gasala (New)	0.57		
53RM02B20	Dhajaphalna-Sanonamja Road	1.30		
	Total	249.60		

3.2.3 CROSS DRAINAGE

The need for cross drainage was identified for the different DRCN roads. The total length of 483 m bridge, 64 m total length of slab culvert, 323 m total length of cement concrete causeway, 50 m total length of stone causeway and 24 units of pipe culvert were identified as being required.

Table 3.2.3 Required cross drainage structures

Road code	Road Name	Length (km)	Bridge (m)	Slab culvert (m)	CC Causeway (m)	Stone Causeway (m)	Pipe culvert (units)
53DR026	Ruinibang-Badachaur-Gumchal-Harjang Road	21.1	2	3	3		3
53DR027	Domai-Kilachaur-Pati Gumchal-Lalubang-Chheudar-Pang Deurali Road	21.5	3	2	3		3
53DR028	Dhulewodhar-Namja-Narneta-Gothechaur Road	19.8	2	2	3		5
53DR029	Sulichaur-Tebang-Pawang-JutungKhola-Mainabare Road	15	1	2	3		4
53RM02A01	Airport-TalloSewar-Beri-TalloGumchal-Harjang-Salmaja Road	14.00			2		8
53RM02A02	Thulonamja-KaKhola-Malepatla-Tasibang Road	6.50					6
53RM02A03	BistaPokhara-Purano Bojyang-PateGumchal-Gargare-BhaisaChhope Road	6.70					7
53RM02A04	Simgitha-Jutung-Narneta Road	6.10	1		2		5
53RM02A05	Lalubang-Alibang-Eipe-Darkhani-Bhaibang-Bakhrekhor Road	9.00					5
53RM02A06	Beunre-Aunlesari- Road	4.40					

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53RM02A07	Salbisauni-Purano Bojyang-Timurga Road	5.40					4
53RM02A08	Kaphaldhik-Beunre-Sindeni Khola-Purnagaun Road	8.20	1	2			6
53RM02A09	Gumchal-Fulbarsana-Gargare-Dhaukhola-Aalibang Road	7.10					3
53RM02A10	BojyangKhola-Saldanda-Kunjari- Road	5.10					3
53RM02A11	Bhumaithala-Panchkhai-Gatekhola-Cheudar Road	6.55			1		3
53RM02A12	Pachkhai-Asarekafal-Rajthar-Jaunlepokhara Road	2.90					
53RM02A13	BojyangKhola-Libanggaira-Purnagaun Road	4.10					
53RM02A16	Pang Pokhara-Lali-Ririp Road	7.40					
53RM02A17	Dhunga Uchalne-Harjang Road	6.20					
53RM02A18	Dhunga Uchalne-Dangbase-Machhena Road	0.64	1				2
53RM02A19	Tallo Gumcha-Uppallo Gumchal-Patla ChaukiGhar-Khara Road	5.26					1
53RM02A20	Beri-Adharbhut Vidhyala-Kalimati-Darakanda-Matadhara Road	6.15					
53RM02A21	Gajala-Khanibang-Bistapokhara Road	3.15		2	1		3
53RM02A22	Bistapokhara-Tunital	3.46	1				
53RM02A23	Alibang-Daukhola-Gargare Road	2.50					
53RM02B01	Pachkhai-Dulepati-Chhap Road	1.80					2
53RM02B02	Gothhalna-Dhanekharka Road	2.40	2				
53RM02B03	Daibang-Majhuwa-Alibang Road	4.60	3	2	1		7
53RM02B04	Jogithar-Rajthar-Popake Road	1.50	2	2			3
53RM02B05	Dandagaun-Kunjari-Panikhola Road	2.70					
53RM02B06	Swamirukh-Thulo Namja-Hasandhara Road	2.20					
53RM02B07	Airport-Garmi-Gajabang-Kilachaur Road	3.80					
53RM02B08	Dhajaphalne-Garangja-Upalokharke-Libang gaira Road	2.90					
53RM02B09	Phulbarsana-JanjyotiMaVi-Chidepani Road	1.20					
53RM02B10	Airport-Pipalchaur-Balle Road	2.80					
53RM02B11	Bhumaithala-Panchkhai-Tengna-Ponghadhara Road	4.60					
53RM02B12	Chandikhola-Kaddar Pokhara-Deurali Road	9.10					
53RM02B13	Libang Gaira-Saldanda-Chiura rukh Road	2.10					
53RM02B14	Eipe-Bhaisachope-Dhungauchalne(new)	4.80					
53RM02B15	Panikhola-Okhalkhope-bhumethala	0.62					

53RM02B16	Sahakari 4-Sunilsmriti-Pabang (New)	1.40					
53RM02B17	Chaite bisuna-Sivaji Than	0.55					
53RM02B18	Gajabang-Salghari (New)	0.45					
53RM02B19	Timurgha-gasala (New)	0.57					
53RM02B20	Dhajaphalna-Sanonamja Road	1.30					
	Total	249.60	19.00	17.00	19.00	0.00	83.00

3.2.4 WIDENING

Widening of the Rural Municipal road core network in Lungri is required in many locations to bring it up to the minimum standard and to ensure sufficient space in the curves. Additional widening to a higher standard is not required because traffic volumes remain very low.

Table 3.2.4 Sections of the rural municipality road core network requiring widening

Code	Road name	Length	Length Required extra Widening
53RM02A01	Airport-TalloSewar-Beri-TalloGumchal-Harjang-Salmaja Road	14.00	10.5
53RM02A02	Thulonamja-KaKhola-Malepatla-Tasibang Road	6.50	4.875
53RM02A03	BistaPokhara-Purano Bojyang-PateGumchal-Gargare-BhaisaChhope Road	6.70	5.025
53RM02A04	Simgitha-Jutung-Narneta Road	6.10	4.575
53RM02A05	Lalubang-Alibang-Eipe-Darkhani-Bhaibang-Bakhrekhor Road	9.00	3.9
53RM02A06	Beunre-Aunlesari- Road	4.40	4
53RM02A07	Salbisauni-Purano Bojyang-Timurga Road	5.40	4.05
53RM02A08	Kaphaldhik-Beunre-Sindeni Khola-Purnagaun Road	8.20	5.175
53RM02A09	Gumchal-Fulbarsana-Gargare-Dhaukhola-Aalibang Road	7.10	5.805
53RM02A10	BojyangKhola-Saldanda-Kunjari- Road	5.10	3.825
53RM02A11	Bhumaithala-Panchkhai-Gatekhola-Cheudar Road	6.55	4.5
53RM02A12	Pachkhai-Asarekafal-Rajthar-Jaunlepokhara Road	2.90	
53RM02A13	BojyangKhola-Libanggaira-Purnagaun Road	4.10	

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Code	Road name	Length	Length Required extra Widening
53RM02A16	Pang Pokhara-Lali-Ririp Road	7.40	4.2
53RM02A17	Dhunga Uchalne-Harjang Road	6.20	4.65
53RM02A18	Dhunga Uchalne-Dangbase-Machhena Road	0.64	3.75
53RM02A19	Tallo Gumcha-Uppallo Gumchal-Patla ChaukiGhar-Khara Road	5.26	4.875
53RM02A20	Beri-Adharbhut Vidhyala-Kalimati-Darakanda-Matadhara Road	6.15	5.625
53RM02A21	Gajala-Khanibang-Bistapokhara Road	3.15	
53RM02A22	Bistapokhara-Tunital	3.46	
53RM02A23	Alibang-Daukhola-Gargare Road	2.50	
53RM02B01	Pachkhai-Dulepati-Chhap Road	1.80	
53RM02B02	Gothhalna-Dhanekharka Road	2.40	
53RM02B03	Daibang-Majhuwa-Alibang Road	4.60	
53RM02B04	Jogithar-Rajthar-Popake Road	1.50	
53RM02B05	Dandagaun-Kunjari-Panikhola Road	2.70	
53RM02B06	Swamirukh-Thulo Namja-Hasandhara Road	2.20	
53RM02B07	Airport-Garmi-Gajabang-Kilachaur Road	3.80	
53RM02B08	Dhajaphalne-Garangja-Upallokharke-Libang gaira Road	2.90	
53RM02B09	Phulbarsana-JanjyotiMaVi-Chidepani Road	1.20	
53RM02B10	Airport-Pipalchaur-Balle Road	2.80	
53RM02B11	Bhumaithala-Panchkhai-Tengna-Ponghadhara Road	4.60	
53RM02B12	Chandikhola-Kaddar Pokhara-Deurali Road	9.10	
53RM02B13	Libang Gaira-Saldanda-Chiura rukh Road	2.10	
53RM02B14	Eipe-Bhaisachope-Dhungauchalne(new)	4.80	

Code	Road name	Length	Length Required extra Widening
53RM02B15	Panikhola-Okhalkhope-bhumethala	0.62	
53RM02B16	Sahakari 4-Sunilsmriti-Pabang (New)	1.40	
53RM02B17	Chaite bisuna-Sivaji Than	0.55	
53RM02B18	Gajabang-Salghari (New)	0.45	
53RM02B19	Timurgha-gasala (New)	0.57	
53RM02B20	Dhajaphalna-Sanonamja Road	1.30	

3.2.5 BLACKTOPPING

An analysis of the traffic data for the different roads making up the rural municipality road core network (see 0) shows that there is no roads that are eligible for blacktopping (traffic volume exceeds 50 PCU). The blacktopping of these roads will be treated as a second phase of improvement after they have been gravelled.

Table 3.2.5 Sections of the rural municipality road core network requiring blacktopping

Code	Description	Total length (km)	Blacktop (km)	Traffic (VPD)	Blacktopping (km)
Total					

3.3 NEW CONSTRUCTION

15.65km of road of RMCRN is proposed for new construction which is provided below. These roads provide access to unconnected places that do not currently have road access.

Table 3.3.1 Sections of the rural municipality road core network requiring new construction

Code	Description	New length, km
53RM02A22	Bistapokhara-Tunital	3.46
53RM02A23	Alibang-Daukhola-Gargare Road	2.50
53RM02B14	Eipe-Bhaisachope-Dhungauchalne(new)	4.80
53RM02B15	Panikhola-Okhalkhope-bhumethala	0.62
53RM02B16	Sahakari 4-Sunilsmriti-Pabang (New)	1.40

Code	Description	New length, km
53RM02B17	Chaite bisuna-Sivaji Than	0.55
53RM02B18	Gajabang-Salghari (New)	0.45
53RM02B19	Timurgha-gasala (New)	0.57
53RM02B20	Dhajaphalna-Sanonamja Road	1.30
	Total Length	15.65

4. COST ESTIMATION

For the cost estimation, use has been made of standard costs for the different activities required. For the conservation activities this results in an estimation of annual costs, while for improvement and new construction activities this result in an estimation of the total costs required.

4.1 CONSERVATION

The costs of the required conservation measures have been calculated using the following standard costs. These standard costs have been applied to the entire rural municipal road core network, whereby distinction is made based on the surface type in the case of recurrent and periodic maintenance. It must be noted here that the standard costs for periodic maintenance are the average annual costs, but that the cost for applying periodic maintenance in a specific section every several years will be higher (the cumulative cost of several years). The estimated costs for the first year are presented below, while the costs for subsequent years will vary slightly as road surface types change as a result of improvements. Detailed cost estimations for the actual maintenance needs in any given year will be presented in the ARMP.

Table 4.1.1 Standard unit costs for conservation

Activity	Unit	Unit cost (NPR/km)
Emergency maintenance	km	30,000
Routine maintenance	km	20,000
Recurrent maintenance (blacktop)	km	500,000
Recurrent maintenance (gravel)	km	400,000
Recurrent maintenance (earthen)	km	250,000
Periodic maintenance (blacktop)	km	200,000
Periodic maintenance (gravel)	km	250,000

For the first year the estimated costs for conservation of the RMRCN come to NPR 47.41 million. Based on this cost for the first year, the costs for conservation of the RMRCN for the next 5 years are estimated at NPR 237.08 million. These costs will change slightly as the roads are improved and the standard conservation costs change. This will be updated in the ARMP on an annual basis.

Table 4.1.2 Estimated conservation costs for the first year (NPR '000)

Code	Total length (km)	Blacktop (km)	Gravel (km)	Earthen (km)	Emergency	Routine	Recurrent (blacktop)	Recurrent (gravel)	Recurrent (earthen)	Periodic (blacktop)	Periodic (gravel)	Total annual cost	Total 5-year cost
53DR026	21.1		10	11.1	333	222			2,775			3,330	16,650
53DR027	21.5			21.5	645	430			5,375			6,450	32,250
53DR028	19.8			19.8	594	396			4,950			5,940	29,700
53DR029	15			15	450	300			3,750			4,500	22,500
53RM02A01	14.00	-	-	14.00	420	280	-	-	3,500	-	-	4,200	21,000
53RM02A02	6.50	-	-	6.50	195	130	-	-	1,625	-	-	1,950	9,750
53RM02A03	6.70	-	-	6.70	201	134	-	-	1,675	-	-	2,010	10,050
53RM02A04	6.10	-	-	6.10	183	122	-	-	1,525	-	-	1,830	9,150
53RM02A05	9.00	-	-	5.20	156	104	-	-	1,300	-	-	1,560	7,800
53RM02A06	4.40	-	-	4.40	132	88	-	-	1,100	-	-	1,320	6,600
53RM02A07	5.40	-	-	5.40	162	108	-	-	1,350	-	-	1,620	8,100
53RM02A08	8.20	-	-	6.90	207	138	-	-	1,725	-	-	2,070	10,350
53RM02A09	7.10	-	-	7.74	233	154.8	-	-	1,935	-	-	2,323	11,614
53RM02A10	5.10	-	-	5.10	153	102	-	-	1,275	-	-	1,530	7,650
53RM02A11	6.55	-	-	6.00	180	120	-	-	1,500	-	-	1,800	9,000
53RM02A12	2.90	-	-	2.90	87	58	-	-	725	-	-	870	4,350
53RM02A13	4.10	-	-	4.10	123	82	-	-	1,025	-	-	1,230	6,150
53RM02A16	7.40	-	-	5.60	168	112	-	-	1,400	-	-	1,680	8,400
53RM02A17	6.20	-	-	6.20	186	124	-	-	1,550	-	-	1,860	9,300
53RM02A18	0.64	-	-	5.00	150	100	-	-	1,250	-	-	1,500	7,500
53RM02A19	5.26	-	-	6.50	195	130	-	-	1,625	-	-	1,950	9,750
53RM02A20	6.15	-	-	7.50	225	150	-	-	1,875	-	-	2,250	11,250
53RM02A21	3.15	-	-	4.50	135	90	-	-	1,125	-	-	1,350	6,750
53RM02A22	3.46	-	-	2.51	76	50.2	-	-	628	-	-	754	3,769
53RM02A23	2.50	-	-	2.46	74	49.2	-	-	615	-	-	738	3,691
53RM02B01	1.80	-	-	1.80	54	36	-	-	450	-	-	540	2,700
53RM02B02	2.40	-	-	2.90	87	58	-	-	725	-	-	870	4,350
53RM02B03	4.60	-	-	4.60	138	92	-	-	1,150	-	-	1,380	6,900
53RM02B04	1.50	-	-	1.50	45	30	-	-	375	-	-	450	2,250
53RM02B05	2.70	-	-	2.70	81	54	-	-	675	-	-	810	4,050
53RM02B06	2.20	-	-	2.20	66	44	-	-	550	-	-	660	3,300
53RM02B07	3.80	-	-	3.80	114	76	-	-	950	-	-	1,140	5,700
53RM02B08	2.90	-	-	2.90	87	58	-	-	725	-	-	870	4,350
53RM02B09	1.20	-	-	1.20	36	24	-	-	300	-	-	360	1,800
53RM02B10	2.80	-	-	2.80	84	56	-	-	700	-	-	840	4,200

53RM02B11	4.60			0.62	19	12.48			156			187	937
53RM02B12	9.10			1.90	57	38			475			570	2,850
53RM02B13	2.10			0.78	24	15.68			196			236	1,178
53RM02B14	4.80			0.86	26	17.24			216			259	1,294
53RM02B15	0.62			1.25	38	25			313			376	1,878
53RM02B16	1.40			1.32	40	26.4			330			396	1,982
53RM02B17	0.55			0.55	17	11.06			138			166	832
53RM02B18	0.45			0.76	23	15.12			189			227	1,136
53RM02B19	0.57			1.15	35	23			288			346	1,728
53RM02B20	1.30			1.13	34	22.6			283			339	1,696
	172.20			158.04	4746	3160.78			39,510			47,417	237,083

4.2 IMPROVEMENT

The costs of the required improvement measures have been calculated using the following standard costs. These standard costs have been applied to the identified improvement requirements presented in the previous chapter.

Table 4.2.1 Standard unit costs for improvement activities

Activity	Unit	Unit cost (NPR)
Rehabilitation	km	800,000
Widening	m	25,000
Gravelling	km	1,000,000
Blacktopping	km	5,700,000
Bridge construction	m	600,000
Slab culvert construction	m	150,000
CC Causeway construction	m	100,000
Stone Causeway construction	m	75,000
Pipe culvert placement	unit	10,000
Masonry wall construction	m ³	8,000
Gabion wall construction	m ³	3,500
Lined drain construction	m	3,500

The resulting estimated costs come to NPR 258.651 million as indicated in the table below.

Table 4.2.2 Cost estimate for improvement measures (NPR '000)

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Code	Total length (km)	Widening	Gravelling	Bridges	Slab culverts	CC causeways	Pipe culvert	Total cost
53DR026	21.1		11,100.00	1,200.00	450.00	300.00	30.00	13,080.00
53DR027	21.5		21,500.00	1,800.00	300.00	300.00	30.00	23,930.00
53DR028	19.8		19,800.00	1,200.00	300.00	300.00	50.00	21,650.00
53DR029	15		15,000.00	600.00	300.00	300.00	40.00	16,240.00
53RM02A01	14.00	262.50	14,000.00	-	-	200.00	80.00	14,542.50
53RM02A02	6.50	121.88	6,500.00	-	-	-	60.00	6,681.88
53RM02A03	6.70	125.63	6,700.00	-	-	-	70.00	6,895.63
53RM02A04	6.10	114.38	6,100.00	600.00	-	200.00	50.00	7,064.38
53RM02A05	9.00	168.75	9,000.00	-	-	-	50.00	9,218.75
53RM02A06	4.40	100.00	4,400.00	-	-	-	-	4,500.00
53RM02A07	5.40	101.25	5,400.00	-	-	-	40.00	5,541.25
53RM02A08	8.20	153.75	8,200.00	600.00	300.00	-	60.00	9,313.75
53RM02A09	7.10	133.13	7,100.00	-	-	-	30.00	7,263.13
53RM02A10	5.10	95.63	5,100.00	-	-	-	30.00	5,225.63
53RM02A11	6.55	122.81	6,550.00	-	-	100.00	30.00	6,802.81
53RM02A12	2.90	-	2,900.00	-	-	-	-	2,900.00
53RM02A13	4.10	-	4,100.00	-	-	-	-	4,100.00
53RM02A16	7.40	138.75	7,400.00	-	-	-	-	7,538.75
53RM02A17	6.20	116.25	6,200.00	-	-	-	-	6,316.25
53RM02A18	0.64	11.98	639.00	600.00	-	-	20.00	1,270.98
53RM02A19	5.26	98.63	5,260.00	-	-	-	10.00	5,368.63
53RM02A20	6.15	115.31	6,150.00	-	-	-	-	6,265.31
53RM02A21	3.15	-	3,150.00	-	300.00	100.00	30.00	3,580.00
53RM02A22	3.46	86.50	3,460.00	600.00	-	-	-	4,146.50

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Code	Total length (km)	Widening	Gravelling	Bridges	Slab culverts	CC causeways	Pipe culvert	Total cost
53RM02A23	2.50	62.50	2,500.00	-	-	-	-	2,562.50
53RM02B01	1.80	-	1,800.00	-	-	-	20.00	1,820.00
53RM02B02	2.40	-	2,400.00	1,200.00	-	-	-	3,600.00
53RM02B03	4.60	-	4,600.00	1,800.00	300.00	100.00	70.00	6,870.00
53RM02B04	1.50	-	1,500.00	1,200.00	300.00	-	30.00	3,030.00
53RM02B05	2.70	-	2,700.00	-	-	-	-	2,700.00
53RM02B06	2.20	-	2,200.00	-	-	-	-	2,200.00
53RM02B07	3.80	-	3,800.00	-	-	-	-	3,800.00
53RM02B08	2.90	-	2,900.00	-	-	-	-	2,900.00
53RM02B09	1.20	-	1,200.00	-	-	-	-	1,200.00
53RM02B10	2.80	-	2,800.00	-	-	-	-	2,800.00
53RM02B11	4.60	-	4,600.00	-	-	-	-	4,600.00
53RM02B12	9.10	-	9,100.00	-	-	-	-	9,100.00
53RM02B13	2.10	-	2,100.00	-	-	-	-	2,100.00
53RM02B14	4.80	120.00	4,800.00	-	-	-	-	4,920.00
53RM02B15	0.62	15.50	620.00	-	-	-	-	635.50
53RM02B16	1.40	35.00	1,400.00	-	-	-	-	1,435.00
53RM02B17	0.55	13.83	553.00	-	-	-	-	566.83
53RM02B18	0.45	11.28	451.00	-	-	-	-	462.28
53RM02B19	0.57	14.18	567.00	-	-	-	-	581.18
53RM02B20	1.30	32.50	1,300.00	-	-	-	-	1,332.50
Total	249.60	2371.88	239600.00	11400.00	2550.00	1900.00	830.00	258651.88

4.3 NEW CONSTRUCTION

For new construction, the following standard costs have been applied to estimate the costs involved.

Table 4.3.1 Standard unit costs for new construction

Activity	Unit	Unit cost (NPR)
Opening up	km	1,200,000
Gravelling	km	1,000,000
Bridge construction	m	600,000

The resulting estimated costs for new construction come to NPR 292.650 million.

Table 4.3.2 Cost estimate for new construction (NPR '000)

Code	Description	Length (km)	Opening up	Gravel	Bridges	Total cost
53RM02A01	Airport-TalloSewar-Beri-TalloGumchal-Harjang-Salmaja Road	14.00	12,600	14,000	0	26,600
53RM02A02	Thulonamja-KaKhola-Malepatla-Tasibang Road	6.50	5,850	6,500	0	12,350
53RM02A03	BistaPokhara-Purano Bojyang-PateGumchal-Gargare-BhaisaChhope Road	6.70	6,030	6,700	0	12,730
53RM02A04	Simgitha-Jutung-Narneta Road	6.10	5,490	6,100	600	12,190
53RM02A05	Lalubang-Alibang-Eipe-Darkhani-Bhaibang-Bakhrekhor Road	9.00	8,100	9,000	0	17,100
53RM02A06	Beunre-Aunlesari- Road	4.40	4,800	4,400	0	9,200
53RM02A07	Salbisauni-Purano Bojyang-Timurga Road	5.40	4,860	5,400	0	10,260
53RM02A08	Kaphaldhik-Beunre-Sindeni Khola-Purnagaun Road	8.20	7,380	8,200	600	16,180
53RM02A09	Gumchal-Fulbarsana-Gargare-Dhaukhola-Aalibang Road	7.10	6,390	7,100	0	13,490
53RM02A10	BojyangKhola-Saldanda-Kunjari-Road	5.10	4,590	5,100	0	9,690
53RM02A11	Bhumaithala-Panchkhai-Gatekhola-Cheudar Road	6.55	5,895	6,550	0	12,445
53RM02A12	Pachkhai-Asarekafal-Rajthar-Jaunlepokhara Road	2.90	0	2,900	0	2,900
53RM02A13	BojyangKhola-Libanggaira-Purnagaun Road	4.10	0	4,100	0	4,100
53RM02A16	Pang Pokhara-Lali-Ririp Road	7.40	6,660	7,400	0	14,060
53RM02A17	Dhunga Uchalne-Harjang Road	6.20	5,580	6,200	0	11,780

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Code	Description	Length (km)	Opening up	Gravel	Bridges	Total cost
53RM02A18	Dhunga Uchalne-Dangbase-Machhena Road	0.64	575	639	600	1,814
53RM02A19	Tallo Gumcha-Uppallo Gumchal-Patla ChaukiGhar-Khara Road	5.26	4,734	5,260	0	9,994
53RM02A20	Beri-Adharbhut Vidhyala-Kalimati-Darakanda-Matadhara Road	6.15	5,535	6,150	0	11,685
53RM02A21	Gajala-Khanibang-Bistapokhara Road	3.15	0	3,150	0	3,150
53RM02A22	Bistapokhara-Tunital	3.46	4,152	3,460	600	8,212
53RM02A23	Alibang-Daukhola-Gargare Road	2.50	3,000	2,500	0	5,500
53RM02B01	Pachkhai-Dulepati-Chhap Road	1.80	0	1,800	0	1,800
53RM02B02	Gothhalna-Dhanekharka Road	2.40	0	2,400	1200	3,600
53RM02B03	Daibang-Majhuwa-Alibang Road	4.60	0	4,600	1800	6,400
53RM02B04	Jogithar-Rajthar-Popake Road	1.50	0	1,500	1200	2,700
53RM02B05	Dandagaun-Kunjari-Panikhola Road	2.70	0	2,700	0	2,700
53RM02B06	Swamirukh-Thulo Namja-Hasandhara Road	2.20	0	2,200	0	2,200
53RM02B07	Airport-Garmi-Gajabang-Kilachaur Road	3.80	0	3,800	0	3,800
53RM02B08	Dhajaphalne-Garangja-Upalokharke-Libang gaira Road	2.90	0	2,900	0	2,900
53RM02B09	Phulbarsana-JanjyotiMaVi-Chidepani Road	1.20	0	1,200	0	1,200
53RM02B10	Airport-Pipalchaur-Balle Road	2.80	0	2,800	0	2,800
53RM02B11	Bhumaithala-Panchkhai-Tengna-Ponghadhara Road	4.60	0	4,600	0	4,600
53RM02B12	Chandikhola-Kaddar Pokhara-Deurali Road	9.10	0	9,100	0	9,100
53RM02B13	Libang Gaira-Saldanda-Chiura rukh Road	2.10	0	2,100	0	2,100
53RM02B14	Eipe-Bhaisachope-Dhungauchalne(new)	4.80	5,760	4,800	0	10,560
53RM02B15	Panikhola-Okhalkhope-bhumethala	0.62	744	620	0	1,364
53RM02B16	Sahakari 4-Sunilsmriti-Pabang (New)	1.40	1,680	1,400	0	3,080
53RM02B17	Chaite bisuna-Sivaji Than	0.55	664	553	0	1,217
53RM02B18	Gajabang-Salghari (New)	0.45	541	451	0	992
53RM02B19	Timurgha-gasala (New)	0.57	680	567	0	1,247
53RM02B20	Dhajaphalna-Sanonamja Road	1.30	1,560	1,300	0	2,860
		172.20	113,850.30	172,200.00	6,600.00	292,650.30

4.4 RMTTP COSTS

The total costs for the Rural Municipal Transport Perspective Plan come to NPR 509.568 million as indicated in the table below.

Table 4.4.1 RMTTP costs (NPR '000)

Code	Conservation	Improvement	New construction	Total Cost
53RM02A01	4,200	14,543	26,600	45,343
53RM02A02	1,950	6,682	12,350	20,982
53RM02A03	2,010	6,896	12,730	21,636
53RM02A04	1,830	7,064	12,190	21,084
53RM02A05	1,560	5,348	17,100	24,008
53RM02A06	1,320	4,500	9,200	15,020
53RM02A07	1,620	5,541	10,260	17,421
53RM02A08	2,070	7,989	16,180	26,239
53RM02A09	2,323	7,915	13,490	23,728
53RM02A10	1,530	5,226	9,690	16,446
53RM02A11	1,800	6,243	12,445	20,488
53RM02A12	870	2,900	2,900	6,670
53RM02A13	1,230	4,100	4,100	9,430
53RM02A16	1,680	5,705	14,060	21,445
53RM02A17	1,860	6,316	11,780	19,956
53RM02A18	1,500	5,714	1,814	9,028
53RM02A19	1,950	6,632	9,994	18,576
53RM02A20	2,250	7,641	11,685	21,576
53RM02A21	1,350	4,930	3,150	9,430
53RM02A22	754	3,173	8,212	12,138
53RM02A23	738	2,522	5,500	8,760
53RM02B01	540	1,820	1,800	4,160
53RM02B02	870	4,100	3,600	8,570
53RM02B03	1,380	6,870	6,400	14,650
53RM02B04	450	3,030	2,700	6,180
53RM02B05	810	2,700	2,700	6,210
53RM02B06	660	2,200	2,200	5,060
53RM02B07	1,140	3,800	3,800	8,740
53RM02B08	870	2,900	2,900	6,670
53RM02B09	360	1,200	1,200	2,760
53RM02B10	840	2,800	2,800	6,440
53RM02B11	187	624	4,600	5,411
53RM02B12	570	1,900	9,100	11,570
53RM02B13	236	784	2,100	3,120
53RM02B14	259	884	10,560	11,702
53RM02B15	376	1,281	1,364	3,021
53RM02B16	396	1,353	3,080	4,829
53RM02B17	166	567	1,217	1,950

Code	Conservation	Improvement	New construction	Total Cost
53RM02B18	227	775	992	1,994
53RM02B19	346	1,179	1,247	2,772
53RM02B20	339	1,158	2,860	4,357
Total	47416.53	169502.03	292650.30	509568.86

5. RANKING

The ranking of the required interventions determines the order in which they will be carried out. This ranking is done separately for conservation, improvement and new construction. Ranking is done according to the cost per person served, whereby the costs are the estimated costs of the previous chapter. For the calculation of the population served, use is made of the population data for the VDCs linked by the road concerned. This data is presented in **Annex 1**.

5.1 CONSERVATION

Ranking of roads for conservation is based on the total conservation costs per person served by the road. This ranking of roads will be updated each year in the ARMP based on the actual cost estimates for the year concerned. An example ranking is provided in the table below based on standard costs for the first year.

Code	Total length	Total cost	Population served	Cost/person
	(km)	(NPR '000)		(NPR)
53RM02B14	4.80	4,920.00	123	25.00
53RM02A23	2.50	2,562.50	135	52.68
53RM02B12	9.10	9,100.00	507	55.71
53RM02A22	3.46	4,146.50	265	63.91
53RM02B20	1.30	1,332.50	149	111.82
53RM02B16	1.40	1,435.00	165	114.98
53RM02A20	6.15	6,265.31	767.8	122.55
53RM02A16	7.40	7,538.75	1014	134.51
53RM02B03	4.60	6,870.00	1014	147.60
53DR029	15	16,240.00	2450	150.86
53RM02A17	6.20	6,316.25	956	151.36
53RM02A21	3.15	3,580.00	544.4	152.07
53RM02B07	3.80	3,800.00	606	159.47
53RM02B11	4.60	4,600.00	773	168.04
53DR027	21.5	23,930.00	4104	171.50
53RM02A19	5.26	5,368.63	991.2	184.63
53RM02A08	8.20	9,313.75	1798	193.05
53RM02B19	0.57	581.18	113	194.43

53RM02B15	0.62	635.50	125	196.70
53RM02B10	2.80	2,800.00	606	216.43
53RM02B08	2.90	2,900.00	652	224.83
53RM02A11	6.55	6,802.81	1672	245.78
53RM02A09	7.10	7,263.13	1804	248.38
53RM02A05	9.00	9,218.75	2445	265.22
53RM02A01	14.00	14,542.50	3864	265.70
53RM02B13	2.10	2,100.00	652	310.48
53RM02A03	6.70	6,895.63	2424	351.53
53DR028	19.8	21,650.00	7657	353.67
53RM02B02	2.40	3,600.00	1304	362.22
53RM02A04	6.10	7,064.38	2571	363.94
53RM02A10	5.10	5,225.63	1910	365.51
53DR026	21.1	13,080.00	5122	391.59
53RM02B18	0.45	462.28	189	408.85
53RM02B17	0.55	566.83	246	434.00
53RM02A07	5.40	5,541.25	2424	437.45
53RM02A13	4.10	4,100.00	1910	465.85
53RM02B05	2.70	2,700.00	1304	482.96
53RM02B04	1.50	3,030.00	1546	510.23
53RM02B06	2.20	2,200.00	1304	592.73
53RM02A06	4.40	4,500.00	2697	599.33
53RM02A02	6.50	6,681.88	4275	639.79
53RM02B09	1.20	1,200.00	848	706.67
53RM02A12	2.90	2,900.00	2319	799.66
53RM02A18	0.64	1,270.98	1214.6	955.64
53RM02B01	1.80	1,820.00	2319	1,274.18

5.1 IMPROVEMENT

In the case of improvement activities, ranking is again based on the basis of the total cost per person served. The resulting order of the roads is shown in the table below. In the case of roads requiring blacktopping, the improvement of the road has been split into two phases. The first phase includes all improvements to bring the road to a maintainable all-weather standard (gravelling, widening, cross drainage and protective structures), while the second phase only includes the blacktopping. This has been done to avoid unnecessarily delaying the improvement of such roads to all-weather gravel standard due to the additional cost of blacktopping (increasing the cost per person served).

Table 5.1.1 Ranking of improvement works (NPR '000)

Code	Length (km)	Total cost (NPR '000)	Population served	Cost/person (NPR)
53RM02A23	2.50	8,671.70	135	15.57
53RM02A22	3.46	10,048.45	265	26.37
53RM02B19	0.57	4,054.25	113	27.87
53RM02B15	0.62	4,406.75	125	28.37
53RM02A20	6.15	24,140.63	767.8	31.81
53RM02B16	1.40	4,653.40	165	35.46

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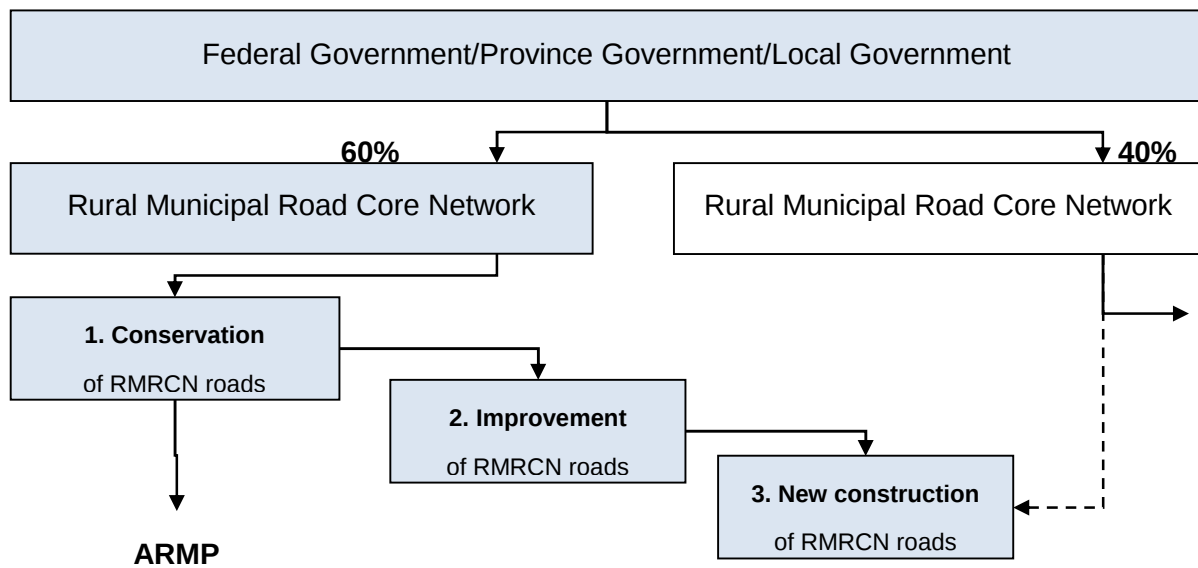
Code	Length (km)	Total cost (NPR '000)	Population served	Cost/person (NPR)
53RM02B20	1.30	3,983.35	149	37.41
53RM02B14	4.80	3,038.69	123	40.48
53RM02A19	5.26	20,931.88	991.2	47.35
53RM02A17	6.20	19,956.25	956	47.90
53RM02A21	3.15	10,780.00	544.4	50.50
53RM02A16	7.40	18,025.00	1014	56.26
53RM02B03	4.60	14,650.00	1014	69.22
53RM02B07	3.80	8,740.00	606	69.34
53RM02A18	0.64	17,313.75	1214.6	70.15
53RM02B18	0.45	2,665.22	189	70.91
53RM02A09	7.10	24,943.93	1804	72.32
53RM02A08	8.20	23,769.38	1798	75.64
53RM02A01	14.00	45,342.50	3864	85.22
53RM02A11	6.55	19,442.50	1672	86.00
53RM02B10	2.80	6,440.00	606	94.10
53RM02B08	2.90	6,670.00	652	97.75
53RM02A03	6.70	21,635.63	2424	112.04
53RM02B12	9.10	4,370.00	507	116.02
53RM02A10	5.10	16,445.63	1910	116.14
53RM02A04	6.10	21,084.38	2571	121.94
53RM02B17	0.55	1,949.74	246	126.17
53RM02A07	5.40	17,421.25	2424	139.14
53RM02B02	2.40	9,070.00	1304	143.77
53RM02A05	9.00	16,787.50	2445	145.64
53RM02A06	4.40	15,020.00	2697	179.56
53RM02A13	4.10	9,430.00	1910	202.55
53RM02A02	6.50	20,981.88	4275	203.75
53RM02B05	2.70	6,210.00	1304	209.98
53RM02B04	1.50	6,180.00	1546	250.16
53RM02B06	2.20	5,060.00	1304	257.71
53RM02B09	1.20	2,760.00	848	307.25
53RM02A12	2.90	6,670.00	2319	347.68
53RM02B13	2.10	1,803.68	652	361.48
53RM02B11	4.60	1,435.48	773	538.50
53RM02B01	1.80	4,160.00	2319	1274.17

6. RUTAL MUNICIPAL TRANSPORT MASTER PLAN (RMTMP)

6.1 BUDGET ALLOCATION

The distribution of the available rural municipality road sector budget is indicated in the figure below. 60% of the total budget is reserved for the Class A and Remaining 40% for the Class B of Rural Municipal road core network. Priority is given to emergency maintenance and routine/recurrent maintenance.

Figure 2. Rural Municipality road sector budget allocation



ANNEXES

ANNEX 1 TRAFFIC DATA

Code	Description	Total length	Motor- cycle	Jeep	Tractor	Mini-Truck	PCU
53RM02A01	Airport-TalloSewar-Beri-TalloGumchal-Harjang-Salmaja Road	14.00	12	3	4	2	19.00
53RM02A02	Thulonamja-KaKhola-Malepatla-Tasibang Road	6.50	9	4	3	3	17.50
53RM02A03	BistaPokhara-Purano Bojyang-PateGumchal-Gargare-BhaisaChhope Road	6.70	5	1	3	0	9.50
53RM02A04	Simgitha-Jutung-Narneta Road	6.10	7	2	2	0	9.50
53RM02A05	Lalubang-Alibang-Eipe-Darkhani-Bhaibang-Bakhrekhor Road	9.00	10	2	3	2	15.00
53RM02A06	Beunre-Aunlesari- Road	4.40	9	2	4	2	16.50
53RM02A07	Salbisauni-Purano Bojyang-Timurga Road	5.40	18	3	3	1	19.00
53RM02A08	Kaphaldhik-Beunre-Sinden Khola-Purnagaun Road	8.20	8	3	2	0	11.00
53RM02A09	Gumchal-Fulbarsana-Gargare-Dhaukhola-Aalibang Road	7.10	4	1	2	0	7.00
53RM02A10	BojyangKhola-Saldanda-Kunjari- Road	5.10	7	2	3	0	11.50
53RM02A11	Bhumaithala-Panchkhai-Gatekhola-Cheudar Road	6.55	9	2	2	0	10.50
53RM02A12	Pachkhai-Asarekafal-Rajthar-Jaunlepokhara Road	2.90	11	2	3	0	13.50
53RM02A13	BojyangKhola-Libanggaira-Purnagaun Road	4.10	14	3	3	2	18.00
53RM02A16	Pang Pokhara-Lali-Ririp Road	7.40	12	2	2	0	12.00
53RM02A17	Dhunga Uchalne-Harjang Road	6.20	9	3	3	0	13.50
53RM02A18	Dhunga Uchalne-Dangbase-Machhena Road	0.64	4	0	3	0	8.00

Code	Description	Total length	Motor- cycle	Jeep	Tractor	Mini-Truck	PCU
53RM02A19	Tallo Gumcha-Uppallo Gumchal-Patla ChaukiGhar-Khara Road	5.26	5	0	3	0	8.50
53RM02A20	Beri-Adharbhut Vidhyala-Kalimati-Darakanda-Matadhara Road	6.15	2	0	3	0	7.00
53RM02A21	Gajala-Khanibang-Bistapokhara Road	3.15	2	0	3	0	7.00
53RM02A22	Bistapokhara-Tunital	3.46	4	0	3	0	8.00
53RM02A23	Alibang-Daukhola-Gargare Road	2.50	5	0	3	0	8.50
53RM02B01	Pachkhai-Dulepati-Chhap Road	1.80	4	2	2	0	8.00
53RM02B02	Gothhalna-Dhanekharka Road	2.40	9	2	2	0	10.50
53RM02B03	Daibang-Majhuwa-Alibang Road	4.60	9	2	2	0	10.50
53RM02B04	Jogithar-Rajthar-Popake Road	1.50	4	1	2	0	7.00
53RM02B05	Dandagaun-Kunjari-Panikhola Road	2.70	5	1	3	0	9.50
53RM02B06	Swamirukh-Thulo Namja-Hasandhara Road	2.20	8	1	2	0	9.00
53RM02B07	Airport-Garmi-Gajabang-Kilachaur Road	3.80	3	1	2	0	6.50
53RM02B08	Dhajaphalne-Garangja-Upallokharke-Libang gaira Road	2.90	4	1	1	0	5.00
53RM02B09	Phulbarsana-JanjyotiMaVi-Chidepani Road	1.20	2	1	1	0	4.00
53RM02B10	Airport-Pipalchaur-Balle Road	2.80	3	1	2	0	6.50
53RM02B11	Bhumaithala-Panchkhai-Tengna-Ponghadhara Road	4.60	4	1	1	0	5.00
53RM02B12	Chandikhola-Kaddar Pokhara-Deurali Road	9.10	6	1	2	0	8.00
53RM02B13	Libang Gaira-Saldanda-Chiura rukh Road	2.10	2	1	1	0	4.00

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Code	Description	Total length	Motor- cycle	Jeep	Tractor	Mini-Truck	PCU
53RM02B14	Eipe-Bhaisachope-Dhungauchalne(new)	4.80	0	0	0	0	0.00
53RM02B15	Panikhola-Okhalkhope-bhumethala	0.62	1	0	0	0	0.50
53RM02B16	Sahakari 4-Sunilsmriti-Pabang (New)	1.40	2	0	0	0	1.00
53RM02B17	Chaite bisuna-Sivaji Than	0.55	3	0	0	0	1.50
53RM02B18	Gajabang-Salghari (New)	0.45	0	0	0	0	0.00
53RM02B19	Timurgha-gasala (New)	0.57	1	0	0	0	0.50
53RM02B20	Dhajaphalna-Sanonamja Road	1.30	1	0	0	0	0.50
Code	Description	Total length	Motor-cycle	Jeep	Tractor	Mini-Truck	PCU

ANNEX 2 POPULATION SERVED

Name of Road	Length	Population Coverage
53DR026 (Ruinibang-Badachaur-Gumchal-Harjang Road)	21.10	5122
53DR027 (Domai-Kilachaur-Pati Gumchal-Lalubang-Chheudar-Pang Deurali Road)	14.50	4104
53DR028 (Dhulewodhar-Namja-Narneta-Gothechaur Road)	30.00	7657
53DR029 (Sulichaur-Tebang-Pawang-JutungKhola-Mainabare Road)	15.00	2450
Airport-TalloSewar-Beri-TalloGumchal-Harjang-Salmaja Road	14.00	3864
Thulonamja-KaKhola-Malepatla-Tasibang Road	6.50	4275
BistaPokhara-Purano Bojyang-PateGumchal-Gargare-BhaisaChhope Road	6.70	2424
Simgitha-Jutung-Narneta Road	6.10	2571
Lalubang-Alibang-Eipe-Darkhani-Bhaibang-Bakhrekhor Road	9.00	2445
Beunre-Aunlesari- Road	4.40	2697
Salbisauni-Purano Bojyang-Timurga Road	5.40	2424
Kaphaldhik-Beunre-Sindeni Khola-Purnagaun Road	8.20	1798
Gumchal-Fulbarsana-Gargare-Dhaukhola-Aalibang Road	7.10	1804
BojyangKhola-Saldanda-Kunjari- Road	5.10	1910
Bhumaithala-Panchkhai-Gatekhola-Cheudar Road	6.55	1672
Pachkhai-Asarekafal-Rajthar-Jaunlepokhara Road	2.90	2319
BojyangKhola-Libanggaira-Purnagaun Road	4.10	1910
Pang Pokhara-Lali-Ririp Road	7.40	1014
Dhunga Uchalne-Harjang Road	6.20	956
Dhunga Uchalne-Dangbase-Machhena Road	0.64	1214.6
Tallo Gumcha-Uppallo Gumchal-Patla ChaukiGhar-Khara Road	5.26	991.2
Beri-Adharbhut Vidhyala-Kalimati-Darakanda-Matadhara Road	6.15	767.8
Gajala-Khanibang-Bistapokhara Road	3.15	544.4
Bistapokhara-Tunital	3.46	265
Alibang-Daukhola-Gargare Road	2.50	135
Pachkhai-Dulepati-Chhap Road	1.80	2319

Gothhalna-Dhanekharka Road	2.40	1304
Daibang-Majhuwa-Alibang Road	4.60	1014
Jogithar-Rajthar-Popake Road	1.50	1546
Dandagaun-Kunjari-Panikhola Road	2.70	1304
Swamirukh-Thulo Namja-Hasandhara Road	2.20	1304
Airport-Garmi-Gajabang-Kilachaur Road	3.80	606
Dhajaphalne-Garangja-Upallokharke-Libang gaira Road	2.90	652
Phulbarsana-JanjyotiMaVi-Chidepani Road	1.20	848
Airport-Pipalchaur-Balle Road	2.80	606
Bhumaithala-Panchkhai-Tengna-Ponghadhara Road	4.60	773
Chandikhola-Kaddar Pokhara-Deurali Road	9.10	507
Libang Gaira-Saldanda-Chiura rukh Road	2.10	652
Eipe-Bhaisachope-Dhungauchalne(new)	4.80	123
Panikhola-Okhalkhope-bhumethala	0.62	125
Sahakari 4-Sunilsmriti-Pabang (New)	1.40	165
Chaite bisuna-Sivaji Than	0.55	246
Gajabang-Salghari (New)	0.45	189
Timurgha-gasala (New)	0.57	113
Dhajaphalna-Sanonamja Road	1.30	149
Total	238.64	

Source: Nepal Population and Housing Census 2011

ANNEX 3 LOCATION OF PROPOSED INTERVENTIONS

Road code	Road Name	Length (km)	Start chainage (km) or X-coordinate	End chainage (km) or Y-coordinate	Rehabilitation (km)	Gravelling (km)	Blacktopping (km)	Bridge (m)	Slab culvert (m)	CC Causeway (m)	Stone Causeway (m)	Pipe culvert (units)
53DR026	Ruinibang-Badachaur-Gumchal-Harjang Road	21.1	0+000	0+021	10.00	11.10	21.10	2	3	3		3
53DR027	Domai-Kilachaur-Pati Gumchal-Lalubang-Chheudar-Pang Deurali Road	21.5	0+000	0+022		21.50	14.50	3	2	3		3
53DR028	Dhulewodhar-Namja-Narneta-Gothechaur Road	19.8	0+000	0+020		19.80	30.00	2	2	3		5
53DR029	Sulichaur-Tebang-Pawang-JutungKhola-Mainabare Road	15	0+000	0+015		15.00	15.00	1	2	3		4
53RM02A01	Airport-TalloSewar-Beri-TalloGumchal-Harjang-Salmaja Road	14.00	0+000	0+014		14.00				2		8
53RM02A02	Thulonamja-KaKhola-Malepatla-Tasibang Road	6.50	0+000	0+007		6.50						6
53RM02A03	BistaPokhara-Purano Bojyang-PateGumchal-Gargare-BhaisaChhope Road	6.70	0+000	0+007		6.70						7
53RM02A04	Simgitha-Jutung-Narneta Road	6.10	0+000	0+006		6.10		1		2		5
53RM02A05	Lalubang-Alibang-Eipe-Darkhani-Bhaibang-Bakhrekhor Road	9.00	0+000	0+009		9.00						5
53RM02A06	Beunre-Aunlesari- Road	4.40	0+000	0+004		4.40						

Road code	Road Name	Length (km)	Start chainage (km) or X-coordinate	End chainage (km)	Rehabilitation (km)	Gravelling (km)	Blacktopping (km)	Bridge (m)	Slab culvert (m)	CC Causeway (m)	Stone Causeway (m)	Pipe culvert (units)
				or Y-coordinate								
53RM02A07	Salbisauni-Purano Bojyang-Timurga Road	5.40	0+000	0+005		5.40						4
53RM02A08	Kaphaldhik-Beunre-Sinden Khola-Purnagaun Road	8.20	0+000	0+008		8.20		1	2			6
53RM02A09	Gumchal-Fulbarsana-Gargare-Dhaukhola-Aalibang Road	7.10	0+000	0+007		7.10						3
53RM02A10	BojyangKhola-Saldanda-Kunjari- Road	5.10	0+000	0+005		5.10						3
53RM02A11	Bhumaithala-Panchkhai-Gatekhola-Cheudar Road	6.55	0+000	0+007		6.55				1		3
53RM02A12	Pachkhai-Asarekafal-Rajthar-Jaunlepokhara Road	2.90	0+000	0+003		2.90						
53RM02A13	BojyangKhola-Libanggaira-Purnagaun Road	4.10	0+000	0+004		4.10						
53RM02A16	Pang Pokhara-Lali-Ririp Road	7.40	0+000	0+007		7.40						
53RM02A17	Dhunga Uchalne-Harjang Road	6.20	0+000	0+006		6.20						
53RM02A18	Dhunga Uchalne-Dangbase-Machhena Road	0.64	0+000	0+001		0.64		1				2
53RM02A19	Tallo Gumcha-Uppallo Gumchal-Patla ChaukiGhar-Khara Road	5.26	0+000	0+005		5.26						1
53RM02A20	Beri-Adharbhut Vidhyala-Kalimati-Darakanda-Matadhara Road	6.15	0+000	0+006		6.15						
53RM02A21	Gajala-Khanibang-Bistapokhara Road	3.15	0+000	0+003		3.15			2	1		3
53RM02A22	Bistapokhara-Tunital	3.46	0+000	0+003		3.46		1				

Road code	Road Name	Length (km)	Start chainage (km) or X-coordinate	End chainage (km)	Rehabilitation (km)	Gravelling (km)	Blacktopping (km)	Bridge (m)	Slab culvert (m)	CC Causeway (m)	Stone Causeway (m)	Pipe culvert (units)
				or Y-coordinate								
53RM02A23	Alibang-Daukhola-Gargare Road	2.50	0+000	0+003		2.50						
53RM02B01	Pachkhai-Dulepati-Chhap Road	1.80	0+000	0+002		1.80						2
53RM02B02	Gothhalna-Dhanekharka Road	2.40	0+000	0+002		2.40		2				
53RM02B03	Daibang-Majhuwa-Alibang Road	4.60	0+000	0+005		4.60		3	2	1		7
53RM02B04	Jogithar-Rajthar-Popake Road	1.50	0+000	0+002		1.50		2	2			3
53RM02B05	Dandagaun-Kunjari-Panikhola Road	2.70	0+000	0+003		2.70						
53RM02B06	Swamirukh-Thulo Namja-Hasandhara Road	2.20	0+000	0+002		2.20						
53RM02B07	Airport-Garmi-Gajabang-Kilachaur Road	3.80	0+000	0+004		3.80						
53RM02B08	Dhajaphalne-Garangja-Upalokharke-Libang gaira Road	2.90	0+000	0+003		2.90						
53RM02B09	Phulbarsana-JanjyotiMaVi-Chidepani Road	1.20	0+000	0+001		1.20						
53RM02B10	Airport-Pipalchaur-Balle Road	2.80	0+000	0+003		2.80						
53RM02B11	Bhumaithala-Panchkhai-Tengna-Ponghadhara Road	4.60	0+000	0+005		4.60						
53RM02B12	Chandikhola-Kaddar Pokhara-Deurali Road	9.10	0+000	0+009		9.10						
53RM02B13	Libang Gaira-Saldanda-Chiura rukh Road	2.10	0+000	0+002		2.10						
53RM02B14	Eipe-Bhaisachope-Dhungauchalne(new)	4.80	0+000	0+005		4.80						
53RM02B15	Panikhola-Okhalkhope-bhumethala	0.62	0+000	0+001		0.62						
53RM02B16	Sahakari 4-Sunilsmriti-Pabang (New)	1.40	0+000	0+001		1.40						

Road code	Road Name	Length (km)	Start chainage (km) or X-coordinate	End chainage (km)	Rehabilitation (km)	Gravelling (km)	Blacktopping (km)	Bridge (m)	Slab culvert (m)	CC Causeway (m)	Stone Causeway (m)	Pipe culvert (units)
				or Y-coordinate								
53RM02B17	Chaite bisuna-Sivaji Than	0.55	0+000	0+001		0.55						
53RM02B18	Gajabang-Salghari (New)	0.45	0+000	0+000		0.45						
53RM02B19	Timurgha-gasala (New)	0.57	0+000	0+001		0.57						
53RM02B20	Dhajaphalna-Sanonamja Road	1.30	0+000	0+001		1.30						
	Total	249.60	0.00	249.60	10.00	239.60	80.60	19.00	17.00	19.00	0.00	83.00

ANNEX 4 DATA COLLECTION AND GIS PROCESSING

A. DATA COLLECTION PROCESS

As mentioned in DTMP Guidelines 2012, the data collection procedure has been conducted. Some of the general data such as district area, population, hydrological and metrological data, SRN status has been collected from secondary sources like Central Bureau of Statistics Nepal, Profile of Nepal 2013 and DoR Publications. For Primary data collection, i.e. Existing Road Inventory; GPS (model C60s and C62s) and Motorcycle has been used. Further for DRCN (new roads), Topographic maps (1:25000) in hard copy and soft copy with aid of Google Earth has been used.

B. GIS PROCESSING FOR MAP PREPARATION

The map preparation process is governed by the field work and field work is ruled by the proper adjustment in GPS. For setting the GPS, we have followed the following steps

1. Set the GPS for units and time
2. For position, select USER UTM Grid defined from the list for grid and define the properties as below:

Latitude of origin	E84
Scale factor	0.9999
False easting	500000 Meter
False northing	0 Meter
Select Datum	WGS84

After collection of the data in waypoint and track format, it is imported to computer by DNR Garmin Software and exported in KML and GPX format. The KML or GPX data is added to ARC GIS 9.3 and exported to Shape file. Added Shape file of Track is edited and append in **Road_Inventory.shp** whose property is given below,

Projected Coordinate System:	Modified_UTM84
Projection:	Transverse_Mercator
False_Easting:	500000.00000000
False_Northing:	0.00000000
Central_Meridian:	84.00000000
Scale_Factor:	0.99990000
Latitude_Of_Origin:	0.00000000
Linear Unit:	Meter

Geographic Coordinate System:	GCS_Everest_1830
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Datum: D_Everest_Adj_1937
Prime Meridian: Greenwich
Angular Unit: Degree

Now, for transferring the **Road_Inventory.shp** doesnot require to transform in Google Earth format, it will directly overlay above the Google Earth with some minimum error. But for remaining general shape file, they should be transformed from Topo to Google Earth.

Rural Municipality Transport Master Plan

Lungri Rural Municipality

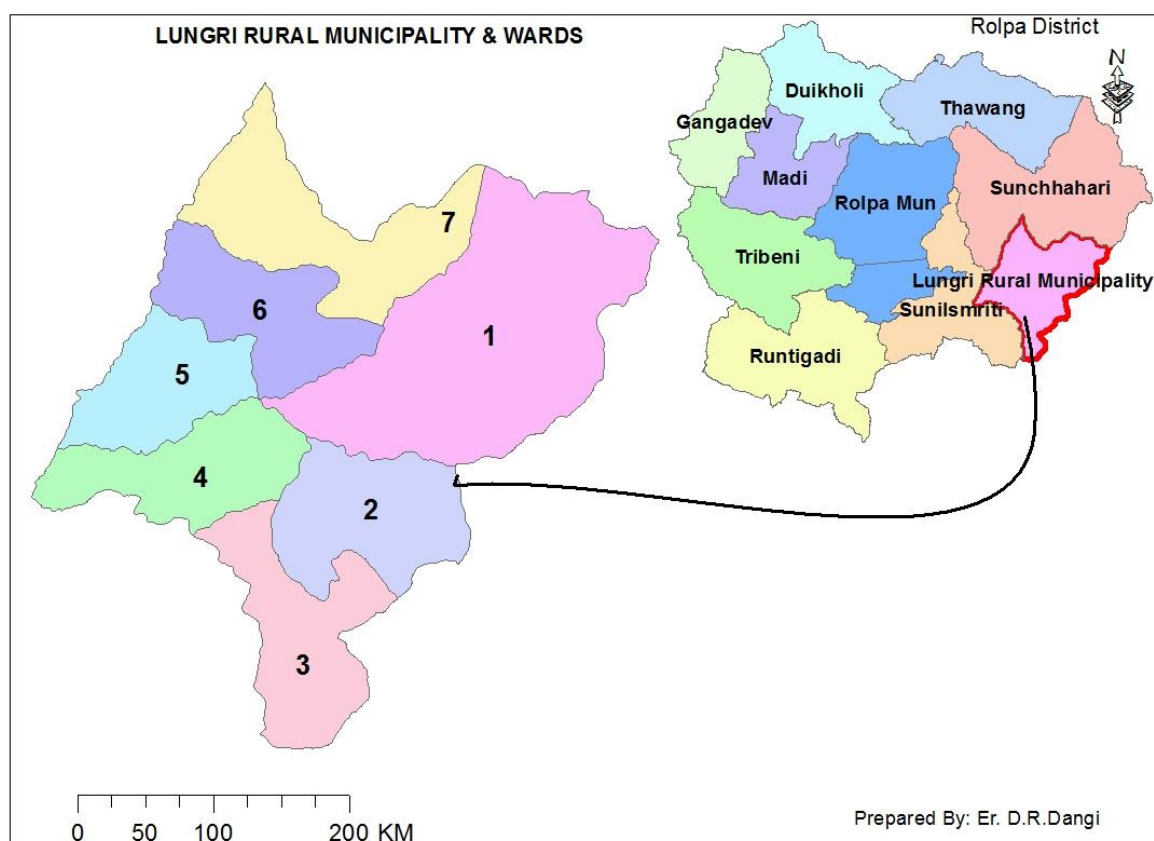
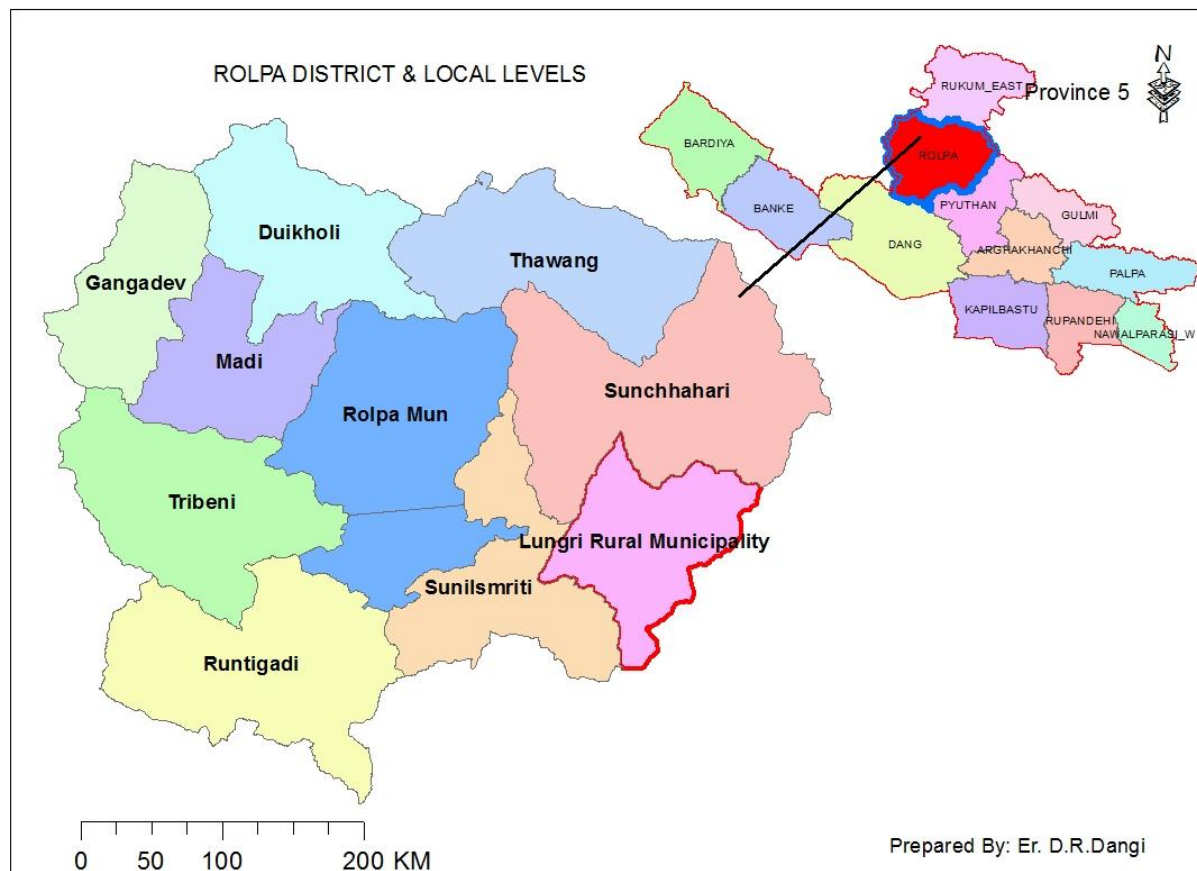
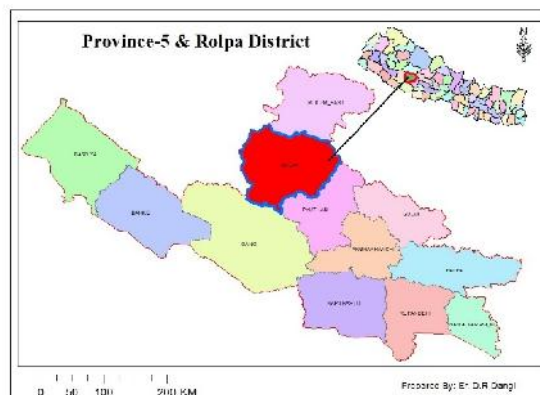
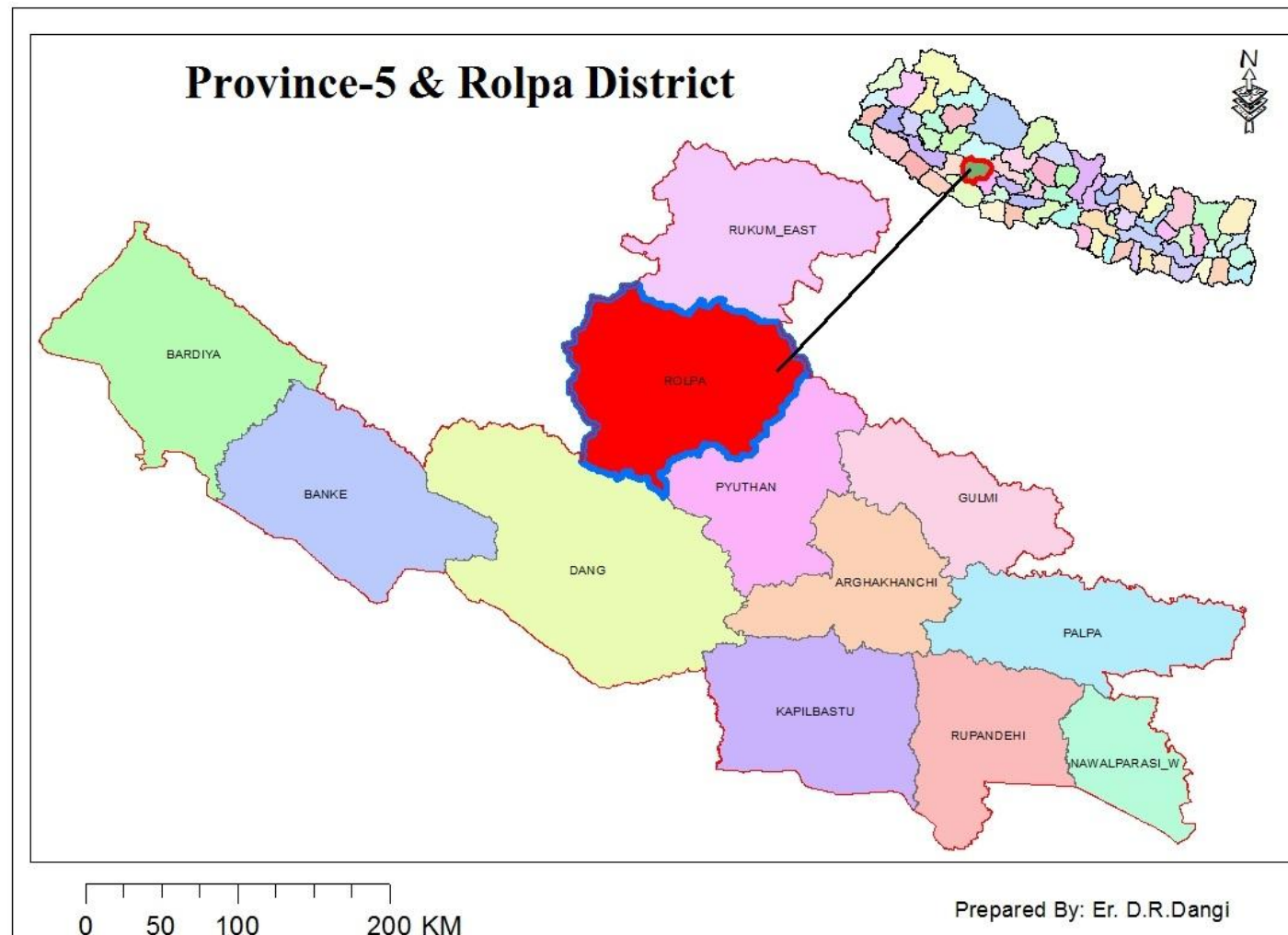
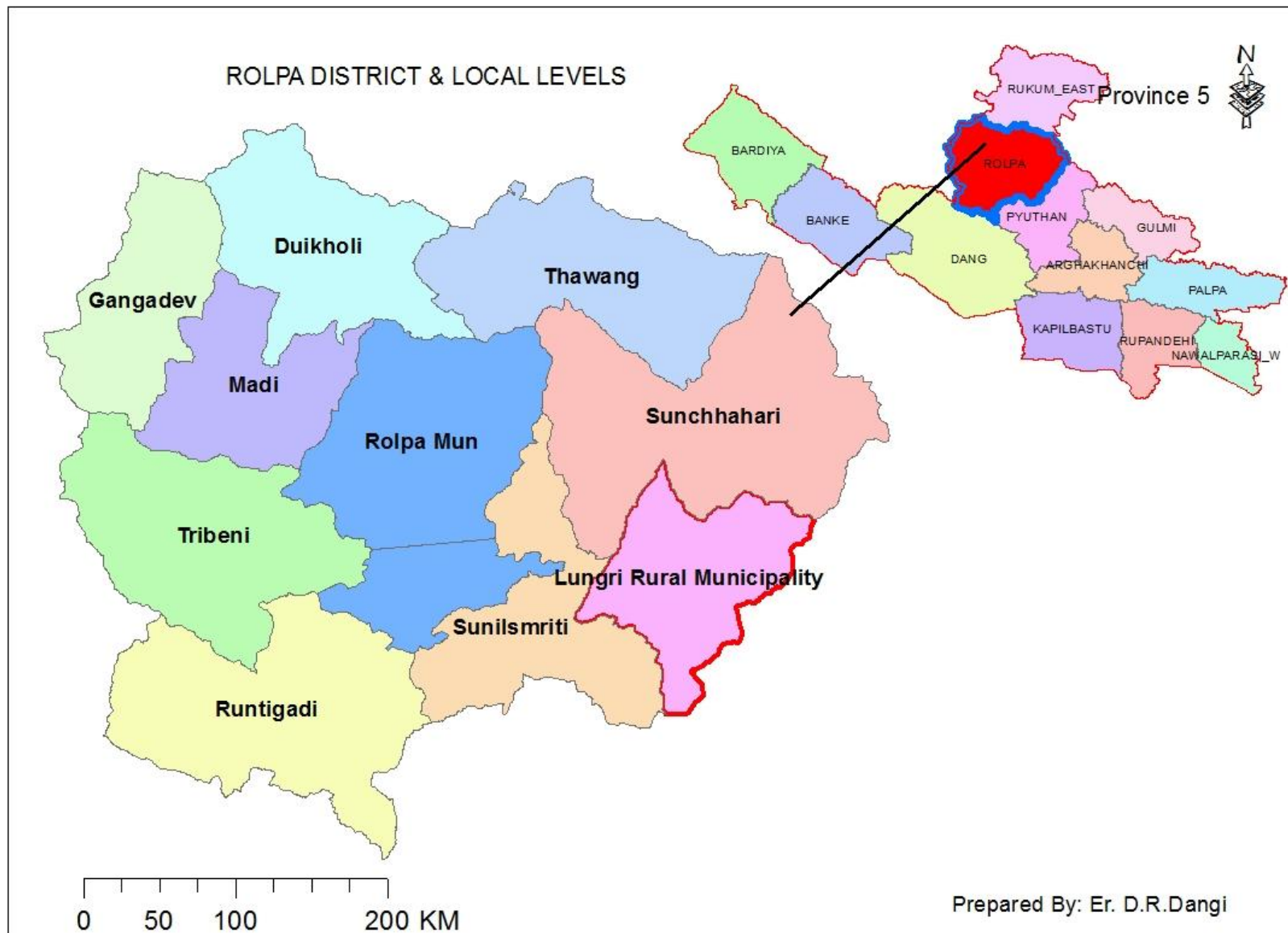


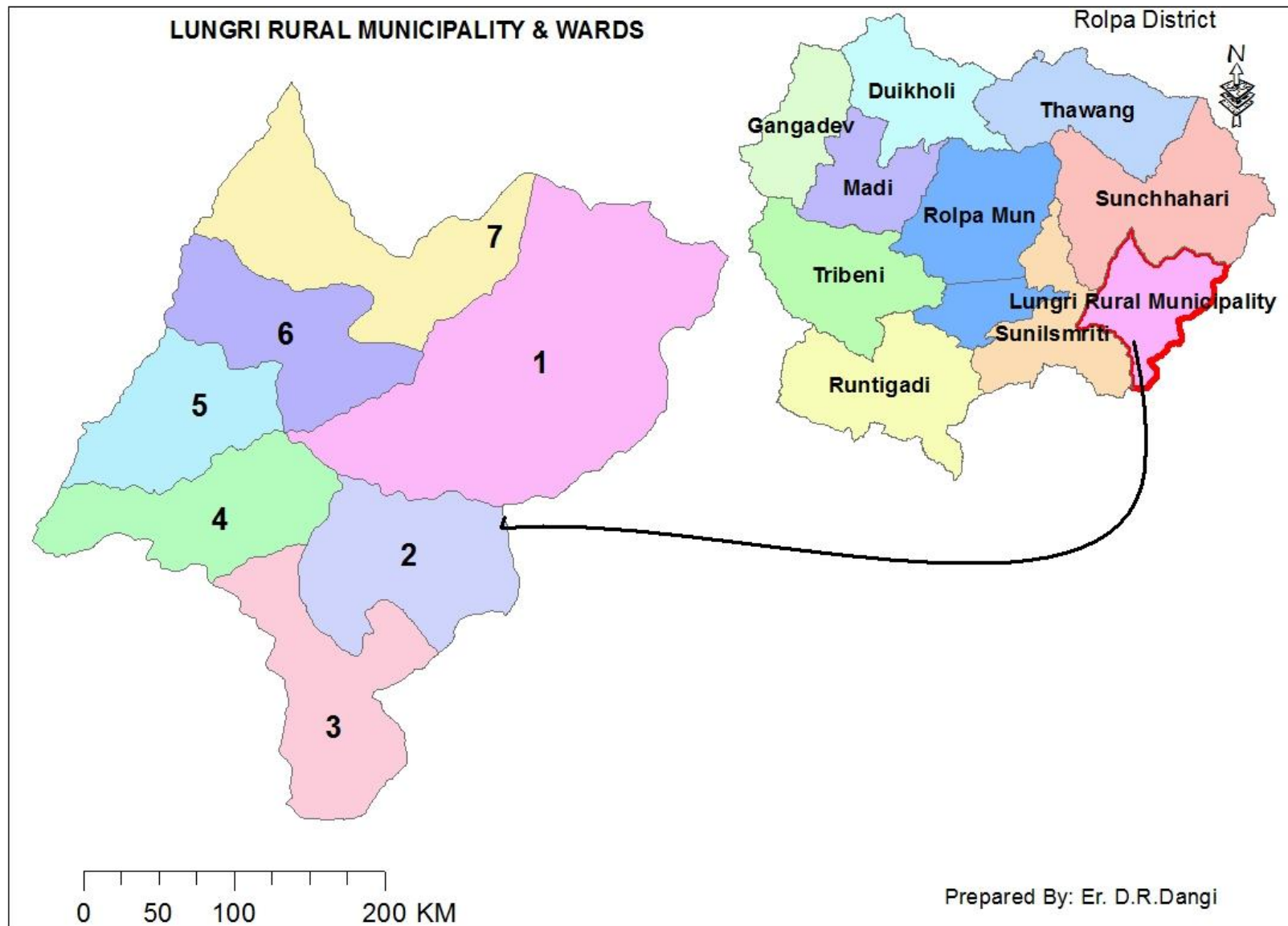
Figure 1 Location of the Lungri Rural Municipality

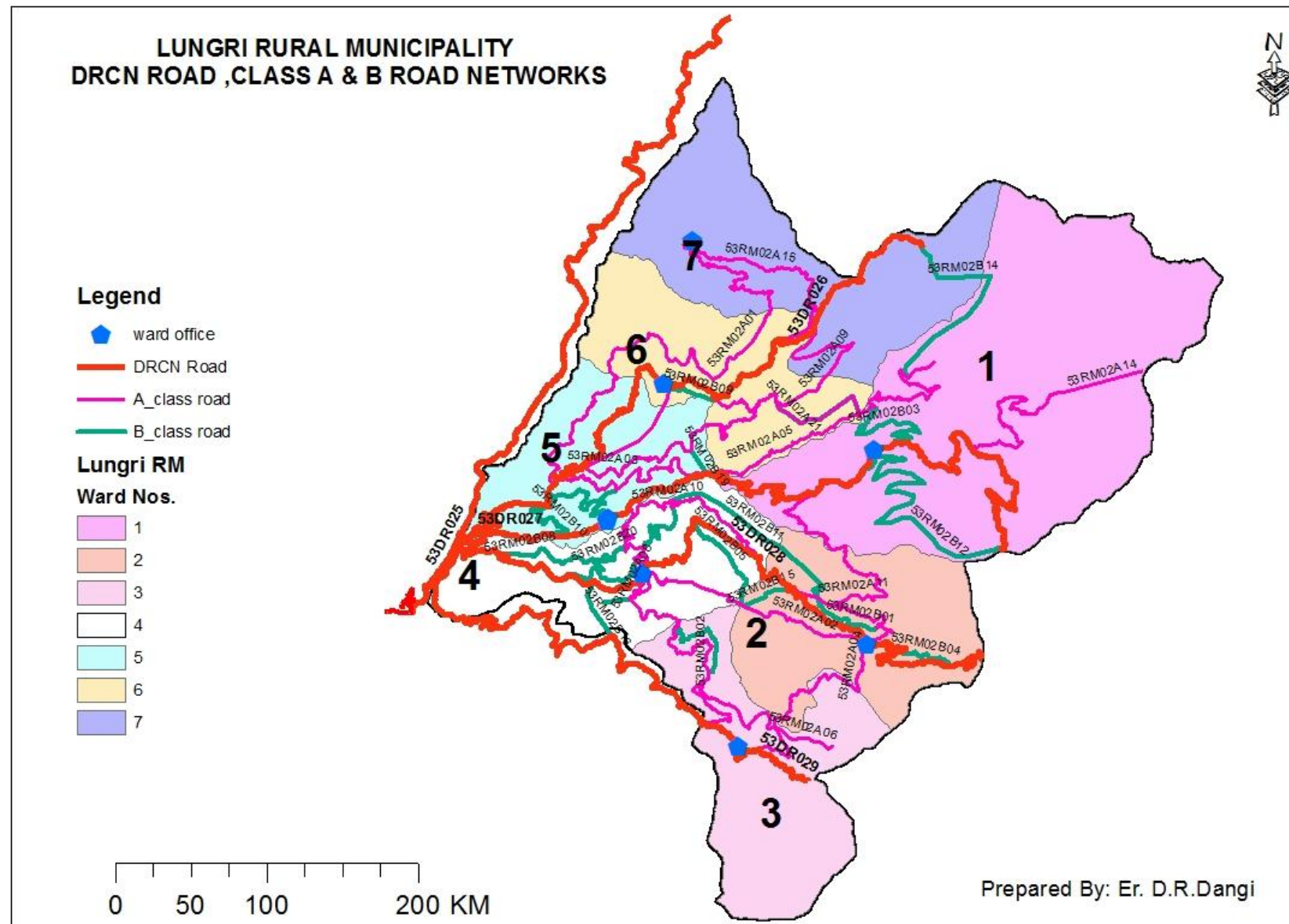


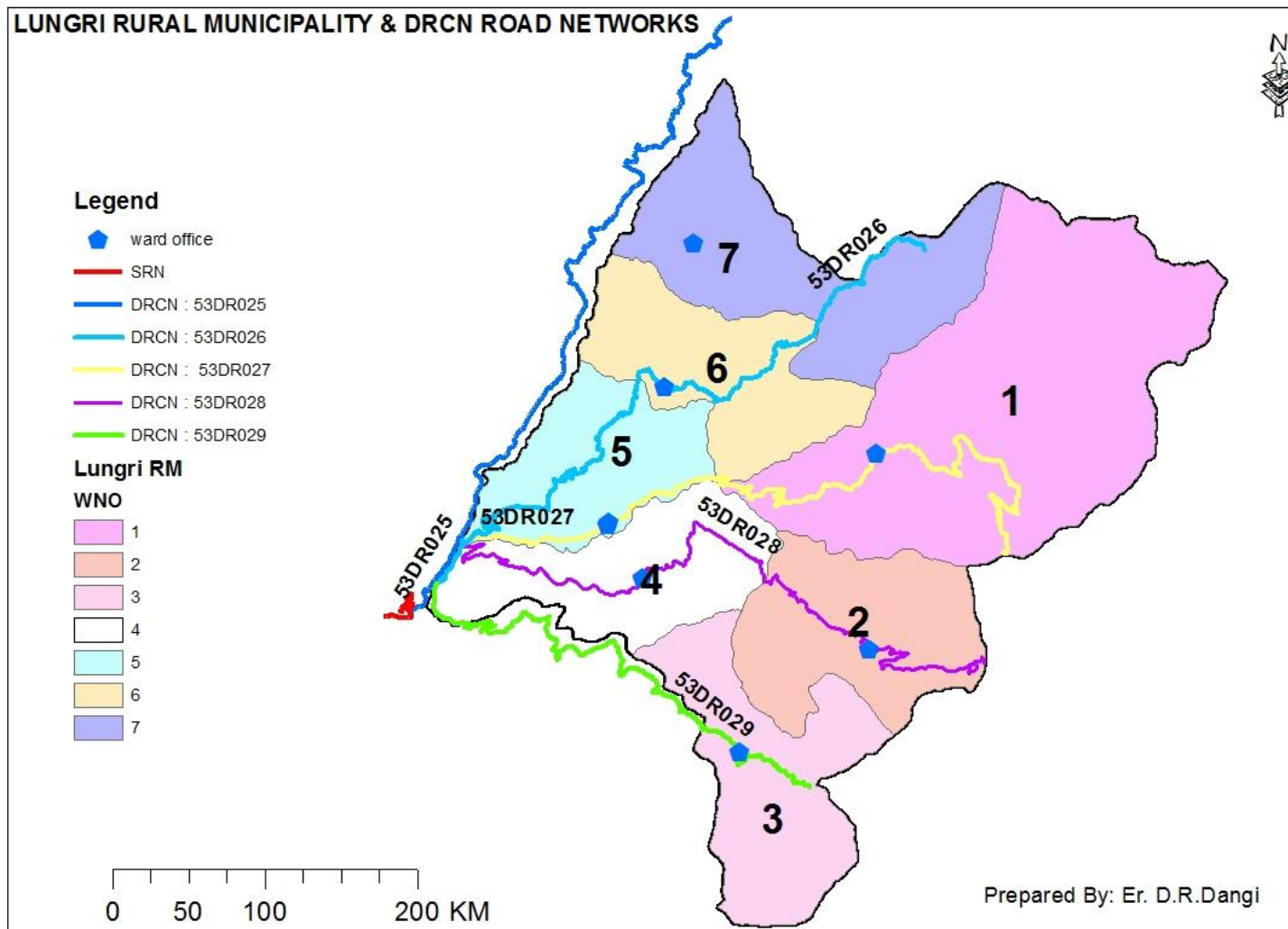
ANNEX 5 MAP

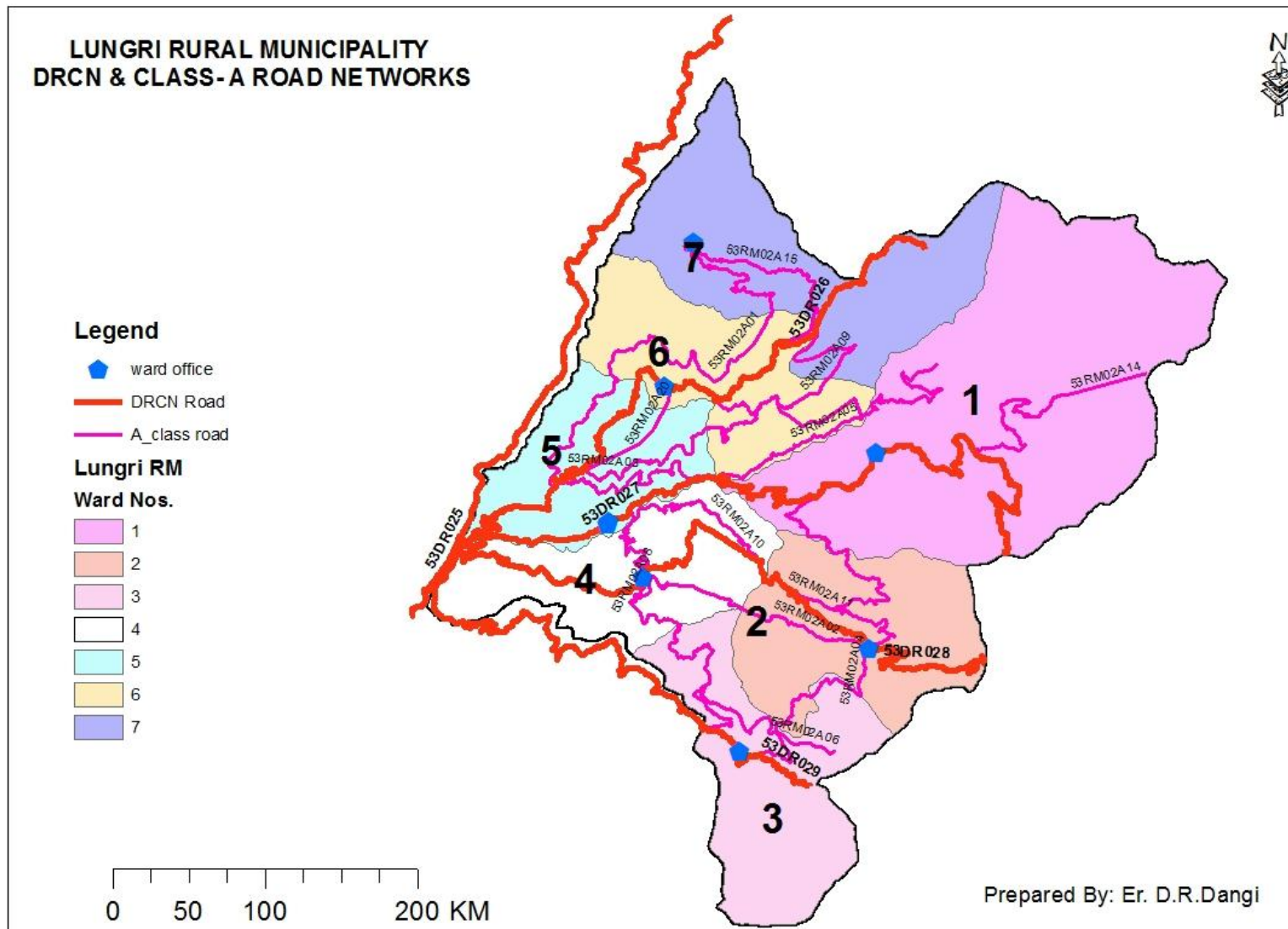


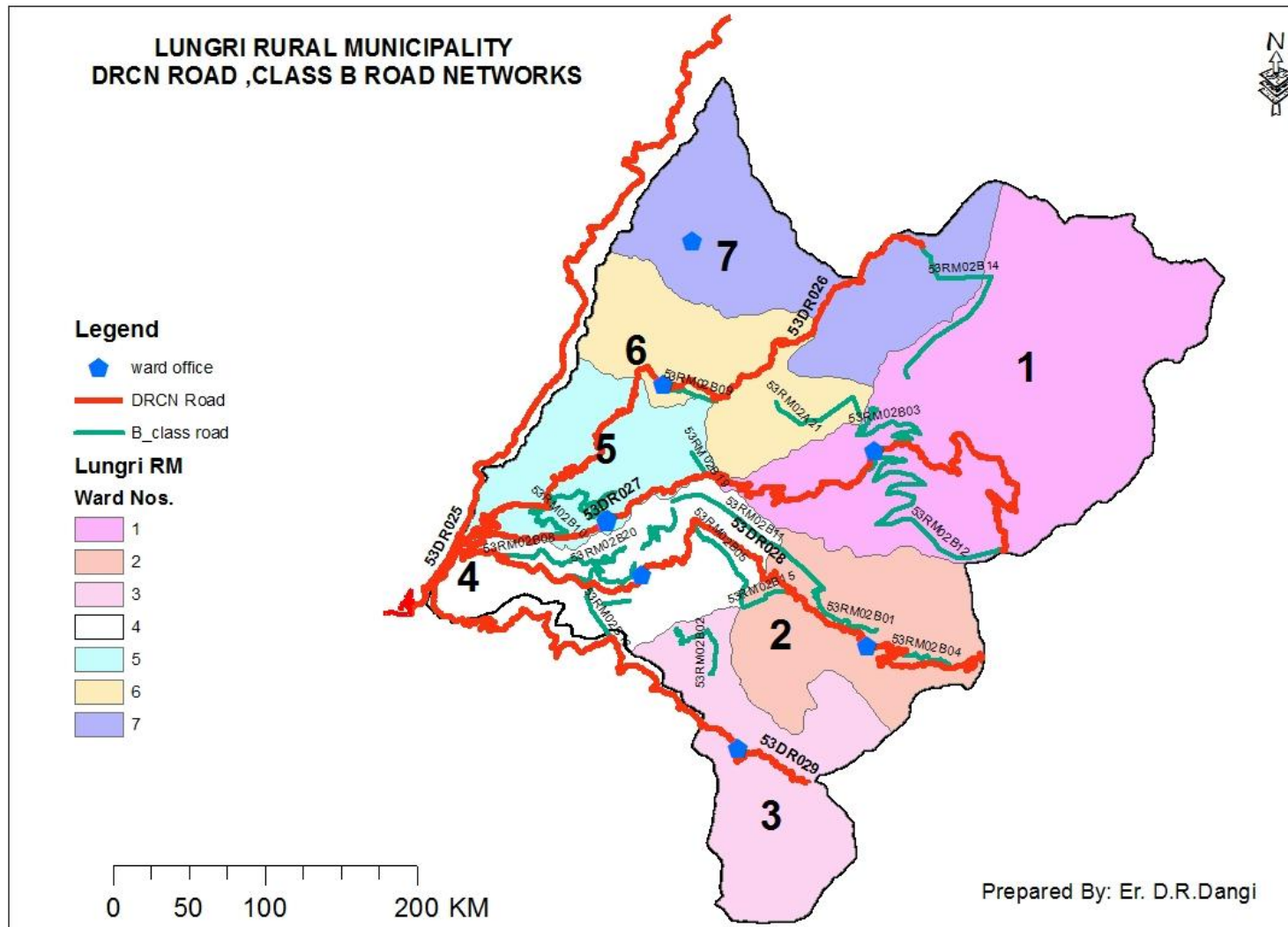












ANNEX 6 PHOTOGRAPHS



Orientation Program





Draft Report Presentation / Discussion with Representatives





Road Inventory Survey