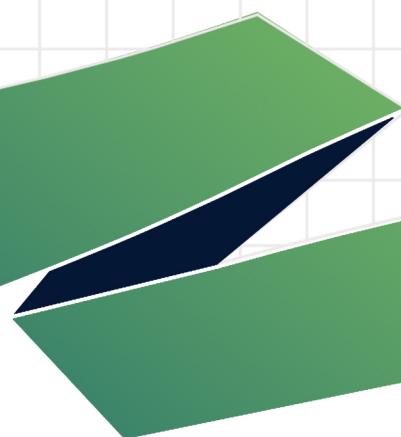


# **Review of**

# **TRAILING LOCAL AREA PLAN AND JARUNGKHASHOR LOCAL AREA PLAN**

*( JUNE 29, 2019 )*



**Department of Human Settlement  
Ministry of Works and Human Settlement**

## **FOREWORD**

Monggar town is the administrative and commercial centre of Monggar Dzongkhag. It is considered as one of the important transit centres for the eastern region making Monggar town one of the most potent towns for future development. Further, the existing establishment of the institutional and service centres in Monggar will add to the vitality of the town.

The Review of Trailing and Jarungkhashor Local Area Plan has been carried out by translating the overall proposal of Monggar Structure Plan 2016-2040, which was approved on the 17th NCCHS meeting held on 3<sup>rd</sup> October 2017. These Local Area Plans are based on an analytical assessment of the existing situation, looking into aspects such as the present land use pattern, existing buildings, land holdings and infrastructure layouts. Analyses of topography, Geotechnical survey and other environmental factors have also shaped the plan. The primary aim of these Local Area Plans is to ensure the fulfillment of the vision of the Monggar Structure Plan that is "*To develop Monggar into a vibrant and lively place to live and work*".

Implementation of any local area plan is a consultative and collaborative process. It involves educating the stakeholders about the benefits of local level planning and the need for land pooling and other collaborative efforts. The attempt in this plan is to avoid land acquisition, so that all the landowners of the local area, equally share the benefits of the developmental activities envisioned. There must be a dialogue with the landowners regarding the "before" and "after" status of their land parcels, explaining the net benefits of the planning process. The local authority will have to carry out a series of community consultations and one-to-one meetings, to make the implementation of these local area plans a truly democratic process, supported by the citizens for whom it is developed. People must realize that their property values will increase dramatically due to local area planning, offsetting their proportionate loss of land. The real success of the town will depend on the sincerity, integrity and ingenuity of the stakeholders in taking the Plan forward. Therefore, I urge all stakeholders to interpret and implement the plan in its true spirit and intention.

The Review of Trailing and Jarungkhashor LAPs have been approved by the 22<sup>nd</sup> National Committee for Human Settlements on 12<sup>th</sup> September, 2019. If any further revision or amendment to the plan is deemed necessary before the next scheduled review, the request should be submitted through the Ministry.

Tashi Delek.

(Dorji Tshering)  
Zhabtob Lyonpo

Minister

Ministry of Works & Human Settlement  
Thimphu : Bhutan

## **ACKNOWLEDGEMENT**

We would like to express our humble gratitude to our Hon'ble Zhabtog Lyonpo Dorji Tshering for his vision, direction and invaluable guidance in the review of Trailing and Jarungkhashor Local Area Plans.

The Ex Hon'ble Secretary of MoWHS, Dasho Chencho Norbu provided constant and valuable advice. We are also indebted for his efforts to ensure that the planning benefits accrue to all stakeholders equitably.

The Hon'ble Secretary of MoWHS, Dasho Chencho Dorji provided constant and valuable advice.

We are grateful to the National Land Commission and the Hon'ble Secretary for facilitating preparation of the plan through timely provision of data and information related to land.

We would like to thank Dasho Ugyen Sonam, Monggar Dzongdag for his initiatives, advice and critical review of the plan and ensuring the successful completion of the planning project. Dasho Dzongrab Gom, Jamyang Cheda for his tireless effort in chairing the meeting and for providing valuable inputs.

We would like to acknowledge the support and assistance of Ram Bahadur Darjee, Dzongkhag Development Regulatory Officer, Tshering Dorji, Land Registrar officer, DK Bishwa, surveyor, Wangchuk Rabten, Building Inspector, Thromde Ngotsab and all the Dzongkhag officials and supportive staffs.

We greatly appreciate the patience, commitment and support of the residents of Monggar and landowner of Trailing and Jarungkhashor settlement. Their local knowledge and review of the proposals helped improve the plan immensely.

The Director of DHS, Mr. Karma Sonam, provided constant guidance and direction. We are also grateful to all the DHS officials for their contribution and critical review of the proposals.

We would like to record our gratitude to the Hon'ble Members of the National Committee for Human Settlement for the final review of the plan and their valuable suggestions for betterment of the plan and its implementation mechanisms.

**The Planning Team:**

Tashi Penjor, Lead Planner & Team Coordinator

Yeshey Jamtsho, Sr. Urban Planner, UPDD, DHS, Team Leader

Kinzang Deki, Sr. Urban Planner, UPDD, DHS, Team member

Tilachand Timsina, Sr. Urban Planner, UPDD, DHS, Team member

Sangay Wangchuk, Architect, Monggar Dzongkhag, Team member

Sonam Seldon Dema, Urban Planner, UPDD, DHS, Team member.

## TABLE OF CONTENT

	<b>Page</b>
<i>Foreward.....</i>	<i>i</i>
<i>Acknowledgement.....</i>	<i>ii</i>
<i>Table of Contents.....</i>	<i>iii</i>
<i>List of Tables.....</i>	<i>vi</i>
<i>List of Figures.....</i>	<i>vii</i>
<i>List of Maps.....</i>	<i>viii</i>
<i>List of Annexures.....</i>	<i>x</i>
<i>List of Abbreviations and Acronyms.....</i>	<i>xi</i>
 <b>Chapter I. INTRODUCTION.....</b>	<b>1</b>
1.1 Location and Profile.....	1
1.2 Monggar Structure Plan (2000-2015).....	2
1.2.1 Vision and Strategies.....	2
1.2.2 Aims and Objectives.....	2
1.2.3 Structure Plan Proposals.....	3
1.3 Proposed Site.....	4
1.3.1 Thromde Area.....	4
1.3.2 Local Area Plan (LAP) Prioritization.....	5
1.3.3 Planning Area.....	6
1.3.3.1 Trailing LAP.....	6
1.3.3.2 Jarungkhashor LAP.....	7
 <b>Chapter II. PLANNING CONSIDERATIONS.....</b>	<b>9</b>
2.1 Geotechnical Survey Report.....	9
2.1.1 Slope (Steep Topography).....	9
2.1.2 Soil Structure.....	10
2.1.3 Geological Condition.....	10
2.2 Monggar Structure Plan (2016-2040).....	12
2.2.1 Universal Accessibility and Walkability.....	12
2.2.2 Economic Potential.....	13
2.2.3 Architectural Identity.....	13
 <b>Chapter III. EXISTING SCENARIO.....</b>	<b>14</b>
3.1 Physical Setting.....	14

3.2	Existing Land Patterns.....	15
3.2.1	Land Holdings.....	15
3.2.2	Land Use Classification.....	17
3.2.3	Plot Size Classification.....	19
3.3	Built Environment.....	21
3.3.1	Building Typology.....	21
3.3.2	Building Height.....	23
3.3.3	Building Material.....	25
3.3.4	Building Use.....	27
<b>Chapter IV.</b>	<b>EXISTING AMENITIES.....</b>	<b>29</b>
4.1	Social Infrastructure.....	29
4.1.1	Social Institutions.....	30
4.1.2	Road Network and Circulation.....	30
4.1.3	Open Space System.....	31
4.2	Existing Utilities and Services.....	32
4.2.1	Water Supply System.....	32
4.2.1.1	Issues.....	32
4.2.2	Sewerage System.....	33
4.2.2.1	Issues.....	33
4.2.3	Drainage System.....	33
4.2.3.1	Issues.....	33
4.2.4	Solid Waste Management.....	34
4.2.4.1	Issues.....	34
<b>Chapter V.</b>	<b>ANALYTICAL STUDY.....</b>	<b>36</b>
5.1	Land Suitability.....	36
5.1.1	Slope Analysis.....	36
5.1.2	Engineering Geology.....	37
5.1.3	Seismic Hazard.....	38
5.1.4	Hazard Analysis.....	38
5.1.5	Analysis and Rationalization of Structure Plan Land Use.....	49
5.1.5.1	Rationalization of E-1 Plots.....	40

	5.1.5.2	Restoration of Drainage Buffer as E-1 Precinct.....	40
5.2		Mode of Land Mobilization .....	40
5.3		SWOT Analysis .....	42
<b>Chapter VI.</b>		<b>PROPOSAL FOR ACTION.....</b>	<b>44</b>
6.1		Concept of the Plan.....	44
6.2		Planning Principles.....	45
6.3		Precinct Plan.....	46
	6.3.1	Environmental Conservation Precinct.....	48
	6.3.2	Open Space System Precinct.....	49
	6.3.3	Institutional Precinct.....	50
	6.3.4	Urban Core 1.....	51
	6.3.5	Urban Core 2.....	52
	6.3.6	Urban Village 1.....	53
	6.3.7	Urban Village 2.....	54
	6.3.8	Environment restricted Development Precinct.....	55
	6.3.9	Service precinct.....	56
6.4		Infrastructure Proposal.....	58
	6.4.1	Water Supply.....	58
	6.4.2	Sewerage System.....	59
	6.4.3	Drainage System.....	60
	6.4.4	Solid Waste Management.....	60
	6.4.5	Traffic and Transportation Proposal.....	61
	6.4.6	Open Spaces and Footpath.....	63
6.5		Plot Reconfiguration.....	64
	6.5.1	Plot Reconfiguration plan: Trailing.....	64
	6.5.2	Plot Reconfiguration Plan: Jarungkhashor.....	66
6.6		Implementation plan.....	67
<b>ANNEXURE.....</b>			<b>69</b>

## LIST OF TABLES

<b>Table</b>		<b>Page</b>
3.1	Land holding details of the planning area.....	15
3.2	Land use classification details of the planning area.....	17
3.3	Plot size classification details of the planning area.....	19
3.4	Built typology details of the planning area.....	21
3.5	Building height details of the planning area.....	23
3.6	Building material details of the planning area.....	25
3.7	Building use details of the planning area.....	27
5.1	Slope distribution table.....	36
5.2	Hazard distribution table.....	38
5.3	Existing area distribution table of the two local area plans.....	41
5.4	Proposed area distribution table of the two local area plans.....	42

## LIST OF FIGURES

<b>Figure</b>		<b>Page</b>
1.1	Trailing Local Area Plan as seen from the National Highway.....	6
3.1	Illustration showing the physical setting of the planning area.....	14
4.1	Road connection to the bus booking.....	30
4.2	The workshop area in Trailing LAP.....	30
4.3	Green open space in the planning area.....	31
4.4	Lack of drains at the workshop area.....	34
4.5	Waste disposed near the road in Trailing.....	34
4.6	Image from the existing waste disposal site.....	35
5.1	SWOT analysis diagram.....	43
6.1	Design section for the drains on steep slope.....	60
6.2	Design section for Primary, secondary and access /tertiary roads.....	62

## LIST OF MAPS

<b>Map</b>		<b>Page</b>
1.1 Location Map of Monggar Dzongkhag.....		1
1.2 Monggar Precinct Plan.....		4
1.3 Monggar Thromde precinct map.....		5
1.4 Trailing Local Area Plan as prepared in the year 2000.....		7
1.5 Jarungkhashor Local Area Plan as prepared in the year 2000.....		8
2.1 Slope analysis map of Monggar as illustrated in the Geotechnical Survey Report.....		10
2.2 Engineering Geological Map of Monggar as illustrated in the Geotechnical Survey.....		11
2.3 Hazard map of Monggar as illustrated in the Geotechnical Survey Report.....		12
3.1 Land holding Map of Trailing and Jarungkashor LAPs.....		16
3.2 Land use classification map of Trailing and Jarungkashor LAPs.....		18
3.3 Plot size classification map of Trailing and Jarungkashor LAPs.....		20
3.4 Built typology map of Trailing and Jarungkashor LAPs.....		22
3.5 Building height detail map of Trailing and Jarungkashor LAPs.....		24
3.6 Building material map of Trailing and Jarungkashor LAPs.....		26
3.7 Building use map of Trailing and Jarungkashor LAPs.....		28
4.1 Map showing the location of various social institutions in Monggar...		29
4.2 Water supply network map.....		32
5.1 Slope analysis map of the planning area.....		36
5.2 Engineering geology map of the planning area.....		37
5.3 Hazard map of the planning area.....		38
5.4 Land use map as per the Structure Plan.....		39

6.1	Concept Plan.....	44
6.2	Proposed Precinct Plan.....	47
6.3	Proposed E-1 precinct map.....	48
6.4	Proposed OS-precinct plan.....	49
6.5	Proposed I-precinct map.....	50
6.6	Proposed UC-1 precinct map.....	51
6.7	Proposed UC-2 precinct map.....	52
6.8	Proposed UV-1 precinct map.....	53
6.9	Proposed UV-2 precinct map.....	54
6.10	Proposed RD precinct map.....	55
6.11	Proposed Service precinct map.....	56
6.12	Proposed Child Care Centre.....	57
6.13	Proposed water supply map.....	58
6.14	Proposed locations for common septic tanks and treatment plant in Trailing.....	59
6.15	Proposed locations for common septic tanks and treatment plant in Jarungkhashor.....	59
6.16	Proposed road layout map.....	61
6.17	Proposed locations of open space and footpath.....	63
6.18	Plot reconfiguration map of Trailing.....	65
6.19	Plot reconfiguration map of Jarungkhashor.....	66

## **LIST OF ANNEXURES**

<b>Annexure</b>		<b>Page</b>
A	Plotting Details.....	69
B	MOM Public Consultation Meetings.....	74
C	One-on-One Consultation Meeting.....	82
D	Revised Developemnt Control Regulation.....	86

## **LIST OF ABBREVIATIONS AND ACRONYMS**

CGI	Corrugated Iron
CSO	Civil Society Organization
DCR	Development Control Regulation
E-1	Environment Conservation Precinct
ECCD	Early Childhood Care and Development
G	Ground Floor
GC	Green Corridor
GI	Geotechnical Investigation
GI	Galvanized Iron
HDPE	High Density Poly-Ethylene
Km	Kilometre
LAP	Local Area Plan
LAPs	Local Area Plans
LP	Land Pooling
LPCD	Litre Per Capita Per Day
M	Metre
MCT	Main Central Thrust
MLD	Mega Litres Per Day
NCRP	National Cadastral Re-Survey Programme
OS	Open Space
RCC	Reinforce Cement Concrete
RD	Restricted Development
RNR	Renewable Natural Resource

ROW	Right Of Way
RSTA	Road Safety and Transport Authority
S	Service Precinct
Sq. km	Square Kilometre
UC	Urban Core
UV	Urban Village
WTP	Water treatment Plant

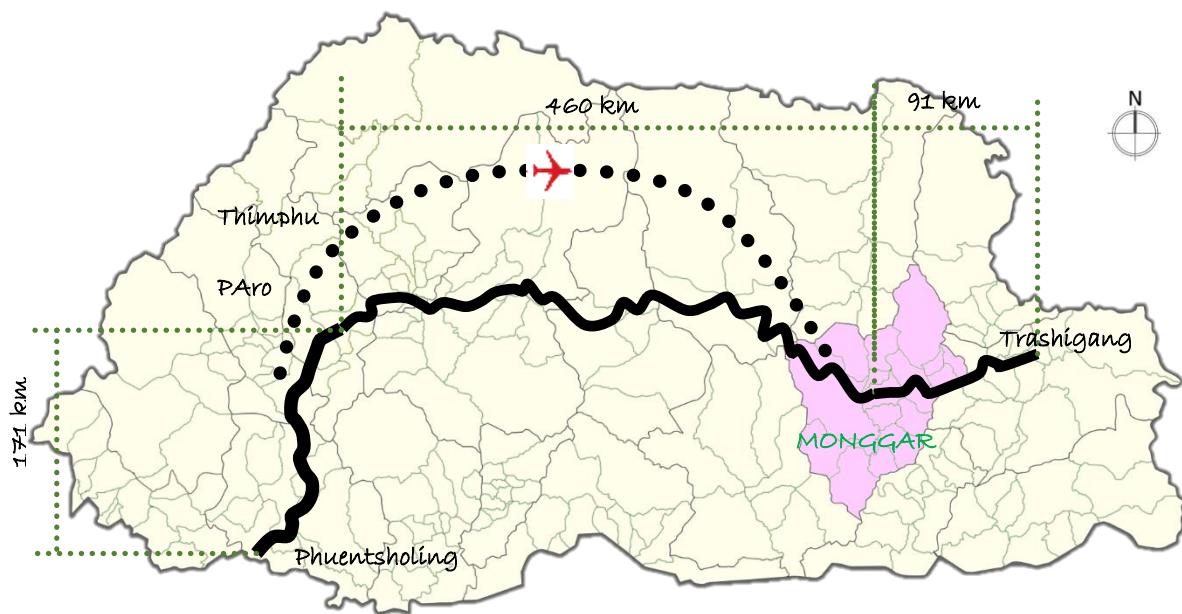
## Chapter I

### INTRODUCTION

#### 1.1 Location and Profile

Monggar Dzongkhag is a district in the eastern part of Bhutan. It is located about 460km to the east of Thimphu on Thimphu-Trashigang National Highway. Located at an altitude ranging from 400m-3800m above sea level, it circumvents an area of about 1940.23 sq.km. It is considered as one of the important transit centres for the eastern region. The annual precipitation ranges from 1000mm to 2000mm per year.

Monggar town is the commercial and administrative centre of Monggar Dzongkhag. The first development plan ‘The Urban Development Plan (1986-2000)’ for the town was prepared in 1985 with an area of 0.412 sq.km, which was extended to 1.654 sq.km when the plan was reviewed in the year 2000. The Thromde area was further increased to 3.05 sq.km during the declaration of Dzongkhag and Yenlag Thromdes by the parliament in 2015. The current Thromde boundary includes the existing Monggar town, Gyalpoizhing and Kidheykhar.



Map 1.1. Location Map of Monggar Dzongkhag.

## **1.2 Monggar Structure Plan (2000-2015)**

The Monggar Structure Plan (2000-2015) was prepared for the Monggar town in the year 2000. The plan was prepared as a strategic document to guide the physical development in Monggar in a cost effective, environmentally sound and sustainable manner. It apportions the area into existing Monggar core and four Local Area Plans namely, Trailing LAP towards the south-west of the core, Jarungkhashor towards the north-west of the core, and Changshingpeg and Naling towards the southeast of the core. Following the end of the Structure Plan period in 2015, it was subsequently reviewed in 2016. The new ‘Structure Plan (2016-2040)’ highlights the need to review the Trailing and Jarungkhashor LAPs as priority due to factors such as its proximity to the national highways, rampant development in the LAPs among others.

### **1.2.1 Vision and Strategies**

The Monggar Structure Plan envisions “*To develop Monggar into a vibrant and lively place to live and work*”

The strategies identified for the realization of the long-term vision are as follows:

- Development of structures that would harmonize with the steep topography of Monggar.
- Development of play areas and green areas.
- Development of network of off-street and on-street pedestrian connectivity that would connect the main activity centres.
- Redesign and redevelopment of the existing park within Monggar core town.
- Promote construction of traditional architectural building.
- Enhance the use of spaces (for instance setback, colonnade areas) within the LAPs and core town through guidelines and regulations and its effective enforcement by the Local government.

### **1.2.2 Aims and Objectives**

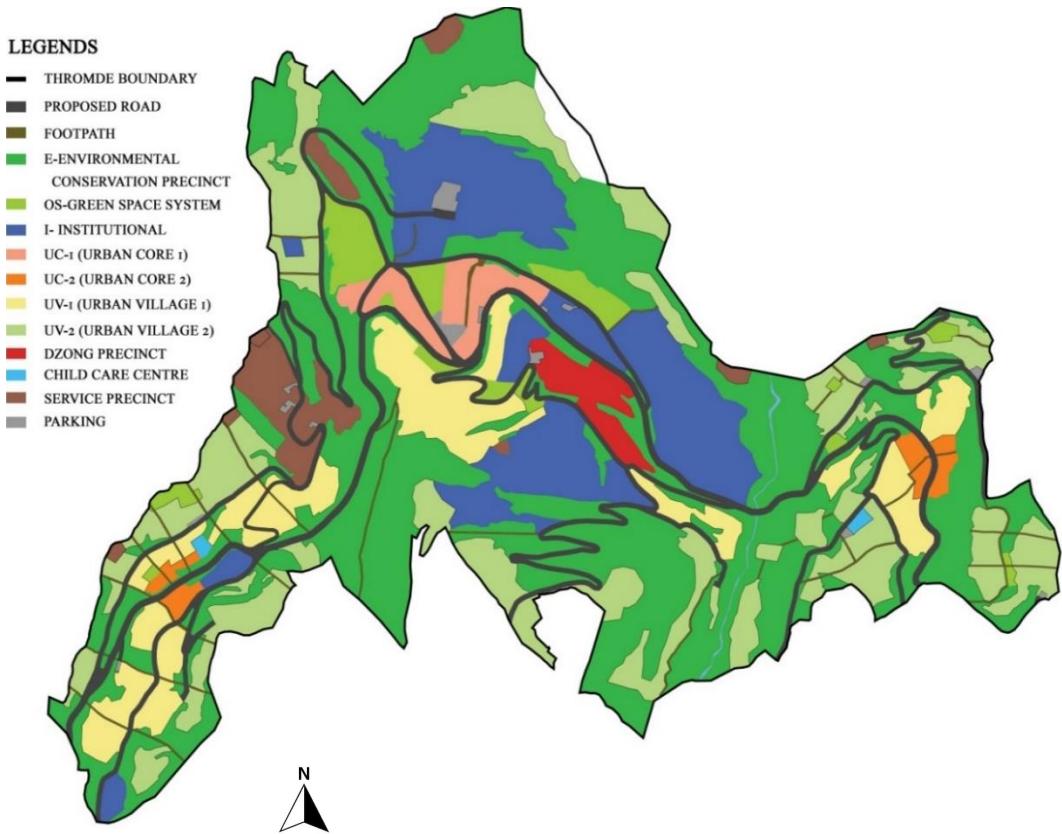
- To promote environment friendly construction through; encouraging split design construction on steep slopes, use of locally available materials, designate and

- preserve environmentally sensitive area from development;
- To designate and develop play areas and green areas to suffice the existing and the future needs;
- To promote pedestrian walkability through the development of network of off-street and on-street pedestrian connectivity that connects the main activity centres;
- To redesign/redevelop the existing park within Monggar core town;
- To promote the construction of traditional architectural building; and
- To enhance the use of spaces (for instance setback, colonnade areas) within the LAPs and core town through guidelines/regulations and its effective enforcement by the Local government.

### **1.2.3 Structure Plan Proposals**

Some of the proposals expended in the plan are as follows:

- Development of network of off-street and on-street pedestrian path for easy accessibility to the main centres.
- Provision of children play areas in each local area plan for easy access by children in the neighborhood .
- The Monggar core area is densely built and is in need of a makeover to integrate with the traditional structures that exists in the core.
- As the topography of Monggar is generally steep, there is a need for the building to be built with split-level floors. The plan proposal strives to encourage split-floor construction to ensure a development that harmonizes with the site context.
- A neighbourhood node has been proposed in Trailing, Changshingpeg, and Kidheykhar to cater to the basic needs of the neighbourhood, as well as for the provision of services such as childcare centre within the identified precinct.

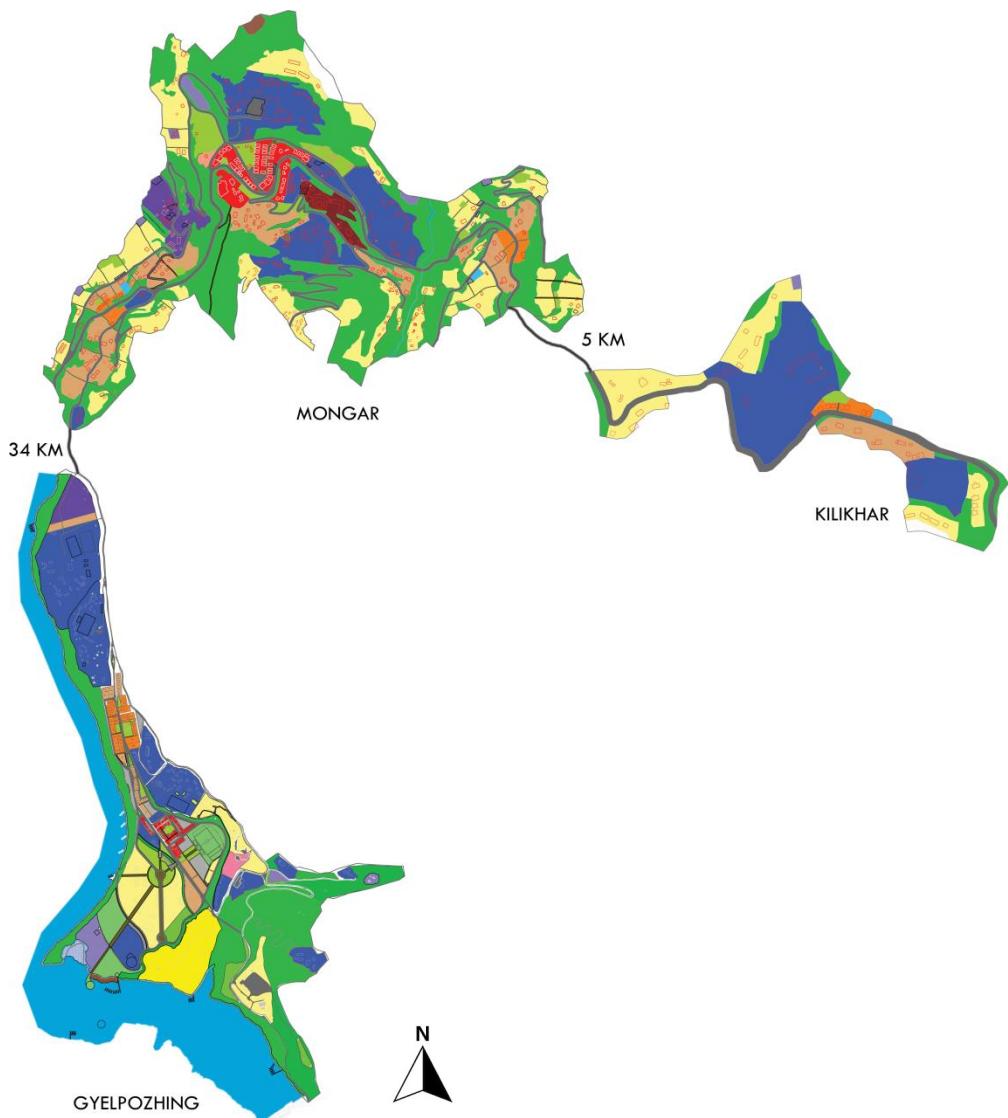


Map 1.2. Monggar Precinct Plan

### 1.3 Proposed Site

#### 1.3.1 Thromde Area

Monggar Thromde has an area equal to 3.05 sq.km. The current Thromde boundary includes the existing Monggar town, Gyalpoizhing and Kidheykhar. The Monggar town area, which comprises the core and the four LAPs, has an area of 1.29 sq.km. As per the structure plan, 4525 individual resides in the Thromde area. At a growth rate of 3.39% (considered in the World Bank Report 2014) for the Thromde, the population is estimated to be around 12484 by the year 2040.



Map 1.3. Monggar Thromde precinct map.

### 1.3.2 LAP Prioritization

Due to the strategic location of the Trailing settlement, the whole settlement can be seen as one enter towards the Monggar town. Even more so, what is more apparent is the rampant growth that has taken place in the area within the last few years. Many of the newly developed structures have not conformed with the existing development control regulations and the site condition. As a result, the new development activities not only

pose a risk owing to dense development on unstable steep terrain, but also has an adverse impact on the aesthetic and image of the town.

Therefore, in addition to the remediation measures, such as the vertical green corridors of width 3.5m that are interspersed across the LAP area and breaks the pressure of the dense developable area, preparation of a detail local area plan for Trailing is also emphasized as a priority by the Monggar Structure Plan. In addition, the Jarungkhashor LAP that abuts the Trailing LAP bears similar traits as the latter, hence; the review of Jarungkhashor LAP was also taken as a priority along with the review of the Trailing LAP as indicated in the structure plan.



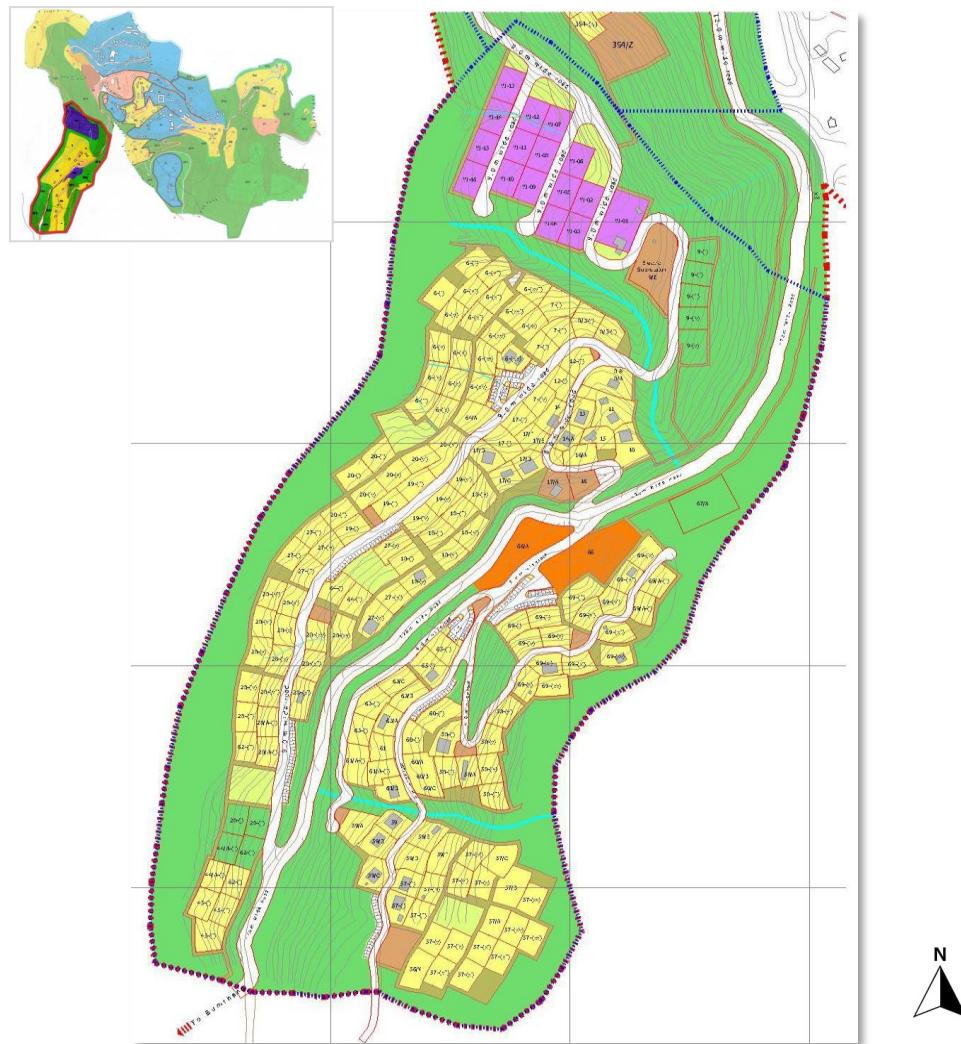
Figure 1.1. Trailing Local Area Plan as seen from the National Highway.

### 1.3.3 Planning Area

#### 1.3.3.1 Trailing Local Area Plan

As indicated earlier, the Trailing Local Area Plan is situated on the Thimphu-Trashigang National Highway, before one enters the main town of Monggar from Bumthang, i.e. towards the west of the town. The National Highway divides the site into two areas, one above and another below the highway. The LAP encompasses an area equal to 63 acres approximately. As per the structure plan, a neighborhood commercial centre, a bus terminus, and a weaving centre are proposed near the commercial core. A service area is also earmarked for workshops that will provide services to Monggar Dzongkhag Thromde. During the LAP preparation in the year 2004, the plots were re-configured as per road proposal in the plan, however owing to its steep topography, unavailability or

the inadequacy of the pooled land, many plots couldn't be provided with road access. A pooling percentage of 26% was deducted from each plot for the provision of service and infrastructure in the LAP.

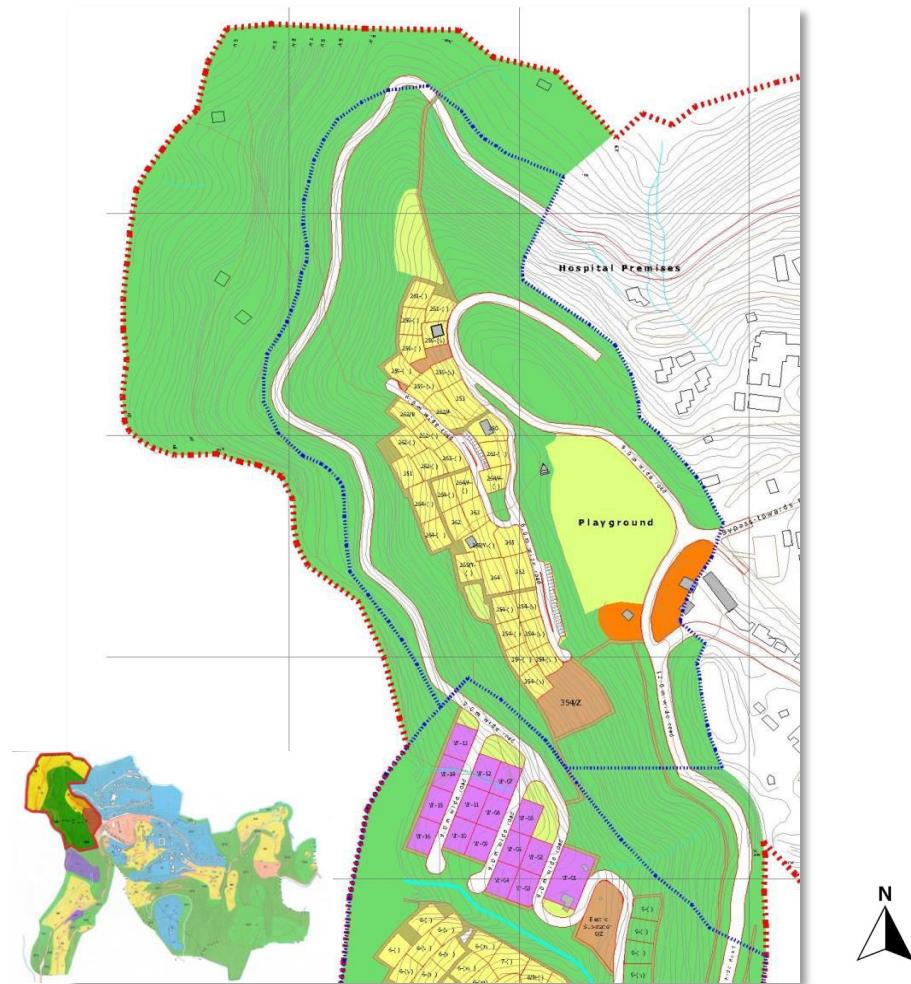


Map 1.4. Trailing Local Area Plan as prepared in the year 2000.

### 1.3.3.2 Jarungkhashor Local Area Plan

With an area of 21 acres approximately, Jarungkhashor LAP is situated on the western slopes below the existing road that leads to the hospital from the town area. Apparently, it is located on the slope adjacent to the Trailing LAP, thus it bears similar natural characteristics as the Trailing LAP. Due to its proximity to the town core, hospital and

the adjoining playground, it has been indicated as a potential area for development by the structure plan. Similar to the Trailing LAP, land pooling exercise was carried out in the area in 2004, whereby, plots were re-configured and off-street pedestrian footpath and roads where proposed from the pooled land. As the area also falls on steep slope and due to the inadequate pooled land, road access to all the plots was not provided, so most of the plots were provided with footpath access. Based on the proposed layout and plot redistribution, 15 percent land pooling contribution was applied to all plots within the LAP.



Map 1.5. Jarungkhashor Local Area Plan as prepared in the year 2004.

## **Chapter II**

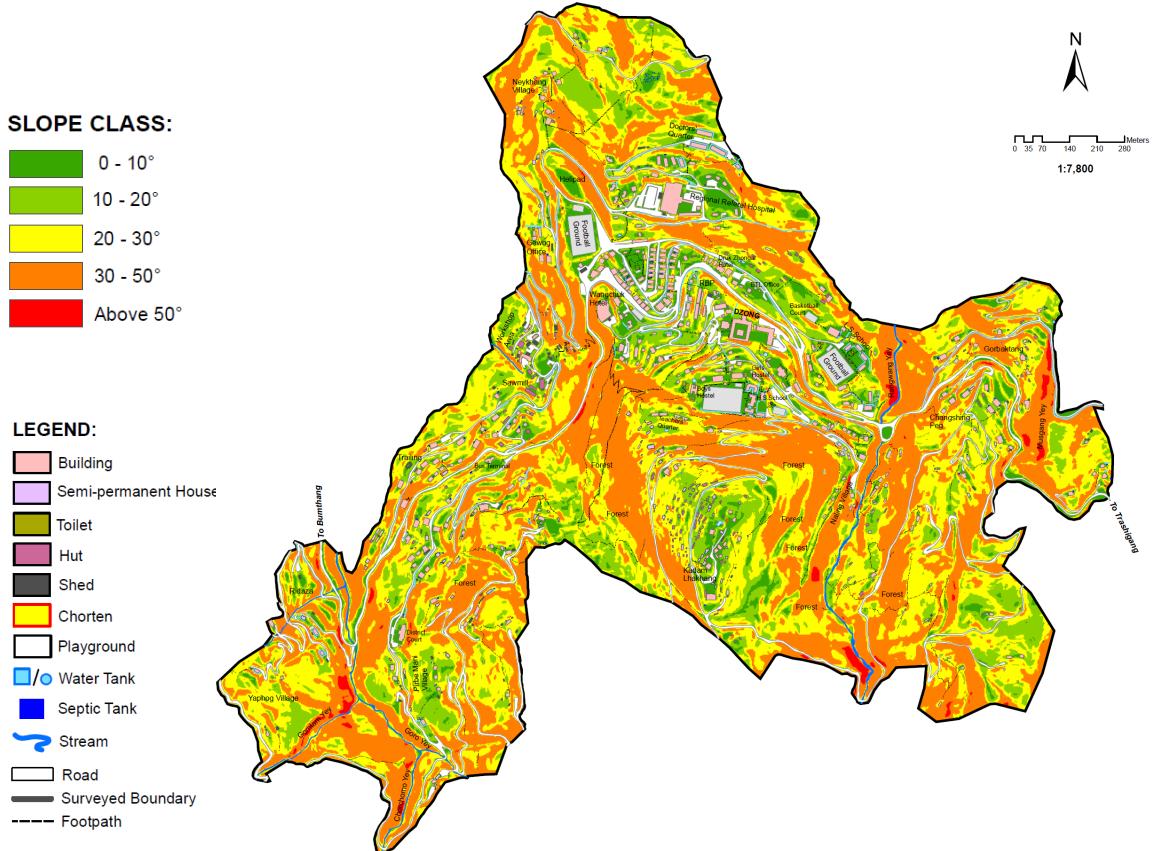
### **PLANNING CONSIDERATIONS**

#### **2.1 Geotechnical Survey Report**

The Trailing and Jarungkhashor LAPs are endowed with steep terrains and other natural conditions that could be precarious for development activities. As the two areas are proposed for planning and eventually development, a Geotechnical Study was initiated and carried out during structure plan preparation in June 2017. The Geotechnical Investigation (GI) works involved data collection encompassing geology, soil conditions, topography, hydrology, land-use, and other geotechnical aspects that could impose risk to the LAP development. Based on the data collected and site investigation, maps of geology, engineering geology, geomorphology and slope were prepared to show different hazards. In addition, the engineering properties of the soils were also studied through trial tests, lab and field tests. Similarly, the quality of the rocks and rock slopes were assessed through standard rock quality rating systems.

##### **2.1.1 Slope (steep topography)**

Based on the assessments pertaining to the slopes, the areas in the LAP were apportioned into low, medium, and high hazard zones. The low hazard zones were the areas with slope between 0-21 degrees, whereby, the report indicates about 21% of land in Monggar falls under the low hazard zone. The medium hazard zones are the areas with slopes between 20-30 degree and the high hazard zones are the areas with slopes above 30 degrees. About 42% and 37% of land in Monggar is studied to be under the medium and high hazard zones respectively. Low height construction and split pattern development that exerts minimum pressure on the land and its topography, as well as due diligence to the normal engineering standards are prescribed for the low and medium Hazard zones. Whereas, for the high hazard zones, along with the mentioned measures for the former zones, as is the practice in other parts of the world, a separate “Site Specific Geotechnical Studies” and “Geotechnical Letter of Assurance” prepared by competent Geotechnical Engineer is recommended.



Map 2.1. Slope analysis map of Monggar as illustrated in the Geotechnical Survey Report.

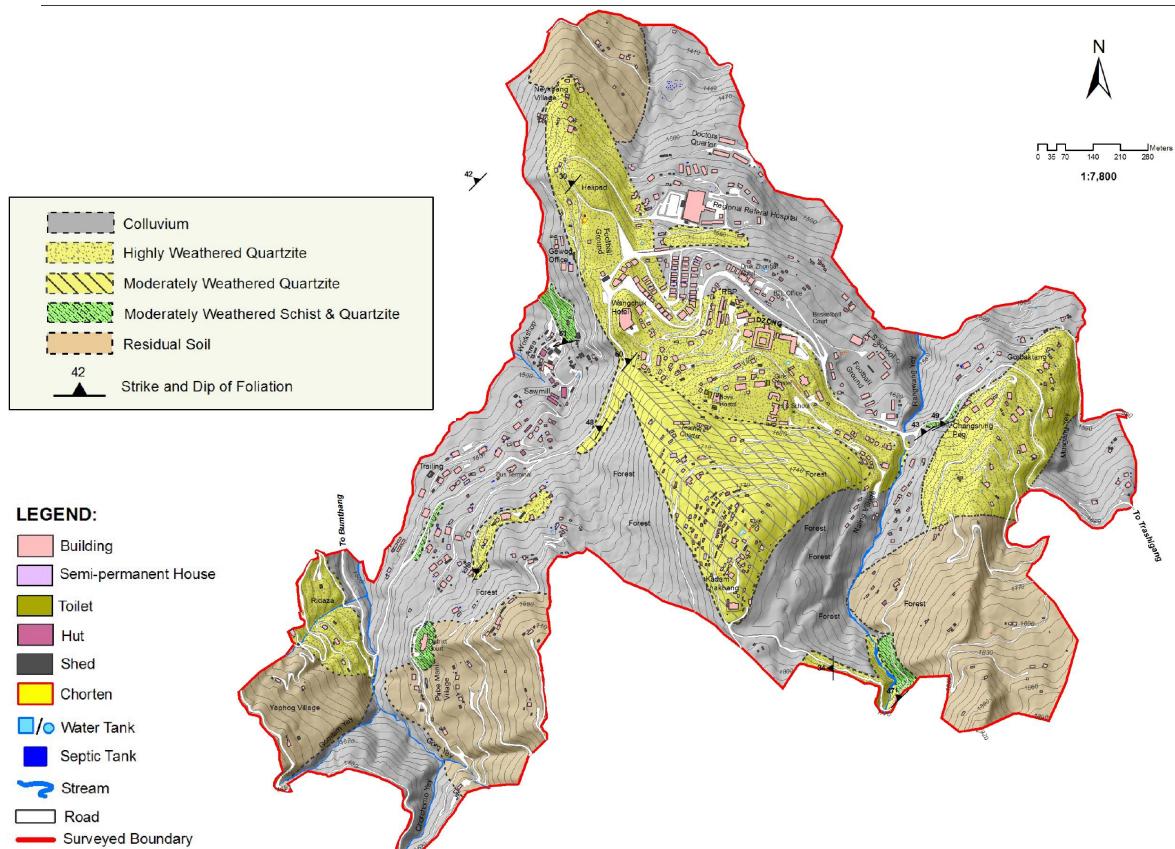
### 2.1.2 Soil Structure

The report states that the soil structure in the planning area is majorly colluvium. Colluvium is a transported soil formed from weathered material deposits, which are transported by natural forces to new sites. By and large, it can be described as landslide debris, which has slowly accumulated, on the long slopes of mountains. These soil types are poorly graded and are often in loose condition. It is also characterized by seepage and slides. Attributing to its traits, development in the LAPs is prescribed to be done with proper mitigation measures, mainly pertaining to drainage and slope treatments.

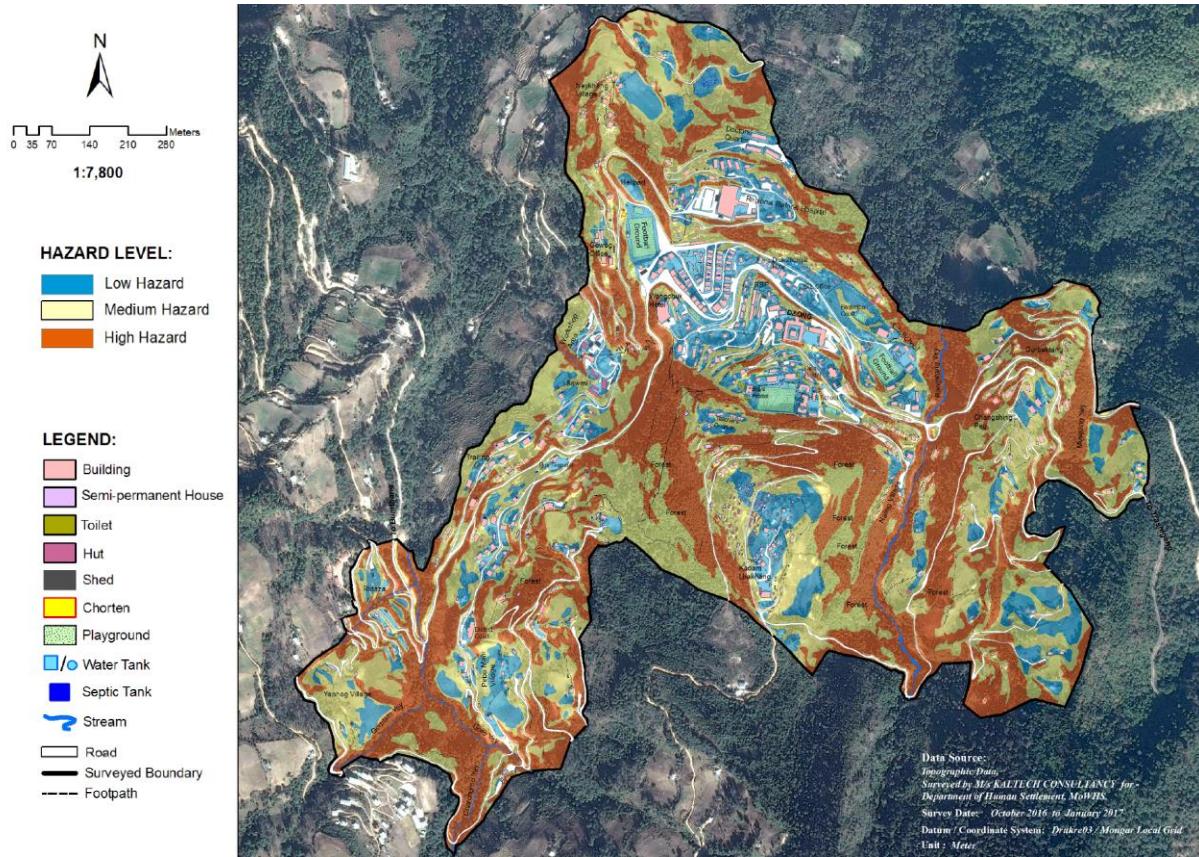
### 2.1.3. Geological Condition

The geological study as per the report has been described to be a more holistic study of an area. It requires the study of both the surface and shallow geologic conditions such as

landslides, debris flow, rock-fall and similar failures, subsidence, land degradation, erosion, scouring, and water bodies (springs, creek, streams both seasonal and perennial, seepages, etc.), and sources of instabilities (due to liquefaction, landslides, subsidence, etc.). The majority of the area in Monggar comprises of rocks of various degree of weathering. Some works have changed into residual soil. Depressions and slopes are covered with colluvium. Albeit the report asserts that the Monggar Thromde, in general, shows very few signs of instability, the Trailing area has been identified to be majorly under colluvium soil structure, which as asserted earlier is an unstable soil for construction.



Map 2.2. Engineering Geological Map of Monggar as illustrated in the Geotechnical Survey Report.



Map 2.3. Hazard map of Monggar as illustrated in the Geotechnical Survey Report.

## 2.2 Monggar Structure Plan (2016-2040)

The Monggar Structure Plan envisions Monggar as a vibrant and lively place to live and work. In doing so, promoting a pedestrian friendly environment, wherein, service and amenities such as playgrounds, parks, markets, etc. are connected to the neighborhoods through unrestrained pedestrian footpaths, are prescribed by the structure plan. An additional option of vehicular connectivity to all for an equitable and an easy access to the public facilities and services are also proposed in the structure plan. Tapping the inherent and the probable derived potentials, but at the same time assessing the carrying capacity of the planning area mainly in terms of the available resources are mentioned in the structure plan.

### 2.2.1 Universal Accessibility and Walkability

The underpinning factor for a livable area is the universal and an easy access to all the services and amenities. Even more so, the access to the amenities through a safe and

unrestrained pedestrian network is above all the traits of a livable neighborhood. Not only does it provide an efficient delivery of services, but also has an imponderable implication on the improvement of individuals' health and the environment of the community. Accordingly, the structure plan proposes many interventions such as widening of roads, creation of off-street footpath network, green buffers, and earmarks open spaces and amenities across the planning area. Nonetheless, through the LAP review, additional interventions to ameliorate the planning areas is required. Proposal of more access roads, service area, parks, revitalization of environmentally sensitive areas, and improving the existing footpath and road networks for a more equitable and universal distribution of services are all that needs to be considered for planning.

### **2.2.2 Economic Potential**

An indispensable constraint or weakness elucidated by the structure plan is the incapacity of the local government and the Thromde in terms of financial and manpower. Tapping the economic potential of the Thromde to generate revenue is an important aspect delivered by the plan. By virtue of its location, Monggar Thromde is deemed as an eastern-central transit station. The upliftment of the tourism industry as well as aggrandizing the local handicrafts and other related markets have all been emphasized in the plan. Nevertheless, a due heed is also given to the carrying capacity of the planning area that considers and compares the available resource with the current and future demographic trends.

### **2.2.3 Architectural Identity**

Another important aspect for realizing the vision of structure plan is to uphold and preserve the identity of the place. For that matter, preserving the traditional structure in the planning area and incorporating traditional architectural styles to the new construction has also been set out as an important aspect of the plan.

## Chapter III

### EXISTING SCENARIO

#### 3.1 Physical Setting

As illustrated in the earlier chapter, the Trailing and Jarungkhashor LAPs are located on the slopes that are clearly visible from the Thimphu-Trashigang National Highway. The highway also divides the Monggar town, and likewise the Trailing LAP into almost two equal halves. The Trailing Local Area Plan marks the entrance to the town from the south-western side. The Jarungkhashor LAP is located in continuation to Trailing area. The workshop on southern side, football ground on eastern side and Thromde boundary on northern and eastern side altogether delineates the boundary of the Jarungkhashor LAP. The physical characteristic of the two LAPs are generally steep. However, there are instances of gentle terrains amidst the steep slopes. A seasonal stream that originates from upper Trailing on the eastern part of the Thromde runs and divides the Trailing LAP from the Jarungkhashor LAP.

The Trailing LAP has an area of 63 acres, while the Jarungkhashor LAP has an area of 21 acres, together, they make up a major portion of the Monggar Thromde. Owing to the sizes of the LAPs, many environmentally sensitive areas and watershed areas are also located within the LAPs. A chorten similar to Jarungkhashor chorten in Nepal is located just below the football ground in the Jarungkhashor LAP. The name of the place is believed to have come from the presence of the chorten in the LAP. Both the LAPs are directly connected with the Monggar Core town area.

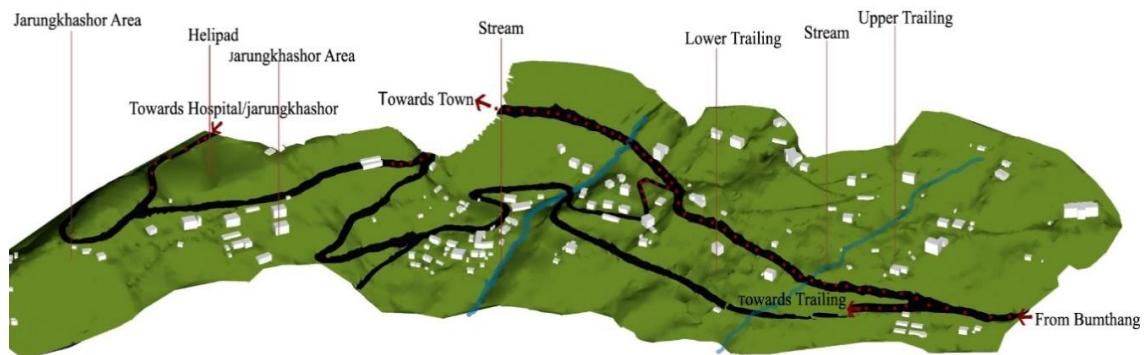


Figure 3.1. Illustration showing the physical setting of the planning area.

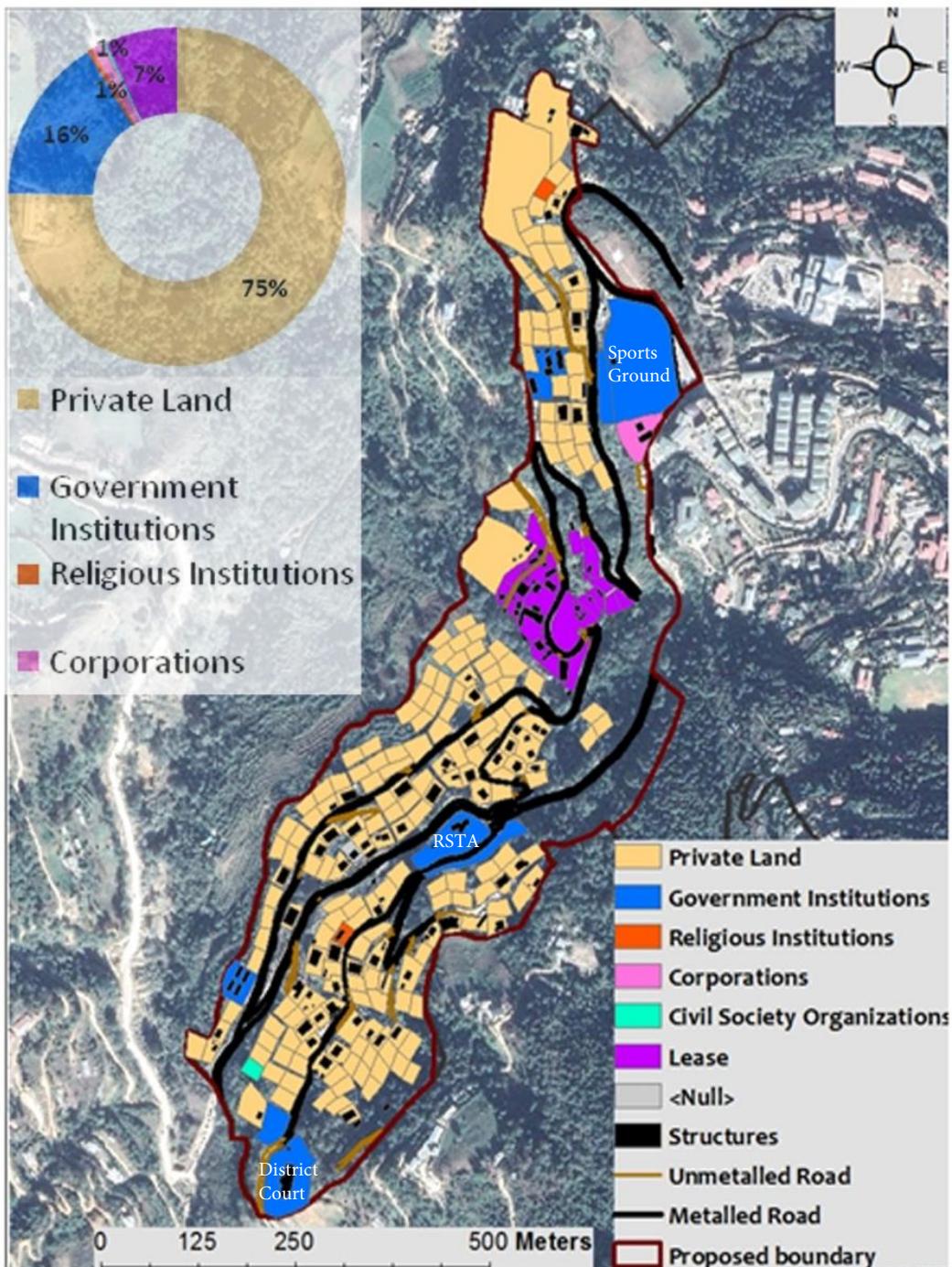
### **3.2 Existing Land Patterns**

#### **3.2.1 Land Holdings**

Most of the plots in the LAP are registered under private ownership accounting to about 75% (32.84 acres) of all land within the two LAPs. Land registered under government institutions accounts to about 16% (6.94 acres), while about 12 plots which account to 6.81% (2.97 acres) are leased out as service plots in the workshop area. Four plots earmarked as others, are plots under the ownership of private religious bodies, corporations and CSOs. The details are illustrated in the table below

<b>Sl. No.</b>	<b>Ownership</b>	<b>No. of Plots</b>	<b>Total Area (Acre)</b>	<b>Composition (%)</b>	<b>Remarks</b>
1	Private Land	216	32.84	75.27	
2	Government Institutions	8	6.94	15.91	
3	Religious Institutions	2	0.24	0.56	Tshokey Dorji Foundation
4	Corporations	1	0.51	1.17	Tashi BOD
5	CSOs	1	0.13	0.29	National Women Association of Bhutan
6	Leased land	12	2.97	6.81	All in Service Precinct

Table 3.1. Land holding details of the planning area.



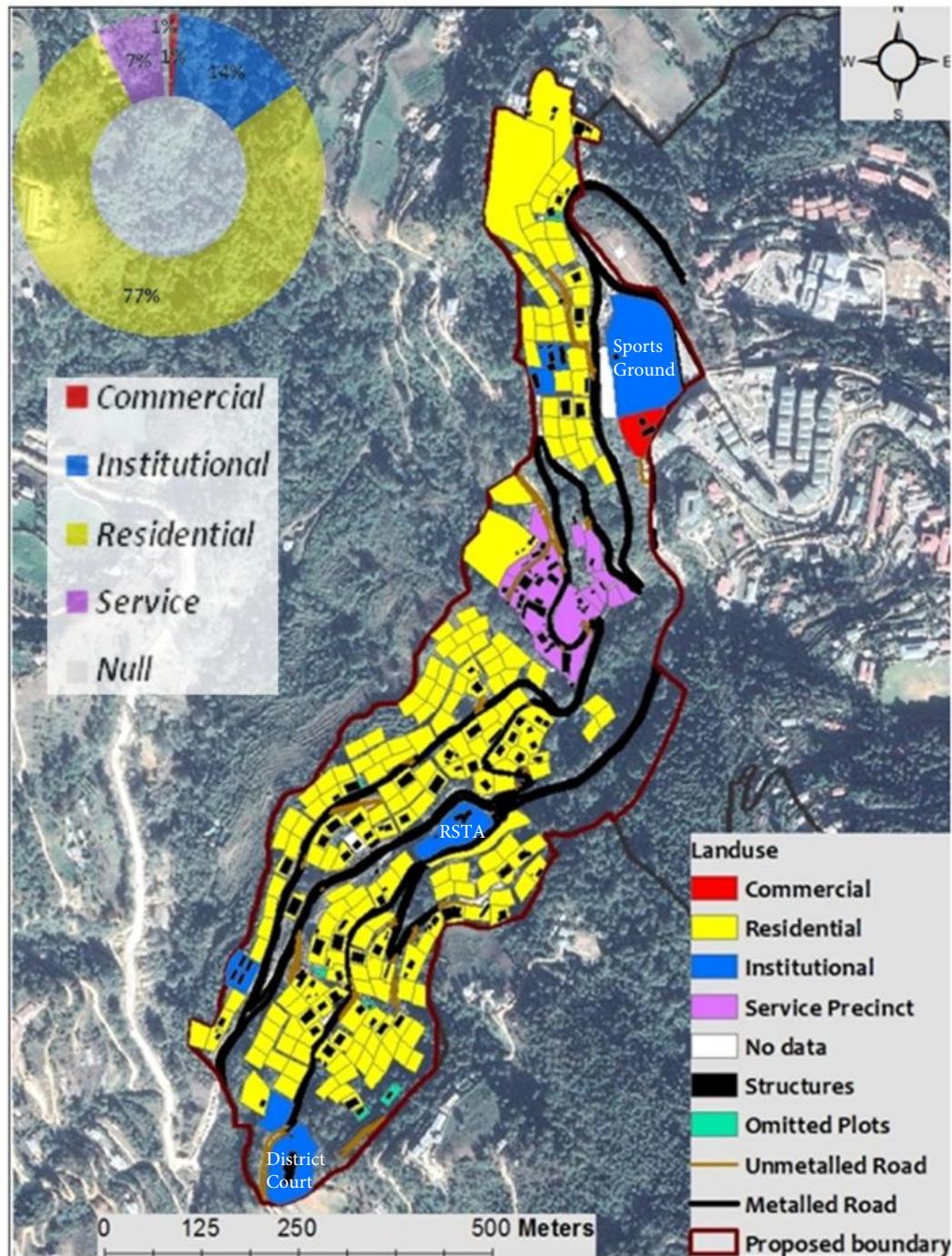
Map 3.1. Land holding Map of Trailing and Jarungkashor LAPs.

### 3.2.2. Land Use Classification

The existing land use forms basis for planning and precinct designation. Land within the LAPs are predominantly used for residential purpose. There are also institutional uses such as Dzongkhag Court, Gewog Administrative office, RNR office, RSTA office and bus terminal, etc. 12 plots from the land under lease holding are being used as services such as automobile workshop, car wash, fabrication units etc. The existing football ground near the Monggar core town is under the ownership of Dzongkhag Sports Association.

<b>Sl. No.</b>	<b>Land use</b>	<b>No. of Plots</b>	<b>Total Area (Acre)</b>	<b>Composition (%)</b>	<b>Remarks</b>
1	Commercial	1	0.51	1.17	Tashi BOD
2	Institutional	6	6.20	14.21	
3	Residential	220	33.57	76.96	
4	Service	12	2.97	6.81	4/16 lease thram pending
5	Null	1	0.37	0.85	Dzongkhag Sports Association

Table 3.2. Land use classification details of the planning area.



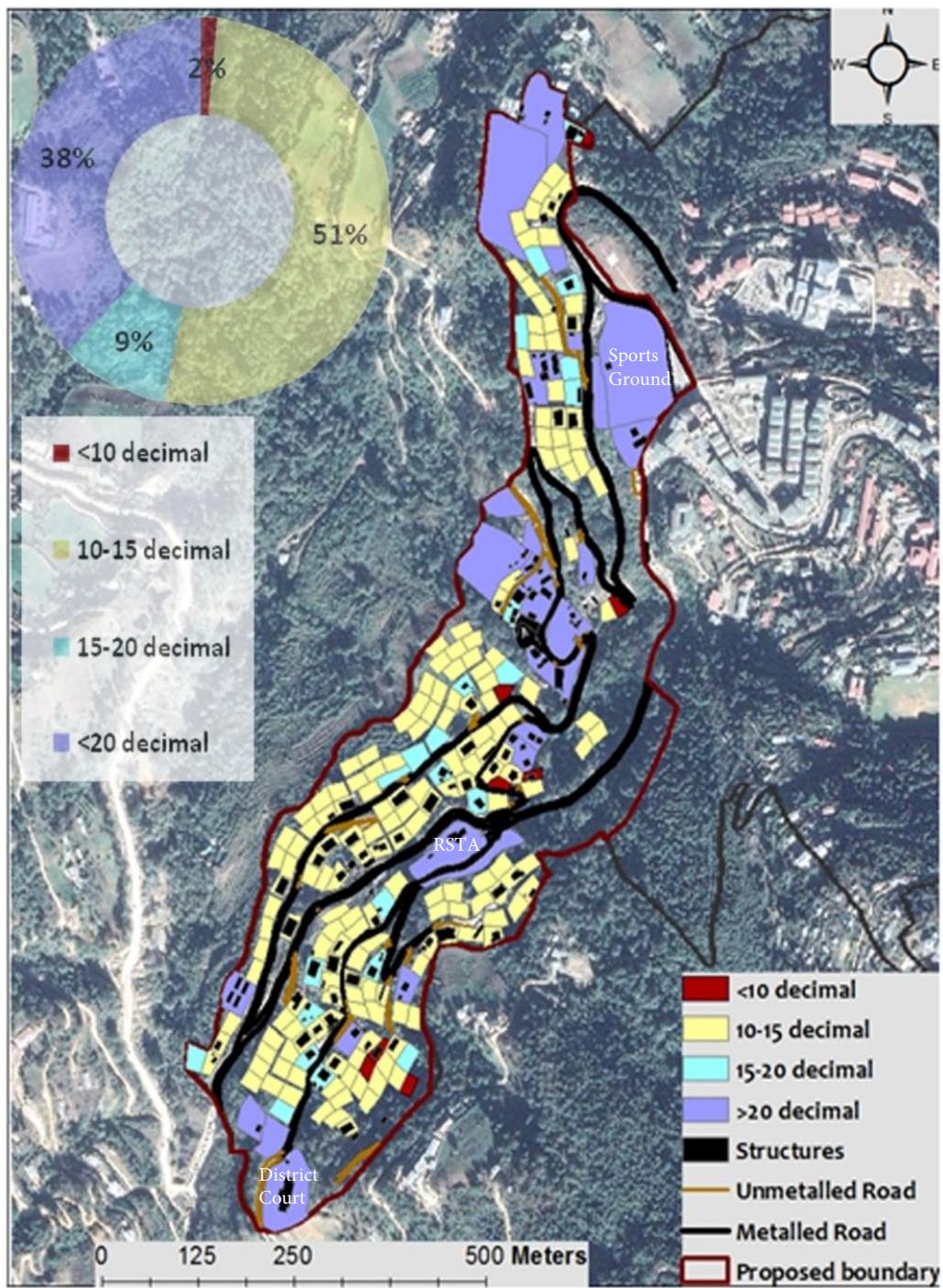
Map 3.2. Land use classification map of Trailing and Jarungkhashor LAPs.

### 3.2.3 Plot Size Classifications

As shown in the table below, majority of plots in the two LAPs falls in size ranging from 10- 15 decimals and constitutes almost 52% (22.47 acres) of the total area. There are 26 plots, with area more than 20 decimals, constituting around 37.77% (16.5 acres), and 8 plots with area less than 10 decimals that comprises a total area of 0.67 acres.

<b>Sl. No.</b>	<b>Plot Size Classification</b>	<b>No. of Plots</b>	<b>Total Area (Acre)</b>	<b>Composition (%)</b>
1	<10 decimal	8	0.67	1.53
2	10-15 decimal	182	22.47	51.50
3	15-20 decimal	24	4.02	9.20
4	>20 decimal	26	16.48	37.77

Table 3.3. Plot size classification details of the planning area.



Map 3.3. Plot size classification map of Trailing and Jarungkhashor LAPs.

### **3.3 Built Environment**

Analysis of existing built environment plays a basic role in planning.

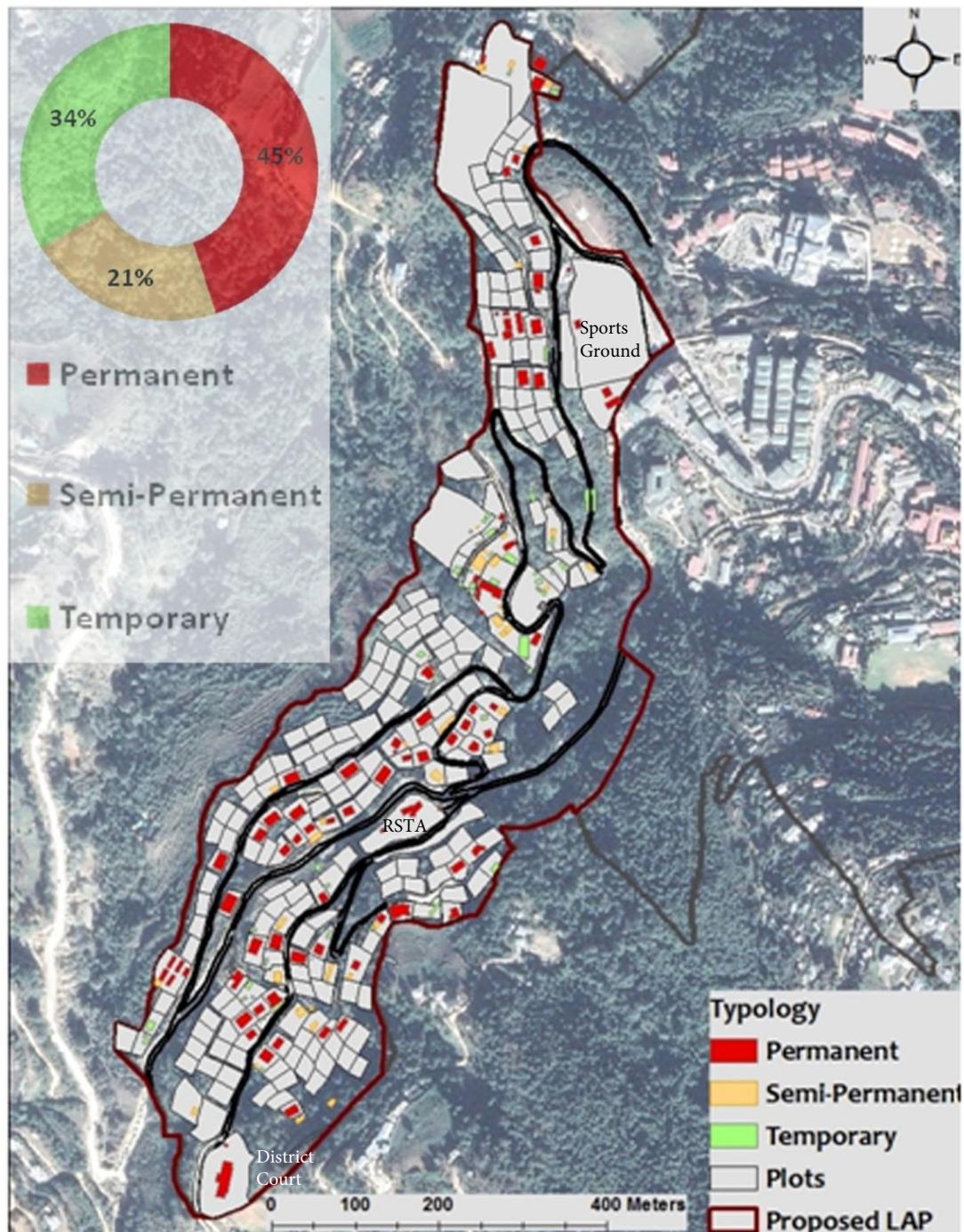
#### **3.3.1 Building Typology**

Nearly half of the existing buildings are permanent structure. 41 structures are semi-permanent in nature and are mostly located in the workshop area and are mostly built by using ekra, single bricks wall, timber, stone masonry, etc.

One third of all structures are temporary in nature and consists of cowsheds, labor camps, stores, and detached toilets.

<b>Sl. No.</b>	<b>Typology</b>	<b>Total Structure</b>	<b>Composition (%)</b>	<b>Remarks</b>
1	Permanent	86	45.03	
2	Semi-Permanent	41	21.47	Including new structures under construction
3	Temporary	64	33.51	

Table 3.4. Built typology details of the planning area.



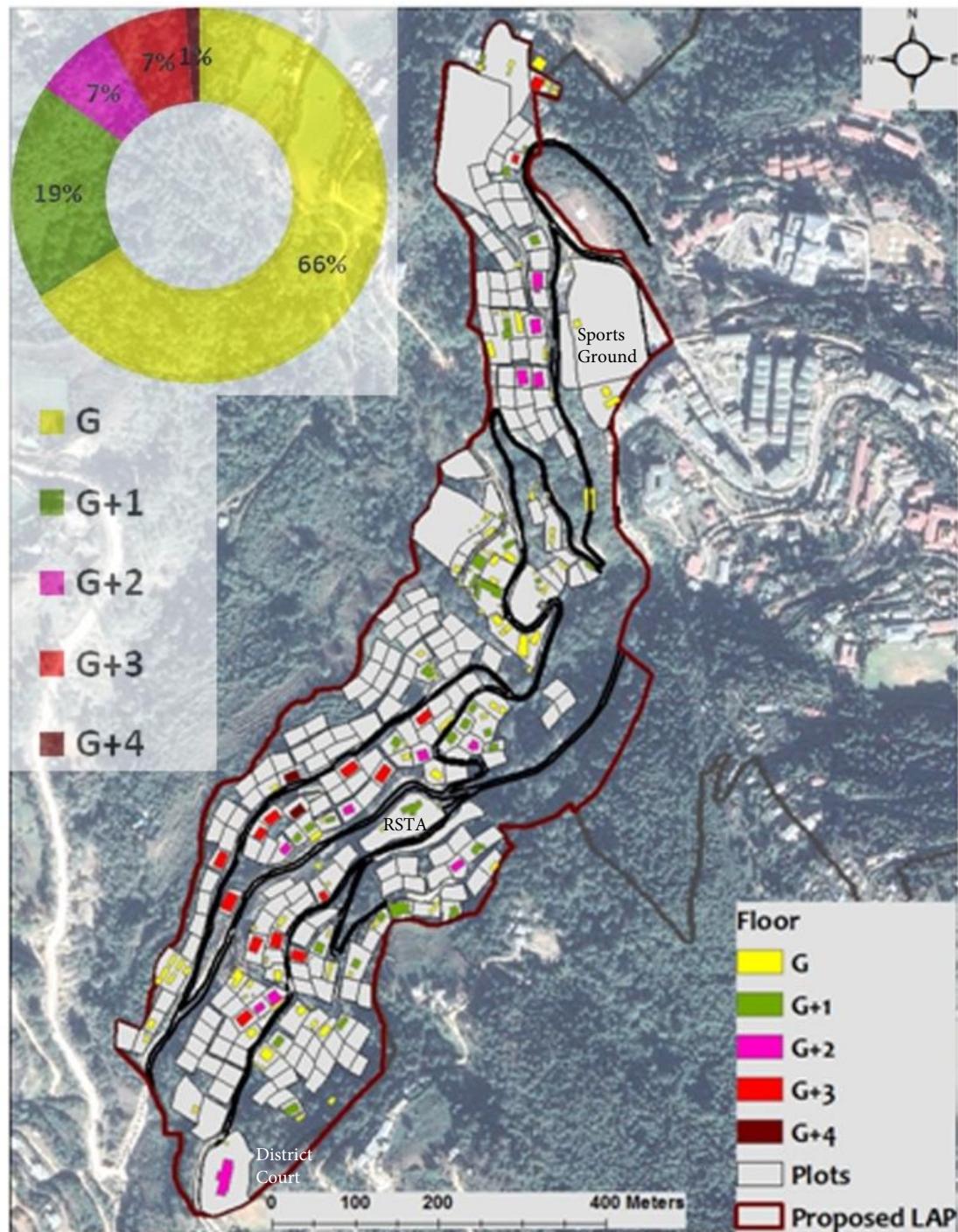
Map 3.4. Built typology map of Trailing and Jarungkhashor LAPs.

### 3.3.2 Building Height

As illustrated in the table below, about 66% of all buildings within the two LAPs are single storied structures followed by 2 storied buildings accounting for about 19%. Three storied buildings accounting to about 7% of all structures. 14 buildings within the LAP are of 4 floors and 2 buildings are of 5 floors inclusive of basement and attics. Since the permissible floor height for the LAP is 3 floors and below, 16 buildings within the LAP are deviating from the allowable floor height.

<b>Sl. No.</b>	<b>Floor</b>	<b>Total Structure</b>	<b>Composition (%)</b>	<b>Remarks</b>
1	G	126	66.0	
2	G+1	36	18.8	
3	G+2	13	6.8	Including new structures under construction and all attics(7)considered as full floor
4	G+3	14	7.3	
5	G+4	2	1.0	

Table 3.5. Building height details of the planning area.



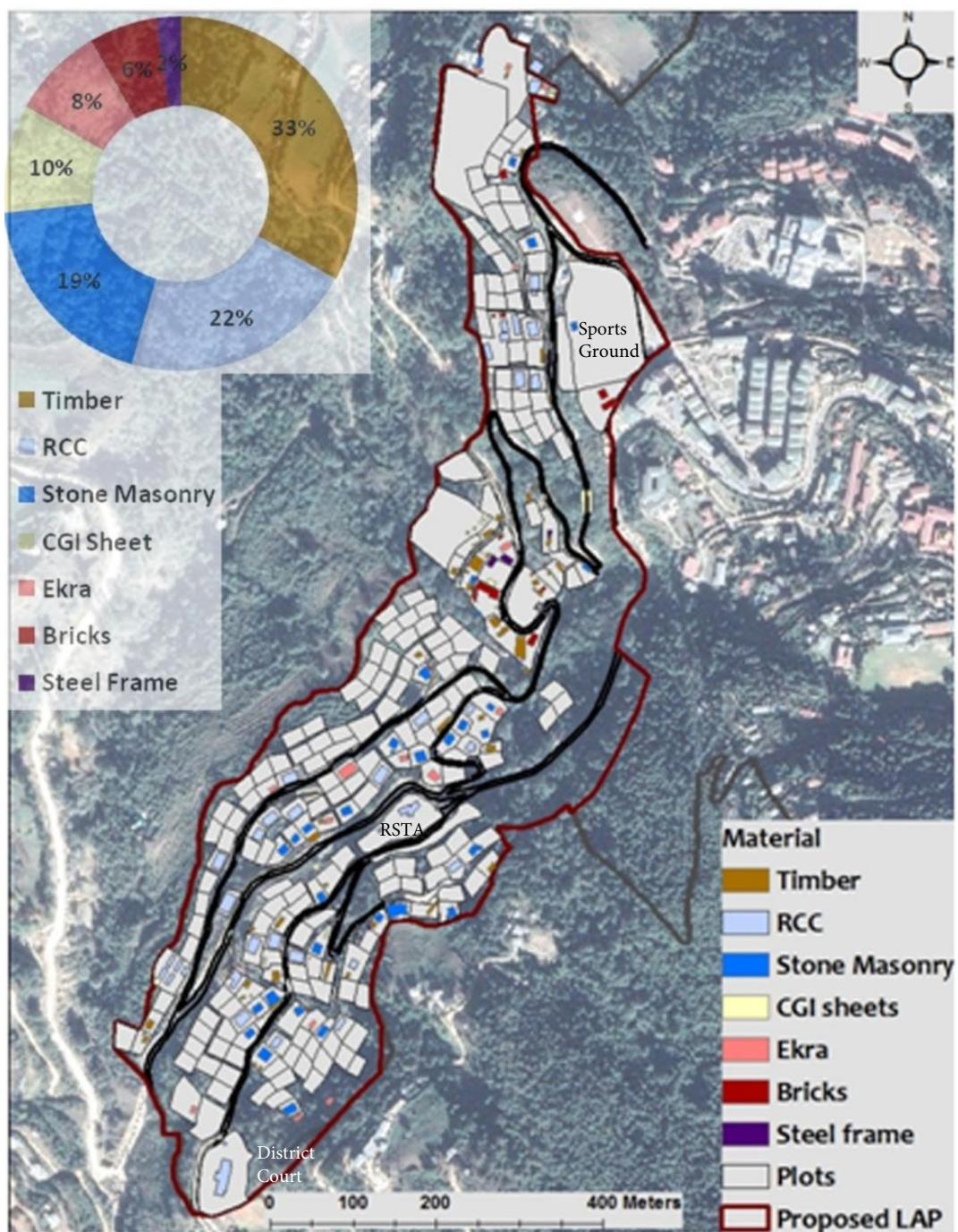
Map 3.5. Building height detail map of Trailing and Jarungkhashor LAPs.

### 3.3.3 Building Material

33% of structures within the LAP are built using timber and accounts to 63 structures mostly used as ancillary structures. 21.5% of structures are built using RCC followed by around 19% stone masonry structures, which are mostly single storied buildings or double storied traditional structures. There are temporary sheds, labor camp and storage facilities constructed using CGI sheets comprising almost 10% of the total structures. 16 structures and 12 structures are constructed using ekra and bricks as the primary material respectively. 4 structures in existing workshop area are steel framed. Looking at the building materials used, most of the permanent buildings are constructed using local materials like timber and stone masonry.

Sl. No.	Material	Total Structure	Composition (%)
1	Timber	63	33.0
2	RCC	41	21.5
3	Stone Masonry	36	18.8
4	CGI Sheet	19	9.9
5	Ekra	16	8.4
6	Bricks	12	6.3
7	Steel Frame	4	2.1

Table 3.6. Building material details of the planning area.



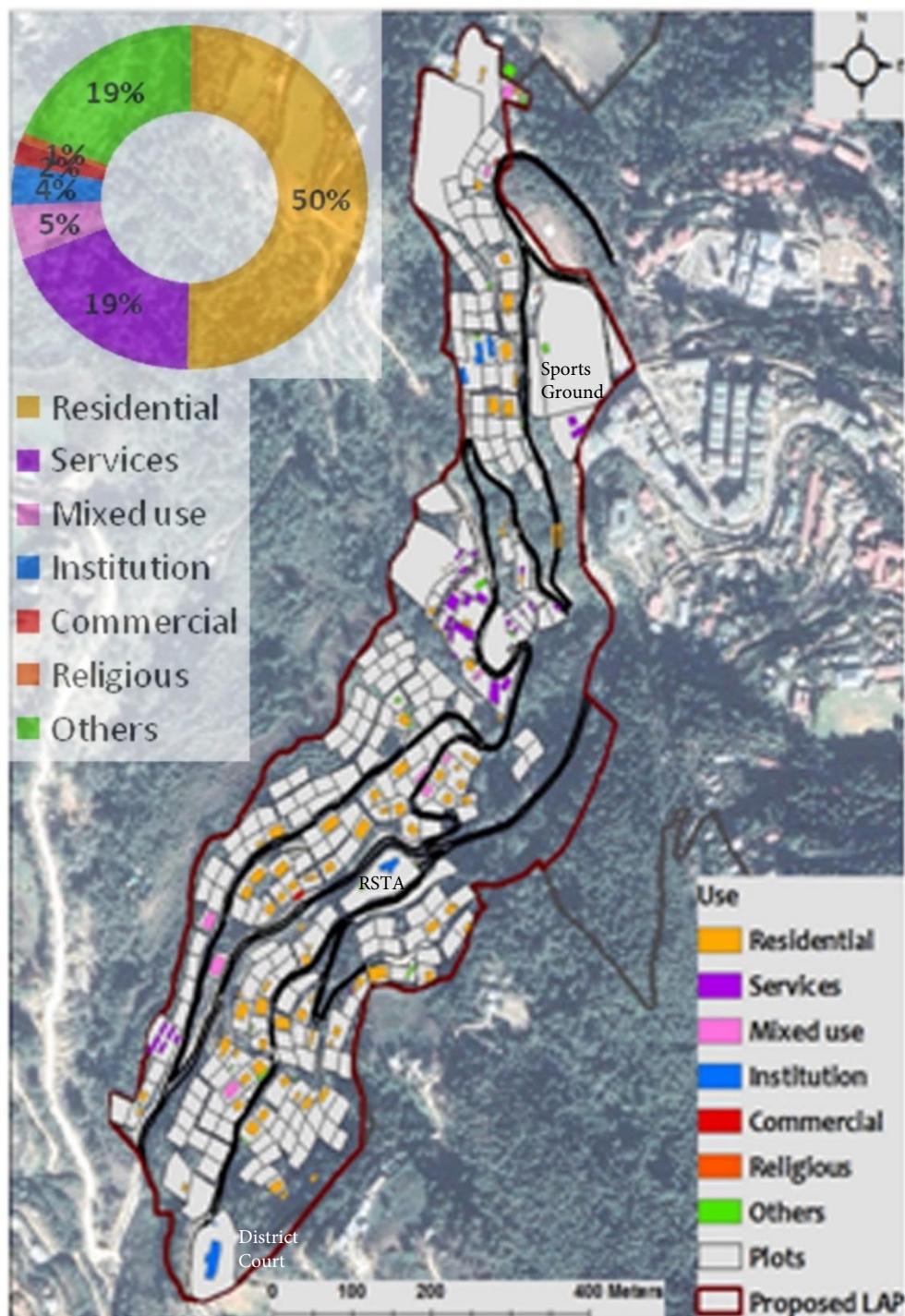
Map 3.6. Building material map of Trailing and Jarungkhashor LAPs.

### 3.3.4 Building Use

The buildings within the LAPs are predominantly used for residential apartment accounting to about 50% of all the structures. There are 36 structures within the LAP which are being used for services such as automobile workshop, car wash, fabrication unit etc. that caters to whole Dzongkhag. 10 structures have both commercial and residential areas (mixed use) and 4 structures are used purely for commercial purpose. There are two structures, which are used for religious purposes. There are other temporary structures used as stores, cowsheds, detached kitchens, and toilets and for other ancillary uses.

<b>Sl. No.</b>	<b>Use</b>	<b>Total Structure</b>	<b>Composition (%)</b>	<b>Remarks</b>
1	Residential	96	50.3	
2	Services	36	18.8	
3	Mixed use	10	5.2	
4	Institution	7	3.7	
5	Commercial	4	2.1	
6	Religious	2	1.0	
7	Others	36	18.8	Store, cow shed, kitchen, toilet, private offices, recreational, gate, etc.

Table 3.7. Building use details of the planning area.



Map 3.7. Building use map of Trailing and Jarungkhashor LAPs.

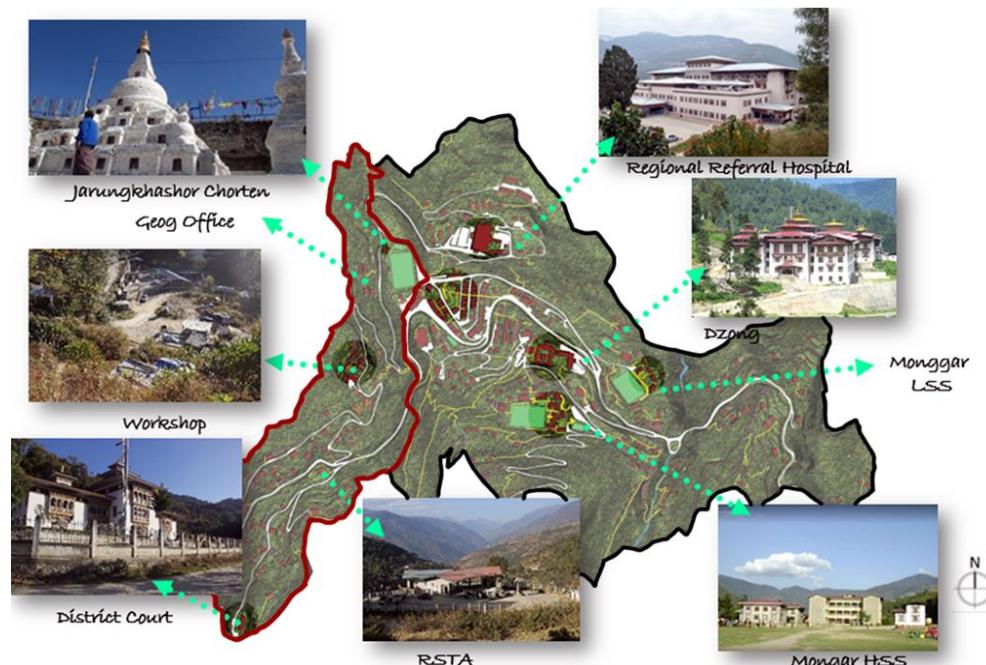
## Chapter IV

### EXISTING AMENITIES

#### 4.1 Social Infrastructure

Social infrastructure is the interdependent mix of facilities, places, spaces, services and network that maintain and improve the standard of living and quality of life in a community. Moreover, it will also include any infrastructure that goes beyond basic economic functions to make a community an appealing place to live in. It is of utmost importance to provide the social infrastructures in order to:

- Improve health and wellbeing
- Encourage social inclusion
- Provide access to facilities and services
- Enhance economic development
- Create sustainable communities



Map 4.1. Map showing the location of various social institutions in Monggar.

#### **4.1.1 Social Institutions**

Owing to its strategic location, Monggar is found to be an ideal location for institutions and offices with regional interests. Though such interests are constrained by the limited space, a number of offices have already been established. Almost 80% of the total of 1001.33 acres of land constitutes institutional establishment. These institutions include Dzongkhag Administration, Dzongkhag Court, Dzongkhag Regional Hospital, Dratshang, Royal Bhutan Police, Lower and Higher Secondary School and Road Safety and Transport office.

The presence of these national level and regional level institutions in Monggar can be seen as a great advantage for such a small town. These strengthen the economic base, ensuring an inflow of capital as well as add vitality to the area. In particular, Road Safety and Transport Authority Office, Dzongkhag Court, and Gewog office are all located within the Trailing and Jarungkhashor LAP. Other institutions are located within the walkable distance of the two LAPs.

#### **4.1.2 Road Network and Circulation**

The Thimphu-Trashigang National Highway passes through the existing Trailing LAP dividing it as Upper and Lower Trailing. The National Highway acts as primary road for the LAP and the secondary roads supplements the primary road connecting it with tertiary roads. The existing roads are mostly unpaved, very narrow and the sharp turning radius makes it difficult for the vehicle to turn at one go. The off-street footpaths are seen in abundance, which are used as short cuts owing to its steep topography. However, most of the footpaths are not managed well.



Figure 4.1. Road connection to the bus booking.



Figure 4.2. The workshop area in Trailing LAP.

#### **4.1.3 Open Space System**

Trailing & Jarungkhashor LAP, lacks an organized and defined open space system. The largest and the most active open space within the LAP is the football ground at Jarungkhashor below the Core town. The football ground provides opportunity for outdoor sports like basketball at the corner, dart throwing, and act as a public gathering during national events.

The existing forest along the steep slopes forms an integral part of the existing open space system within the existing LAP. These densely vegetated patches of slopes need to be identified and efficiently compounded with the existing open space system. The identified surface drainage patterns and the buffer zones along the natural streams provide an opportunity to efficiently integrate the pedestrian movement. Apart from creating active recreational open spaces, there is a need to design open spaces within the residential area and other community facilities.

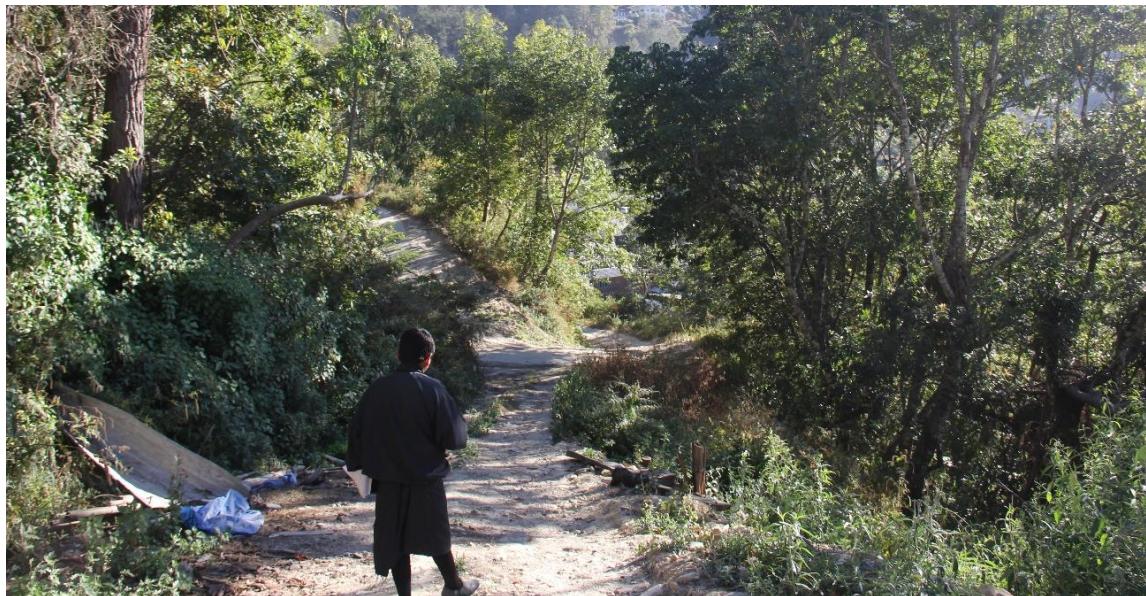


Figure 4.3. Green open space in the planning area.

## 4.2 Existing Utilities and Services

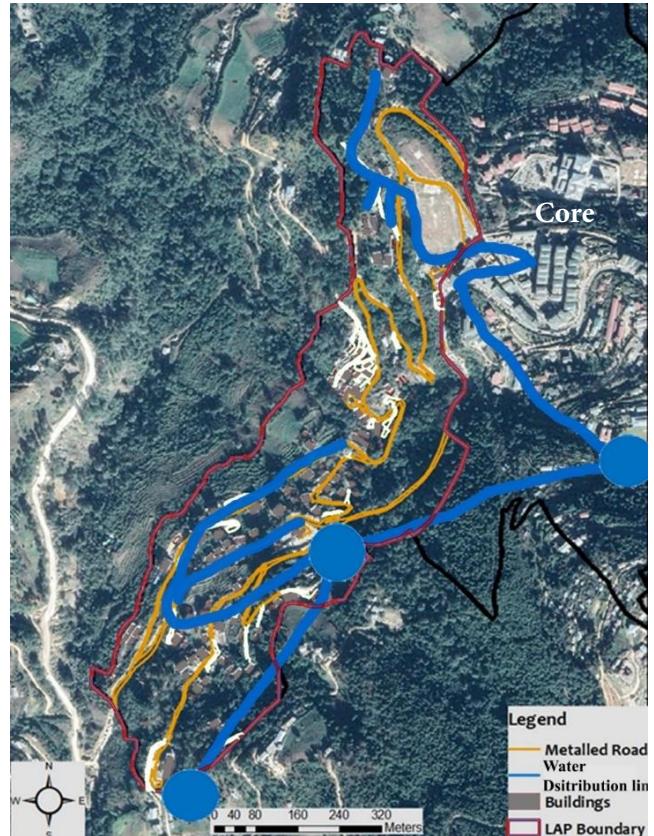
### 4.2.1 Water Supply System

The water supply network in Monggar is from ten different sources most of which are collected in newly constructed 1.5MLD water treatment plant at Kadam. Water collected in reservoir located at Yakpogang is fed into Kadam Treatment plant, which is finally distributed to most part of the Monggar town. For Trailing LAP, the main water source is from Yagang which is connected to the supply tank located at Upper Trailing. Unlike other water sources, it is not treated.

In addition to Municipal water supply line, there are numerous private water supply networks within Trailing LAP. The Sources are from Shongkolung (Upper Trailing) and spring water source from Zargang (above service precincts identified within LAP). Since the Dzongkhag has already completed constructing WTP as well as new water distribution network, supply tank at Upper Trailing is also connected to Kadam WTP. The majority of the residents of Jarungkhashor and Trailing area rely on the Yagang stream and the treated water from Kadam, which is also located in the vicinity. The distribution network comprises of both GI and HDPE pipes.

#### 4.2.1.1 Issues

- Inadequate storage tanks and reservoirs.
- Due to the absence of an integrated supply network, the residents acquire their water through private pipelines. More often than not, the water from the sources



Map 4.2. Water supply network map.

are not checked as to whether the water is safe for drinking or not, thereby leading to several health concerns.

- Persistent low-pressure problems in the town and inability to meet current water demands due to the rudimentary water supply system.

#### **4.2.2 Sewerage System**

In Monggar, majority of the population depends on an individual onsite septic tank and soak pit. The existing core area has communal septic tank located at the end of the town below hospital. However, its underground sewer network line has become redundant making it difficult to track. Apart from core area, all household and institution depends on individual onsite system (Septic tank and soak pit) which is periodically cleaned with the assistance from Dzongkhag Administration. With the increase in population, there is a need to re-conceptualize the sewerage system in Monggar through the construction of new sewer lines and communal septic tanks.

##### **4.2.2.1 Issues**

- Absence of an organized sewerage system with no provision of on-site or off-site treatment processes in town. The wastewater, which is left untreated, could pollute the raw water sources.
- Improper disposal creates breeding sites for flies and insects that spread numerous water borne diseases.

#### **4.2.3 Drainage System**

Drainages in the LAPs are either nonexistent or poorly maintained. As good drainage is necessary to prevent erosion and landslide in the sloping areas, proper drainage system needs to be developed. Consequently, storm water often follows the nearest road or the natural depressions making its way down to the main rivers without any treatment. Besides, the runoff from the open drains and road poses threat of erosion to the settlements in the lower plains especially during heavy down pours.

##### **4.2.3.1 Issues**

- Lack of proper drains leads to heavy surface run-offs during the rainy season. These not only pollutes the surrounding areas by washing away the debris and

scattering it all over the place, but also is detrimental to the planning area that is composed of slide prone colluvium soil.



Figure 4.4. Lack of drains at the workshop area.



Figure 4.5. Waste disposed near the road in Trailing.

#### 4.2.4 Solid Waste Management

With the influx of population in Monggar town, waste management is becoming an issue in the locality. Most often, with the lack of community bins for waste disposal, residents throw garbage improperly. The absence of adequate community bins exacerbates the situations and results in littering. The Thromde collects the solid waste twice a week in core area and once for Trailing, Changzhingpeg, Gyalpozhang and Lingmithang.

Currently, there are two landfill sites. One located at Konbar, which is 14Km away from the town towards the western side of the core area and other one at Tshokhor located between Gyalpozhang and Kurizam at a distance of 35km. Unlike landfill site at Tshokhor, Konbar has segregation of wet waste (kitchen waste) and dry waste (Plastic, bottles, papers). To manage and make Monggar a clean town, the Dzongkhag administration in consultation with private entrepreneurs; We-Care has started to collect and segregate waste at source that is reused and recycled.

##### 4.2.4.1 Issues

- Absence of infrastructures such as sanitary landfill for the efficient management and disposal of the huge quantity of waste that are generated on a daily basis.
- Solid waste strewn in places that are not designated for disposal.



Figure 4.6. Image from the existing waste disposal site.

## Chapter V

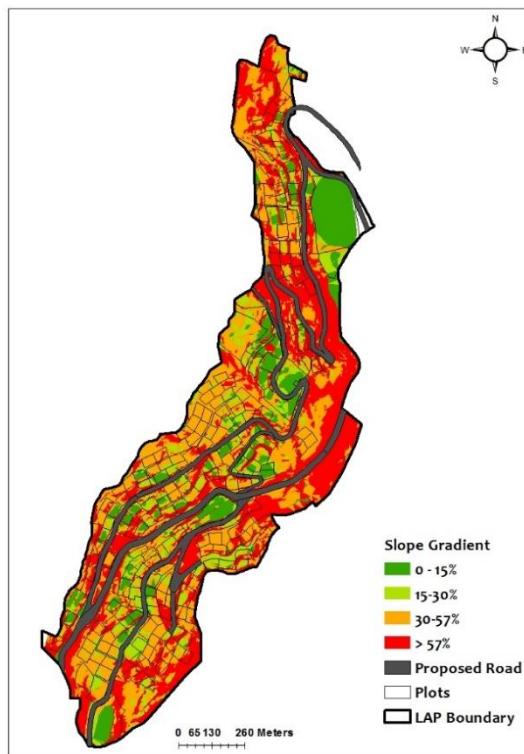
### ANALYTICAL STUDY

#### 5.1 Land Suitability

A land suitability analysis entails carrying out the following analyses:

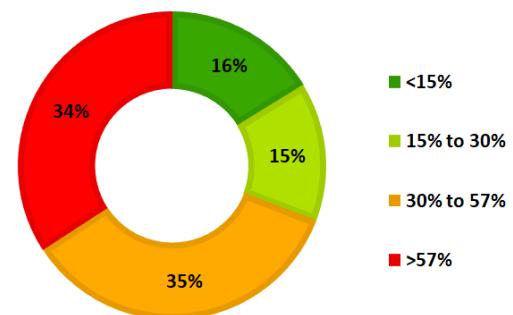
##### 5.1.1 Slope Analysis

Slope analysis is carried out to understand the gradient of slope and the stability of the slope for development. Slope gradient has been categorized into four as shown in table 1. The analysis shows that majority of land within the two LAPs (about 70%) falls in the slope gradient greater than 30% implying the need for structural mitigation to stabilize the slope for development. There is very less land available for development that do not require any structural mitigation and these areas seems to be the areas that have been excavated and flattened either for the purpose of recreational uses like football ground or for building construction.



Slope gradient	Total Area (acres)	(%)
<15%	13.56	16.2
15% to 30%	12.23	14.6
30% to 57%	29.30	35.0
>57%	28.61	34.2

Table 5.1. Slope distribution table.



Map 5.1. Slope analysis map of the planning area.

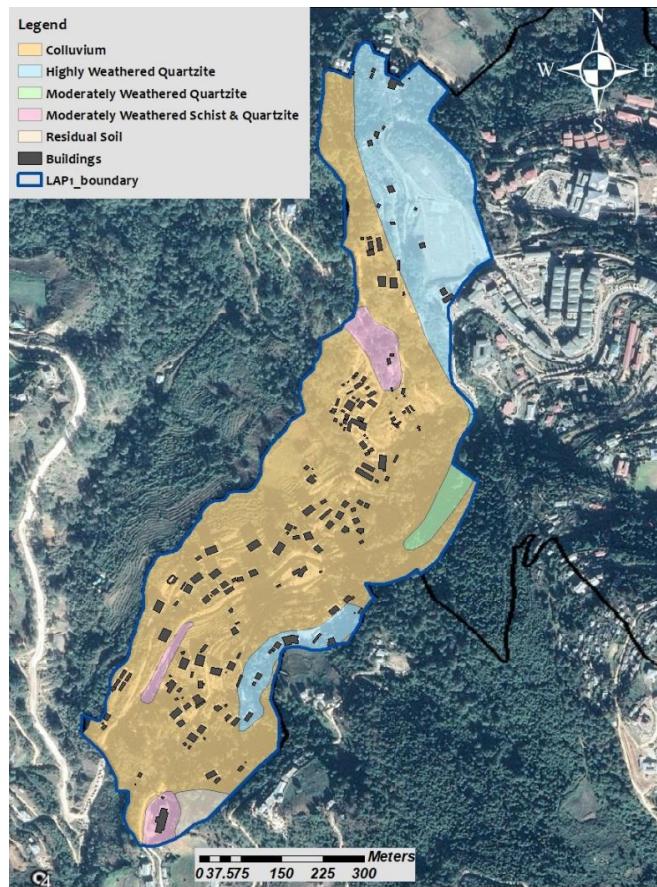
### 5.1.2 Engineering Geology

Geologically Monggar Town is located in the lesser Himalayas, at about 10 km south of the Main Central Thrust (MCT). The engineering geology map (below) illustrates the surficial and shallow geologic conditions such as land slide, debris flow, rock fall and similar failures, subsidence, land degradation, erosion, scouring, and water bodies and the sources of instabilities. The units in the engineering geological map for the LAP comprises of; Moderately weathered quartzite; Moderately weathered schist with quartzite; Highly weathered quartzite; Residual soil; Colluvium; Land slide/debris flow; Streams/ water bodies.

Majority of the land in Trailing area and the lower Jarungkhashor area (total of 71%) are covered with colluvium while the upper part of Jarungkhashor area and a small

portion of Trailing area above RSTA consists of highly weathered Quartzite. Some area below the workshop area, the court area and some area above idea development centre consists of moderately weathered schist and quartzite.

Colluvium may be described as a non-homogeneous mixture of soil, cobbles and boulders that are formed by agents of gravitational forces, and mostly along or towards the base of long slopes of moderate to steep grades. The deposits have distinct zones of weakness and hardness, and distinct surface separating the potentially sliding formation from the more stable, underlying residual soil or bedrock. Seepage from adjacent escarpment and/or from direct rainfall infiltration may saturate the deposits.



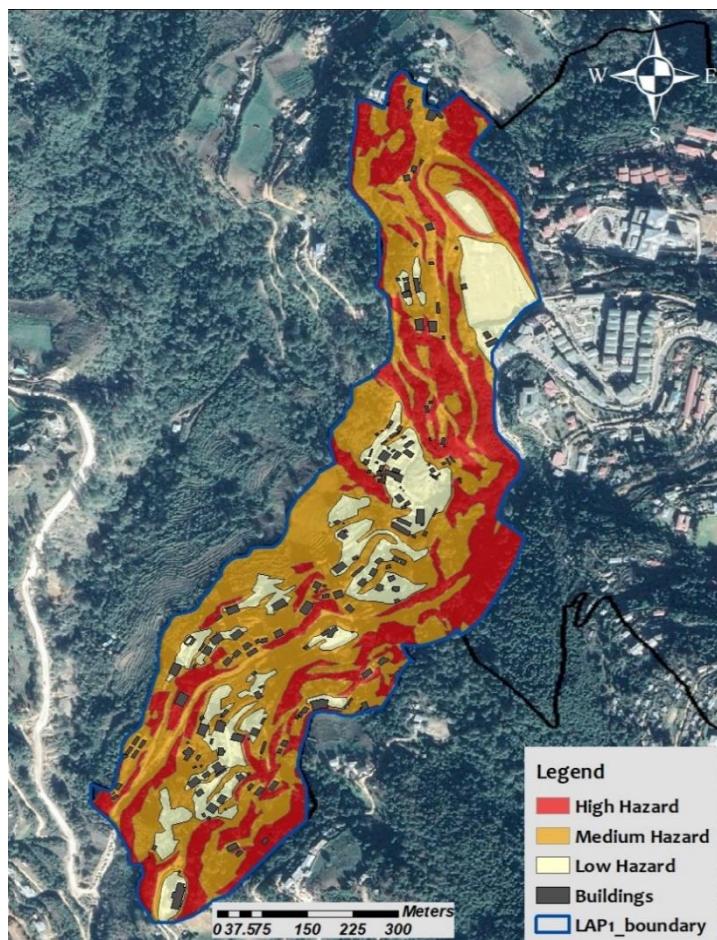
Map 5.2. Engineering geology map of the planning area.

### 5.1.3 Seismic Hazard

Seismic hazard is an important consideration for the whole country and more so for Monggar as the seismicity of the region indicates that the area is quite active. Monggar town is just about 10 km south of the Main Central Thrust (MCT), which is capable of producing large earthquakes. Therefore, Monggar town and the LAP areas are at risk of seismic shaking from a major earthquake fault such as the MCT.

### 5.1.4 Hazard Analysis

The LAP area have been divided into three hazard zones based on the slope angle of the terrain, underlying geologic materials, geomorphology including active or dormant landslides, susceptibility to erosion and closeness to major earthquake faults.



Hazard level	Area (acres)	%
High	26.15	31.0
Medium	41.67	49.4
Low	16.36	19.4

Table 5.2. Hazard distribution table.

#### Low Hazard

About 19% of all land within the LAP boundary equivalent to about 16 acres falls within low hazard zone. These areas are considered to be more or less safe zones, where normally no disaster occurs.

#### Medium Hazard

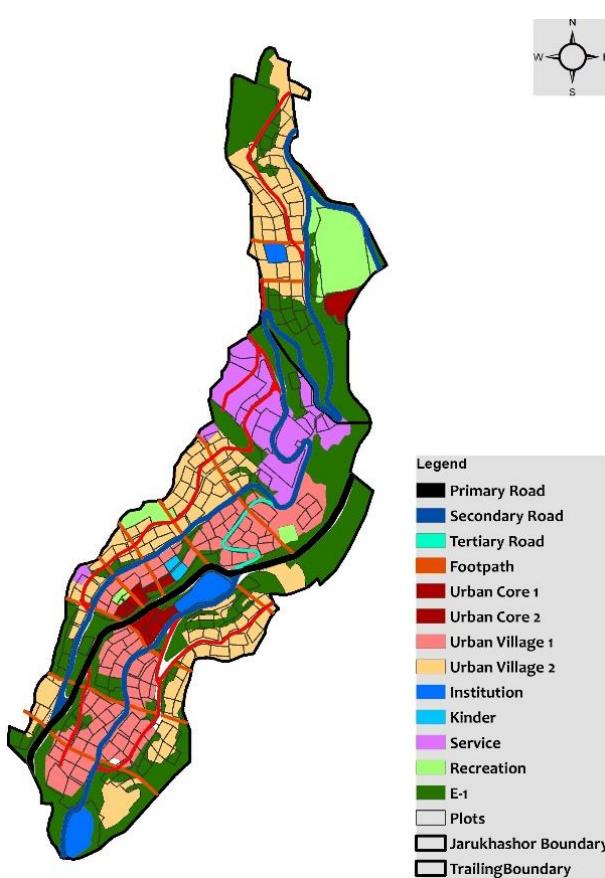
Almost half of all areas within the LAP accounting to about 41.7 acres fall under medium hazard zone.

Map 5.3. Hazard map of the planning area.

## High Hazard

High hazard zone comprises of 31% or 26.15 acres of all land within the LAP boundary. These areas are very difficult to stabilize and sometimes even impossible. So it is better to avoid such areas for road alignment and engineering construction works. Even though, some high hazard areas can be mitigated with technical measures, the cost can be too high.

### 5.1.5 Analysis for the Rationalization of Structure Plan Land Use



Map 5.4. Land use map as per the Structure Plan.

Finally, the low hard areas were considered suitable for higher density development and hence earmarked as Urban Village 1 (UV-2) and Urban Core 2 (UC-2) precincts in the Trailing and Jarungkhashor LAP.

The land use map has been followed during the plot reconfiguration exercise with the exception of some changes during the plot rationalization particularly related to the plots in the E-1 precinct.

The land use map for the Monggar Structure Plan 2016-2040 has been based primarily on the hazard maps of the geotechnical study derived from the hazard analysis such as the engineering geology, geomorphology study, earthquake analysis and the slope analysis of the site.

The areas coming under high hazards were considered unsuitable for development and hence, earmarked as environmental conservation precincts wherein development will not be permitted.

The areas coming under medium hazard were considered suitable for lower density development and hence earmarked as Urban Village 2 (UV-2) precinct wherein low-density residential development will be permitted with some soil mitigation works.

#### **5.1.5.1 Rationalization of Plots**

There are many instances where a plot falls in two or more precincts within the LAP. These issues have been resolved through rationalization of plots into only one precinct with the following rationales:

1. If a developable precinct within a plot comprises more than 50% of the plot area, the plot is rationalized into the adjoining developable precinct.
2. Similarly, if the developable precinct within a plot comprises of less than 50% of the plot area, then the plot is rationalized into the RD precinct.
3. If the whole plot falls in the E-1 precinct, the plot is rationalized as RD precinct. However, if that plot is a big plot that can be subdivided into two or more plots, then a part of the plot with road access and without any other encumbrances is rationalized as RD plot.
4. If a single rationalized E-1 plot is surrounded by other developable precincts, then that plot is further rationalized into adjacent developable precincts.

#### **5.1.5.2 Restoration of Drainage buffer as E-1 precinct**

During the preparation of local area plan, upstream of workshop area was found to be watershed and waterway during rainy season. Hence, the area has been designated as Environmental Conservation precinct (E-1).

### **5.2 Mode of Land Mobilization**

Land Pooling technique was used to assemble land for the provision of urban infrastructure and facilities at the time of preparing the LAP for Trailing and Jarungkhashor in 2004. Land Pooling Contribution ratio of 15% and 26% were applied in Jarungkhashor LAP and Trailing LAP respectively at that time. The infrastructures proposed were the 9m Secondary and 6m tertiary roads and network of footpaths, common parking and open spaces.

At the time of the plan implementation, provisions of the road ROW were mostly done as per the plan, however, the plot allocation did not go as per the plan in many of the cases due to following reasons:

1. Change in the Thromde boundary in 2010 and the subsequent National Cadastral Resurvey Programme (done to incorporate the boundary and other land related changes) during which plots coming under the purview of the rural administration were relocated to environmental conservation zone and other public spaces earmarked in the plan.
2. Some plots have been relocated from the core area to Trailing LAP.

The failure to implement the LAP as per the plan resulted in issues related to accessibility and haphazard development due to which the review of the two LAPs were recommended in the Monggar Structure Plan 2016-2040 as a priority.

<b>Sl.no</b>	<b>Particulars</b>	<b>Trailing (Acres)</b>	<b>Jarungkhashor (Acres)</b>
1	Total LAP area	63.19	21.14
2	Total registered private land	24.33	9.26
3	Total registered government land	3.14	3.80
4	Total registered leased land	2.97	0

Table 5.3. Existing area distribution table of the two local area plans.

The revised LAP boundary for Trailing LAP comprises of 63.19 acres of land out of which 24.33 acres are under private ownership, 3.14 acres under government institutions and 2.97 acres under leased land. The remaining 32.75 acres of land within Trailing LAP boundary are under State ownership and are in the form of road right of ways, footpaths, environmental conservation zone, etc.

Similarly, revised LAP boundary for Jarungkhashor LAP comprises of 21.14 acres of land out of which 9.26 acres are under private ownership and 3.80 acres under government institutions. The remaining 8.08 acres of land within Jarungkhashor LAP boundary are under State ownership and are in the form of road right of ways, footpaths, environmental conservation zone, etc.

<b>Sl.no.</b>	<b>New Proposals</b>	<b>Area (acres)</b>
1	proposed new road	3.093
2	Proposed OS	1.942
3	Proposed GC	1.356
4	Proposed S-1	0.806
5	Proposed ECCD	0.119
6	Proposed parking	1.588
7	Proposed footpath	0.921
	<b>Total Area (acres)</b>	<b>9.825</b>

Table 5.4. Proposed area distribution table of the two local area plans.

Some of the proposals for the two LAPs highlighted in the Monggar Structure Plan 2016-2040 are the green visual corridor to enhance the image of the Trailing LAP, the common septic tanks, local open spaces and ECCD. New access roads, footpath connectivity and common parking are proposed as part of the LAP revision proposals to improve the connectivity and accessibility in the locality. All the new proposals together comprise of about 9.825 acres of land which needs to be mobilized from the landowners as part of their contribution towards additional infrastructure (especially the new proposed road and green corridor) and from the state land within the LAP.

It was decided to apply the maximum allowable contribution of 30% to both the LAPs to mobilize land for additional infrastructure. This implies an additional land pooling contribution of 4% in Trailing LAP and 15% in Jarungkhashor LAP for those plots that have contributed 26% and 15% respectively in the previous LAP and 30% for those plots that have not contributed any land at the time of previous LAP preparation. The additional land pooling contribution amounts to 1.47 acres of land in Trailing LAP and 0.97 acres in Jarungkhashor LAP with a total of 2.44 acres of land. The remaining 7.385 acres of land required for the new proposals are to be mobilized from nearby state land.

### **5.3 SWOT Analysis**

SWOT indicates the various strengths, weaknesses, opportunities and threats that confront the proposed development for Trailing and Jarungkhashor Local Area plan. It is a summary of all the studies and analysis that has been carried out pertaining to the area under study. Such an analysis helps to arrive at a clear course of direction for future proposals and development options and to take the precautions necessary to negate the perceived threats and shortfalls.

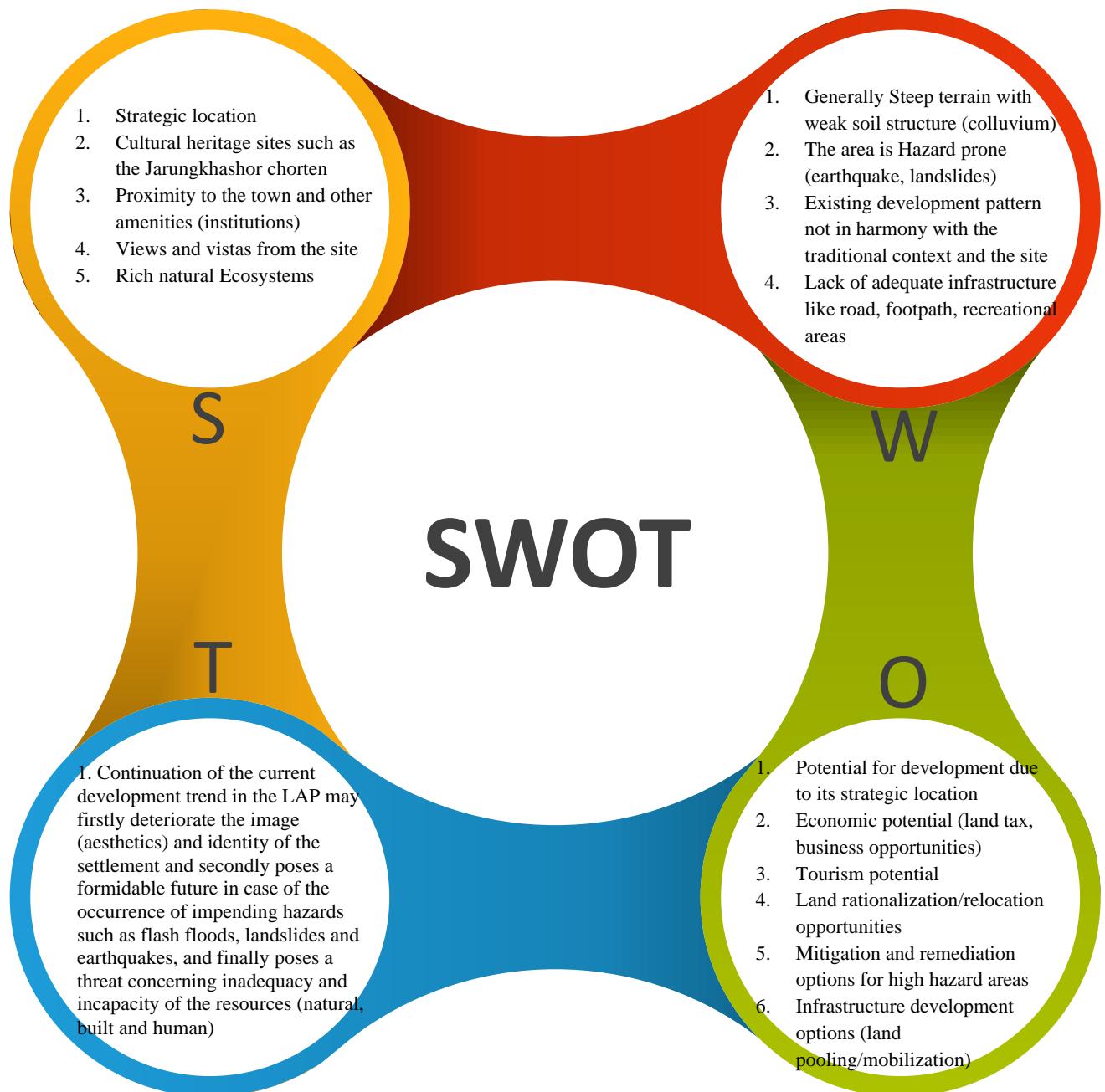


Figure 5.1. SWOT analysis diagram.

## Chapter VI

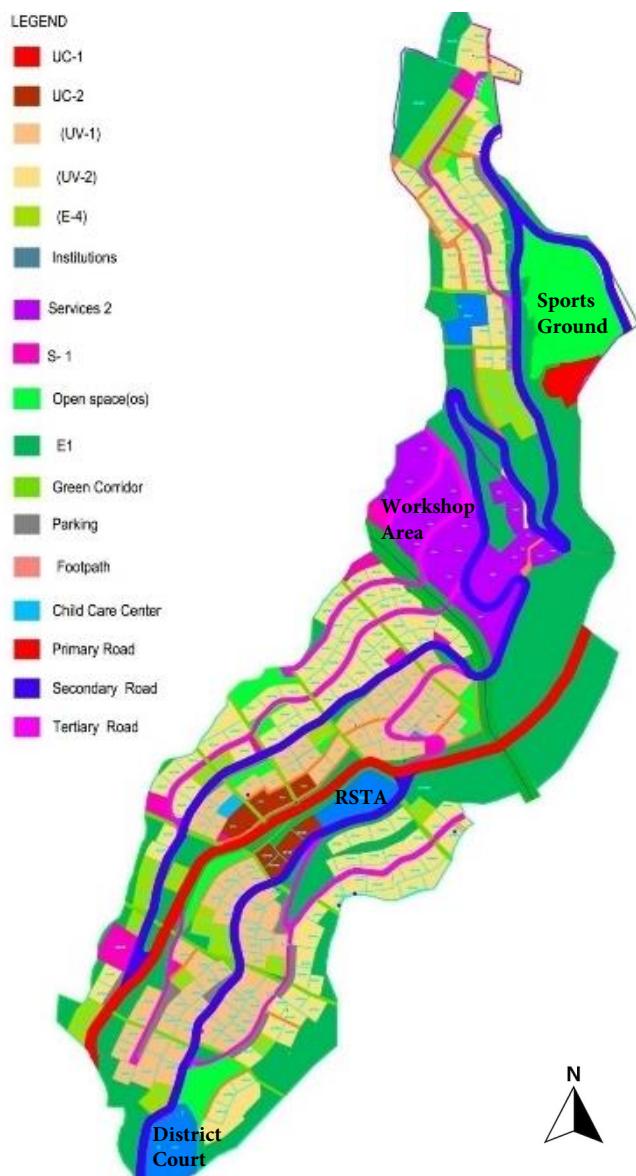
### PROPOSAL FOR ACTION

#### 6.1 Concept Plan

The concept plan for the Trailing and Jarungkhashor Local Area Plan is based on the planning consideration that has been mentioned in the previous chapter of the report. As elucidated, providing universal accessibility to services and amenities, promoting walkability, preserving environmentally sensitive areas, tapping the economic potential, and promoting the traditional identity of the place are the underpinning factors that led to the inception and eventually the formulation of the concept plan.

The concept plan in principle has been prepared under the purview of the structure plan. That said, the precincts and land uses illustrated in the plan predominantly adheres to the land use provisions thereof. However, in order to ameliorate the issues that have been identified in the structure plan and through an empirical triangulation that was conducted vide site visits, the local area plan was conceptualized to resolve the issues through expending solutions and rationalization options.

The three overarching issues in the LAPs that have surfaced as the main topic of discussions and deliberation throughout the planning period and public



Map 6.1. Concept Plan.

consultation were:

1. Increase in building heights to G+3
2. Lack of access road (tertiary roads) and other services to all the plots despite the exercise of land pooling in the LAPs.
3. The change in precincts from developable to environment precincts and vice versa.

Apart from the issue of the floor height, which was decided to be done as per the existing DCR and accordingly, abide by the findings of the geotechnical survey report, the rest of the issues were addressed through the plan.

1. Additional pooling (4% in Trailing and 15% in Jarungkhashor) was agreed during the second public consultation meeting. This was done in order to facilitate services such as roads, footpaths, common parking, drains, etc. to all the plots. Therefore, through the exercise of land pooling, new roads, common parking, parks and open spaces, and other services have been proposed in the concept plan.
2. Rationalization of plots were carried out as part of local area plan preparation including that of configuring the plots to more regular shapes and addressing plots falling in two or more precincts.
3. The recovery of environmentally sensitive areas such as the water shed areas and the stream channels were also proposed in the plan.
4. Apart from resolving the issues, the plot reconfigurations were also done.
5. The plan also conceives a development that is low rise and adheres to the preservation of the traditional architectural identity of the place.

## **6.2 Planning Principles**

The planning principles for the concept plan have been explained as a part of planning consideration in chapter 2 and much of the same has been emphasized throughout the various sections in the report. Nevertheless, the planning principles for the plan are:

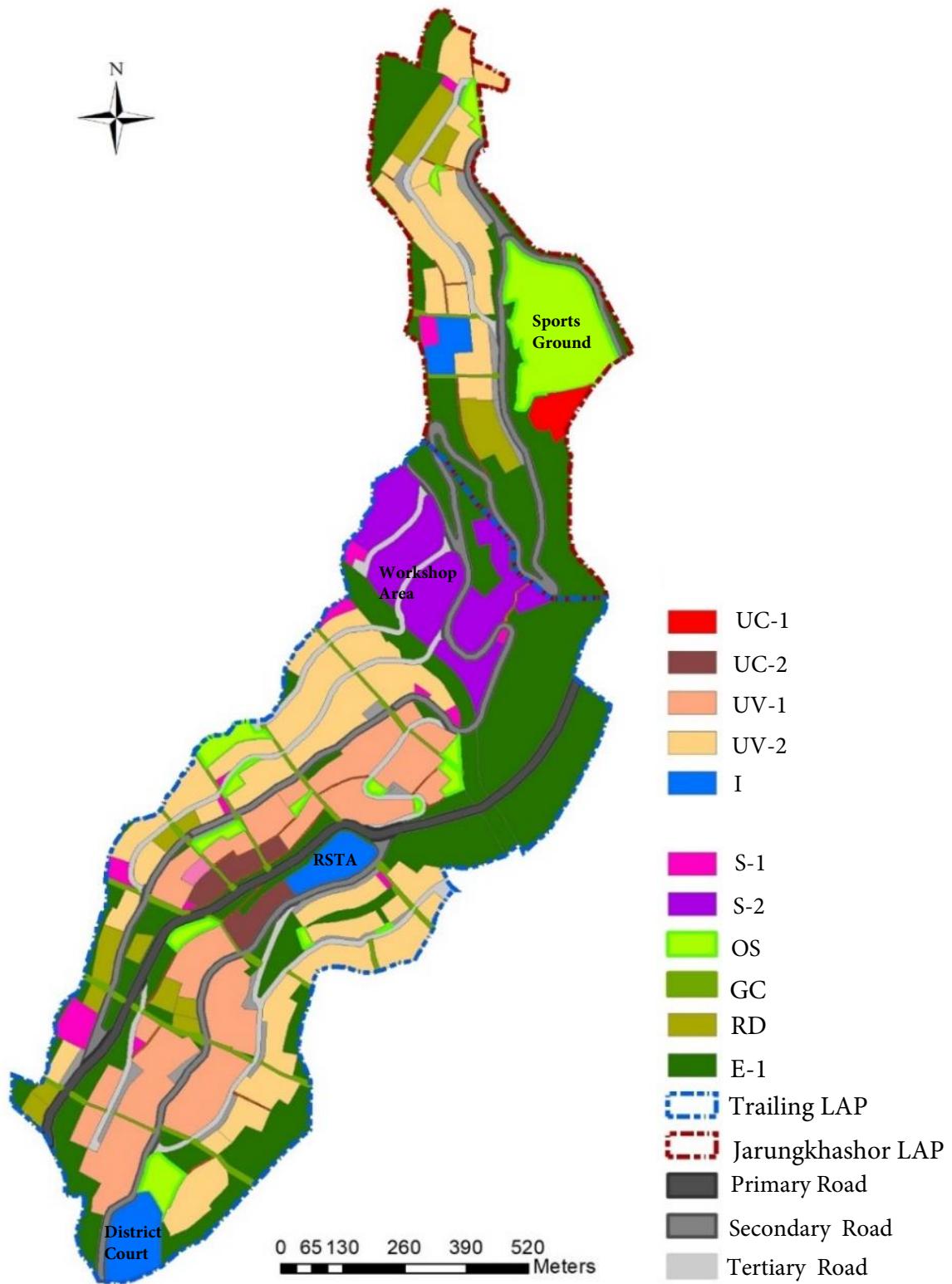
1. Universal accessibility and walkability
2. Access to all public/social amenities and services via roads and an unrestrained network of footpaths and green corridors.

3. Preservation of the environmentally sensitive areas
4. Recovery, revitalization, and conservation of environmentally sensitive areas such as watershed areas, water sources, steep slopes, forest areas, natural streams, etc. for larger environmental benefit of the community.
5. Promotion of the traditional architectural identity
6. Low-rise constructions with a built form that is consistent to the site and adheres to the traditional architectural style of the place as an assurance for the long-term goal of preserving and promoting the architectural identity of the place.
7. Harness the Economic potential of the place
8. Tapping the economic potential of the place through mediums such as tourism, local arts and crafts industry, but at the same time assuring a prudent utilization and management of the limited natural resources.

### **6.3 Precinct Plan**

A Local area plan (LAP) is the guiding document that attempts to accomplish and realize the underlying vision of a structure plan. It also lays down definitive and exhaustive guidelines for development. The focus of the precinct planning is to identify priority areas for development with respect to housing development, places of employment, places of retail and other ancillary uses and activities that will make Trailing and Jarungkhashor a sustainable community. The Precinct plan will also take cognizance of the key characteristics of each district in order to bring compatible activities together before delineating the precincts. These characters of the districts form the basic unit of planning for the town. A precinct plan gives more flexibility than the conventional land-use plan, however, it is to be understood that every precinct has a dominant activity and other activities are supportive to it. The support activities are governed by the main activity and therefore, only a limited number of support activities may be allowed within a precinct subject to their compatibility with the main activity. The proposed precincts have been demarcated with a scientific temperament and rationale with due regard to the Bhutanese lifestyle.

The precinct plan for Monggar Structure Plan has been prepared on the basis of slope analysis, geotechnical study, analysis of the town functionality and aesthetics, analysis of amenities and services and case study analysis. The precinct for the LAP is mostly based on the Structure Plan Precinct with some changes that resulted due to plot rationalization and reclamation of drainage buffer and spring water source near the workshop area.



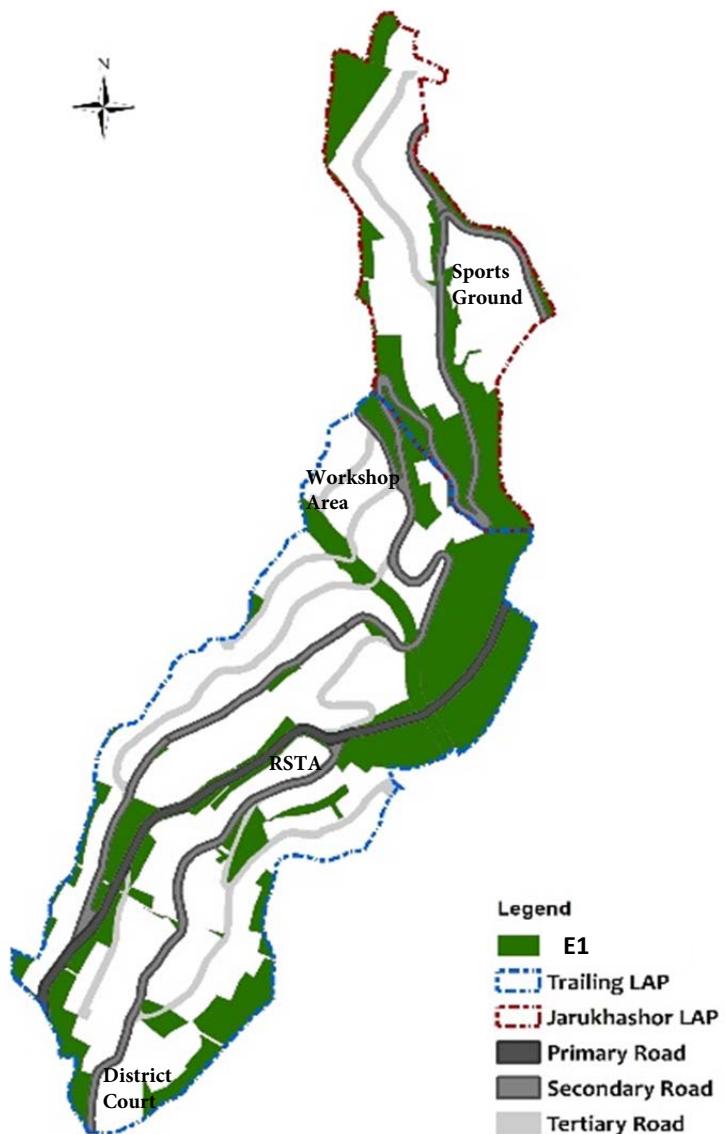
Map 6.2. Proposed Precinct Plan.

Following are the designated precincts of the Monggar Structure plan that are applicable for Trailing and Jarungkhashor LAP:

### 6.3.1 Environmental Conservation Precinct (E-1).

30.89 acres of the total 84.32 acres of land within Trailing and Jarungkhashor LAP falls under Environmental Conservation Precinct (E-1). Majority of the E-1 area within the LAP are under steep slope which also coincides with the high hazard zones from the geotechnical studies.

The areas earmarked as E-1 precincts are highly susceptible to natural and manmade hazards and therefore, development is strictly prohibited in the precinct due to increased risk to the livelihood and human settlement. 8.85 acres of land in Jarungkhashor and 22.02 acres of land in Trailing falls under E-1 precinct. Two private plots in Jarungkhashor and one RSTA plot in Trailing falls under E-1 precinct.

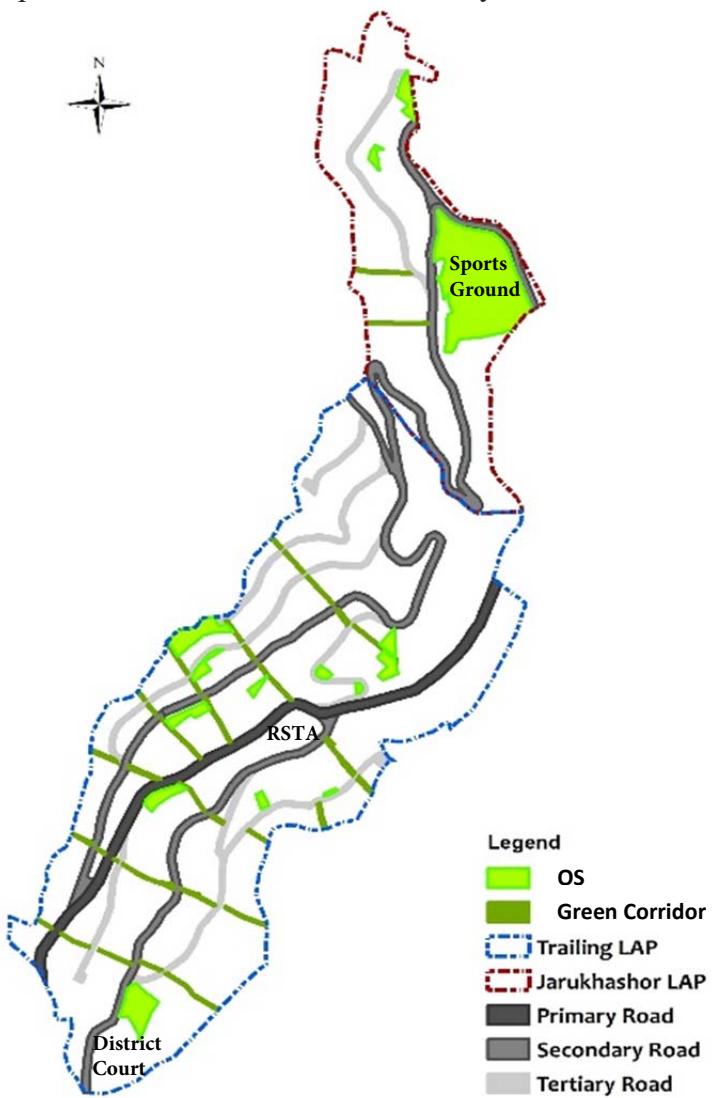


Map 6.3. Proposed E-1 precinct map

### 6.3.2 Open Space System Precinct (OS)

It consists of network of open spaces within Trailing and Jarungkhashor settlements such as the children's play area, parks, chortens, football ground, basketball court, green visual corridor, etc. Local open spaces are distributed in such a way that it can be accessed within 5-minute of walking distance by the residents. The football ground and basketball court are located in Jarungkhashor near the Jarungkhashor chorten, which are all in close proximity to the town core.

The green visual corridors of 3.5m width are mostly located in Trailing area. Its main function is to help give a form and order to the haphazard development taking place in Trailing and to enhance the image of the area. Proposed OS consists of a total area of 5.26 acres of land and proposed green corridor consists of a total of 1.4 acres of land within the LAP.

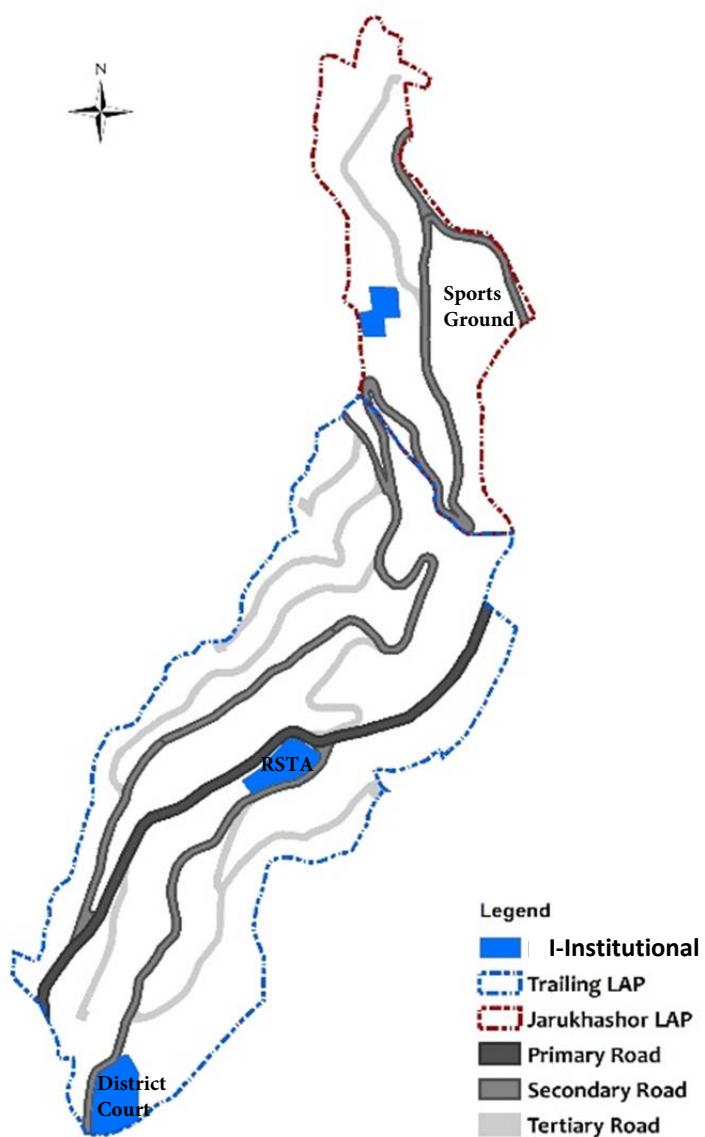


Map 6.4. Proposed OS-precinct plan

### 6.3.3 Institutional Precincts (I)

The institutional precinct in the LAP houses the Gewog Administration office in Jarungkhashor and Road Safety and Transport Authority office with the bus terminal and the Dzongkhag Court in Trailing area.

The institutional precinct comprises of a total of 2.6 acres of land with 56 decimal occupied by the Gewog office, 84 decimals by the RSTA and 1.2 acres occupied by the Dzongkhag Court office.

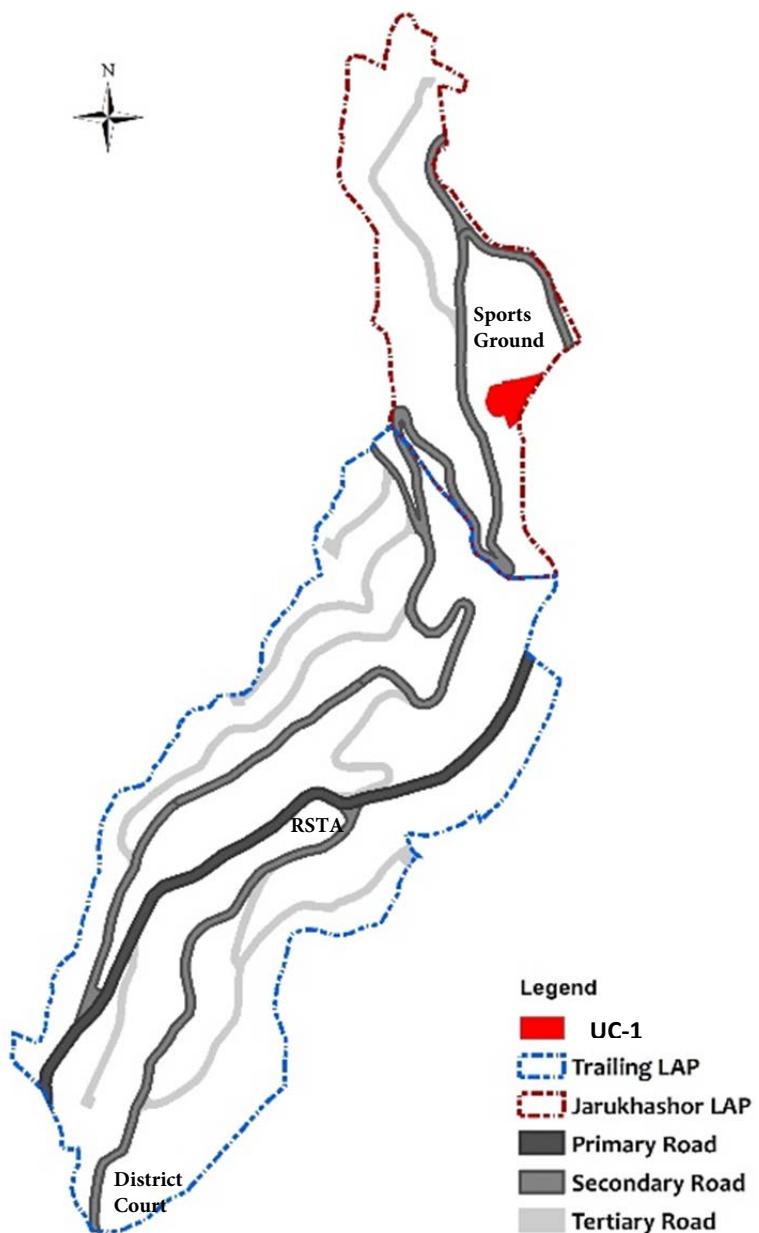


Map 6.5. Proposed I-precinct map.

#### **6.3.4 Urban Core 1 (UC-1)**

The Urban Core 1 (UC-1) comprises of the existing main commercial centre of Monggar town. The precinct is earmarked for high density development.

A small extension of the existing Monggar town core area, namely the BOD fuel station falls within the LAP boundary. It comprises of an area of about 55 decimal land within the LAP.



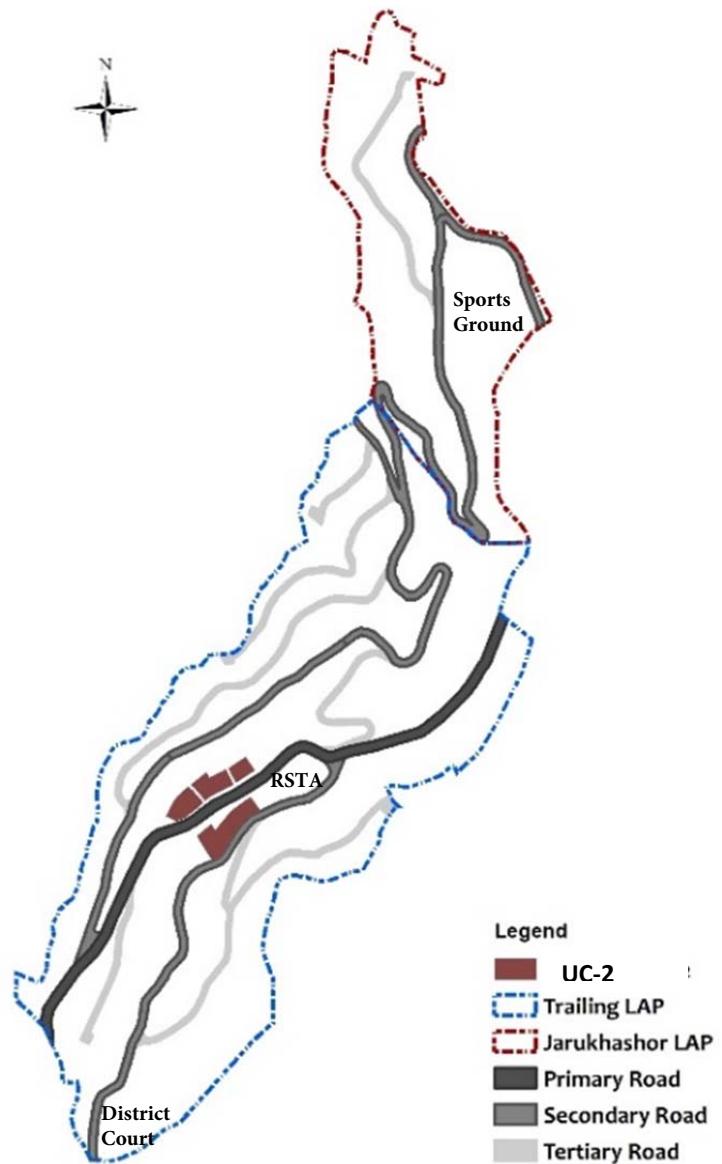
Map 6.6. Proposed UC-1 precinct map.

### 6.3.5 Urban Core 2 (UC-2)

Urban Core 2 precinct functions as a commercial core that provides basic goods and services at the neighbourhood level.

It is proposed within walking distance of all neighborhoods so that the basic necessities can be easily accessed by all. It is proposed for medium density development.

The UC-2 precinct in Trailing is proposed to service the residents of Trailing area while the Jarungkhashor residents can avail the service of the existing town core for necessities, as it is closer than the neighbourhood node in Trailing.

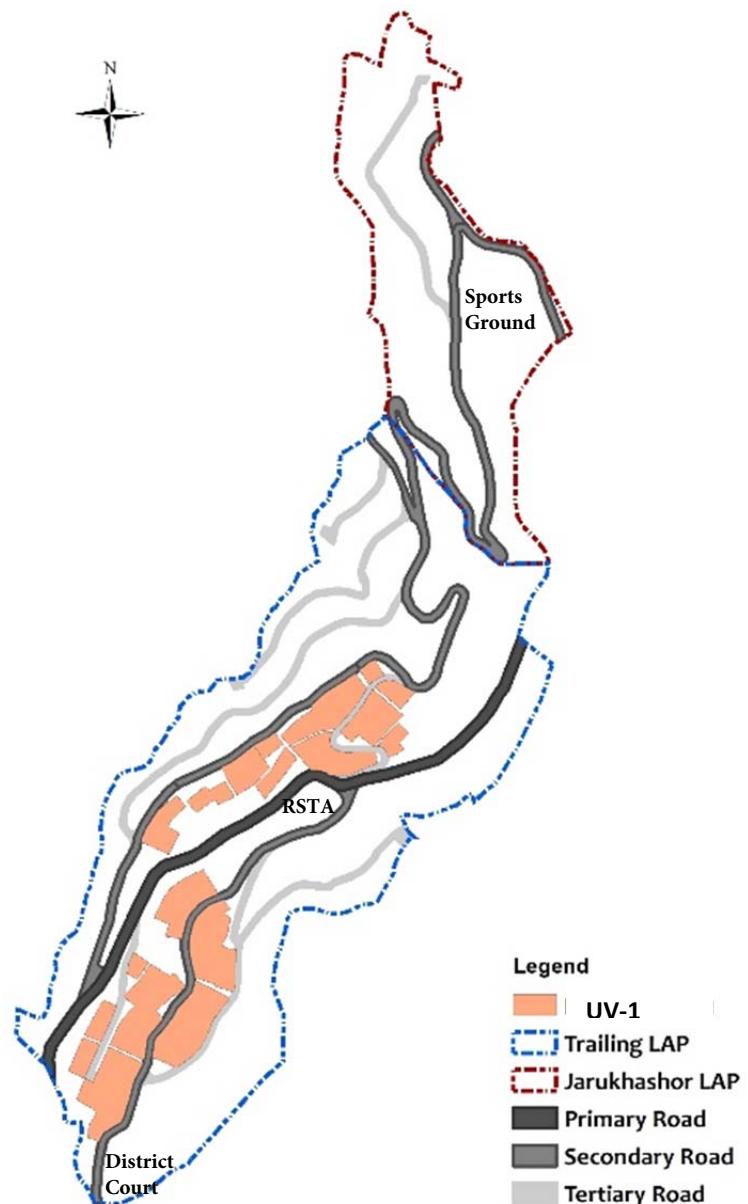


Map 6.7. Proposed UC-2 precinct map.

### 6.3.6 Urban Village 1 (UV-1)

The Urban Village 1 (UV-1) precinct is a mixed use precinct with predominantly residential use where local level retail shops and services are permitted in the ground floor or any other floor with separate means of access/staircase from within the building or outside the building.

UV-1 precincts are earmarked in areas of lower hazard and are proposed for medium density residential development. It comprises of an area of about 10 acres of land in Trailing area around the neighbourhood node.

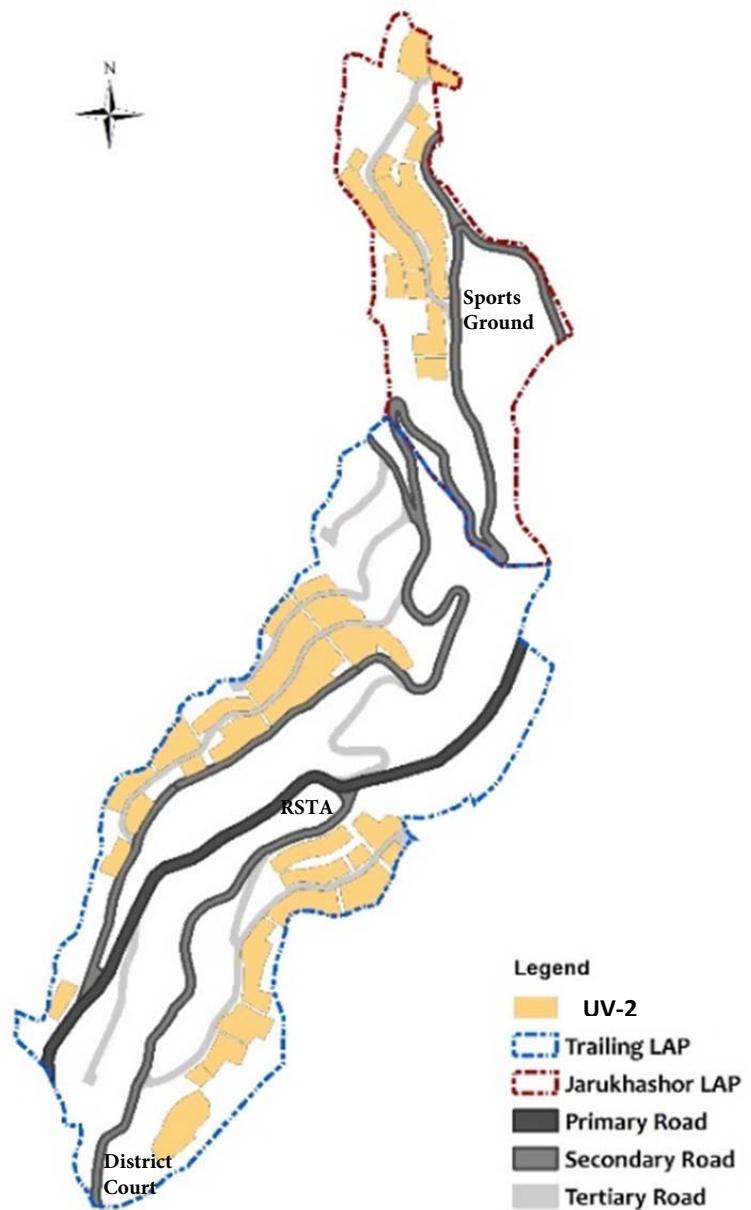


Map 6.8. Proposed UV-1 precinct map.

### **6.3.7 Urban Village 2 (UV-2)**

The Urban Village 2 (UV-2) precinct is a low density residential precinct. The precinct is proposed for lower density development, as it is located in medium hazard zone. Additionally, it can be accessed only by tertiary road or footpath access in some cases.

It comprises of an area of about 4.3 acres in Jarungkhashor and 10.9 acres in Trailing area with a total area of 15.2 acres within the LAP boundary.



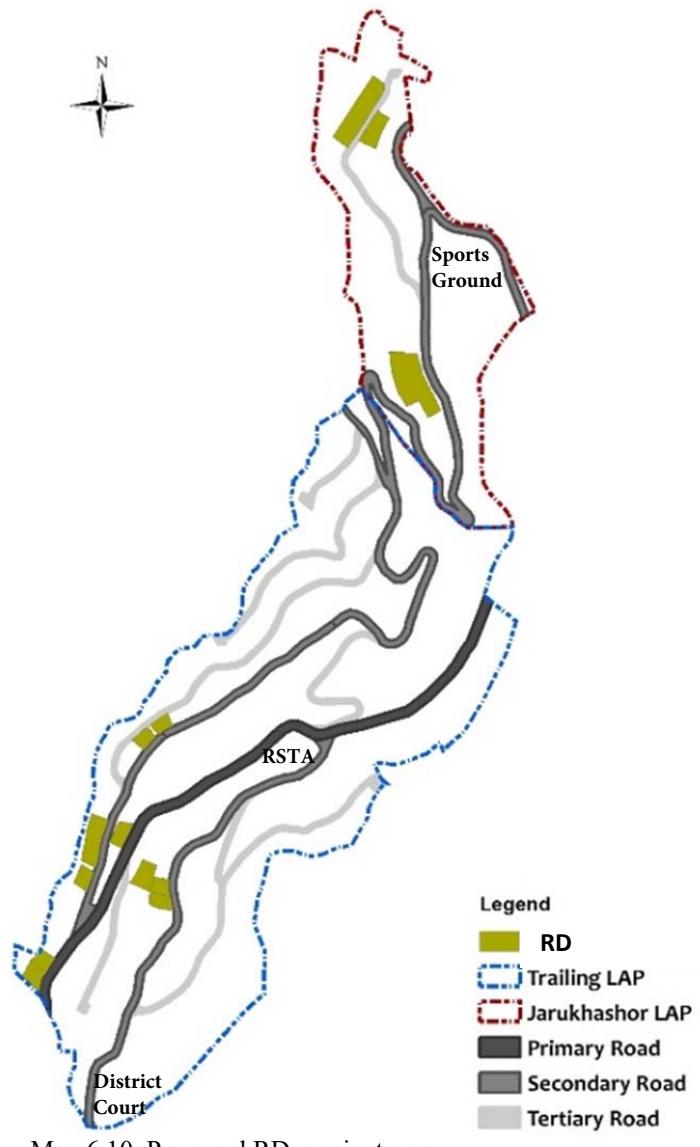
Map 6.9. Proposed UV-2 precinct map.

### 6.3.8 Restricted Development Precinct (RD)

The RD precinct is a new precinct proposed after rationalization of plots that either falls completely or partially in the environment precinct. Restricted residential development of up to two floors with plot coverage of up to 30% may be permitted in RD precinct. However, it may be subject to further geotechnical scrutiny and detailed mitigation measures for the development of site. It consists of an area of about 3.29 acres of land within the LAP boundary.

Following are various scenarios in which plots are rationalized into RD precincts;

- If a plot consists of two precincts wherein E-1 comprises of more than 50% of the plot area, the plot is rationalized as RD precinct;
- if a plot falls in E-1 precinct and that plot has contributed land towards land pooling contribution during the preparation of the LAP in 2004, then the plot is rationalized as RD precinct;
- Additionally, if a plot with area large enough to be subdivided into two or more plots has slope favourable for development, then the part of the plot with road access is rationalized as RD plot.



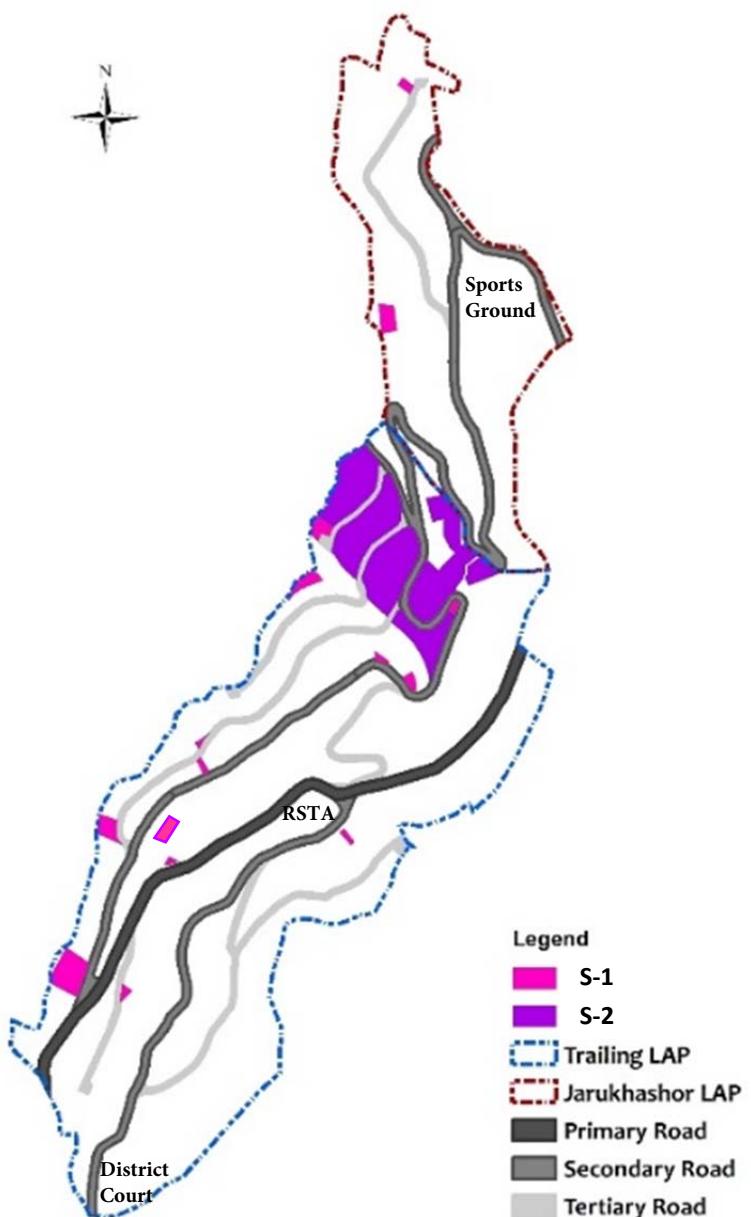
Map 6.10. Proposed RD precinct map.

### 6.3.9 Service Precinct (S-1 & S-2)

The service precinct within the LAP are further divided into Service 1 (S-1) precinct and Service 2 (S-2) precinct, where S-1 precinct is for non-polluting utility services and S-2 precinct is for polluting services like the vehicle workshops and heavy industries.

S-1 precinct consist of about 1.2 acres of land within the LAP boundary and are mainly for common septic tanks and service plots for utilities. The Ideal Development Centre in Trailing is also earmarked as S-1 precinct as it comprises of cottage industries such a bakery, milk processing units, etc.

S-2 precinct consist of about 5.1 acres of land within Trailing area and majority of it are leased out for various service related uses. However, there are two vacant private plots within the S-2 precinct.



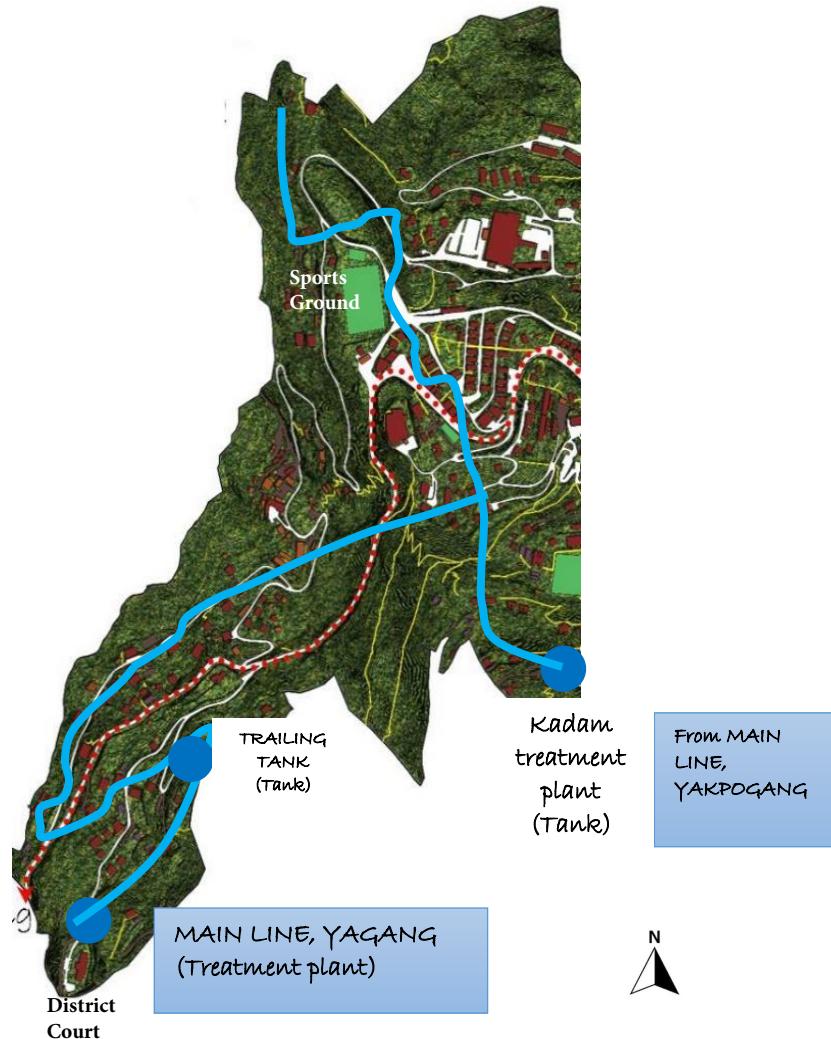
Map 6.11. Proposed Service precinct map.

## 6.4 Infrastructure Proposal

### 6.4.1 Water Supply

Water supply source for Monggar is at Yakpogang. There is also an ongoing construction of integrated water supply at Kadam, which will supply water to proposed LAPs.

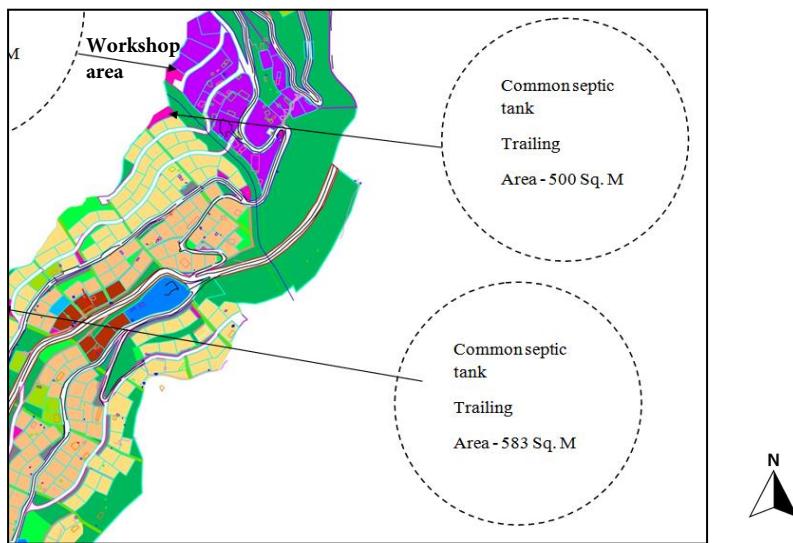
The carrying capacity of the LAPs is estimate at around 4600 people and the water demand thereof is 0.8 MLD considering 175 LPCD (135 LPCD + 15% unaccounted losses+ 15% fire safety).



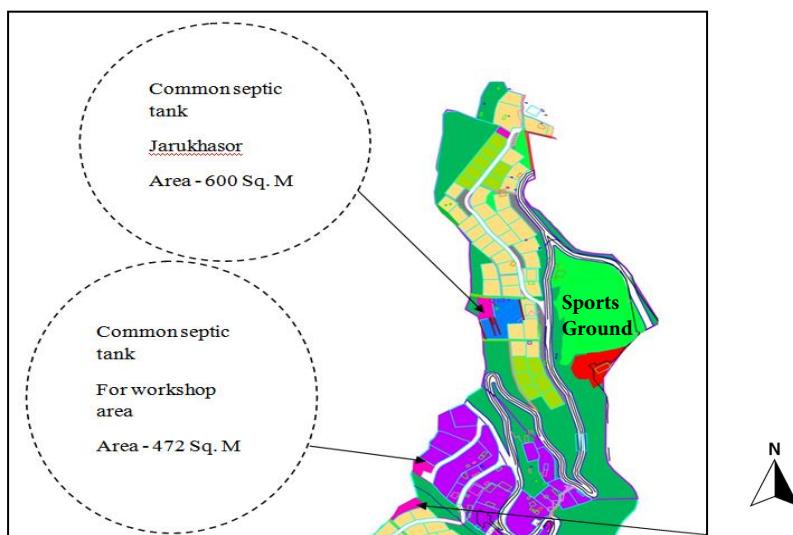
Map 6.13. Proposed water supply map.

#### 6.4.2 Sewerage System

By looking at the kind of topography and soil condition from geotechnical study, the structure plan proposes to have common septic tank for some areas. There are two septic tanks for Trailing taking into the account of number of plots in the area. For workshop area and Jarungkhashor, a septic tank each has been proposed at the lowest elevation of the area.



Map 6.14. Proposed locations for common septic tanks and treatment plant in Trailing.



Map 6.15. Proposed locations for common septic tanks and treatment plant in Jarungkhashor.

### 6.4.3 Drainage System

As per slope analysis and the geotechnical study, the area in the LAPs has sloping terrain and soil is not stable. Therefore, the implementation of proposed drainage system has to be a priority. The drainage system has been proposed along the proposed road and vertical green corridors.

Further, the plan proposes drains on a long steep slope to be broken up by introduction of contour drain and stilling basin so that the total drop does not become too high. In addition, the drain slope length should not exceed 20-30 meters. The size of the contour drain can be designed by considering flow volume generated from the upstream catchment and considering a negligible channel slope to carry that discharge.

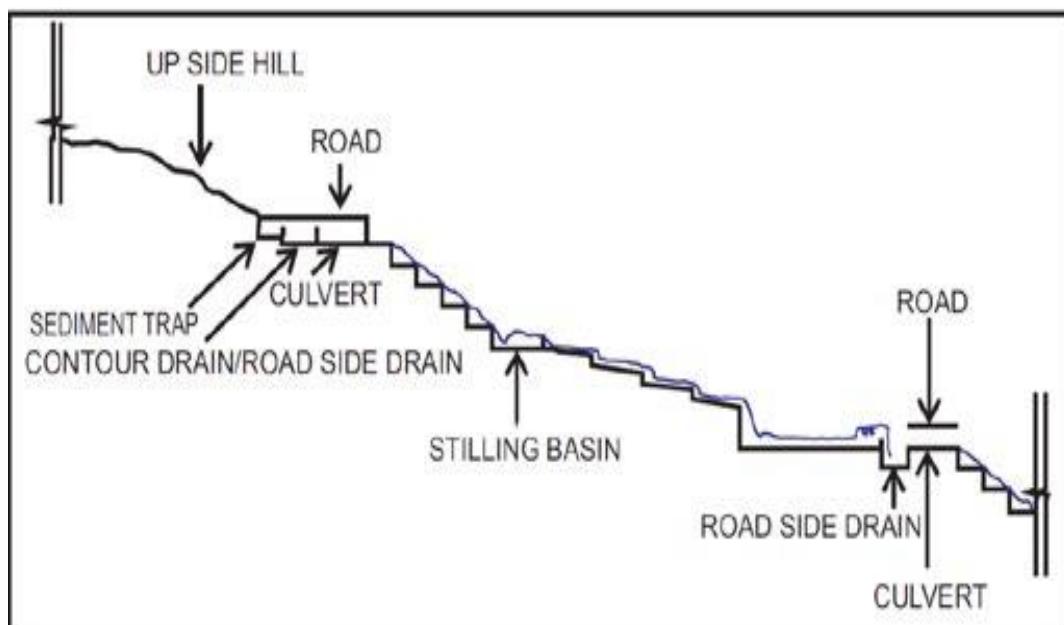


Figure 6.1. Design section for the drains on steep slope.

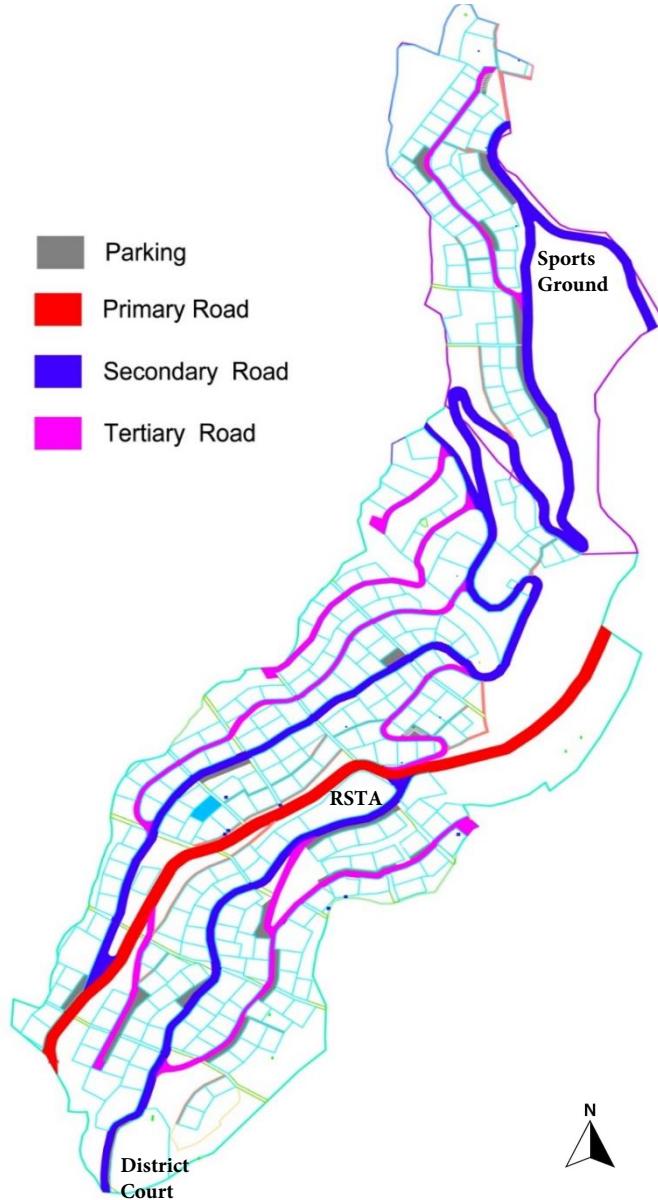
### 6.4.4 Solid Waste Management

Thromde collects solid waste twice a week and takes to current landfill site at Tshozor. Thromde is already working on new site for landfill in Konbar, which is around 14 kms away from core town.

#### 6.4.5 Traffic and Transportation Proposals

The structure plan proposes to widen the existing road and highway with provision of pedestrian footpaths on one side. Off street footpaths are provided where possible for the plots on steeper area.

In LAP proposals there are around nine new access road of 6m ROW which are proposed in order to provide road access to all the plots where possible. Primary road is of 12m ROW and secondary is 9m. For those plots, which do not have direct road access, common parking have been proposed at the nearest distance with footpath access to the plot. The details are illustrated in the map below.



Map 6.16. Proposed road layout map.

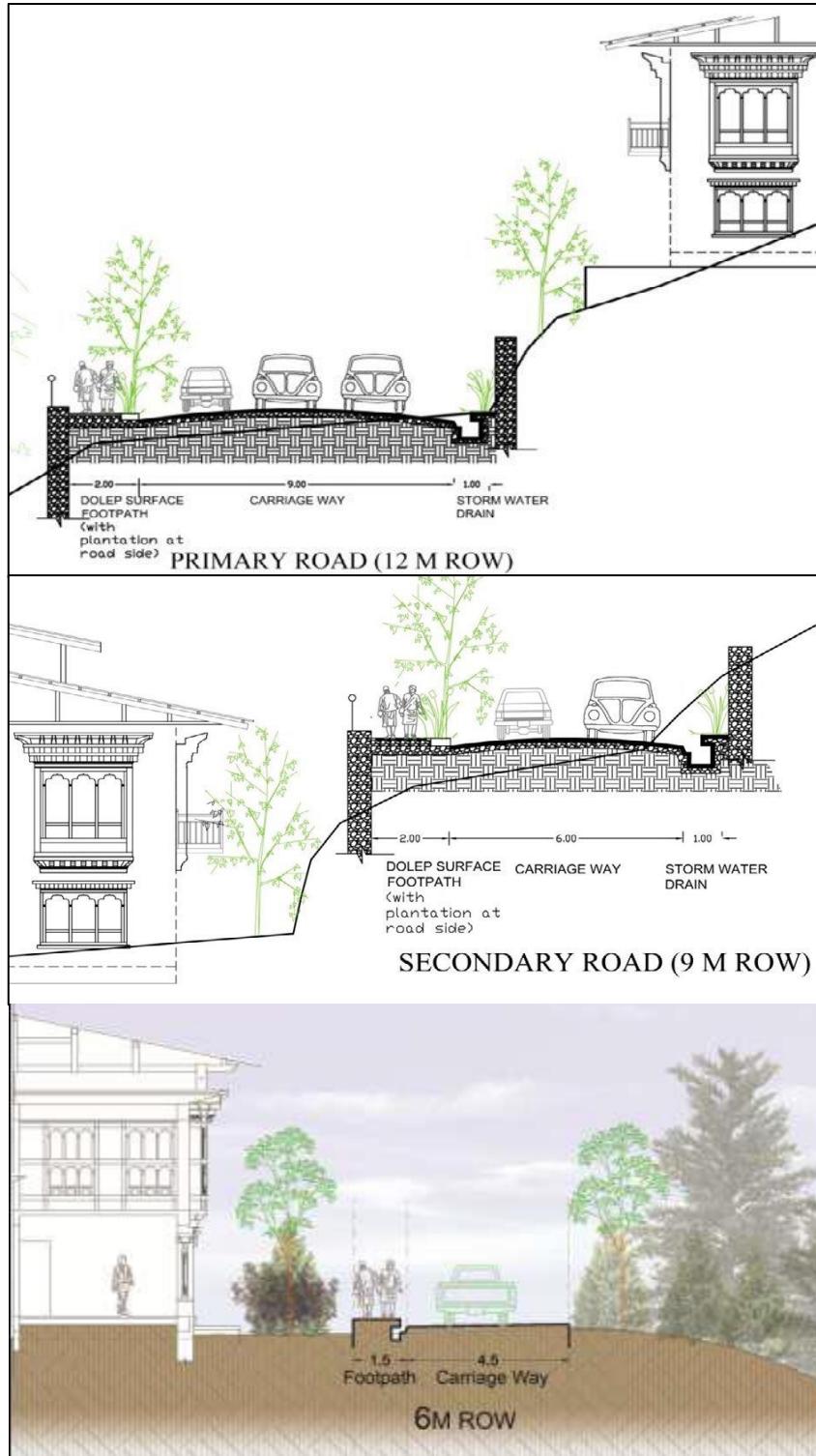
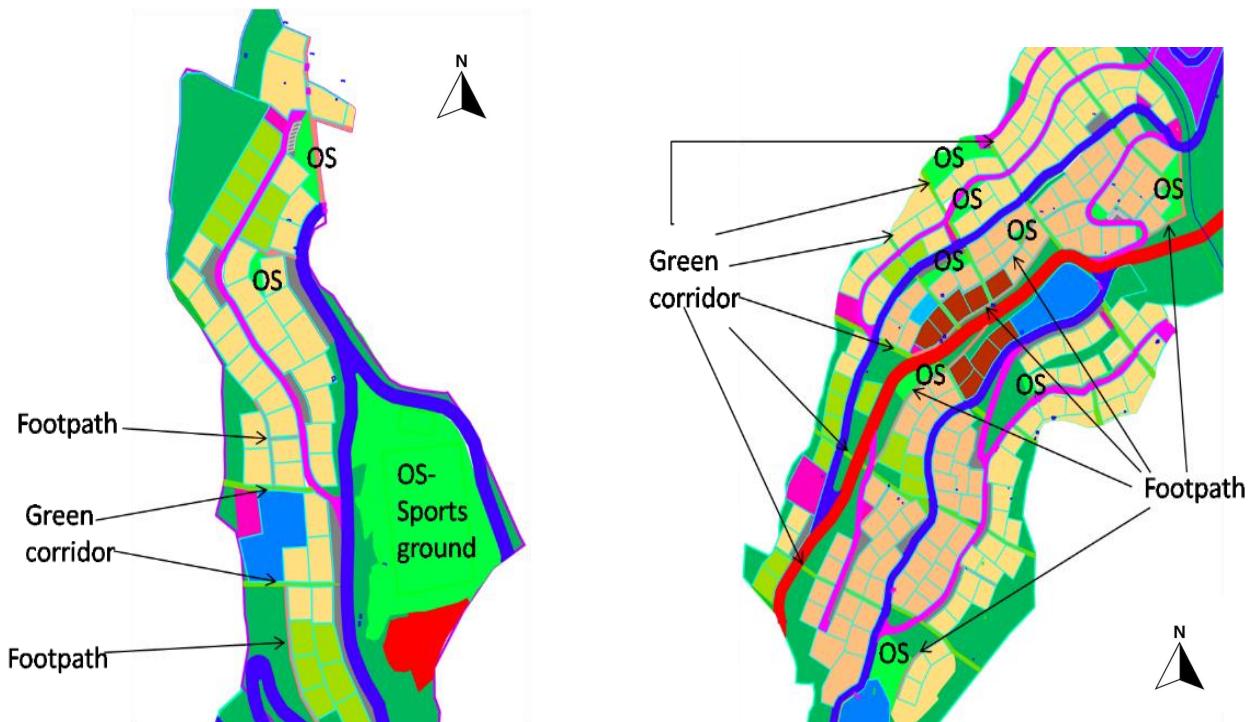


Figure 6.2. Design section for Primary, secondary and access /tertiary roads.

#### 6.4.6 Open Spaces and Footpath

It consists of network of open spaces within the settlement, such as children play area, parks, green corridor, playground, etc. The open space will offer space for lively social interaction along with physical activity. The green corridors, which are 3.5m in width, serves as footpath and view corridors. There are three open spaces in Jarungkhashor one of which serves as sports ground. There are seven parks/open spaces in Trailing. The details are illustrated in the figure below



Map 6.17. Proposed locations of open space and footpath.

## **6.5 Plot Reconfiguration**

Following are the principles that have been used for reconfiguration of plots for Trailing and Jarungkhashor LAP:

- **Principle of Correspondence:**

Where plots are retained in its original location or near its original location with minimal displacement.

- **Divisibility:**

Where keen attention has been given to the future subdivision of the plots or its divisibility to the minimum plot sizes and the blocks are designed in such a way to ensure the fulfillment of this principle

- **Build-ability:**

Where plot width of standard plots are maintained at a minimum size of 14-15m in order to ensure its adequacy and convenience for building construction.

- **Accessibility:**

Where road access has been provided for all plots considering that topography permits and wherever not feasible, then a footpath access with a common car parking nearby.

- **Equity:**

Equity has been considered for plots falling in the RD precincts and accordingly the land pooling contribution for the precinct have been limited from 20%-26% while the contribution for other developable plots is fixed at 30%. The main reason for reduced contribution for RD precinct is mainly due to the reduced development rights compared to the other developable precincts.

### **6.5.1 Plots Reconfiguration Plan: Trailing**

Land pooling contribution of 26% was applied to the plots within Trailing for the preparation of the Trailing LAP in 2004. However, there were still many plots without road access within the LAP. Upon site verification, road access was found feasible in some areas and thus new tertiary roads were proposed wherever feasible as part of the plan revision.

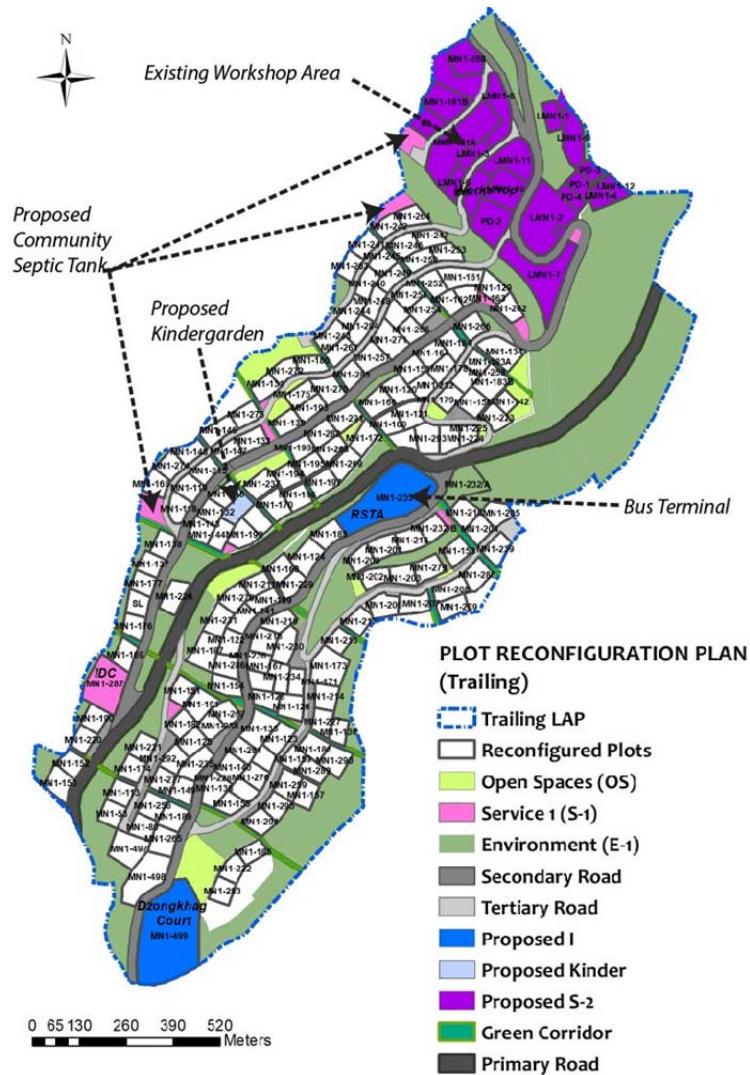
Additional land was required for the provision of new tertiary road and also for the new local open spaces, green corridors and service plots. Therefore, in absence of adequate developable land in the LAP, it was decided to apply an additional land pooling contribution of 4% to all plots that have contributed 26% in the previous LAP, thereby making it 30% in total. 30% land pooling was applied to those plots that have not

contributed any land in the previous LAP. No additional contribution was applied to RD plots as they have already contributed 26% in the previous LAP. As for the land under government institutions such as the RSTA, the Dzongkhag Court and the Idea Development Centre, land pooling contribution was not applied as these institutions were of service oriented in nature.

Areas of some plots belonging to the same owner were adjusted wherever required to resolve reconfiguration problems such as the need to maintain the alignment of the green visual corridor (**MN1-146 & MN1-147**, **MN1-245 & MN1-246** and **MN1-249 & MN1-250**) and the inability

of some plots to contribute land due to existence of building covering the whole plot (**MN1-206 and MN1-201**). Plot MN1-232 belonging to RSTA is further subdivided into two plots whereby one plot falls under the E-1 precinct (**MN1-232/A**) and other in the developable precinct (**MN1-232/B**).

Considering the terrain of the area, it was not possible to provide road access to some plots and for those plots that do not have direct road access, footpath access is provided with common parking located nearby. As for the workshop area, the leased plots are allotted the leased area and reconfigured wherever required for the road right of



Map 6.18. Plot reconfiguration map of Trailing.

way. Land Pooling contribution of 30% have been applied to the two private plots in the S-2 precincts and tertiary road access have been provided for the plots

### 6.5.2 Plots Reconfiguration Plan: Jarungkhashor

In the previous Jarungkhashor LAP, land pooling contribution of 15% have been applied to all the plots. In the revised LAP, new tertiary road of 6m ROW was proposed in addition to local open spaces, parking, service plots and green visual corridors. Additional land was required for the provision of these new public amenities, and therefore, it was decided to apply an additional land pooling contribution of 15% for all plots that have contributed 15% in the previous LAP, making it 30% in total. This was done in consultation with the landowners and due to the lack of developable government land in the area.

Some plots have been relocated from developable precincts to E-1 precinct during the NCRP

demarcation, these plots have been relocated to developable precinct after thorough analysis of the cases.

As for the plots in the RD precinct, additional 5% contribution has been applied to them, making it a total of 20% LP contribution for RD precincts.



Map 6.19. Plot reconfiguration map of Jarungkhashor.

## **6.6 Implementation Plan**

As part of any Local Area Plan, the implementation plan is an important section, which serves as an overall strategy and guide the implementing body to complete all the development activity successfully. This chapter serves as the guide for prioritizing and allocating the resources accordingly. It would also help various Departments to plan and implement different projects with better coordination, efficiency and transparency. The implementation plan has been divided into three phases spanning over the planning period.

### **Phase 1**

#### **>Demarcation of the plots:**

Once the plan is approved by the landowners and the approving authority, the plan validation would be carried out by the National Land Commission. Then the demarcation process would be coordinated by the Dzongkhag administration with the Surveyors, Land record officials and Planners.

#### **>Widening of existing road and construction of drains and service ducts**

With the aim of providing connectivity and access to all the plots in the plan area, the first priority is to widen the road to the proposed right of way. The road will be widened according to the designed cross section. The widening of the roads will also include the construction of the footpaths, drains and service ducts as indicated in the design cross section (concern Department to be consulted for the detail Design).

#### **>Construction of access with drains and service ducts**

Alongside the widening works, the construction of new access roads should also be done according to the design cross section. Footpaths and service ducts should be constructed with the access road as per the design section.

### **Phase 2**

#### **>Distribution network for water supply**

With the construction of water treatment plant and reservoir, the provision of water supply distribution line should also be commenced. The areas within the planning area where the project has not covered has to be taken care in this phase.

#### **>Sewerage and STP**

A central sewerage treatment plant should also be implemented in this phase alongside with a sewer network.

## **Phase 3**

### **>Construction of Parking**

The construction of parking space for residents will be implemented in this phase of the plan.

### **>Construction of off- street footpath**

In the final phases of the plan, the pedestrian infrastructure will be improved and built according to the plan. The footpaths will be the connecting the green areas together and improve the overall walkability of the town.

### **>Development of open spaces**

Finally, the last phase will focus on the development of the open spaces and green areas that are located in the area. The green area will be developed as breathing space for the town.

**ANNEXURE A**

**Proposed Land Reallocation - Trailing**

S.N.o.	Name	Thram No.	Plot No.	Registered Area		Polygon Area	Area Considered	Land Pooled (26%)	Land to be Allocated	Plot Allocated	Land Allocated (size)	Total Land Allocation	Difference Area	Access Pedestrian / Vehicular	SL no.	New thram no.	Current Land Owner	Plot no.	LAP2004 net area Sq.ft	Current Thram Area_sqft	Additional Area Sq.ft	Contribution applied in 2004	Additional Contribution (4% or 30% or 0) Sq.ft	Area after Contribution(in sqft)	Area after Contribution (in sqm)	Proposed Area (Sq.m)	Proposed Plot ID	Developable or E-1 zone (Whole in UV-II-coverage 30%)	D to E-1 or E-1 to D	Proposed Precinct	Remarks	Plotting Remarks
				Acres	Sq. mts.																											
1	Neten	172	6	3.25	13143.93	12872.19	13143.93	3417.42	9726.51	6-(i)	485.64	9726.51	0.00	P	Baningpoktor	1	199 Choden	MN1-241	5225	4754	26%	190.160	4563.840	423.995	423.995	D		UV-II				
										6-(ii)	485.64			P		2	199 Choden	MN1-242	5225	4544	26%	181.760	4362.240	405.265	405.265	D		UV-II				
										6-(iii)	485.64			P		3	199 Choden	MN1-243	5225	6225	1000	26%	249.000	5976.000	555.189	555.189	D		UV-II			
										6-(iv)	485.64			P		4	199 Choden	MN1-244	5225	5709	484	26%	228.360	5480.640	509.168	509.168	D		UV-II			
										6-(v)	485.64			P		5	199 Choden	MN1-240	5225	4977		26%	199.080	4777.920	443.883	443.883	D		UV-II			
										6-(vi)	485.64			P		6	199 Choden	MN1-245	5225	5247	22	26%	209.880	5037.120	467.964	427.514	D		UV-II			
										6-(vii)	485.64			P		7	199 Choden	MN1-246	5225	5199		26%	207.960	4991.040	463.683	504.133	D		UV-II			
										6-(viii)	485.64			P		8	199 Choden	MN1-247	5225	4864		26%	194.560	4669.440	433.805	433.805	D		UV-II			
										6-(ix)	485.64			P		9	202 Jigme Drakpa	MN1-261	5225	4975		26%	199.000	4776.000	443.705	443.705	D		UV-II			
										6-(x)	485.64			P		10	221 Tobgay Gyaltsen	MN1-284	5225	5012		26%	200.480	4811.520	447.005	447.005	D		UV-II			
										6-(xi)	485.64			P		11	199 Choden	MN1-248	5225	5147		26%	205.880	4941.120	459.045	459.045	D		UV-II			
										6-(xii)	485.64			P		12	199 Choden	MN1-249	5225	5507	282	26%	220.280	5286.720	491.152	448.492	D		UV-II			
										6-(xiii)	485.64			P		13	199 Choden	MN1-250	5225	4838		26%	193.520	4644.480	431.486	474.146	D		UV-II			
										6-(xiv)	485.64			P		14	221 Tobgay Gyaltsen	MN1-285	5225	4954		26%	198.160	4755.840	441.832	441.832	D		UV-II			
										6-(xv)	485.64			P		15	202 Jigme Drakpa	MN1-260	5225	4503		26%	180.120	4322.880	401.609	401.609	D		UV-II			
										6-(xvi)	485.64			P		16	199 Choden	MN1-251	5225	5518	293	26%	220.720	5297.280	492.133	492.133	D		UV-II			
										6-(xvii)	485.64			P		17	199 Choden	MN1-252	5225	5058		26%	202.320	4855.680	451.107	451.107	D		UV-II			
										6-(xviii)	485.64			P		18	199 Choden	MN1-253	5225	4994		26%	199.760	4794.240	445.399	445.399	D		UV-II			
										6-(xix)	499.35			P		19	199 Choden	MN1-254	5225	5427	54	26%	217.080	5209.920	484.017	484.017	D	(With traditional house)	UV-II			
										6-(xx)	485.64			P		20	199 Choden	MN1-255	5225	4944		26%	197.760	4746.240	440.940	440.940	E-1 (less than 50%)		UV-II			
2	Kezang Choden	842	7	0.72	2900.50	3048.57	2900.50	754.13	2146.37	7-(i)	689.45	2146.37	0.00	P	Baningpoktor	21	385 Tshering Yangden	MN1-161	7418	8212	794	26%	328.480	7883.520	732.403	732.403	E-1 (less than 50%)		UV-II			
										7-(ii)	485.64			V		22	146 Choden	MN1-162	5225	4657		26%	186.280	4470.720	415.343	415.343	D		UV-II			
										7-(iii)	485.64			V		23	146 Choden	MN1-163	5225	4020		26%	160.800	3859.200	358.531	358.531	D		UV-II			
										7-(iv)	485.64			V		24	146 Choden	MN1-164	5225	5387	162	26%	215.480	5171.520	480.450	480.450	D		UV-I			
3	Ngawang Pemo	1139	8	0.04	142.46	125.16	142.46	37.04	105.42	8 & 8/A	899.94	899.94	0.00	V	Trailing																	
4	Ngawang Pemo	1139	8/A	0.27	1073.68	1079.97	1073.68	279.16	794.52		899.94			P	Trailing	25	124 Ngawang Pemo	MN1-134	9683	9509		26										

									20-(vi)	485.64			P		63	171	Sangay Chozom	MN1-193	5225	5096		26%	203.840	4892.160	454.496	<b>454.496</b>		D		<b>UV-II</b>				
								20-(vii)	773.95			V		64	208	Sherab Dema	MN1-271	8328	8616	288	26%	344.640	8271.360	768.434	<b>768.434</b>		D		<b>UV-II</b>		Shifted towards Industrial area along the same line.			
25	Tshomo	901	27	1.17	4739.88	5780.80	4739.88	1232.37	3507.51	27-(i)				P	Trailing	65	135	Gyelshen Trulku	MN1-148	5225	4864		26%	194.560	4669.440		433.805	<b>433.805</b>	E-1 (less than 50%)		<b>UV-II</b>		As per thram no. 901 of Tshomo, plot no. 27 had 1.4433 acrea out of which 0.24 was transferred to thram no.1371 of Ugyen Tenzin. But as per this record two plots , for Ugyen Tenin is created from	
									27-(ii)	485.64			P		66	134	Ugyen Tenzin	MN1-146	5225	5957	732	26%	238.280	5718.720	531.286	<b>568.548</b>		D		<b>UV-II</b>		37.262 Sq.m adjusted (added) to MN1-146 from MN1-147 due to reconfiguration inconveniences		
								27-(iii)	485.64			V		67	178	Sangay Dorji	MN1-215	5225	4940		26%	0.000	4940.000	458.941	<b>458.941</b>		E-1		Same as LAP 2004	<b>RD</b>				
								27-(iv)	485.64			V		68	134	Ugyen Tenzin	MN1-147	5225	4998		26%	0.000	4998.000	464.329	<b>427.067</b>		E-1		Same as LAP 2004	<b>RD</b>	Remaining area of 37.262 Sq.m adjusted with his other plot MN1-146			
								27-(v)	485.64			P		69	196	Jigme Zangpo	MN1-237	5225	6225	1000	26%	249.000	5976.000	555.189	<b>555.189</b>		D with G+3 building		<b>UV-I</b>					
								27-(VI)	485.64				Trailing	70			Tshewang Lhamo		5225	5225		26%	209.000	5016.000	466.002	<b>466.002</b>		D with G+1 traditional house		<b>UC-II</b>		omitted plot. under process with NLCS.		
								27-(vii)	593.67			P		71	151	Tshomo	MN1-170	6388	6473	85	26%	258.920	6214.080	577.307	<b>577.307</b>		D with G+1 traditional house		<b>UC-II</b>		The plot depth could not be reduced due to the nearby structure and the footpath			
26	Netenmo	174	28	2.52	10194.05	10069.10	10194.05	2650.45	7543.60	28-(iii)	485.64			P	Trailing	72	228	Naichu	MN1-292	5225	5344	119	26%	213.760	5130.240	476.615	<b>476.615</b>		E-1 (less than 50%)		<b>UV-I</b>			
								28-(iv)	485.64				P		73	161	Tenzin Wangchuk	MN1-182	5225	5266	41	26%	210.640	5055.360		469.658	<b>469.658</b>	E-1	D to E1 (shifted due to change in boundary)	<b>E-1 to UV-II</b>				
								28-(v)	485.64			P		74	212	Pema Chophel	MN1-275	5225	5360	135	26%	214.400	5145.600	478.042	<b>478.042</b>				***Shifted to Jarungkhashor					
								28-(vi)	485.64			P		75	147	Karma Deki	MN1-165	5225	5311	86	26%	212.440	5098.560	473.672	<b>473.672</b>		E-1 (less than 50%)		<b>UV-II</b>					
								28-(vii)	485.64			P		76	211	Norbu Tshering	MN1-274	5225	5342	117	26%	213.680	5128.320	476.436	<b>476.436</b>		D		<b>UV-II</b>					
								28-(viii)	485.64			P		77	127	Ugyen Wangchuk	MN1-137	5225	5025		26%	201.000	4824.000	448.164	<b>448.164</b>		E-1 (less than 50%)		<b>UV-II</b>					
								28-(ix)	485.64			P		78	109	Yangmo	MN1-118	5225	5339	114	26%	213.560	5125.440	476.169	<b>476.169</b>		D		<b>UV-II</b>					
								28-(x)	485.64			V		79	109	Yangmo	MN1-119	5225	5350	125	26%	214.000	5136.000	477.150	<b>477.150</b>		D		<b>UV-II</b>					
								28-(xi)	485.64			V		80	186	Ugyen Dorji	MN1-226	5225	6225	1000	26%	0.000	6225.000	578.321	<b>578.321</b>		E-1 with G+3 building		Same as LAP 2004	<b>RD</b>				
								28-(xii)	600.13			V		81	122	Chekey	MN1-132	5225	4701		26%	188.040	4512.960	419.268	<b>419.268</b>		D with G+3 building		<b>UV-I</b>					
								28-(xiii)	485.64			V		82	132	Rinchen	MN1-143	5225	5156		26%	206.240	4949.760	459.848	<b>459.848</b>		E-1 (less than 50%)		<b>UV-I</b>					
								28-(xiv)	485.64			V		83	132	Rinchen	MN1-144	6780	5255		26%	210.200	5044.800	468.677	<b>468.677</b>		E-1 (less than 50%)		<b>UV-II</b>		no road access, no additional contribution			
27	Tshering Yangzom	1207	28/A	0.28	1146.52	1171.21	1146.52	298.10	848.43	28(A)-(i)	485.64			V	Trailing	84	157	Tshering Yangzom	MN1-176	5225	4808		26%	0.000	4808.000	446.678	<b>446.678</b>		E-1		Same as LAP 2004	<b>RD</b>		
								28(A)-(ii)	485.64			V		85	157	Tshering Yangzom	MN1-177	5225	4625		26%	0.000	4625.000	429.677	<b>429.677</b>		E-1		Same as LAP 2004	<b>RD</b>				
28	Choney Zangmo	1150	44/A	0.31	1270.77	1353.35	1270.77	330.40	940.37	44(A)-(i)	485.64			P	Trailing	86	182	Choney Zangmo	MN1-220	5225	4841		26%	193.640	4647.360	431.754	<b>431.754</b>		E-1 (less than 50%)		<b>UV-II</b>			
								Balance one Plot in Conservation Zone																										
29	Tumchenmo	164	45	0.54	2175.68	1921.23	2175.68	565.68	1610.00	45-(i)	485.64			P	Trailing	87	137	Chenco Tshering	MN1-150	5225	6732.189		26%	0.000	6732.189	625.441	<b>625.441</b>		E-1		Same as LAP 2004	<b>RD</b>		
								45-(ii)	638.72			P		88	137	Chenco Tshering	MN1-151	6873	5366		26%	214.640	5151.360	478.577	<b>478.577</b>		D with Single storied bungalow		<b>UV-I</b>		Lagthram pending due to excess area...to discuss with architecture			
								45-(iii)	485.64			P		89	137	Chenco Tshering	MN1-152	5225	5225.349		26%	0.000	5225.349	485.451	<b>485.451</b>		E-1		Same as LAP 2004	<b>RD</b>				
30			56/Y			857.73	857.73	223.01	634.72	56/Y	634.72	0.00	P	Not Found																				
31		57			10562.04	10562.04	2746.13	7815.91	57-(i)	531.31	</																							





## **Proposed Land Reallocation-Jarungkhashor**

## Additional plot

## **ANNEXURE B**

### **Minutes of Meeting**

<b>Subject</b>	: Second Public consultation Meeting for the review of Jarungkhashor and Trailing Local Area Plans in Monggar Dzongkhag.
<b>Venue</b>	: Wangchuk Hotel Conference Hall
<b>Date</b>	: 14/05/2019
<b>Time</b>	: 10:00 AM onwards

#### **Attendees**

- The plot owners of Trailing and Jarungkhashor.(The name-list attached)
- The meeting was chaired by Dasho Dzongrab, Monggar Dzongkhag.

#### **Introduction**

In continuation to the first public consultation meeting held on 14/12/2018; the second public consultation meeting for the review of Local Area Plans of Jarungkhasor and Trailing was held on 14th, May, 2019 in Wangchuk Hotel, Monggar. The consultation meeting was held to:-

- Reflect on the issues pertaining to the environmental precinct, non-compliance, and service infrastructures in the two LAPs
- Appraise to the public on the planning proposals or land mobilization options to facilitate land pooling and subsequent infrastructure provision in the two LAPs

#### **Discussion and Decisions**

- The team from the Department of Human Settlement, Ministry of Works and Human Settlement presented the existing issues in the two LAPs and planning proposal (1 and 2) for the public to choose.
- The proposal 1 presented by the team was to improve the existing urban infrastructures, as well as, to provide new infrastructures such as roads, drains, open spaces to those plots that do not have the mentioned infrastructures.
- The proposal 2 was also presented as a contingency proposal in the case of the rejection of proposal 1. The proposal 2 was to retain the existing LAP structure and delve into minor improvements pertaining to roads, drains without pooling the land.
- In the case of choosing proposal 1, the team highlighted that plot owners are required to contribute land for the development of common service infrastructures such as access road, drainage, sewer line and water supply.

- As per the Land Pooling Rules and regulation 2018, the maximum allowable land pooling percentage from a plot owner is 30 %. Accordingly, in the Trailing LAP, the team proposed to have a maximum 4% of land pooling from the plot owners who have already contributed 26 % and 30% from the plot owners who didn't contribute land for the Local Area Plan ( 2004- 2015). Similarly, for the Jarungkhashor LAP, the team proposed for a maximum of 15 % of land pooling from the plot owners who have already contributed 15 % and 30% from the plot owners who didn't contribute land for the Local Area Plan ( 2004- 2015).
- The team also present on the numbers and percentage of plots falling in environmental conservation precinct and restriction on construction in this precinct.
- Other issues presented were the issues pertaining to the non-compliance both at a larger planning level and at the building level. The disarray of the plots and the precinct changes (developable to environment and vice versa) that are attributed mainly to the NCRP 2010 were also expounded during the presentation.
- The building height deviations apparent at the sites were also elucidated as a non-compliance to the exiting DCR and the structure plan.
- The risks involved with the increase in the building height as compared to the permissible height was explained at 3 major fronts: 1. Safety (due to the poor soil structure, the steep slope and the impending natural hazards); 2. Water supply and infrastructure inadequacy; and 3. Built form and architectural identity.
- After the presentation, the floor was open for question and answer session, whereby, the public present in meeting raised following issues, question, and concerns:

<b>Sl. No</b>	<b>Issues and Concerns raised</b>	<b>Discussions, decision, and Response</b>
1.	<p><i>Allow a additional floor in Trailing and Jarungkhasor ( G+3 )</i></p> <ul style="list-style-type: none"> <li>• Public requested the team to review the site and explore proper construction technologies and mitigation measures that could make area feasible for construction of G+3 storied building.</li> </ul>	<ul style="list-style-type: none"> <li>• The team stated that the existing DCR has been formulated as per the geo-technical survey, during which, many consideration, including building heights, soil structure, slope, etc. have been looked. Accordingly, the team emphasized that the three storey maximum permissibility at the sites (as per the DCR) should be heeded and respected to avoid major hazards and implications in the future.</li> </ul>

	<ul style="list-style-type: none"> <li>The public made remarks on the possibility of constructing G+3 structures on the site by siting examples of building of the mentioned heights being built.</li> </ul>	<ul style="list-style-type: none"> <li>The team stated that the G+3 building that are built at the site are deviations that requires necessary actions. Further, the team emphasized on the precarious characteristic of these buildings such as in some cases walls being taller than the buildings, signs of cracks and landslides, steep footpaths etc.</li> <li>The team also re-emphasized on the inadequacy of infrastructures and water supply that could also result from the deviations.</li> </ul>
2.	<p><i>To make Environmental Conservation precinct (E-1) developable</i></p> <ul style="list-style-type: none"> <li>Public raised concern regarding the restriction on construction in the plots falling in E-1 zone. Some of the landowners stated that the plots falling in E-1 are the only plot they own and restriction on construction is not fair.</li> <li>The public wants the authorities to do site feasibility survey for the individual plot as many plots falling in E-1 are developable visually.</li> <li>Also, at least allow low rise, low foot print construction for the plots falling in E-1 zone.</li> </ul>	<ul style="list-style-type: none"> <li>The team stated that the E1 precincts were designated or earmarked through geo-technical survey and the non-allowance of construction at these sites are at the best interest of the people and the community.</li> <li>The team also mentioned that a plot wise site visits were carried out. And despite also accepting the peoples claim pertaining to buildable terrains at some locations, the team emphasized on the soil structure and implication at the larger planning scale if all the structure are being allowed to construct, especially, due to the smaller land holdings and the congested plot arrangements.</li> <li>The team however would see the possibility of rationalizing some plots that are partially earmarked as E1 precinct.</li> <li>The team assured the public of presenting the issues to the department for decisions and way forewords pertaining to the issue.</li> </ul>

3.	<p>Substitution for the plots falling in E-1 zone</p> <ul style="list-style-type: none"> <li>• Public wants substitution for the plots falling in E-1 in other developable area.</li> <li>• They also raised that few institutions has huge chunk of undeveloped land that could be used for land substitutions. Likewise, public also suggested for relocation of gewog office for the same purpose.</li> </ul>	<ul style="list-style-type: none"> <li>• The team asserted that an exercise has already been carried out to provide land substitution for those effected by the E-1 precinct, nonetheless, due to the two LAP areas being predominantly hazardous or steep, a land substitute could not be identified.</li> <li>• The team however said that with additional pooling some plots could be relocated to developable areas.</li> </ul>	
4.	<p>Lack of urban Infrastructures( Access road, Storm water drainage, sewer line and water supply etc)</p> <ul style="list-style-type: none"> <li>• Public raised their concern with regard to the lack of urban infrastructure to their plot despite having contributed for land pooling</li> </ul>	<ul style="list-style-type: none"> <li>• The team stated that one of their proposals caters to the mention issue, whereby, new roads and infrastructure have been proposed for the plot without thereof. However, an additional land pooling has been proposed as the land pooling availed initially did not suffice to provide infrastructure to all the plots.</li> </ul>	

At the end of all the discussions, the team urged the landowners to select from the two proposals expended during the presentation. Whereby following results were achieved:

### **Statement of agreement - Jarungkhasor LAP**

The all plot owners of Jarungkhasor present in the meeting agreed to contribute their land for land pooling for development of urban infrastructure in the LAP.

Sl.No	Plot No.	Name & Contact No	CRC NO	Signature
①		Namugangpa (1pt)		→
②		Kesang Tshering (1pt)		→
③		Kuna Wangmo (2pts)		→
④		Tenzin Wangmo (1 pt)		→ Cheich
⑤		Wangmo Jatsho (1 pt)	13586120	→ Pema
⑥		Choden (4 pts) (2 acres without plotting)	13632412	→
⑦		Ojen Lhamo (1pt)	13130865	→ Gellai
⑧		Tashi Tenzin (2pts)	13115774	→ Sonam
⑨		Ugpen Dorji (1 pt)	13130318	→
⑩		Tigme Choden (1pt)	13607542	→
⑪		Tshewang Choden (1pt)		→
⑫		Choden 1 (pt)	13682022	→
⑬		Wangmo (2 pts)	13608092	→ Dorj
⑭		Lekjay (1 pt)	13683996	→ Dorj
⑮		Tshewang Pelden (2pt)	13688155	→ Dorj

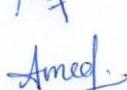
## Trailing LAP

The following plot owners of Trailing present in the meeting agreed to contribute their land for land pooling for development of urban infrastructure in the LAP.

15/04/2019

The plot owners of trailing who wants to give land for land pooling (4%, who have already contributed 26%) and 30% who have not contributed before) for common services facilities development.

S.NO	Plot NO	Name & Gataad No	C.D.no	Signature
1	45 (2, 11 5 11) (3 Plots)	CHEN CHHO TSHEWANG	10802001372	
②	Domzang	1 plot (contact no. 17730754)		
③	Ilangmo Atamgang	2 plots (contact no. 17628254)		
④	Rinzin Jamtsho	4 plot " 17730754)		
⑤	Chenmi Tshewang	1 plot 10702001415		
⑥	Lhasang Norden	1 plot 107020011417		
⑦	Tsewang Chocgom	1 plot 107020011403		
⑧	Choden	17 plot 106177307733		
⑨	Richen Zangmo	1 plot 10708002147		
⑩	Cheki	1 plot 11512003067		
⑪	Sonam Wangchuk	" 10716002687		
⑫	Tshomo	" 10709003359		
⑬	Gem Tshering	" C/No. 17788225		

- ⑯ Pema Langmo 1 plot 10102001933   
 ⑯ Cheten Langmo " 10600008000073   
 ⑯ Tashi Yangzom " 10608002332   
 ⑯ Ogyen Tenzin 2 plots 10716000581   
 ⑯ Tshering Deki. 1 plot. 10605003566   
 ⑯ Tshewang Lhamo 2 plots 10711001306   
 ⑯ Oijen Lhamo. 2 plots. 10709000985. 

However, the following plot owners of Trailing did not want to contribute land for Land pooling.

The plot owners of trailing, who do not want to give land on land pooling. of 4%.					
④ NO	Plot No	Name & Gataud No	CID No	Signature	14/05/2019
①	1 plot	Karma Yangmo	10702001479		
②	"	Neten	10709003370		
③	3 plots	kinzang Choden	10709003326		
④	1 plot	Neten	10709002297		
⑤	2 Plot	Sonam Zendum	17121272		

In conclusion, the plot owners of Trailing and Jarungkhashor LAP agreeing to contribute for land pooling are more than the required (2/3 )rd majority. Thus, it was decided that the planning team will proceed with option of providing access road and improved infrastructure by means of additional land pooling.

### **1. Land pooling committee:**

(*Domzang*)  
*Tshogpa*

(*Chencho Tshering*)  
*Tshogpa*

(*Tashi Norbu*)  
*Tshogpa*

(*Cheki*)  
*Tshogpa*

### **2. Team from DHS, MoWHS:**

(*Yeshi Jamtsho*)  
*Sr. Urban Planner*

(*Tilachand Timsina*)  
*Sr. Urban Planner*

(*Sonam Seldon Dema*)  
*Urban Planner*

### **3. Monggar Dzongkhag Administration:**

*Dasho Dzongrab*

(*Sangay Wangchuk*)  
*Architect*

(*Ram Bahadur Darjee*)  
*Municipal Engineer/DRO*

(*Sonam Tashi*)  
*District Engineer*

(*Tshering Dorji*)  
*Land Registrar*

(*Namgay Dorji*)  
*Throm Ngotshab*

(*Dhan Kr. Biswa*)  
*Surveyor*

(*Kamala*)  
*Land Record Assistant*

## ANNEXURE C

**One to one consultation meeting on:** 27<sup>th</sup> and 28<sup>th</sup> June, 2019

**Venue:** Wangchuk Hotel on 27<sup>th</sup> June & Human Settlement Office on 28<sup>th</sup> June, 2019.

### 1. Trailing LAP

**Issue # 1.** Chorten within Road ROW at the end of proposed road-7.

Since Chorten is one of the main religious monuments within this locality, it is deemed necessary to preserve the chorten with footpath around it. In addition, as requested by the curator of the Chorten, team decided to realign the proposed road with minimal impact on nearby plots. This eventually has led to change in shape and location of the adjacent plots (MN1-158/279/202/203 below road and MN1-280/207/208/209 above road).

Further in the same area, plot MN1-279/202/203 has been reconfigured considering hard rock surface located in between plot MN1-158 and MN1-279. In consultation with plot owner of MN1-279, a gap of 6m is kept as green buffer in between his plot and plot MN1-158.

In the vicinity, the earlier proposed Service Plot next to plot MN1-207/208/209 has to be sacrificed to achieve adequate plot depth. However, we are able to achieve additional common parking in front of plot MN1-279 and MN1-158.

**Issue # 2.** Reconfiguration of two plots at the end of proposed road alignment-4

Considering the original location and shape of plot No. MN1-497, it is aligned against contour and plot MN1-80 has been adjusted opposite to plot MN1-53. This preference is given based on initial location of plot MN1-80 which is shifted from core town of the Monger during NCRP.

**Issue # 3.** Plots along tertiary road connecting RSTA junction to Industrial area has been reconfigured.

Following are the reasons for changes along aforementioned road;

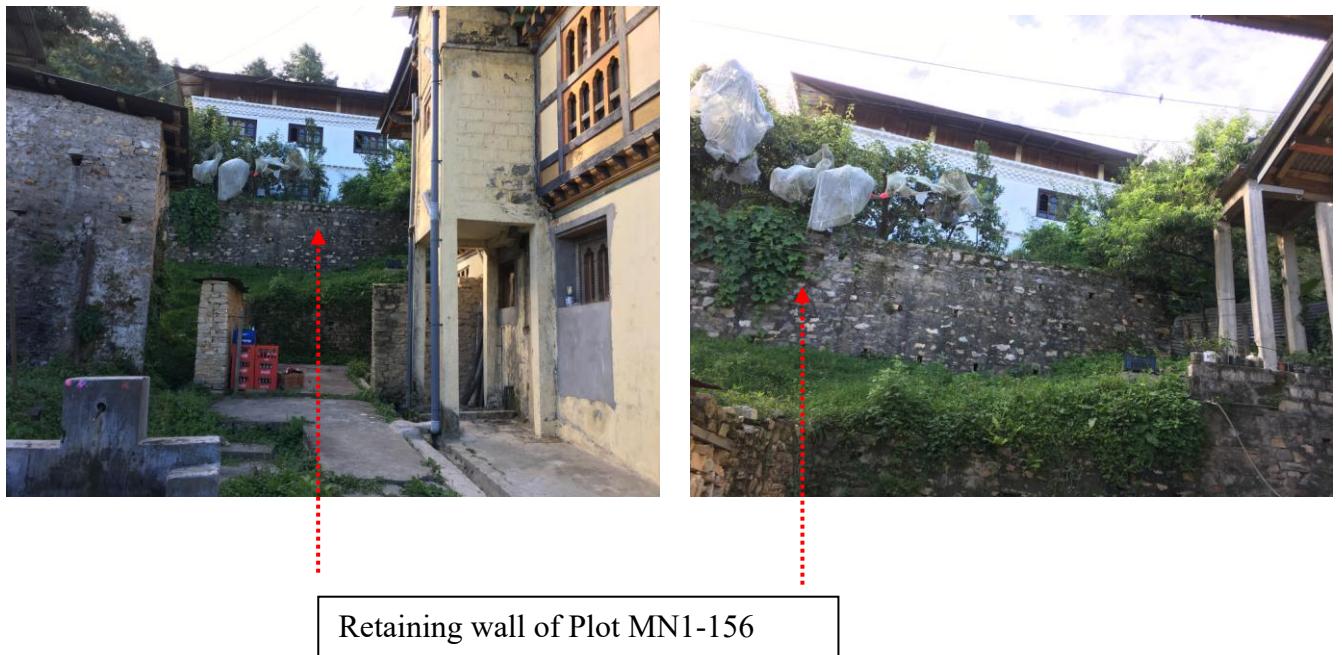
i. Since there is retaining wall below Plot MN1-156, its boundary has to be shifted back to include retaining wall within its boundary.

ii. Plot owner of MN1-179 is not willing to adjust other plots towards road side(corner side) claiming it is more stable towards vacant part of his land. However, he requested to pool land from other two sides if it is inadequate.

Thus, keeping these reason into consideration, major changes happened for plot MN1-225 with the shifted to current location as reflected in the updated map. The representative was given an option to select plot above MN1-160, however, he preferred to have plot adjacent to his other plot(MN1-224) over earlier option.

Owing to shift in this plot, minor changes are made to adjoining plots (MN1-183/258/179/156/142/223/224 and MN1-293).

With these changes, for this locality open space next to plot MN1-224 is compensated with open space next to plot MN1-179 and parking space is retained as per initial proposal.



**Issue # 4.** Inclusion of retaining wall of Plot MN1-153 within her plot boundary

Since there is a retaining wall of plot MN1-153 which also falls in the empty space between road and proposed plot boundary, the LAP team decided to further reconfigure with negligible impact on nearby plots (MN1-120/166/212/178 and MN1-164) as reflected in the updated map.



Retaining wall of Plot MN1-153

## **2. Jarungkhashor LAP**

**Issue # 1.** Change in location of plot No. MN1-471 and MN1-493 below proposed road alignment-4. Since the owner requested to have her two plots (MN1-471 and MN1-472), adjacent to each other, the team decided to reconfigure with negligible impact on adjoining plots (MN1-475/493/474/477/479 & 478). Majorly, the reconfigured proposal of both the plot falls within her previous location occupied by MN1-172.

Similarly, owing to inadequate plot depth, two proposed footpath connecting lower portion is reduced to one and parking area has to be sacrificed.

**Issue # 2.** Subdivision and change in precinct for plot MN1-500 at the end of proposed road alignment-4

As requested by the plot representative, changes in the plot precinct have been incorporated considering developable area and area adjacent to road. It is divided as E-1, RD and UV-II plots. LAP team decided to have 3-UV-II Plots based on his developable area in addition to 5 RD plots along road facing area. In addition, remaining area has been categorized as E-1.

### **LAP Review team members:**

Chairman

Jarungkhashor Tshokpa

Middle Trailing Tshokpa

Upper Trailing Tshokpa

Lower Trailing Tshokpa

Thom Thumey

Development Regulatory Officer

Land Record officer

Sr. Urban Planner (Team Leader from MoWHS)

Architect

## ANNEXURE D

# **Revised DCR**

<b>Designated Precinct</b>	<b>Plot Area (in sqm)</b>	<b>Max. Plot Coverage</b>	<b>Minimum setbacks (m)</b>	<b>Max. Height (no. of storey)*</b>	<b>Remarks</b>
UV-1 ( Medium Density ,Mixed Use Precinct)	485.64 & above	40 %	Minimum of 3 m on all three sides and minimum of 2 m in the front or follow the existing building line, if there are any	3	Inclusive of basement or split floor level
UV-2 (Low density ,Residential development)	485.64 & above	30 %	Minimum of 3 m on all three sides and minimum of 2 m in the front or follow the existing building line, if there are any	3	Inclusive of basement or split floor level
UC-2 (Urban Core -2)	485.64 & above	40 %	Minimum of 3 m on all three sides and minimum of 2 m in the front or follow the existing building line, if there are any	3	Inclusive of basement or split floor level
UC-1 (Urban Core 1)	225 & above	50 %		4	Not applicable
Resorts	1000 & above		As per the precinct's plot coverage and number of floors (resorts to be allowed only in UV2 precinct)		Depending on the availability of sufficient water

<b>I- Institutional</b>	1000 &above	30 %	Minimum 3m on all sides	2	Inclusive of basement or split floor level
<b>Child care centre</b>	1000 &above	30 %	Minimum 3m on all sides	2	Inclusive of basement or split floor level
<b>Dzong Precinct</b>					
<b>Service precinct (S1 and S2)</b>	-	-	Minimum of 3 m on all sides	2	Inclusive of basement or split floor level
<b>OS- Green Space System</b>	-	10 %	-	2	Inclusive of basement or split floor level
<b>E- Environment Conservation Precinct</b>	-	-	-	-	
<b>RD Restricted Development</b>	-	20-30%	Minimum of 3 m on all three sides and minimum of 2 m in the front or follow the existing building line, if there are any	1-2	Inclusive of basement or split floor level

\*Includes split level floor or basement if there will be any. Basement to be used for services and not for habitation. If the site does not qualify for a basement or split floor, there should be one floor less than prescribed in the table above.