

# Thimphu Paro

Strategic Prospectus



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Figure 1.1 Paro Airport



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In February 2020, I joined the members of the Royal Commission for Urban Development, the urban and economic planning teams from The Ministry of Works and Human Settlement and the Thimphu Thromde, and consultants from Prior+ Partners and Arup to develop a framework for a regional plan for the Thimphu -Paro region.

We are all deeply grateful to His Majesty the King, whose sponsorship of the gathering, and expressions of care for us permeated our time together. We also were very appreciative of the thoughtfulness, experience and commitment of members The Royal Commission who sequestered with us for 14 days of quarantine. And we were consistently impressed with the knowledge and skills of the Ministry of Works and Thimphu Thromde teams.

Our work began and ended with visits to the region, which grounded us in the beauty of its ecology, the pervasiveness of its hundreds of Dzongs, Lhakhangs and other spiritual sites, its agriculture, and historical homes and villages. But we also saw the intrusion of modern concrete apartment buildings and cheap hotels, the erosion of the integrity of agricultural continuity, and unplanned urban sprawl that contradicted the spirit of Bhutan. Key areas of beauty, ecological coherence, heritage, and spiritual significance are now being threatened, from the Kabesa Valley to the area around and north of the Drukylu Dzong.

The government has also projected significant growth in the region's populations. These threaten to further erode Bhutan's ecology and culture. There has not yet been an assessment of their impact on The Thimphu Paro region. For example, the 21st Century Economic Roadmap proposes to increase tourism to over 800,000 people a year. How many hotels and busses would that add to the region? Where would they be located? How much would they alter Bhutan's character?

The population projections propose adding approximately 200,000 people to the Thimphu-Paro Region, but does not project the cost of the infrastructure necessary to support that many people, nor the impact it would have.

We all share concern about the impact of this growth. Unregulated growth has proven to be corrosive wherever in the world it has spread. But growth doesn't have to just "happen". It can be managed to match a region's vision and resources,

and shaped to enhance the fabric of communities. This report is the first step in a year long process to figure out how.

To truly facilitate the Bhutanese Vision of Gross National Happiness, it became clear that The Thimphu- Paro regional plan must integrate every issue that the nation is facing- from its economic development to its spiritual continuity. And thus the scope this work touches every element of Bhutanese society, every government agency and every hard decision that needs to be made.

At its very core, Bhutan must figure out how to balance the rights, interests and responsibilities of individuals with the commons and the common good.

In the past, this issue was less challenging. Most Bhutanese lived in small, agricultural villages, where they worked together in harmony, guided by local Buddhist teachers and a culture of respect for nature, enjoyment of community and collaboration, and an aspiration to relieve the suffering of all sentient beings. Land was nurtured to grow enough to feed the community, and perhaps a bit for trade, not more. Local spirits were satiated with offerings and ceremonies.

Homes were built by families and friends, using wood harvested from a local community managed forest and bricks and rammed earth from the fields. The only 'hired hands' were a master carpenter to guide the process, and a painter to decorate the house, when complete with auspicious symbols. As a result, homes were owned financially debt free, but karmically woven into the fabric of the community. Homes often housed four generations, with great grand parents and grand parents helping in the gardens and with childcare, while the parents and younger grandparents worked in the fields, grazed herds, and produced household crafts. During the day, doors are left open, even in the winter, inviting neighbors to come and go, sharing food, tea and work, like Himalayan college dorm. It is a complete, integrated social and economic system.

Unfortunately, the vibrancy of the village life has not been translated to Bhutan's urban and growing suburban conditions. Young people in the work force live alone in apartments, with little contact with neighbors, or at most with parents. There is really no role or physical place for the elderly, who remain in their villages, or spend their days



in Thimphu hanging out at the Chorten. People buy their homes instead of making them, incurring debt. Many landowners see their land as having economic value, and aspire to either develop it or sell it, rather than nurture it for the future.

Whereas the village culture is grounded in the common good, the urban culture seems to be more grounded in individual advancement. Most urban dwellers keep a connection to their village, and the family and friends who remain. But as urban migration increases, some villages are beginning to empty out, and soon may not be viable.

At the same time the pressures of migration on Thimphu and Paro have generated urban issues common to the developing world- water, sewer, and transportation systems unable to keep up with the growth, unaffordable housing, a lack of walkable neighborhoods enriched with parks and community facilities and growing sprawl. The individual economic imperative has made every urban landowner a developer or developer to be- getting approvals to build an apartment building or hotel, regardless of the economics.

The migration into Thimphu and Paro is matched by an out migration of young people to Australia and other parts of the world, where they can earn ten times the median income of Bhutan doing menial labor, often disregarding their substantial education.

These development challenges are not unique to Bhutan- what is unique is the framing of its aspirations as Gross National Happiness, an extraordinary framework that grounds Bhutan's aspirations for its future in the essence of its past. Gross National Happiness (GNH) encompasses three p's and nine domains. The translation of GNH to guide contemporary development issues has been incomplete. To enrich it, we have called on the principles from another book that inspired His Majesty, Doughnut Economics by Kate Raworth. The integration of these two approaches looks like this:

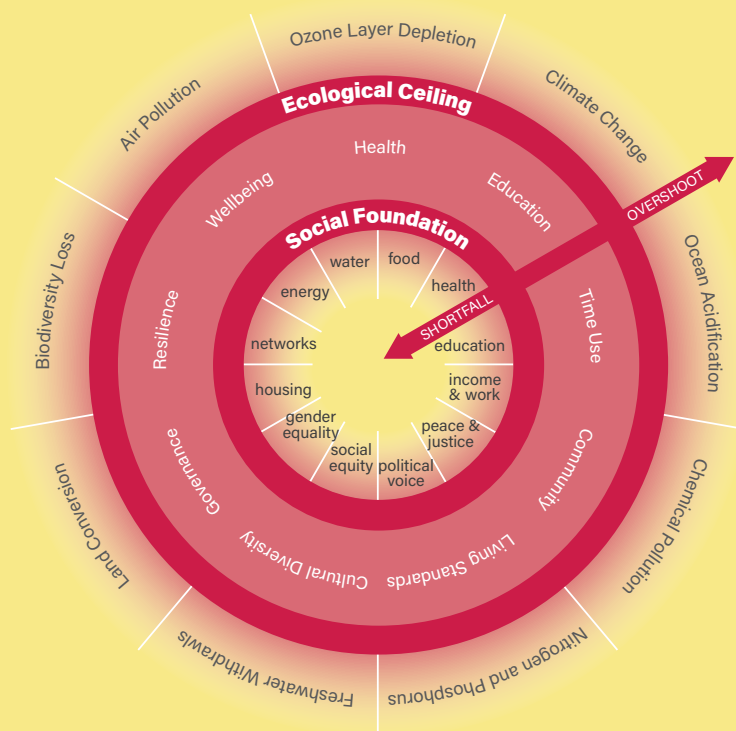


Figure 1.2 Gross National Happiness and Doughnut Economics



Going forward, we aspire to a plan that supports a wellbeing economy with elements that include:

- Viable organic agriculture both integrated into the urban/ regional fabric, and in the fully rural parts of the country.
- A green building economy, using traditional materials of wood and earth in sophisticated, digitally enabled ways, to create beautiful places of community rather than isolation, training local people for high value jobs.
- A model of neighborhood development that translates the communal values and resources of the villages into the urban context.
- A land development model that easily integrates small holdings into larger parcels, better suited to create mixed income and at times, mixed use apartment buildings, offices, retail, industrial, manufacturing and distribution sites, schools, community and health centers, and other to provide government services.
- Sufficient affordable housing to match the needs of every family in the region.
- An urban design code that is grounded in Bhutan's architectural heritage, but looks contemporary, and guides buildings to be green, and to enhance the public realm.
- The preservation, enhancement of spiritual, cultural and heritage sites, as well as walking paths to connect them.
- The protection of forests, rivers, wetlands, and steep slopes not only from development, but from pollution.
- Infrastructure that protects the environment and enhances well-being.
- A transportation system that provides collective ease of connection through walking, biking (including electric two wheelers) and shared electric vehicles, from minibuses to BRT.
- A waste management system that feeds a circular economy.
- A diversified export base growing from the production of higher value products.
- A diversified tourist base of high value, low impact, lower volume tourists, who come to learn

from Bhutan's GNH, Buddhist culture, and crypto and Wellbeing economies.

- An increasingly 21st century digital economy that engages and keeps Bhutan's bright young people in the nation.
- The development of distributed solar PV and thermal, in conjunction with the elimination of imported fossil fuels.
- A regulatory system that is more protective of the commons, rigorous about enforcement, and supportive of entrepreneurship.
- A land title system, built on blockchain, that provides for the protection of agricultural and cultural lands, whilst providing for the economic advancement of the landowner through the government purchase or exchange of critical lands.
- A land valuation system based on international best practices.
- A fair and unavoidable land and building tax system to pay for the public infrastructure and staffing needed to carry this out.
- A democratic system that more fully engages residents in the governance of their communities.
- A more rigorous environmental review process, with a grievance review process.
- An advocate for cultural and spiritual resources.



Figure 1.3 Workshop participants including members of the Royal Commission

Our mission is to bring all of these elements together in a regional plan that is grounded in the Bhutanese values of Tha Damtsi (a sacred commitment to others, Ley Judrey (good begets good) and Medhay Tshogpa, in a way that is beautiful and economically viable.

Bhutan's concept of Gross National Happiness, fifty years old this year, its carbon positive energy system and commitment to forest and biodiversity preservation has made it an ecological leader of the world. In His October 23, 2021 Royal Command to Establish the Royal Commission for Urban Development, His Majesty called on us to develop so that "Thimphu serve(s) as a model city for the world, reflecting our national vision for urban planning and development."

We are deeply inspired by this vision. Jonathan (UK), Rory, I and the other members of the team have taken on this challenge with the fullness of our hearts, minds, knowledge and experiences. The enclosed report describes our best thoughts on the first steps to get there.

We are grateful to be able to serve this mission.  
Warmly,

Jonathan F.P. Rose  
Chair, International Advisory Committee on  
Urban Development



# Executive Summary

Thimphu and Paro are at a turning point, after a period of rapid growth and associated negative impacts there is an opportunity to rethink how the two valleys are planned and develop. Their future change will encapsulate Gross National Happiness and Doughnut Economics guiding principles.

This report is a first step in this transformation; setting the scene, establishing a shared vision and outlining key objectives towards achieve the vision for the region.

The introduction provides the context, the project aim and the process behind this document. The development process includes a collaborative review of key planning documents, reports and data at the national, regional and local level in addition to workshops and study tours held during a visit by the Consultant team in February 2022. Workshops include sessions with Doughnut Economics Action Lab thinking about the future of the Thimphu Paro region and from the perspective of Doughnut Economics underpinned by Gross National Happiness.

Chapter two concludes the assimilation process of current conditions through identification of the high-level issues and opportunities faced by the region grouped according to ten themes. This includes the challenge of balancing development versus protections such as accommodating growth whilst protecting the natural environment including slopes, rivers, and forests as well as cultural landscapes and heritage assets. The analysis recognises there is a limited capacity to enforce

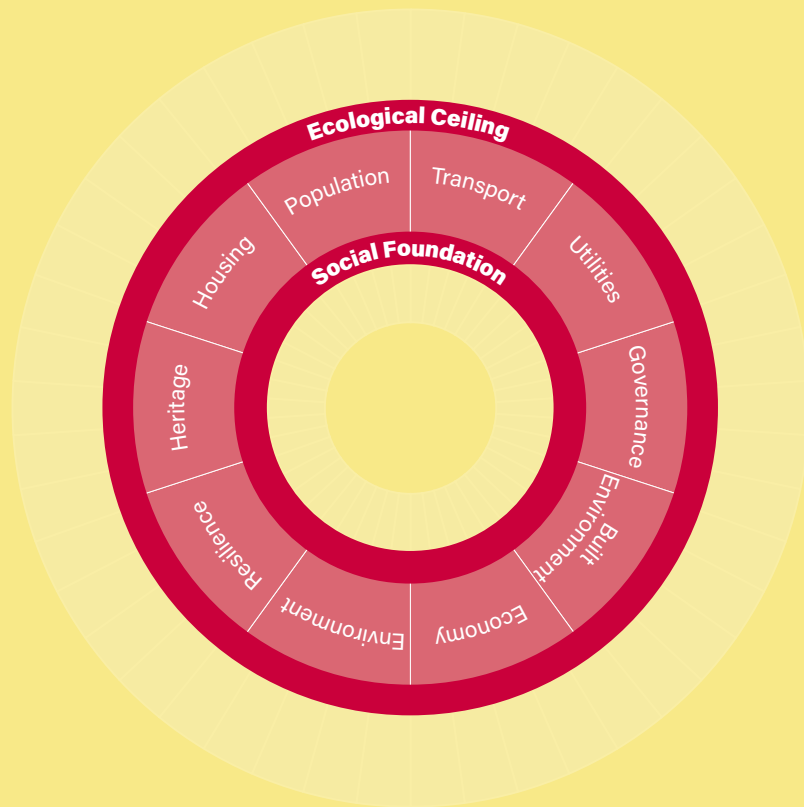


Figure 1.4 Thimphu Paro Strategic Prospectus Principles

existing plans which impacts the ability to control development. In addition urban areas are dealing with rising congestion and emissions as a result of the rapid expansion in use of the private car. This is followed by the identification of key drivers for change in the region; drivers that both may already be influencing development as well as those that could be harnessed in the future.

Chapter three defines an inspiring and comprehensive vision for the future of Thimphu and Paro, situated within the existing Gross National Happiness and Doughnut Economics framework.

*The Thimphu Paro region will cultivate balance between tradition and modernity as well as balance between the natural environment, prosperity, and heritage.*

*The region will nurture community, ensuring neighbourhoods are diverse, equitable and friendly that support health and wellbeing at all phases of life.*

*The region will also create opportunity, driving growth, supporting livelihoods and be governed with wisdom and compassion.*

*Finally, the region will inspire by fostering spirituality and culture and function as a model for sustainable development.*

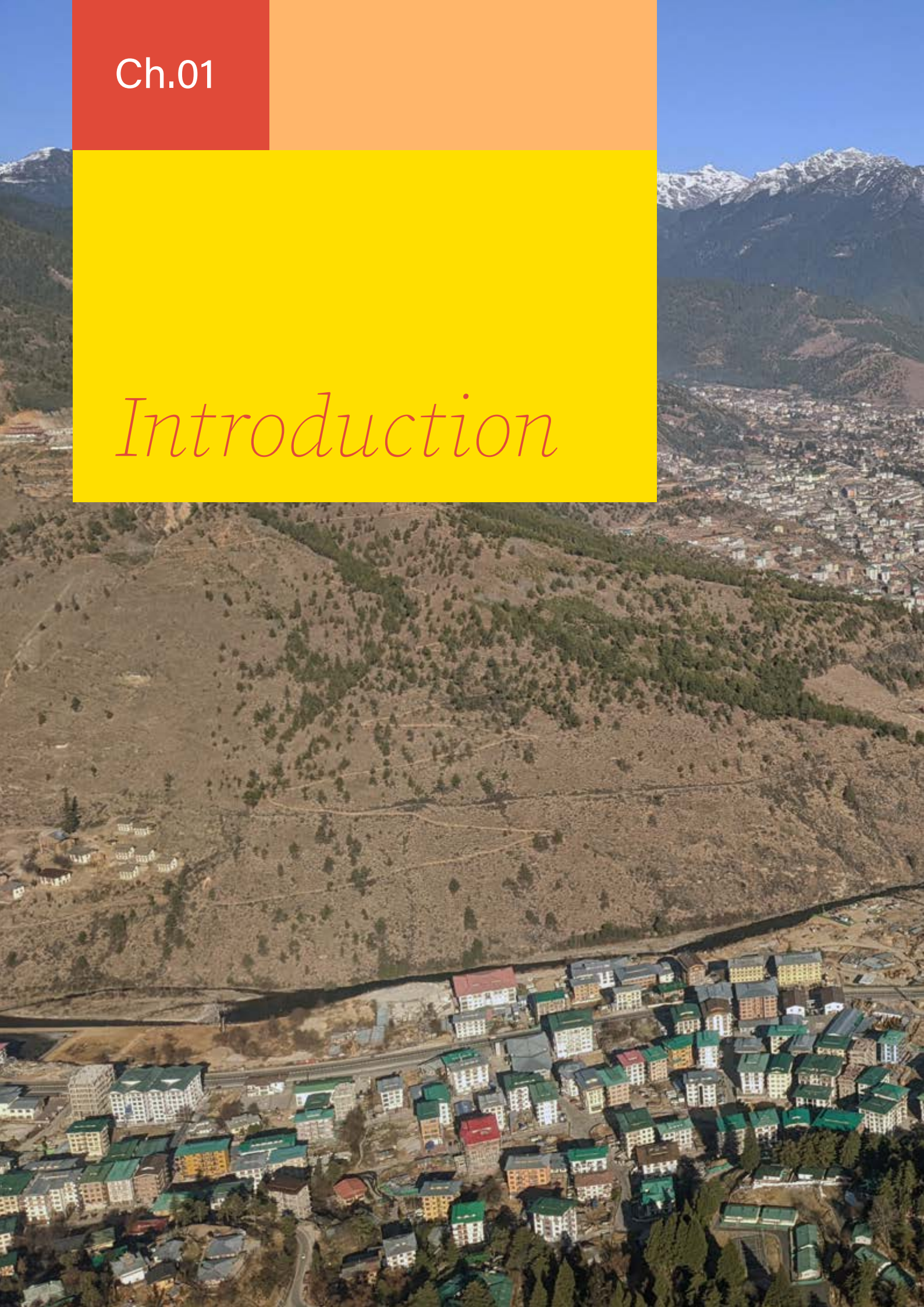
The future development of Thimphu and Paro should not impede on the region's ecological context, but at the same time steps are required to ensure the social conditions of current and future residents are met in a way that protects and enhances the region's globally unique culture. Ten themes and associated thirty sub themes fit within the framework and serve as a tool to evaluate later spatial options for the region.

The document concludes by outlining next steps and priority projects. This is centred upon how to progress with project two, developing a preferred spatial strategy for the Thimphu Paro region. Priority projects also identify projects that emerged during workshops and site discussions in February 2022 that are beyond the remit of the Regional Strategy and Thimphu Structure Plan but could be conducted in parallel.



Ch.01

*Introduction*







## 1.0 Introduction

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# 1.1 Project Aim



## *1.1.1 Introduction*

This document provides a base for the emerging plan for the Thimphu Paro Region - National Capital City Region, from North Wang Chuu River/Kabesa valley to the north and west ends of Paro valleys. It describes an overarching regional vision and objectives, grounded in the nation's Gross National Happiness framework the economic aspirations of Doughnut Economics and the social and environmental vision of a Well Tempered City.

This project is the first in a series to be carried out under the aegis of the Royal Commission for Urban Development by the consulting teams of Prior and Partners, Arup and Gerald Eve in collaboration with the Ministry of Works and Human Settlement, Thimphu Thromde and representatives from other Government departments.

**Project 1** - Strategic Prospectus for the Thimphu Paro Region

**Project 2** - Regional Strategy for the Thimphu Paro Region

**Project 3** - Revised Thimphu Structure Plan including Infrastructure Implementation Plan, City Centre Action Plan, and Investment Strategy.



Figure 1.5 Aerial view of Mountain Boundaries

## *1.1.2 Purpose of this report*

Since the adoption of the Thimphu Structure Plan 2002-2027 (TSP), the City of Thimphu, neighbouring Paro and associated rural areas have developed rapidly. During this period, the region has experienced uncontrolled urbanisation and resulting sprawl, including development of agricultural lands across the two valleys. To manage the growth in the region, spatial plans were prepared for Paro, the Paro Valley Development Plan 2017 (PVDP), and other smaller towns in the periphery of Thimphu City.

Since these plans do not look at the overall integration of the region as one entity, a need for the regional plan emerged. The plans also lacked clear lines of authority and responsibility for implementation.

This project presents the opportunity to develop a compelling vision for the Thimphu-Paro region addressing its immediate and long term future, balancing a thriving 21st century economy with the preservation of the region's unique environment, culture and spiritual heritage as well as mitigating against geohazards and climate change. In addition, to correct the limitations of the TSP, it must propose clear regulatory and financial mechanisms for the plans implementation.

The overall aim of this project is to establish a framework and series of priorities to ensure a sustainable pattern of development for the Thimphu Paro region, creating a place that exemplifies Gross National Happiness and Doughnut Economics.

This report functions as a the output of part 1. It has been built upon a base of data at the national, regional and local level pulled together by the Urban Planning Group of the Ministry of Works and Human Settlement in addition to workshops and study tours.

The Strategic Prospectus is intended to:

- Establish the regional baseline (context and existing conditions)
- Identify trends, drivers, issues and opportunities affecting regional development
- Define an overarching regional vision and objectives for the Thimphu Paro Region, situated within Gross National Happiness and Doughnut Economics parameters
- Identify key actions to provide for the development of infrastructure and other priority projects
- Establish the foundation for a high-level Regional Strategy (Project 2) and revised Structure Plan for Thimphu (Project 3)



### *1.1.3 Methodological Framework*

Preparation of this strategic prospectus involved engagement with three methodological frameworks.

Doughnut Economics is an international framework for sustainable development taken up and applied to nations and city governments across the globe. Gross National Happiness is a framework for sustainable development that is uniquely Bhutanese but is an inspiration much more broadly. Finally, Towards a Well Tempered Thimphu was developed specifically to explore and resolve the urban challenges faced by Thimphu.

Despite the various scales in which these frameworks operate, all share a common thread moving away from the traditional growth paradigm towards an approach to sustainable development that better supports health and wellbeing and environmental and cultural protections.

Figure 1.6 Paro Landscape



## *Doughnut Economics*

The Doughnut or Doughnut Economics is a framework for sustainable development created by economist Kate Raworth. The framework promotes sustainable growth as the Doughnut defined by:

- Inner limits - the social foundation of life essentials such as food, housing, employment and a political voice.
- Outer limits - the planetary boundaries of life-supporting elements such as a stable climate, fertile soils and a protective ozone layer.

The Doughnut of social and planetary boundaries frames the critical challenge of humanity in the 21<sup>st</sup> century to meet the needs of all within the means of the planet. Doughnut Economics aims to transform the future by transforming the dynamics of economics and human activities. Two transformational dynamics informed this work:

- From a degenerative to a regenerative economy
- From a divisive to a distributive economy

## *Gross National Happiness*

Gross National Happiness (GNH) was introduced by His Majesty the Fourth King of Bhutan, Jigme Singye Wangchuck, in the 1970s.

GNH recognises that sustainable development cannot only be measured through economic output parameters but requires a holistic approach. It also recognises the fact that happiness is multi-dimensional and true contentment follows the sense that others are happy not just the self. Across Bhutan, proposals and projects should work to improve GNH.

Bhutan's Comprehensive National Development Plan explores how to improve GNH across the Country and this project responds to this and will sit underneath it.



## *Towards a Well Tempered Thimphu*

The requirement for a regional plan for the Thimphu Paro region came about as part of the original review period for the Thimphu Structure Plan. One output of this review 'Towards a Well Tempered Thimphu' included the preparation of a Regional Framework Plan as a recommendation. The report also outlined five main themes:

1. The natural and historic built environment - its repair, protection & conservation.
2. Connectivity, accessibility and movement - transforming movement to be safe, enjoyable and green (and taming the motor car and its emissions/air pollution).
3. Creating liveable neighbourhoods - with mixed and balanced communities, with good infrastructure (physical, social and cultural).
4. The city centre - a new vision, high quality and greener urban environment better managed.
5. Good governance - underpinned by citizen engagement and improving collaboration between public agencies.



# 1.2 Context

## 1.2.1 Overview

The Kingdom of Bhutan, known as the Druk Yul, meaning the Land of the Thunder Dragon, is an independent sovereign country in the Eastern Himalayas bordered by China to the North and India to the South.

Roads links run north south into India and west to Nepal and are the primary access points for goods and people. International flights enter via Paro International Airport with flight routes to India, Bangladesh, Thailand, Malaysia and Singapore.

Bhutan has a population of 754,000, approximately the same size as Cyprus and Luxembourg in a nation of 38,394 square kilometers. The country is divided into 20 districts or Dzongkhags. Thimphu, the capital, and neighbouring Paro are located to the west of the country and have the highest population densities, with Thimphu home to approximately 114,000 inhabitants.

The Country and its settlement patterns have a longitudinal character shaped by series of valleys running north to south, which divide the country into four main regions. Thimphu and Paro, which make up part of the National Capital Region falls within the Western Region. Punakha and Wangdue Phodrang also fall under the National Capital Region but are out of the scope of this piece of work.

- Country Boundary
- Dzongkhag Boundary
- Primary Road Network
- Settlement













Figure 1.7 National Context



## 1.2.2 Study Area

The Strategic Prospectus for the Thimphu and Paro covers the area defined by the tentative planning boundary which extends to Drukgyel Dzong in the North West, Dobji Dzong to the South and Babena in the North East. The tentative planning boundary covers the two Thromdes as well as areas located along main transport routes across the two valleys. This includes mountain slopes, urban settlements, villages, forests and paddy fields in a landscape that is uniquely Bhutanese in character. The boundary will be finalised in the later stages of Project 2.

The Strategic Prospectus also considers the governance structure and conditions needed to deliver the vision and objectives.

-  Dzongkhag Boundary
-  Tentative Planning Boundary
-  Asian, Primary and Secondary Highway
-  Urban and Dzongkhag Road
-  Farm and Forest Road
-  River and stream





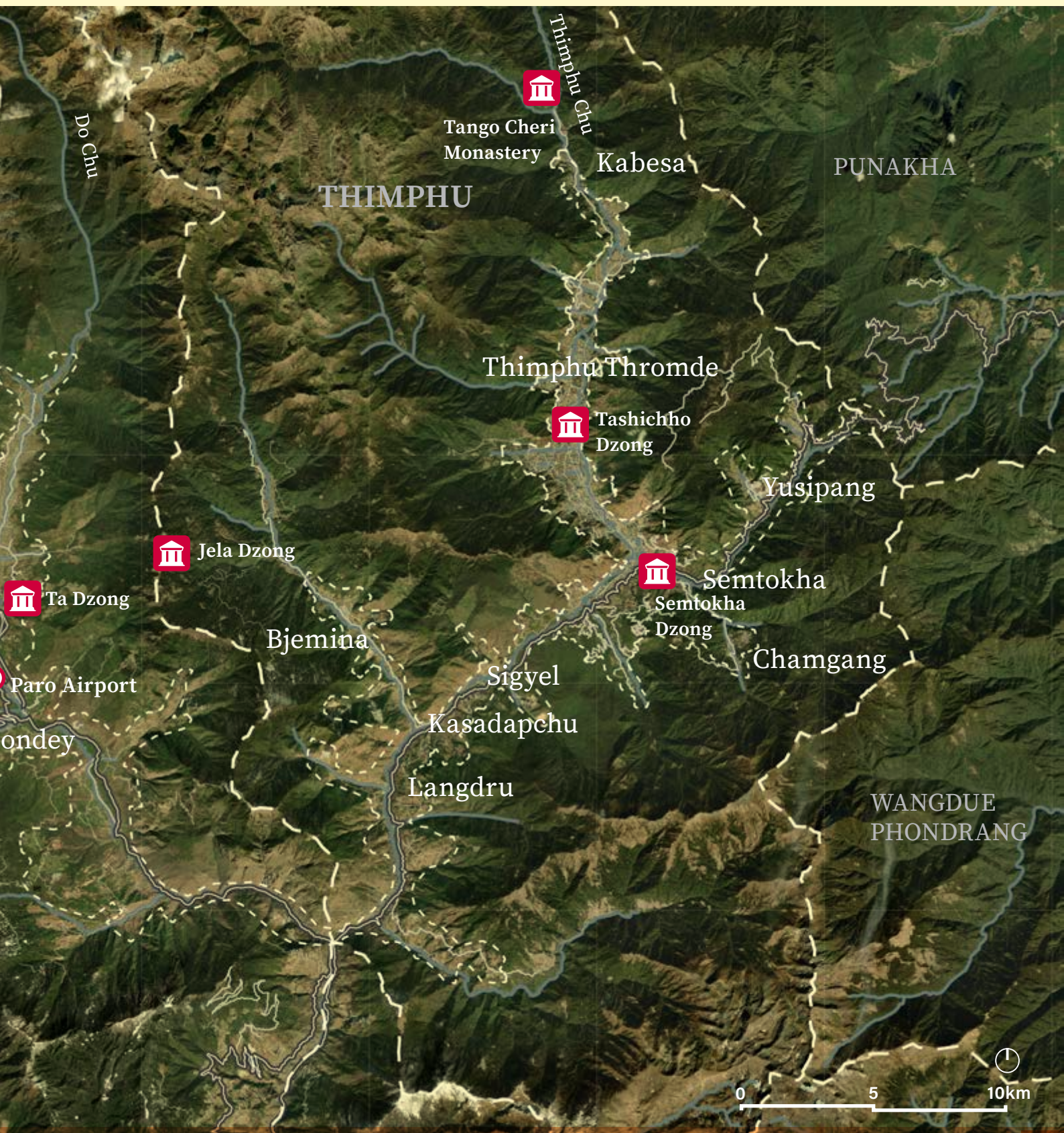


Figure 1.8 Study Area



# 1.3 Project Development

## 1.3.1 Planning Context

The preparation of directions for the Thimphu Paro Regional plan and the revised Thimphu Structure Plan sits within an existing planning framework. The below chart identifies the relevant hierarchy of planning and policy documents informing this study.



### NATIONAL

### THEMATIC POLICY AND TECHNICAL GUIDANCE

The Comprehensive National Development Plan (CNDP) provides an overall direction for change across the country.

It establishes a vision based on the national identity and envisaged state imagery focused on the creation of a supportive environment for desirable economy, society and environment in the long term. This includes pursuit of regionally balanced development, the middle path and an alternative socio-economy.

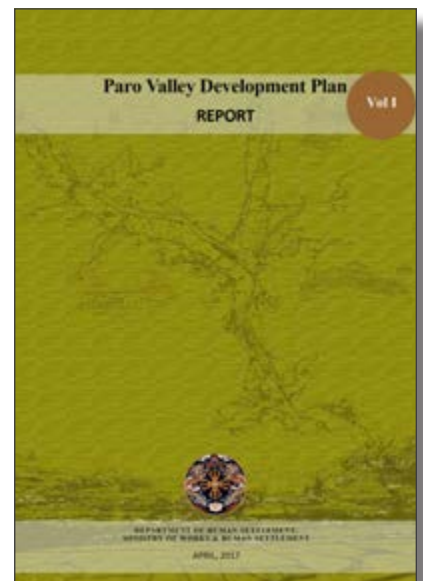
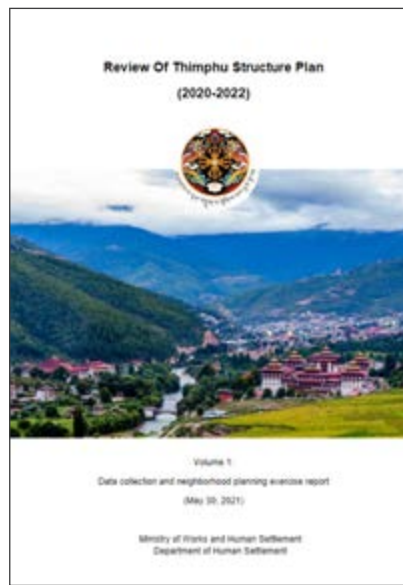
Various policies sit along the CNDP guiding national and local initiatives. This includes but is not limited to the following:

- Bhutan Draft Economic Roadmap
- Bhutan Vision 2020
- Strategy for Gross National Happiness
- National Human Settlement Policy
- National Construction Industry Policy
- Tourism Policy of the Kingdom of Bhutan

Thematic documents at the national level are developed by ministries. These includes but is not limited to the following:

- National Health Policy
- National Housing Policy
- National Education Policy
- Bhutan Transport 2040 Integrated Strategic Vision

Figure 1.9 Planning Policy Context



**LOCAL**

The Ministry of Works and Human Settlement is responsible for the production of technical guidance for planning and development. This includes but is not limited to the following:

- Spatial Planning Framework, Guidance and Standards
- Building Regulations and Building Codes
- Bhutanese Architecture Guidelines

The Thimphu Structure Plan 2002-2027 sought to guide the direction of change for Thimphu, guided by intelligent urbanism principles. A review was conducted in 2021 to explore issues with implementation, assess boundaries and review main themes.

The Paro Valley Development Plan 2017 sets out the general direction and objectives for development of the Paro Valley.



## 1.3.2 Project Team

Preparation of directions for a Regional Plan for Thimphu and Paro and an updated Thimphu Structure Plan is an inherently interdisciplinary process, it requires input from a range of expertise. The diagram below outlines the structure of the team responsible for delivery of the project.

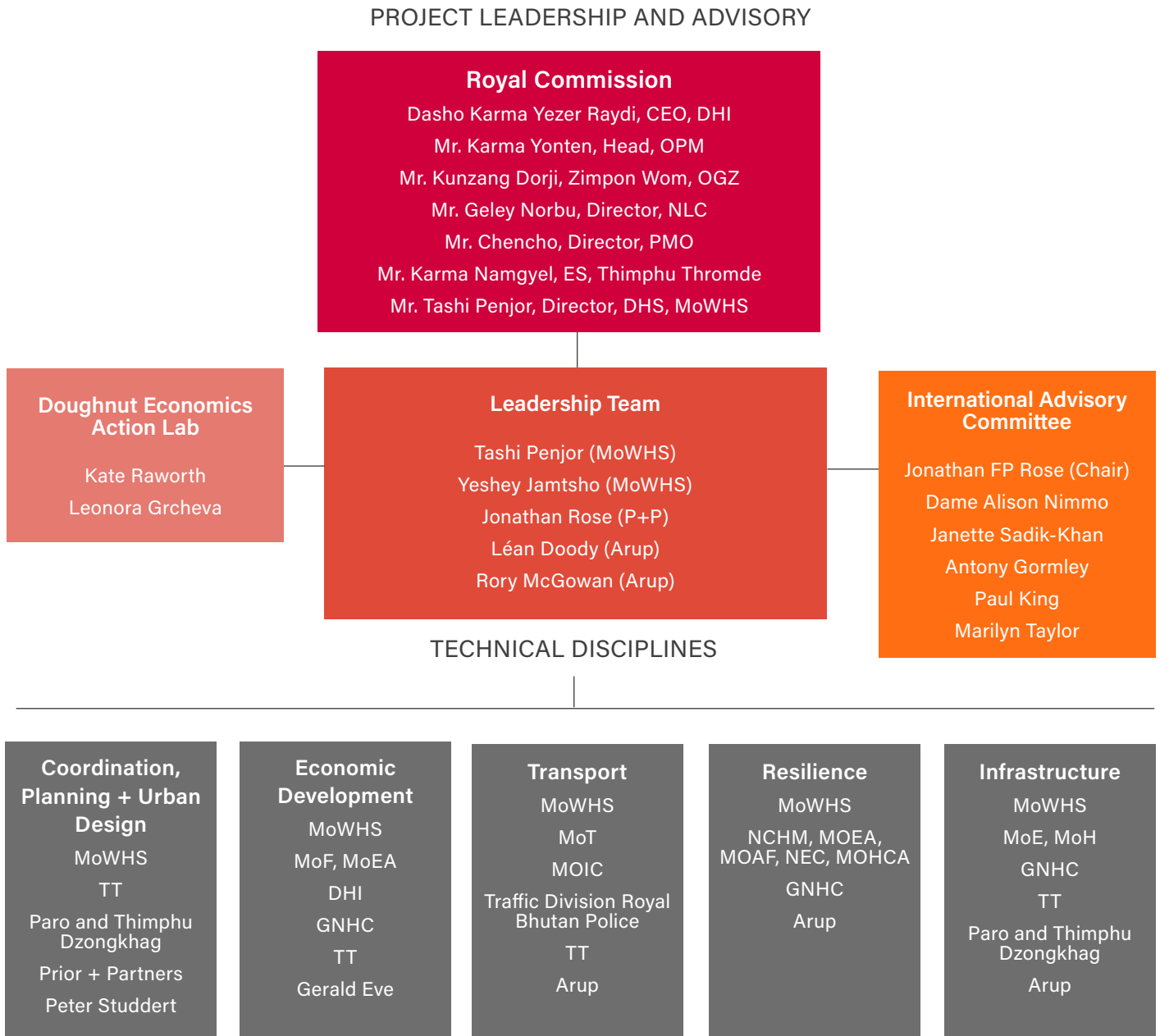


Figure 1.10 Project Team and Leadership

### 1.3.3 Governance

To be effective, the plan requires buy in from a wider range of stakeholders and governmental departments. Representatives from various ministries, departments and organisations also input into the projects and share responsibility for implementation. The diagram below summarises the governance structure responsible for the development and implementation of the project. It is not representative of the typical governance arrangements.

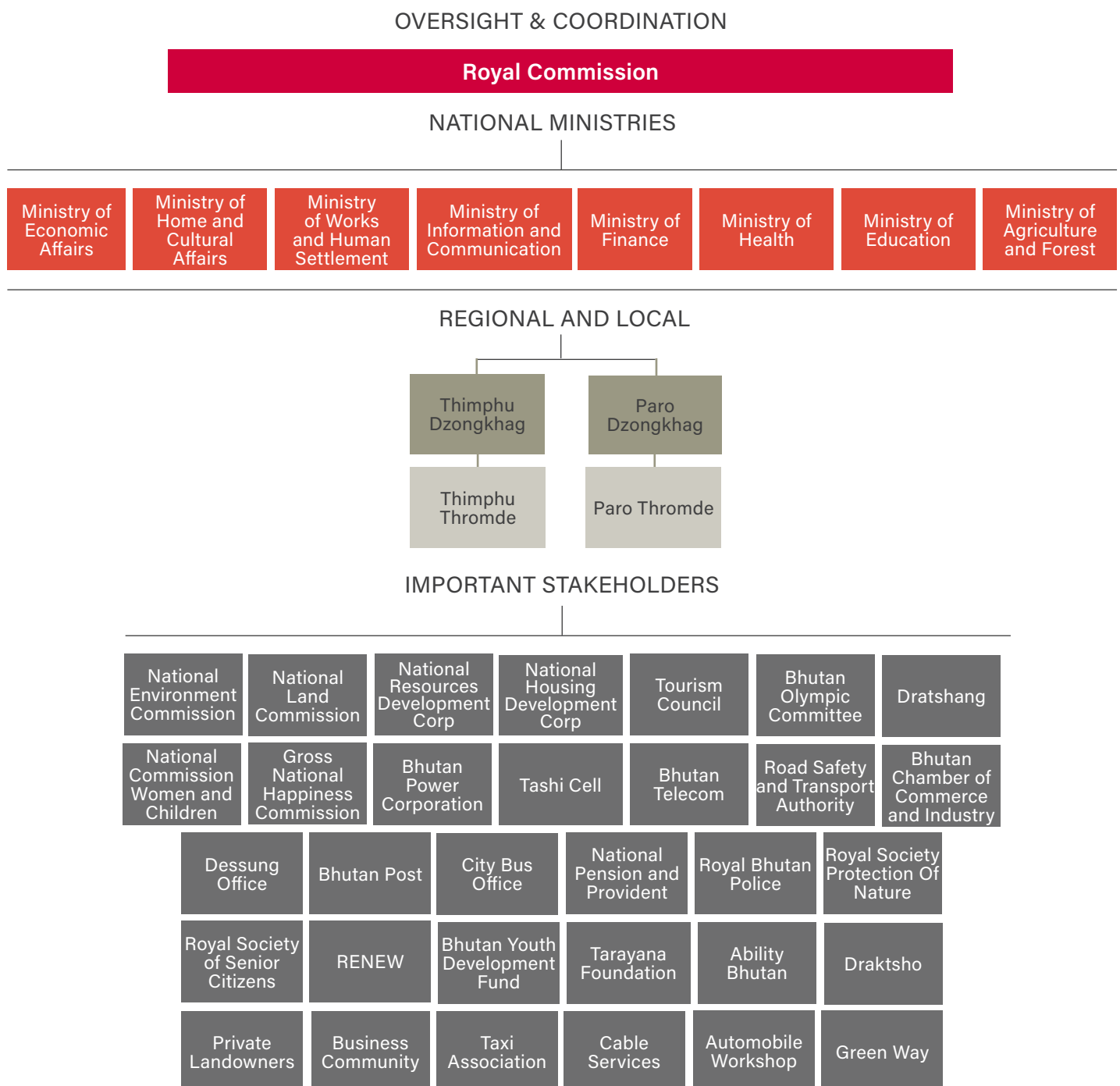


Figure 1.11 Project Governance and Input



### 1.3.4 Project Timeline

The project timeline extends from the kick off in November 2021 to the Revision of the Thimphu Structure Plan completion tentatively in December 2022.

The three projects timeline below indicates key workshops and deliverables at milestones.

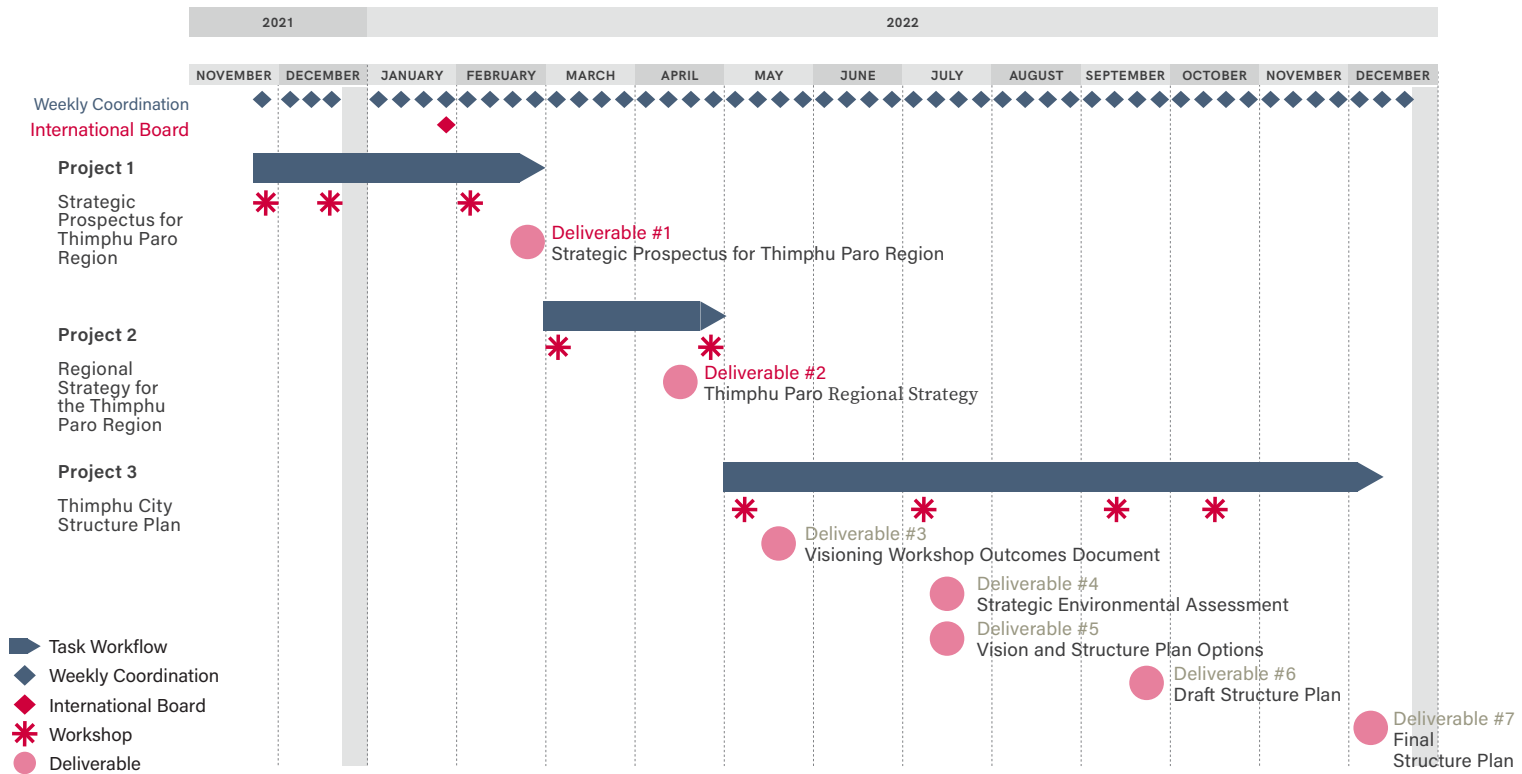


Figure 1.12 Project Timeline

## 1.3.5 Stakeholder Engagement Process

### Summary of the engagement process

The Strategic Prospectus was developed through a series of workshops and stakeholder engagement exercises. Stakeholder engagement was conducted at three points in the development of this document, and engaged with representatives from organisations outlined in section 1.3.3.

- December 2021 Hybrid Sessions

Workshops were held over Zoom using a Miro board (digital pinboard) to define key issues and opportunities split into theme based sessions. The consultant team first outlined a summary of desktop study preliminary research. The MoWHS and stakeholders teams provided feedback and input helping to further refine understanding.

- Data Collection

The client team conducted key informant interviews with over 40 different stakeholders to gather their perspectives.

- February 2022 In Country Workshops

Intensive workshops were held over a two week period in February 2022. Ten members of the consultant team travelled to Paro to work with representatives from the Royal Commission, National Ministries, Thimphu Thromde and other departments.

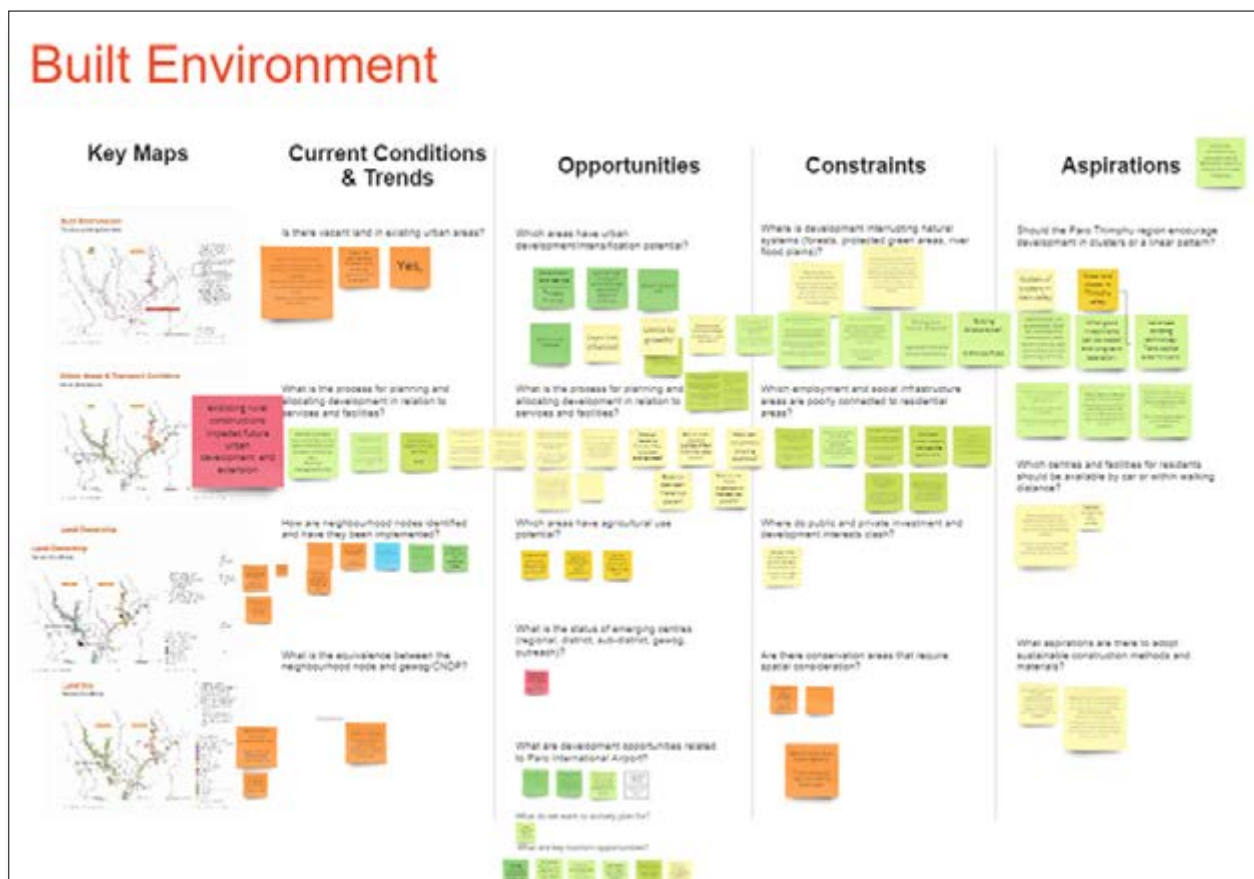


Figure 1.13 Example Miro board showing inputs gathered in response to key questions



## *In Country Sessions*

The workshops held in country in February were organised as follows:

- 2<sup>nd</sup> February - Plenary session on key drivers for change.
- 3<sup>rd</sup> February - Breakout sessions on objectives for future development organised per theme.  
Presentation and workshop led by Doughnut Economics Action Lab.
- 4<sup>th</sup> February - Breakout sessions on objectives for future development organised per theme.
- 7<sup>th</sup> February - Breakout sessions on the vision for the future of the Thimphu Paro region.

Further discussions were held with the following stakeholders:

- 26<sup>th</sup> January - Meeting with International Advisory Panel
- 4<sup>th</sup> February - Meeting Governance and Planning expert Peter Studdert
- 6<sup>th</sup> February - Meeting with:  
Dasho Karma Ura  
Dasho Karma Tshiteem  
Dasho Kinley Dorji  
Dasho Sonam Kinga
- 7<sup>th</sup> February - Meeting with Prime Minister
- 8<sup>th</sup> February - Meeting with Paro Valley Development Plan team
- 9<sup>th</sup> February - Meeting with:  
Economic Roadmap Team  
Mayors of Thimphu and Paro
- 10<sup>th</sup> February - Meeting with:  
Alan Organschi (Timber Building in Bhutan)  
Online audience with His Majesty the King of Bhutan
- 11<sup>th</sup> February - Presentation and discussion on:  
Plastic recycling opportunities with Coca Cola Nepal  
Biogas Opportunities in Nepal
- 12<sup>th</sup> February - On-site meeting with ABD Housing Project Team  
Audience with Her Majesty the Queen of Bhutan



Figure 1.14 In Country workshop session



Ch.02

*Issues and Opportunities*







## 2.0 Issues and Opportunities

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# 2.1 Overview



## 2.1.1 Overview

Establishing a vision for the future of the Thimphu Paro region requires a comprehensive understanding of the existing context and the main drivers for change.

The first steps of Project 1 includes a multi-disciplinary analysis of current conditions through review of existing documents and policies. The preliminary desktop analysis was further revised through site visits and workshops. The analysis is structured around ten themes.

The following pages present a summary of the key issues and opportunities. This is intended to be a high level summary of factors that apply across the entire region, a more specific analysis is included in the appendix.

## 2.1.2 Themes

The themes structuring the opportunities and issues analysis are briefly introduced below. The key conclusions of the analysis are presented in the following two sub-sections Key Issues and Key Opportunities.

### 1. Population

23.5% of Bhutan's population of 754,000 people live in the Thimphu and Paro Dzongkhags. The Dzongkhags populations are expected to grow through further immigration from eastern regions and rural to urban migration.

### 2. Built Environment

Traditional Bhutanese villages and towns built with sustainable techniques promote community activities and integrate natural systems. Modern development disrupts green and blue infrastructure and creates few welcoming public spaces.

### 3. Heritage and Culture

Significant sites from Bhutan's tangible and intangible patrimony are located in the Thimphu Paro valleys. Tangible heritage includes religious and governance buildings and cultural landscapes. Natural elements such as rivers or forests are also considered sacred.



Figure 1.1 Aerial View of Paro International Airport

#### 4. Housing and Social Infrastructure

There is limited affordable housing availability in the Thromdes and the majority of the housing stock is rental. New ways of delivering housing and affordable housing is critical for the sustainability of local communities.

#### 5. Economy

Bhutan's economy is undergoing a process of transformation. Economic growth, diversification and productive employment are required to achieve the national aspiration of becoming a high-income economy by 2030.

#### 6. Governance

Urban planning and development is relatively new to Bhutan and has been mainly driven by individual initiatives. New regulations aim to create a planning framework and define a hierarchy of plans.

#### 7. Natural Environment

Paro and Thimphu valleys host rich ecosystems and a diversity of landscapes across the Himalayan forests and rivers. However rapid, unplanned urbanisation is resulting in negative impacts to the natural environment.

#### 8. Transport

The existing regional road network is centred along the valleys, with most movement being dominated by private vehicles. Achieving sustainable development will require significant improvements to public transport and active travel infrastructure.

#### 9. Resilience

The Thimphu Paro region needs to be resilient to potential hazards such as landslides, earthquakes, floods and forest fires. Rapid rates of urbanisation and modern construction methods are increasing vulnerability to the aforementioned hazards.

#### 10. Utilities

Rapid urbanisation and sprawl in Thimphu and Paro has not been supported by an adequate increase in capacity for water supply, waste water treatment, power, telecommunications and waste disposal infrastructure.





Figure 1.2 Paro Dzong



# 2.2 Key Issues

## *Population*

- Rural to urban migration adds development pressure to Paro and Thimphu with impacts on land, infrastructure and services. The urban population is expected to increase 35% from 2017 to 2027 across the region
- Growing elderly population in rural areas creates uncertainty over community sustainability
- Growing younger population in urban areas adds pressure on access to education, employment and quality affordable housing opportunities
- Urban areas growth is constrained by heritage protection, natural environment protection and topography and natural hazards constraints.

## *Built Environment*

- Rapid urban sprawl disrupts natural systems
- Limited capacity to stop illegal development
- Rapid conversion from residential to other uses adds housing market pressure
- Lack of land use planning resulting in uneven distribution and undesirable location of services
- Ineffective and hard to coordinate land pooling process
- Fragmented public realm with limited pedestrian space

## *Transport*

- Connectivity is focused along valley corridors while connectivity to other regions is inadequate
- Thimphu and Paro are 50 km away by roads, around one hour and 20 minutes drive
- Growing urban residents and vehicle ownership are increasing congestion
- Priority of motor vehicles over pedestrians reduces walkability
- Informal parking blocks pedestrian public spaces
- High use of taxis and a low mode share for buses which are slow and lack adequate infrastructure
- Footpaths are narrow, discontinuous and inaccessible to people with limited mobility

## *Heritage and Culture*

- Complex decision making, lack of accountability and limited incentives for heritage conservation
- Increasing sprawl impacts the paddy fields cultural landscapes
- New areas don't reflect traditional Bhutanese and Buddhist culture and ways of living
- Knowledge related to traditional crafts and construction methods is deteriorating
- Unsustainable contemporary construction techniques and materials impact traditional settlements and cultural landscapes
- Urban sprawl reduces spaces to meet as a community and practice traditions

## *Natural Environment*

- Decreasing green spaces in urban environments
- Forests, wetlands and agricultural landscapes are under pressure from urban sprawl
- Water quality of rivers next to human settlements is deteriorating
- Carbon emissions are increasing due to transport, energy related emissions and the contemporary construction materials

## *Housing and Social Infrastructure*

- Housing supply does not meet increasing demand
- Housing market mostly depends on small, private developers
- High rents and shortage of available housing for young people
- Affordable housing programmes exist, but public sector led housing provision is low
- Health facilities are not adequate for Thimphu's growing population
- Schools need quality and accessibility improvements
- Poor and unequal provision of community facilities and outdoor spaces



## *Economy*

- High value low volume tourism strategy results are eroded by low value high volume regional tourism
- Tourism market limited by seasonality, regional imbalance and a lack of diverse offer
- Limited wholesale/retail markets, 7% share in Paro and 10% share in Thimphu
- Limited financial services sector
- Reliance on foreign low skilled construction workers
- Reliance on imported materials and machinery for construction
- Low value exports from industry and agriculture
- Reliance on imported products
- Land fragmentation and ownership has historically restricted large-scale commercial agri-business

## *Governance*

- Weak democratic representation of resident population because voting is limited to registered land owners
- Private owner perceived development rights make it difficult to enforce planning and protection rules and restrictions and to secure public benefits such as public spaces or setbacks.
- Lack of interest in planning processes and participation in engagement activities
- Poor coordination between agencies and stakeholders, both in terms of consultation and working relations between agencies
- The land tax system has not evolved since 1992, with rates based on land area not value
- Lack of digitised data
- Inconsistencies in data management across agencies
- Insufficient capacity to monitor and enforce

## *Resilience*

- Increasing threats from and vulnerability to climate change with climate hazards including flash floods, glacial lake outburst floods, windstorms, forest fires and landslides
- Urban sprawl and unsustainable management practices include loss of forest cover exacerbating the vulnerability to climate change
- Increased cover of non permeable surfaces worsens flooding
- Development on steep slopes and loss of tree cover furthers landslide likelihood
- Rapid growth in use of the private car combined with wood burning as a source of heating and cooking increases urban air pollution
- Lack of sufficient hazard and risk data for geohazards which limits the ability to make scientific designation of hazard zones
- Emergency management systems are in place but with significant weaknesses

## *Utilities*

- Inconsistent water supply, partly due to topography
- Poor stormwater drainage particularly in Paro which results in declining water quality of rivers in urban areas
- Inappropriate disposal of wastewater in Paro
- Illegal dumping and poor condition and maintenance of septic tanks
- Difficulties upgrading aging power infrastructure and significant investment required to meet future demand
- Limited coverage of telecoms with lack of space, high cost and difficulty getting approval to lay fibre
- Thimphu landfill site is now at capacity





Figure 1.3 Waste in a stream in the Paro Valley





Figure 1.4 – Tachog Lhakhang



# 2.3 Key Opportunities

## *Population*

- Support balanced growth across the National Capital Region identifying appropriate locations for growth
- Regenerate and densify existing and future centres in both valleys
- Create employment opportunities for young people in rural areas
- Explore new models of housing delivery and modes of living

## *Built Environment*

- Regenerate, densify and promote urban infill, including government owned land within Thimphu
- Promote traditional and low carbon contemporary construction techniques
- Promote placemaking, protection and enhancement of local character by ensuring urban villages and neighbourhood nodes respond to residents' need
- Reassess land pooling process for better outcomes and coordination with land owners
- Define clear limits to Thimphu and Paro's urban growth through a 'Green Belt' type designation
- Bring the vitality and conviviality of Bhutanese village life to urban centres

## *Economy*

- Leverage the significant investment in basic education and new entrants to the job market
- Diversify tourism products and offerings
- Expand the financial and knowledge sector including focus on attracting international talent
- Explore the carbon offset market
- Value additive manufacturing and production, including timber construction such as at Khasadapchu
- Achieve national aspiration to establish and maintain a fully organic agricultural system
- Create high-value organic products from agricultural produce including medicinal plants
- Wood based exports and bio-prospecting

## *Heritage and Culture*

- Establish conservation areas to protect heritage and cultural assets and their setting (e.g. heritage structures, traditional farms and paddy fields and traditional villages) from inappropriate development
- Consider compensation for property owners located within conservation areas, who are no longer able to develop their land
- Explore UNESCO World Heritage Site designation for significant sites
- Require new buildings to respond to landscape, local heritage and site requirements
- Explore the use of heritage structures for community uses and integrate into local centres through land use public realm planning

## *Natural Environment*

- Introduce green and blue infrastructure within urban areas
- Promote sustainable management of natural resources including reforestation in degraded areas
- Expand the community forest management models to other environments
- Prioritise native species to support biodiversity

## *Housing and Social Infrastructure*

- Explore alternative housing delivery models to reach national and local targets, including incentives for the private sector
- Promote diverse models of living and housing types and tenures
- Create housing authority with rights vested in the DHS/MoWHS and supported by laws
- Model social infrastructure requirements according to population and catchment areas
- Promote flexible design of social infrastructure facilities for easier adaptation to changing needs



## *Transport*

- Connect settlements and destinations with a quality public transport and pedestrian network
- Plan a quality and low emissions public transport service, likely bus rapid transit
- Identify key walking routes and provide quality pedestrian infrastructure including footpaths, crossings and walkable neighbourhoods
- Create walkable links to cultural and religious sites
- Provide efficient travel options for international tourists
- Upgrade road network to all-weather standard
- Prioritise non-motorised transport and public transport in urban areas
- Create electric vehicles initiatives and incentives
- Create off-street parking at city periphery and encourage/enforce use
- Support efficient freight movement

## *Governance*

- Empower Royal Commission to better facilitate multi-agency coordination and activity alignment
- Transform digital services to drive transparency in city governance: IT structures standards, data management and databases of plans.
- Explore and encourage participation of residents in planning and decision making processes
- Implement a value based land taxation system to increase income
- Increase Thromde implementation and enforcement capacity by promoting skills training and financing
- Establish, enhance and fund dedicated programme for addressing skills shortages at all levels
- Provide adequate financing and resourcing of enforcement teams
- Monitoring strategy during construction to ensure adherence to standards and codes

## *Resilience*

- Establishment of a strategy for the collection and management of geohazard data, including a centralised database
- Identify broad geohazard areas where data is lacking
- Promote sustainable management of natural resources including reforestation in degraded areas
- Implement a risk informed planning and development strategy, including review by qualified experts to ensure the safety of the population
- Review standards for infrastructure construction and maintenance
- Protect river catchment areas and water quality
- Consider wildland urban interface to protect against the spread of fires

## *Utilities*

- Implement sustainable urban drainage and wastewater treatment and reuse in Thimphu and Paro
- Improve water supply network, governance and monitoring in Thimphu and Paro
- Expand sewer network and upgrade septic tanks to meet demand in Thimphu
- Establish a proper watershed management and safety plan in Paro
- Diversify supply of power between wind, solar and hydro sources
- Deploy smart networks including 5G and the Internet of Things
- Transition to the circular economy, particularly through consideration of the construction industry, biogas collection and composting of biodegradable waste





Figure I.5 Pa Chuu



# 2.4 Drivers and Trends



## 2.4.1 Overview

Following identification of the current conditions, issues and opportunities the following 10 key drivers were established. These key drivers seek to capture phenomena that is already in place influencing change in the region or topics as well as practices that could be harnessed to better achieve desired outcomes. These are used to define vision and objectives in the later chapters.

### 1. Bhutanese culture and spiritual identify

Bhutan has a very rich culture. While traditions are still strong in comparison with other nations they have been weakened in the process of urbanisation and undermined by western consumerism particularly by the rising generation.

### 2. Fostering a diversified circular economy

Bhutan's traditional economy was inherently circular, with very little dependence on imported goods or export income. Today Bhutan's economy is fairly dependent on the sale of hydro power to India, and the import of labour and goods and a new path towards a regenerative economy is needed.

### 3. Effective Governance

Improve efficiency, transparency and the capacity to deliver on projects through mechanisms such as increasing democratic representation, tax reforms, better coordination between departments and capacity building.

### 4. The climate emergency and the natural environment

Maintain Bhutan's reputation as leaders in environmental protection by reducing emissions from human activity and increasing resilience to the impacts of climate change.



Figure 1.6 Thimphu IT Park and Solar Panels

#### 5. Urban resilience and emergency management

Increase resilience to geohazards and the worsening impacts of climate change through the considered planning of urban growth, mitigation and retrofit.

#### 6. A changing population

Plan proactively to address migration patterns, distributing growth to locations that can support good quality of life with minimal impacts to sensitive environmental and heritage sites.

#### 7. Enterprise and education – jobs, skills and new ways of working

Investments in infrastructure and upskilling would support new sectors including STEM, digital literacy and sustainable construction.

#### 8. Urban and rural life quality including affordability and inclusion

Improve quality of life for both urban and rural areas addressing the current crisis in housing provision and affordability, delivering basic utilities to all and creating space for social and cultural life.

#### 9. Digital environments and connections

Support the increasing uptake of digital lifestyles and the opportunities and efficiencies this can bring through strengthening of the digital economy, digital society and digital governance.

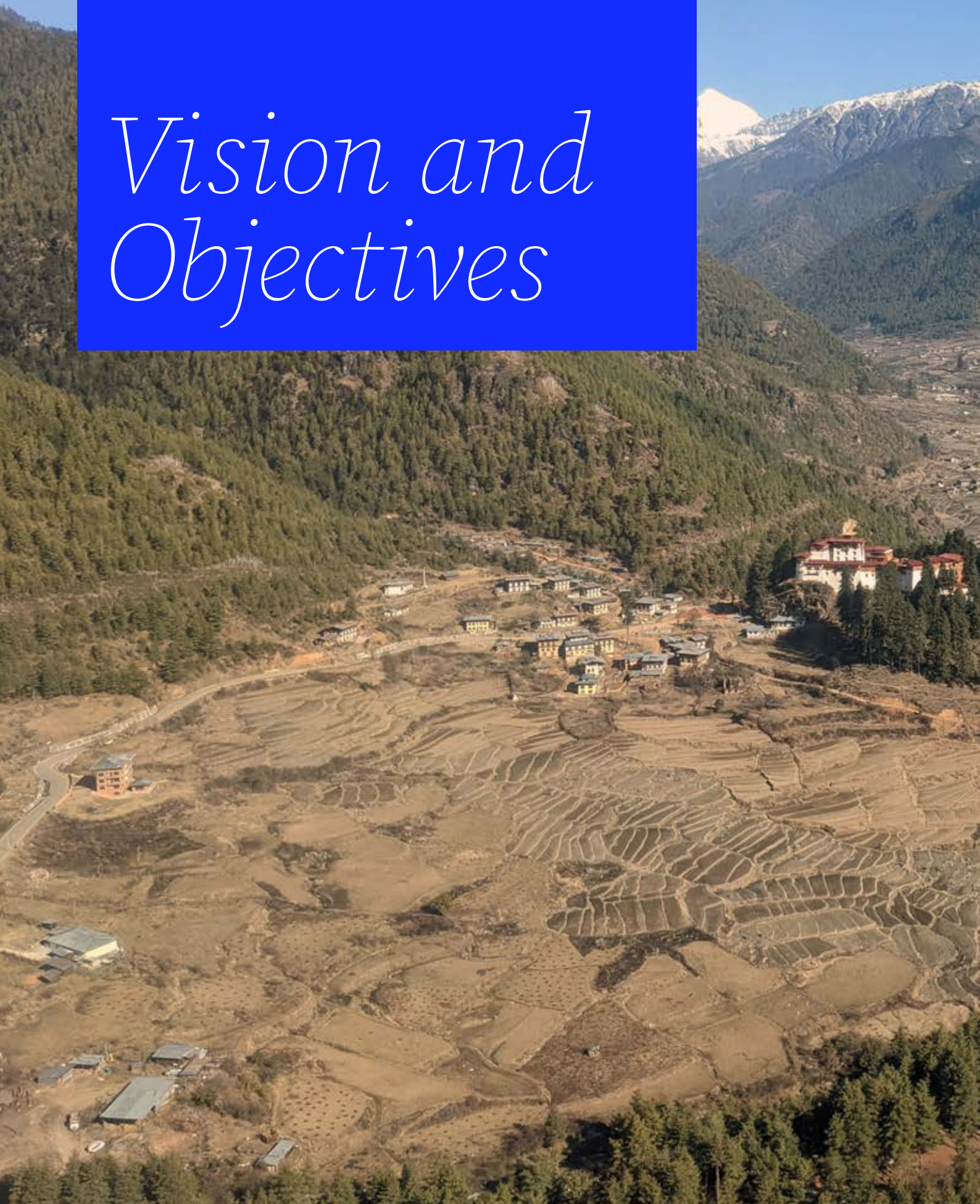
#### 10. Mobility including active travel and changing technologies

Reverse the challenges associated with the rise in private car ownership through investment in public transport, a better network of pedestrian and cycle routes and improving vehicle emissions standards, including the uptake of electric vehicles.



Ch.03

# *Vision and Objectives*







## 03 Vision and Objectives

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# 3.1 Overview

## 3.1.1 Overview

This chapter outlines the Thimphu Paro Strategic Prospectus vision, principles and objectives.

The description and relationship between the vision, principles and objectives elements are illustrated in figures 3.1 and 3.2.

These are defined following the:

- Review of the existing situation and key opportunities and issues as set out in Chapter 2 and Appendix.
- Workshops held in Bhutan between the 3<sup>rd</sup> and 7<sup>th</sup> of February 2022.
- Expert reviews and synthesis.

Section 3.2 explains the rationale behind the vision statement. A first Thimphu Paro Strategic Prospectus vision was defined in collaboration with Doughnut Economics Action Lab (DEAL) through a hybrid virtual and in-person workshop on February 3<sup>rd</sup> 2022. The vision was further refined through workshops and expert reviews.

Section 3.3 presents the themes, principles and objectives. The objectives were developed through ten workshop breakout sessions organised over two days. Each session was facilitated by a local and international discipline expert and involved relevant stakeholders. The objectives were further refined through expert reviews and consolidation.

The **vision** sets out the long term view of what the Paro Thimphu region will become by 2047.

**Example: Thimphu Paro will cultivate balance between tradition and modernity.**

A **theme** has the role to group and categorise emerging issues to be addressed through the strategic prospectus.

**Example: Heritage and Culture**

A **principle** describes a general aim to be pursued by the strategic prospectus.

**Example: Thimphu Paro will protect and promote heritage sites through planning and management policies**

An **objective** describes a specific action to be reflected in the strategic prospectus and used in the evaluation of options.

**Example: Designate heritage conservation areas.**

Figure 1.1 Thimphu Paro Strategic Prospectus elements

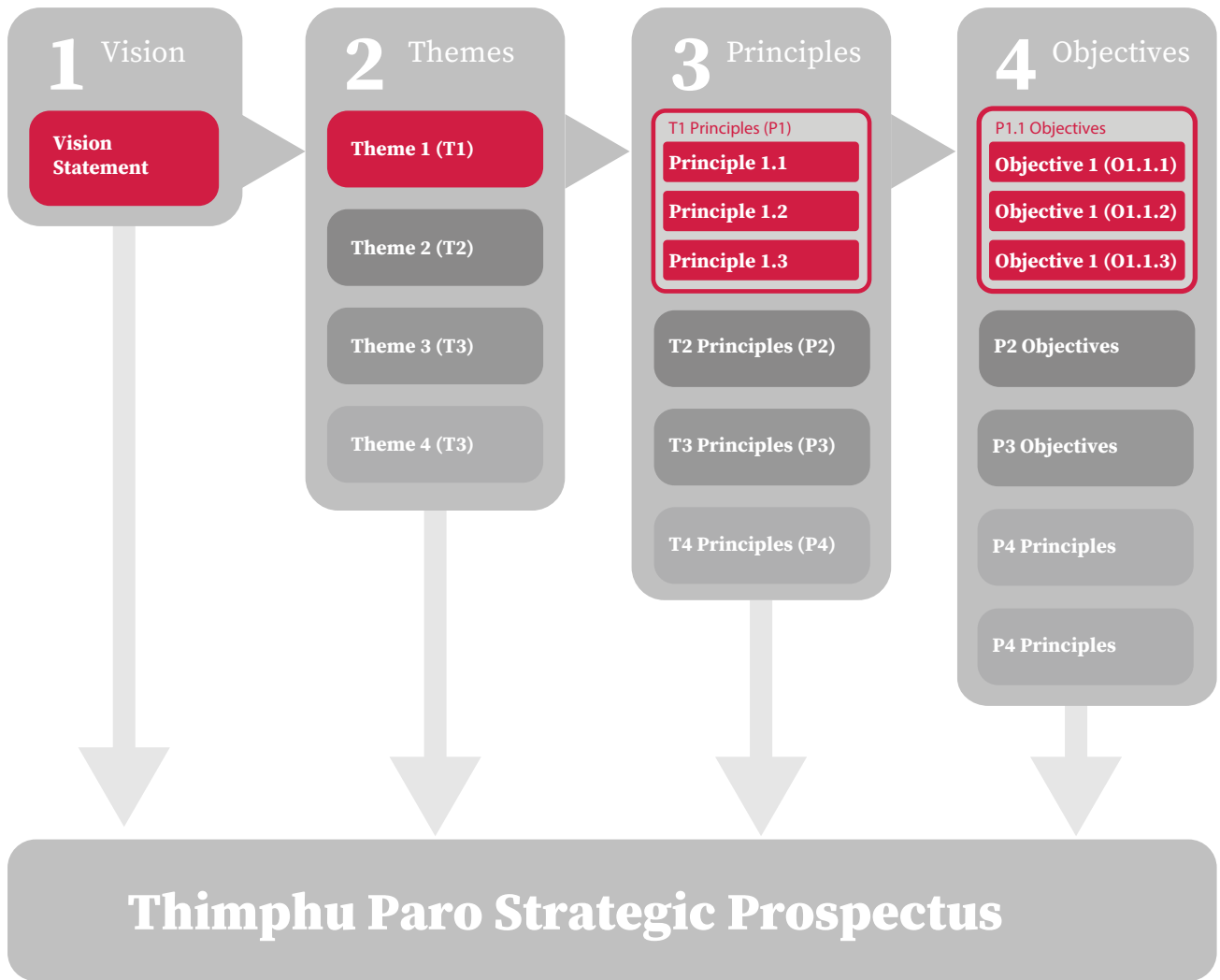


Figure 1.2 Relationship between Thimphu Paro Strategic Prospectus elements



## NINE DOMAINS



Figure 1.3 Gross National Happiness nine domains and indicators

## THREE P'S

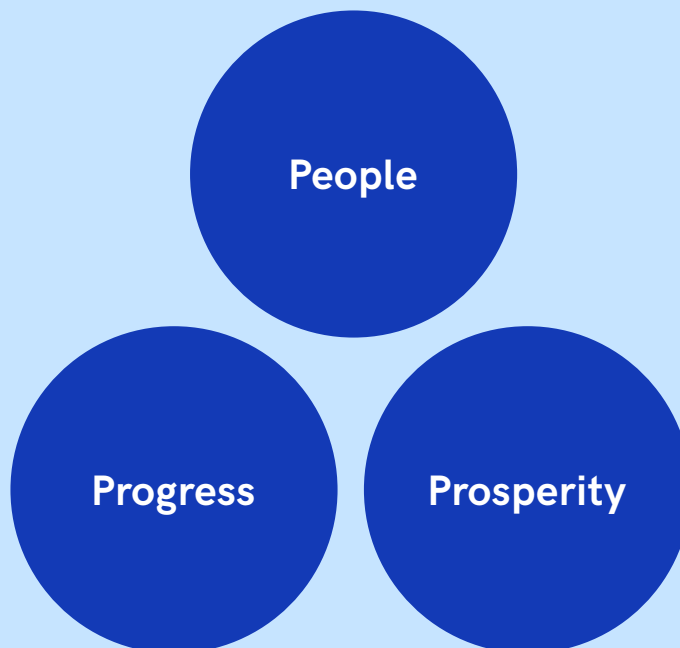


Figure 1.4 Gross National Happiness Three P's

# 3.2 Vision

## 3.2.1 Overview

The vision set out the long term intent for the transformation of the region. It seeks to ensure an integrated approach to spatial development and transformation. The vision takes forward the opportunities and issues identified in Chapter 2 and structures emerging thinking through the lens of two frameworks critical to the long term future of Bhutan and of the planet:

- Gross National Happiness
- Doughnut Economics

## 3.2.2 What Makes a Happy City

Gross National Happiness (GNH) was introduced by His Majesty the Fourth King of Bhutan, Jigme Singye Wangchuck, in the 1970s. GNH is used in Bhutan as a measure of progress and an alternative to the Gross Domestic Product (GDP) used through most of the world as a measure of economic growth.

The approach builds upon Bhutan's 1,200 year history of Buddhism where the cultivation of happiness, compassion and non-violence toward all sentient beings is central to Buddhist philosophy.

GNH recognises that sustainable development cannot only be measured through economic output parameters but requires a holistic approach. It also recognises the fact that happiness is multi-dimensional and true contentment follows the sense that others are happy not just the self.

The GNH index is defined across three p's and nine domains with specific indicators.

The three GNH p's are:

- People
- Prosperity
- Progress

The domains weigh equally whereas indicators under domains have specific weightings. The GNH index is built from data collected through periodic surveys which are representative by district, gender, age and rural-urban residence.

The GNH indicators are selected according to five criteria:

- Reflect GNH values articulated in official documents and Bhutan's culture and traditions.
- Statistically robust.
- Reflect how happiness changes in different regions and groups over time.
- Relevant for public action.
- Understandable by citizens.



### *3.2.3 How can we live within the Doughnut?*

#### **Doughnut Economics**

The Doughnut or Doughnut Economics is a framework for sustainable development created by economist Kate Raworth.

#### **Degenerative to Regenerative**

Bhutan is diversifying its economy and new activities need to consider resources as a finite supply as degenerative practices run down Earth's life-supporting systems. The future should focus on regenerative activities working with and within the cycles of the living world.

Contemporary industrial activities are degenerative by default, taking raw materials, making it into stuff used for a short while and discarding it into landfills. The take-make-waste approach is depleting the Earth's resources and polluting the natural environment.

Economies that are regenerative by design run on renewable energy, turn waste from one process into resources for other activities so that raw materials are never used up but remain in use.

#### **Divisive to Distributive**

Bhutan's society and economy is transforming and access to opportunity for all remains a critical challenge for the future. A critical dynamic for the future is the shift from a divisive economy, capturing opportunity and value in the hands of the few, to a distributive economy, sharing opportunity and value far more equitably for all.

Traditional economies are divisive by default. In the rich world the gap between rich and poor is at its highest in 30 years. The gap is also widening in developing countries. Further economic growth is not going to even out the imbalance as conventional policy choices further promote rising inequalities.

Economies that are distributive by design go beyond redistributing income to redistributing the wealth that comes from controlling land, money creation, business, technology and ideas.

#### **Doughnut Economics Action Lab (DEAL)**

Doughnut Economics Action Lab is a community focused on turning ideas into action. It provides compelling thought leadership on economic transformation, drawing on the core concepts of Doughnut Economics.

The DEAL team led two workshop sessions with the project team reflecting on the future of the Thimphu Paro region through the three p's and nine domains of Gross National Happiness and the Doughnut Economics framework.

The first workshop session explored the past ways of living from earlier generations, current trends and possibilities for the future looking at both degenerative and divisive activities as well as regenerative and distributive activities.

The second workshop session focused on the conditions needed to make change happen and powers to act from a purpose, network, governance, ownership and finance perspective.



Figure 1.5 The Doughnut of social and planetary boundaries, DEAL 2017

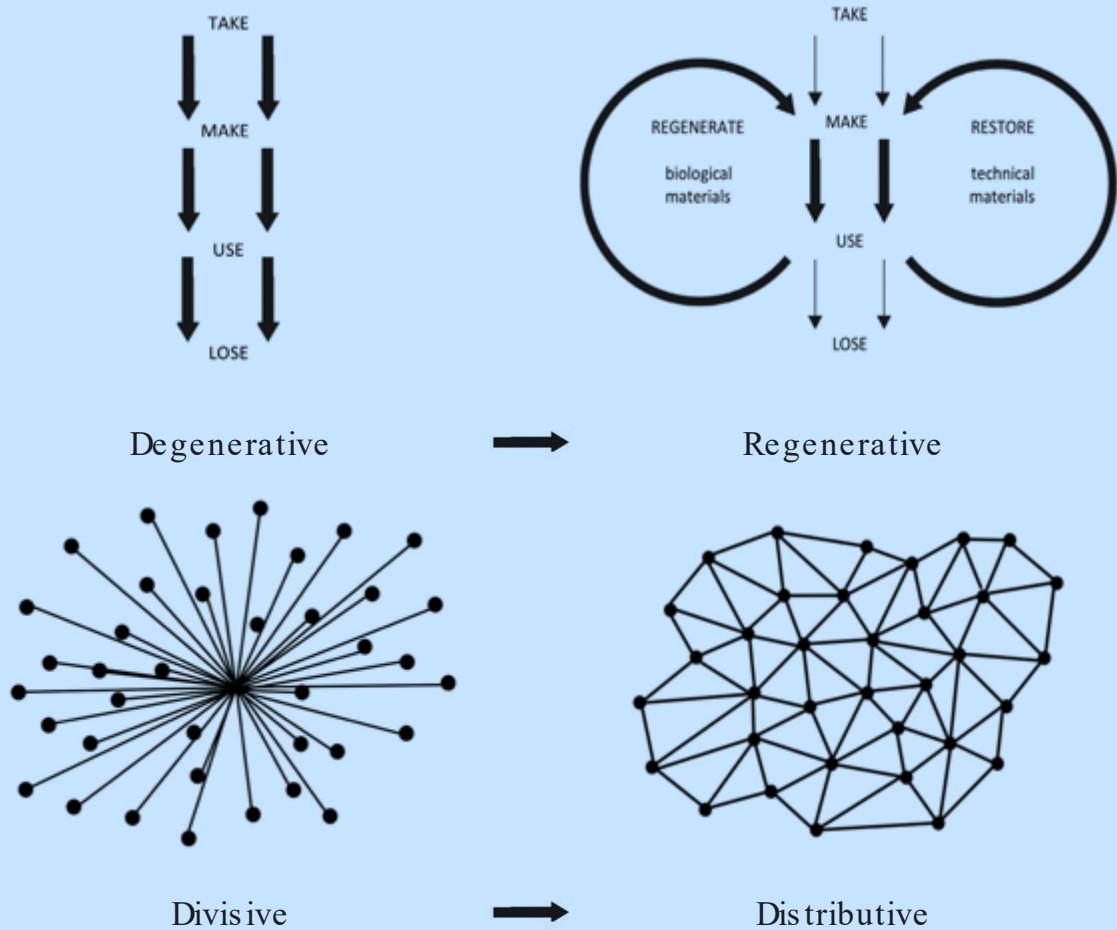
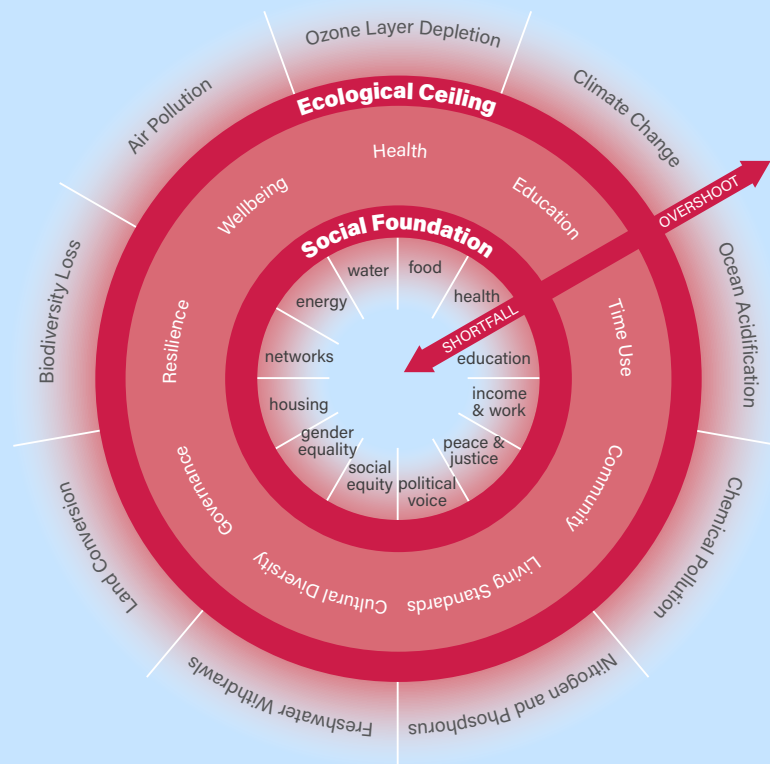


Figure 1.6 To transform the future transform the dynamics, DEAL 2017





Figure 1.1 Mountains and forests



*The Thimphu Paro region will...*

*Cultivate Balance*

balance between tradition and modernity, rural and urban and the natural environment, heritage and prosperity.

*Nurture Community*

neighbourhoods that are diverse, equitable and friendly and support health and wellbeing at all life phases.

*Create Opportunity*

drive growth, support livelihoods and be governed with wisdom and compassion.

*Inspire*

foster spirituality and culture and function as a model for sustainable development.

Figure 1.7 Thimphu Paro Vision



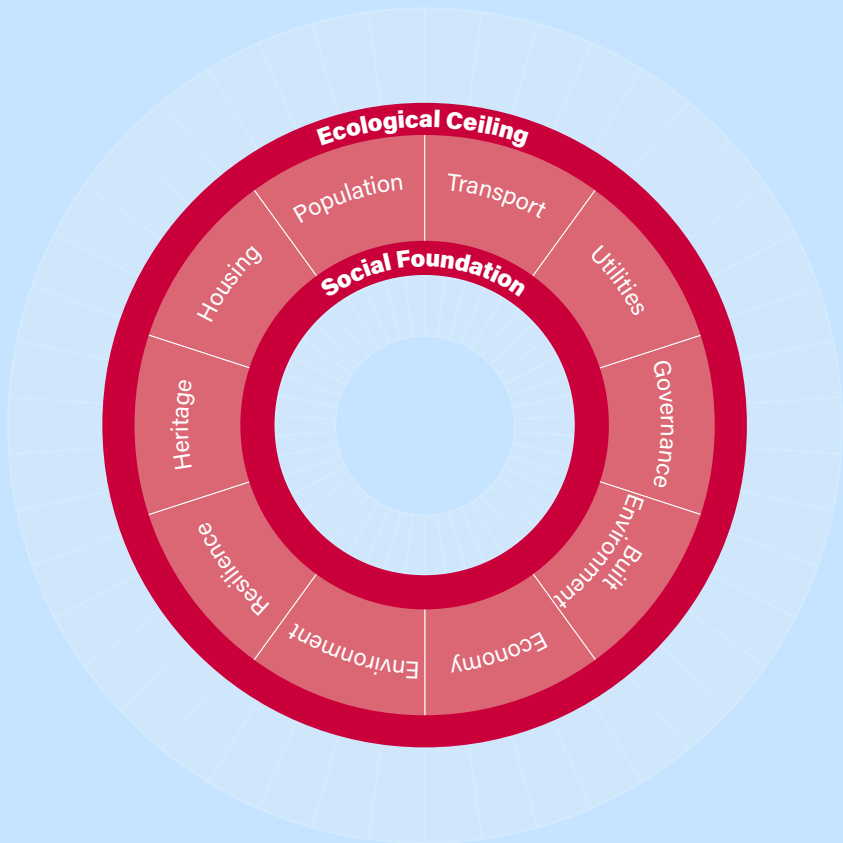


Figure 1.9 Thimphu Paro Strategic Prospectus themes

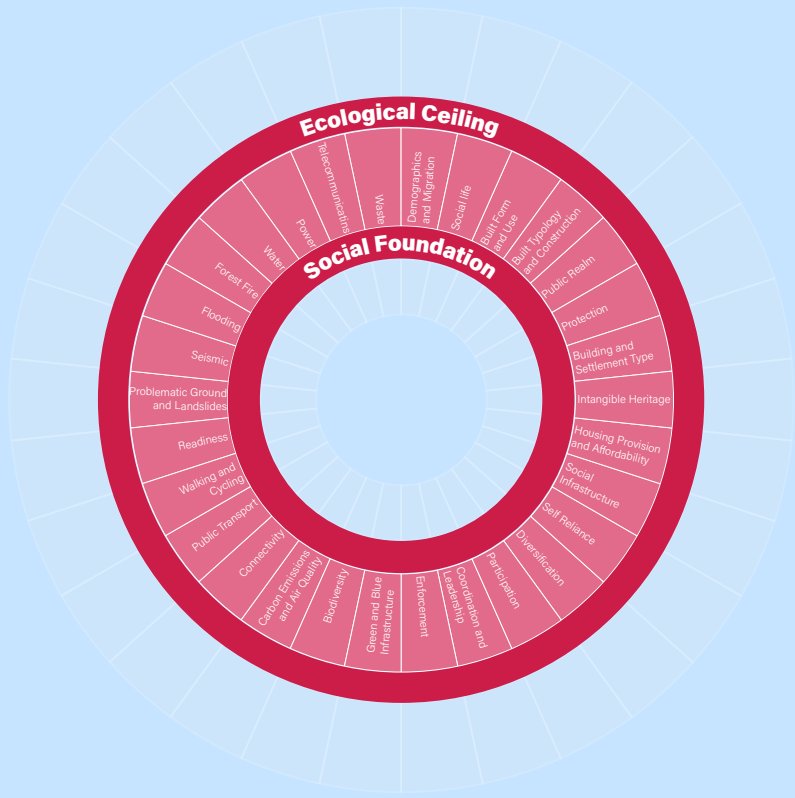


Figure 1.8 Thimphu Paro sub-themes

# 3.3 Themes, Principles and Objectives

## 3.3.1 Overview

This subsection sets out the strategic framework underpinning the Thimphu Paro Strategic Prospectus vision. This takes forward the issues and opportunities outlined in Chapter 2 as well as the stakeholder engagement workshops. The themes, principles and objectives seek to ensure an integrated multi-disciplinary approach to the spatial development and transformation of the Thimphu Paro region.

The ten themes are grounded in the three p's and nine domains of Gross National Happiness. They identify what we want to change within the limits of the Doughnut Economics, the social foundation and planetary boundaries. The ten themes cover:

- Transport
- Utilities
- Governance
- Built Environment
- Economy
- Environment
- Resilience
- Heritage
- Housing
- Population

The themes include sub-themes and associated principles defining future transformation ambitions across the region. The objectives define what the Strategic Prospectus is going to change and how it is going to accomplish this.

The Doughnut diagram on the opposite page describes the relationship between the ten themes and thirty sub-themes of the Thimphu Paro strategic prospectus.



### 3.3.2 Themes and Principles

The table below summarises the themes, sub themes as well as associated principles underpinning the Thimphu Paro Strategic Prospectus.

THEME	SUB THEME	PRINCIPLE
<b>1. Population</b>	<b>1.1 Demographics and Migration</b>	Thimphu Paro will promote a balanced distribution of the population.
	<b>1.2 Social Life</b>	Thimphu Paro will promote equal opportunities.
<b>2. Built Environment</b>	<b>2.1 Built Form and Use</b>	Thimphu Paro will achieve balance between the two valleys and support health and wellbeing.
	<b>2.2 Building Typology and Construction</b>	Thimphu Paro will develop a sustainable contemporary Bhutanese type.
	<b>2.3 Public Realm</b>	Thimphu Paro will design and retrofit public realm to support conviviality and enhance heritage sites.
<b>3. Heritage and Culture</b>	<b>3.1 Protection</b>	Thimphu Paro will protect and promote heritage sites through planning and management policies.
	<b>3.2 Building and Settlement Types</b>	Thimphu Paro will protect tradition and reimagine modern Bhutanese building types.
	<b>3.3 Intangible Heritage</b>	Thimphu Paro will recover and enhance cultural values.
<b>4. Housing and Social Infrastructure</b>	<b>4.1 Housing Provision and Affordability</b>	Thimphu Paro will increase and improve affordable housing for all.
	<b>4.2 Social Infrastructure</b>	Thimphu Paro will support quality of life and social and cultural life.
<b>5. Economy</b>	<b>5.1 Self- reliance</b>	Thimphu Paro will be a self reliant region, promoting local materials, products and resources for sustainable resourcing and revenue creation.
	<b>5.2 Diversification</b>	Thimphu Paro will enable productive employment in diverse value additive industries
<b>6. Governance</b>	<b>6.1 Participation</b>	Thimphu Paro will increase accessibility and engagement
	<b>6.2 Coordination and Leadership</b>	Thimphu Paro will increase efficiency and transparency
	<b>6.3 Enforcement</b>	Thimphu Paro will ensure compliance

THEME	SUB THEME	PRINCIPLE
<b>7. Natural Environment</b>	<b>7.1 Green and Blue Infrastructure</b>	Thimphu and Paro will maximise green and blue infrastructure.
	<b>7.2 Biodiversity</b>	Thimphu and Paro will enhance biodiversity whilst reducing instances of conflict.
	<b>7.3 Carbon Emissions and Air Quality</b>	Thimphu and Paro will be pioneers meeting carbon reduction targets and reducing poor air quality.
<b>8. Transport</b>	<b>8.1 Connectivity</b>	Thimphu and Paro will improve connectivity across and within the two valleys
	<b>8.2 Public Transport</b>	Thimphu and Paro will enhance sustainability and efficiency of movement through implementation of effective and desirable public transport
	<b>8.3 Walking and Cycling</b>	Thimphu and Paro will create attractive and coordinated routes
<b>9. Resilience</b>	<b>9.1 Readiness</b>	Thimphu and Paro will be prepared through data collection and disaster management plans
	<b>9.2 Problematic Ground and Landslides</b>	Thimphu and Paro will reduce risk and damage to both current and future development
	<b>9.3 Seismic</b>	Thimphu and Paro will ensure developments are resilient to seismic activity
	<b>9.4 Flooding</b>	Thimphu and Paro will reduce risks due to flooding
	<b>9.5 Forest Fire</b>	Thimphu and Paro will reduce instances of forest fires
<b>10. Utilities</b>	<b>10.1 Water</b>	Thimphu Paro will deliver an efficient water supply and waste water treatment system and promote sustainable stormwater management
	<b>10.2 Power</b>	Thimphu Paro will promote a resilient and sustainable power network
	<b>10.3 Telecommunications</b>	Thimphu Paro will create a safe and equitable network
	<b>10.4 Waste</b>	Thimphu Paro will reduce waste and facilitate the transition to the circular economy



### 3.3.3 Objectives

The following pages outline the objectives, these establish specific actions to be taken forward. The objectives were developed through ten workshop breakout sessions organised over two days. Each session was facilitated by a local and international discipline expert and involved relevant stakeholders. The objectives were further refined through expert reviews and consolidation.

## 1. Population

SUB THEME	OBJECTIVES
<b>1.1 Demographics and Migration</b> Thimphu Paro will promote a balanced distribution of the population	1.1a Decrease migration flow of people from rural to urban areas.
	1.1b Identify opportunities for regeneration and the creation of new urban centres across the two valleys.
<b>1.2 Social Life</b> Thimphu Paro will promote equal opportunities	1.2a Create employment opportunities for young people in rural areas.
	1.2b Identify gaps in social infrastructure across the region and provide suitable facilities such as health and education.

## 2. Built Environment

SUB THEME	OBJECTIVES
<b>2.1 Built Form and Use</b> Thimphu Paro will achieve balance between the two valleys and support health and wellbeing	2.1a Achieve balance across the region through the promotion of distinct characters and roles for Thimphu and Paro.
	2.1b Protect Thimphu and Paro as spiritual practices of learning, contemplation, ritual and community by preserving the Lahkangs and Dzongs, enhancing their access, publishing their calendars and connecting them with neighbourhood centres through a network of green trails.
	2.1c Create distinct rural and urban areas that promotes and protects culture, tradition and landscapes whilst improving quality of life.
	2.1d Develop a green belt to limit urban sprawl.
	2.1e Support good health and wellbeing in urban areas through establishing a network of walkable mixed use urban centres with good provision of entertainment and recreational facilities.
<b>2.2 Building Typology and Construction</b> Thimphu Paro will develop a sustainable contemporary Bhutanese type	2.2a Develop a contemporary Bhutanese building type that mixes the sustainability, resilience and aesthetics of traditional architecture with the space and comfort of contemporary buildings.
<b>2.3 Public Realm</b> Thimphu Paro will design and retrofit public realm to support conviviality and enhance heritage sites	2.3a Improve community vitality through east west links across the valleys, a network of pedestrian and cycle friendly public spaces and well designed public realm including boundary treatments.
	2.3b Preserve the sanctity of religious and spiritual sites and their surrounding landscapes by limiting development and integrating with a network of public spaces.



## 3. Heritage and Culture

SUB THEME	OBJECTIVES
<b>3.1 Protection</b> Thimphu Paro will protect and promote heritage sites through planning and management policies	3.1a Define a clear hierarchy of heritage sites with associated protection strategies such as management plans.
	3.1b Protect significant views and define development constraints around important heritage sites such as Dzongs and Lakhangs
	3.1c Define and protect cultural and sacred landscapes such as paddy fields and Lakhangs.
	3.1d Promote urban realm improvements and better accessibility to heritage sites supporting cultural, religious and recreational practices.
	3.1e Define conservation areas, with development limitations, for villages that have largely kept their traditional built and open space structures such as Kareyphu in Thimphu, Chukha village in Paro.
<b>3.2 Building and Settlement Types</b> Thimphu Paro will protect tradition and reimagine modern Bhutanese building types	3.2a Renovate and provide modern utilities in deteriorating monuments without altering their significance.
	3.2b Create economic incentives for heritage conservation in rural areas such as encouraging conversions of traditional buildings into long term home stays (knowledge or spiritual exchange programs).
	3.2c Explore the potential for heritage sites to be used for community uses, so they become more of a regular part of everyday life.
<b>3.3 Intangible Heritage</b> Thimphu Paro will recover and enhance cultural values	3.3a Create economic opportunities for villages in conservation areas such as the promotion of traditional handicrafts.
	3.3b Promote intangible culture heritage such as folk music, dance, cuisine, Driglam Namzha (Bhutanese discipline and etiquette), rituals and festivals in homes and communities.
	3.3c Create social gathering spaces where different generations can meet and exchange knowledge through storytelling or rituals practice.
	3.3d Promote traditional skills such as Zorig Chosum, thirteen arts and crafts representing Bhutanese identity: paper making, stonework, blacksmithing, clay arts, painting, bronze casting, carving, woodturning, woodworking, weaving, silver and goldsmithing, cane and bamboo work and needlework.
	3.3e Create spaces where younger generations can learn and practice traditional arts and crafts.

## 4. Housing and Social Infrastructure

SUB THEME	OBJECTIVES
<b>4.1 Housing Provision and Affordability</b> Thimphu Paro will increase and improve affordable housing for all	4.1a Explore alternative models to support housing delivery and ownership including the role of non profit organisations such as housing associations.
	4.1b Create mixed income and multi-generational housing to facilitate community and communal responsibility for the care of the aged and differently abled.
	4.1c Implement a programme where the Government can take responsibility for distressed structures, converting them into more productive uses.
	4.1d Ensure all homes are designed to be energy efficient with flexible layouts that meet the needs of all residents and protect privacy.
	4.1e Widen the eligibility of affordable housing so it is distributed fairly among all populations irrespective of their employment background and financial status with rents not exceeding 30% of monthly income.
	4.1f Implement inclusionary zoning by providing incentives for the private sector and not for profit sector to deliver affordable housing.
<b>4.2 Social Infrastructure</b> Thimphu Paro will support quality of life and social and cultural life	4.2a Create a coordinated network of facilities that responds to the hierarchy of urban centres, is distributed equitably, promotes walkability and helps support a sense of place.
	4.2b Design social infrastructure to be flexible to support multiple uses.
	4.2c Create communities that support health and wellbeing through the provision of common infrastructures including lhakhang, health care, libraries, parks, childcare, laundry facilities and space for performing rituals.



Figure 1.10 Contemporary Housing in Rural Areas



## 5. Economy

SUB THEME	OBJECTIVES
<b>5.1 Self Reliance</b> Thimphu Paro will be a self reliant region, promoting local materials, products and resources	<p>Self-reliance in resourcing and revenue:</p> <ul style="list-style-type: none"> <li>▪ Establish a value-based tax system for land and property to ensure that more tax can be collected at a local level and directed back into local services.</li> <li>▪ Update the basis and methodology for valuing land and property to reflect international best practice and to support the move to a value-based tax system, whilst building a skills programme and institutional capacity.</li> <li>▪ Consideration should also be given to all other taxes that a land/ building owner may be liable for to assess whether the methodology for these taxes should also be updated to reflect market value.</li> <li>▪ Explore other tax and legal measures to capture value.</li> </ul>
	<p>Self-reliance in energy:</p> <ul style="list-style-type: none"> <li>▪ Diversify energy mix with alternative renewable sources including biogas, solar and wind, and establish storage capacity.</li> <li>▪ Create a retrofit programme of buildings to improve energy efficiency and install green technology (micro-renewables).</li> </ul>
	<p>Promotion of local materials, products and materials</p> <ul style="list-style-type: none"> <li>▪ Use public purchasing power to change market behaviours by procuring local materials, products and services.</li> <li>▪ Financial institutions to act as a vehicle for change to control the quantum and quality of new development, including the use of local materials, products and services.</li> <li>▪ National skills programme for the green building economy.</li> </ul>
<b>5.2 Diversification</b> Thimphu Paro will enable productive employment in diverse value additive industries and drive innovation, revenue and investment	<p>5.2a Diversification of tourism products and events for example, shorter treks, trail running and mountain biking, with promotional. Realign/ restructure the tourism strategy to protect the high value low volume offer.</p>
	<p>5.2b Diversification of the services sector with growth in financial markets, data/ IT.</p>
	<p>5.2c Establish value additive low carbon manufacturing and production.</p>
	<p>5.2d Promote high value and high quality organic and low carbon agricultural product under a 'Brand Bhutan'/'Spirit of Bhutan' identity.</p>
	<p>5.2e Identify and implement key infrastructure investment projects to enable economic growth and diversification.</p>
	<p>5.2f Attract catalytic uses/ occupiers in key growth sectors, in particular: Climate change and environmental management, education/ knowledge, high end tourism, Vajrayana Buddhism (spiritual tourism) and traditional medicine and wellness.</p> <p>For Paro in particular this could include: Airport 'city' (logistics and commercial hub), meetings, incentives, conference and exhibitions (MICE) and high value agri-business.</p>

## 6. Governance

SUB THEME	OBJECTIVES
<b>6.1 Participation</b> Thimphu Paro will increase accessibility and engagement	6.1a Increase democratic participation and the degree of local representation in the planning and decision making process.
	6.1b Increase accessibility and transparency of the planning process through standardising plans and data sources and creating platforms of communication including digital tools.
	6.1c Expanding the process of consultation required for local area plans to all plans and projects.
<b>6.2 Coordination and Leadership</b> Thimphu Paro will increase efficiency and transparency	6.2a Strengthen performance management systems through the creation of appropriate targets that are linked to the implementation of regional and structure plan, as well as foster the culture of NGAR (translated as mettle) within the civil service.
	6.2b Upskill through an ongoing programme of skills training and the creation of a placement programme across departments and regions to ensure comprehensive understanding of broader processes.
	6.2c Promote coordination between agencies and stakeholders. This could be through the creation of a platform to host discussions, a system of incentives and penalties to encourage coordination and establishment of avenues to settle disputes.
	6.2d Increase transparency of government operations through clear delineation of the roles and responsibilities at all levels.
	6.2e Ensure details of financing and decision making is regularly reported publically.
	6.2f Devolve more responsibility to the Thromdes and Dzongkhag administration, particularly with regard to financing and human resources.
<b>6.3 Enforcement</b> Thimphu Paro will ensure compliance	6.3a Provide stronger tools and better coordination to enforce and halt illegal development including the power to cut utilities, financing and labour permits.
	6.3b Increase rates of implementation and quality of outcomes through establishing compliance mechanisms such as financial penalties, ensuring action plans are clear and integrated and securing sufficient resources and responsibility for long term management and maintenance of projects.



## 7. Natural Environment

SUB THEME	OBJECTIVES
<b>7.1 Green and Blue Infrastructure</b> Thimphu and Paro will maximise green and blue infrastructure	7.1a Create 'room for the river' through a return to natural alignments, protection of catchment areas and compensation mechanisms to protect setbacks from rivers, wetlands and other sensitive areas.
	7.1b Create a connected network of green spaces through securing the banks of rivers and streams, integrating spaces with the movement network and introducing urban greening initiatives such as pocket parks and green roofs.
	7.1c Widen the protection of landscapes and habitats including the protection of forests in private lands through mechanisms including payment for environmental services, land compensation and expanding the community forest management model to other environments.
<b>7.2 Biodiversity</b> Thimphu and Paro will enhance biodiversity whilst reducing instances of conflict	7.2a Increase biodiversity through restriction of the use of invasive species and promotion of endemic plant species.
	7.2b Reduce instances of human wildlife conflict through protection and improvements of habitats and secure waste management systems.
<b>7.3 Carbon Emissions and Air Quality</b> Thimphu and Paro will be pioneers meeting carbon reduction targets and reducing poor air quality	7.3a Reduce carbon emissions from buildings through the promotion of sustainable construction techniques such as timber and improved thermal efficiency for new and existing buildings including programmes for retrofit
	7.3b Promote local renewable energy generation including solar PV heating systems and the use of ground and air source heat pumps.
	7.3c Expand the network of air quality monitoring stations. Then reduce air pollution through mechanisms including promotion of public transport, limiting polluting industries in urban areas, monitoring and enforcement of the construction industry and better pavements.



Figure 1.11 Takin

# 8. Transport

SUB THEME	OBJECTIVES
<b>8.1 Connectivity</b> Thimphu and Paro will improve connectivity across and within the two valleys	8.1a Improve sustainability through increasing the mode share of public and non-motorised transport modes and promoting the transition of vehicles to electric.
	8.1b Better connect remote settlements to economic opportunities, social and cultural activities, and services.
	8.1c Deliver an integrated and coherent transport network that provides a greater mix of options and coordinates with land use planning and delivery.
	8.1d Support efficient movement of goods to domestic and international markets including preservation of sufficient land.
<b>8.2 Public Transport</b> Thimphu and Paro will enhance sustainability and efficiency of movement through implementation of effective and desirable public transport	8.2a Implement a convenient, attractive, good value public transport with good network coverage and supporting infrastructure and facilities.
	8.2b Improve efficiency and convenience through the implementation of a smart and intelligent transport system with better data for decision making and information for people.
<b>8.3 Walking and Cycling</b> Thimphu and Paro will create attractive and coordinated routes	8.3a Promote non-motorised transport for short, local trips through sufficient space and facilities for walking and cycling, integrating urban centres/ neighbourhood nodes with mobility hubs, create pedestrian priority in the urban core and increased east west connectivity through the valleys.



Figure 1.12 Parking at the Clock Tower Square, Thimphu



## 9. Resilience

SUB THEME	OBJECTIVES
<b>9.1 Readiness</b> Thimphu and Paro will be prepared through data collection and disaster management plans	9.1a Improve resilience through the establishment of a framework for the collection and management of geohazard related data, using a centralised database 9.1b Preparation of disaster management plans for development zones, including implementation and monitoring strategies for early warning systems, evacuation strategies and provision of emergencies services.
<b>9.2 Problematic Ground and Landslides</b> Thimphu and Paro will reduce risk and damage to both current and future development	9.2a Coordinated collection of observational and anecdotal information where relevant geohazard related data is lacking 9.2b Restrict spread of development and deforestation on slopes and problematic ground to protect against landslides. 9.2c If spread onto slopes and problematic ground is required, ensure there is sufficient investigation, design, mitigation and monitoring to reduce potential for risk. 9.2d Ensure standards for infrastructure design, construction and maintenance are appropriate to reduce risk of landslides.
<b>9.3 Seismic</b> Thimphu and Paro will ensure developments are resilient to seismic activity	9.3a Ensure new buildings are designed to be resilient to seismic activity including potential updates to building codes if required.
<b>9.4 Flooding</b> Thimphu and Paro will reduce risks due to flooding	9.4a Restrict development and impermeable cover on floodplains. 9.4b Cross-collaboration with infrastructure development to ensure available capacities as a result of increased surface runoff during monsoon season to reduce cascading effect on other geohazards.
<b>9.4 Forest Fire</b> Thimphu and Paro will reduce instances of forest fires	9.4a Reduce urban sprawl and human interference into forests to reduce risk of fires. 9.4b Ensure utilites are appropriately located and designed to reduce the potential of forest fires.



Figure 1.13 Snowfall in Paro Valley

## 10. Utilities

SUB THEME	OBJECTIVES
<b>10.1 Water</b> Thimphu Paro will deliver an efficient water supply and waste water treatment system and promote sustainable stormwater management	10.1a Create green infrastructure and sustainable/natural drainage solutions to store and treat runoff at source.
	10.1b Promote water recycling at a household/business level.
	10.1c Develop a utilities masterplan taking into account projected land uses and demand.
	10.1d Establish and implement a system of maintenance for stormwater management.
	10.1e Retain permanent team members with expertise in the management of wastewater systems.
	10.1f Enforce standards for the development and maintenance of septic systems.
	10.1g Initiate awareness campaign initiated to educate the public on the correct disposal of Fats, Oil and Grease to prevent blockages of the network.
	10.1h Build sewer network and sewage treatment plant(s) in Paro.
	10.1i Put in place monitoring at all sewage outfalls to identify areas where upgrades/interventions are needed.
	10.1j Extend wastewater network in Thimphu and investigate opportunities for consolidation of sewage treatment plants, replacing with pump stations if required to convey wastewater to a sewage treatment plant downstream.
	10.1k Identify gaps, leakage and areas of flooding in the existing water supply network and focus resources on closing gaps and regular repairs.
10.1l Investigate engineering/ technological solutions to make water supply more resilient.	
<b>10.2 Power</b> Thimphu Paro will promote a resilient and sustainable power network	10.2a Investigate alternative sources such as solar, wind or biomass.
	10.2b Implement Smart Grid Management System to identify inefficiencies/problems in the network.
	10.2c Enforce building regulations that require installation by a certified electrical engineer.
	10.2d Create awareness campaign to educate the public on the risks of unregulated electricity works.
<b>10.3 Telecommunications</b> Thimphu Paro will create a safe and equitable network	10.3a Consider telecommunications as a basic service for all citizens.
	10.3b Replace overhead lines with underground to minimise disruption due to damage.
<b>10.4 Waste</b> Thimphu Paro will reduce waste and facilitate the transition to the circular economy	10.4a Reduce waste and facilitate the transition to the circular economy by maximizing re use of materials during construction, promoting the sharing economy, restricting the use of single use plastics, promoting digital ways of working and implementing compost schemes and biogas collection from landfill and water treatment plants.



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# *Next Steps & Priorities*







## 4.0 Next Steps and Priorities

4.1 Next Steps

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4.2 Priority Projects

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# 4.1 Next Steps



## 4.1.1 Overview

This Strategic Prospectus is a call to action to deliver a sustainable plan for Thimphu-Paro region's future health, happiness, and prosperity.

Through a rapid assessment of issues and opportunities, and extensive engagement with key stakeholders, it has identified a Vision and Objectives Framework that will guide the development of this plan over the long-term and identify priorities for investment in the short-to-medium-term.

Building on the Vision and Objectives Framework and the kick-off workshops held between 9<sup>th</sup> and 11<sup>th</sup> February 2022, a Regional Strategy will be developed. The Regional Strategy (Project 2) will establish a high-level spatial planning framework for the Thimphu-Paro region. This will provide strategic direction for the development of a comprehensive regional plan to be undertaken under a separate commission and will provide context to inform the review of the Thimphu Structure Plan (Project 3).

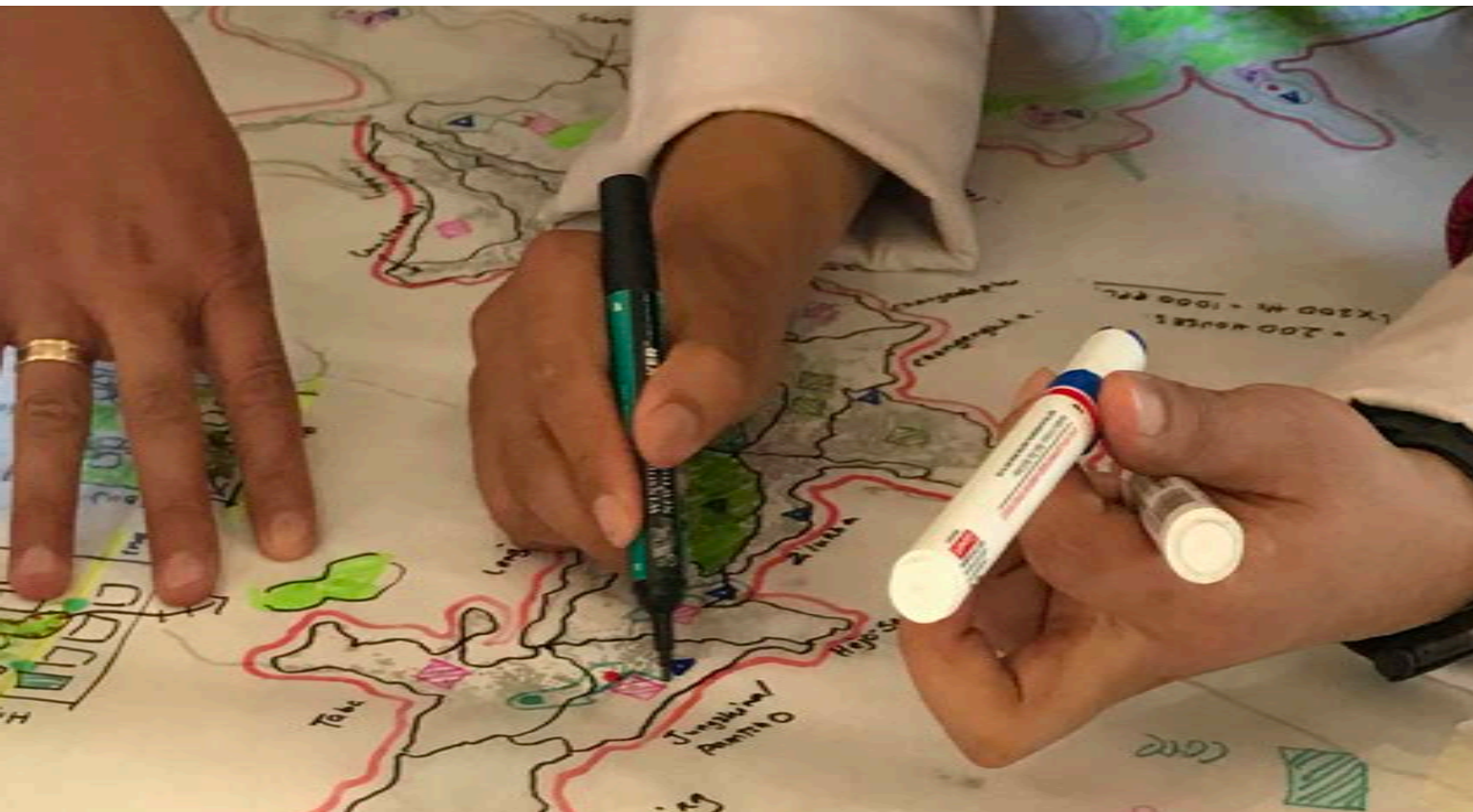


Figure 1.1 Workshop exploring spatial options

As a first step in developing the Regional Strategy, a comprehensive Site Availability and Capacity Assessment will be undertaken, to identify the potential future growth carrying capacity of the Thimphu-Paro Region and establish a sustainable 'basis for planning' that aligns with the Vision and Objectives Framework. This exercise will identify publicly owned lands suitable for development and/or existing sites suitable for regeneration. Sites will be evaluated and scored against the Vision and Objectives Framework to confirm their suitability. An analysis of carrying capacity will be undertaken for those sites deemed suitable, establishing the carrying capacity for the region and the sustainable basis for planning to inform spatial scenario development.

Once the basis for planning is established, spatial scenarios will be developed to explore possible spatial outcomes for the Regional Strategy, these will be evaluated against the Vision and Objectives Framework, to establish the preferred direction, with the preferred scenario being developed and refined. Supporting strategies will be developed to underpin the Regional Strategy, covering land use planning, environment, socio-economy, transport, utility infrastructure and economics.



## 4.1.2 *Technical Studies*

To support project two and three as they progress, further data collection will be required. The following summarises information that is currently missing that is either essential or beneficial to the projects. This includes reference to studies that are already underway by other departments. Further details are included in the appendix.

The appendix also includes further observations around implementation of the economic objectives, which are beyond the scope of the Regional Strategy.



Figure 1.2 Workshop discussions

ACTION	DESCRIPTION
GIS Strategy	<p>Various different departments and organisations collect and house geospatial data. However, it is evident that the structure / format of the data can be inconsistent, and accessibility can be limited.</p> <p>A successful GIS strategy will facilitate data-informed integration and collaboration between departments and between stakeholders within these departments. New or improved insights can be uncovered when using cross-department data.</p> <p>A strategy can allow for structure to be placed on tools and workflows which will increase efficiencies in data analytics. A well developed strategy will also allow for integration of new technologies or data formats.</p>
Civil Infrastructure	<p>Inventory of Civil Infrastructure Assets in GIS Format and a recognised coordinate system</p> <ul style="list-style-type: none"> <li>▪ Thimphu Water Supply</li> <li>▪ Paro Water Supply</li> <li>▪ Solid Waste Drop Off Locations</li> <li>▪ Engineering drawings for the water intake systems in Paro and Thimphu</li> <li>▪ Hydrological Modelling Results</li> <li>▪ Any standard or guidelines from the Department of Engineering Services</li> <li>▪ Water tank capacities</li> </ul>
Traffic counts	<p>Traffic counts (all modes including pedestrians) at key locations throughout the region would help the development of the regional plan and the Thimphu Structure Plan. This would have to occur at a time when all activity is back to normal, with no COVID restrictions in place and ideally when tourism returns.</p>
Bus capacity and demand	<p>Collection of bus passenger volume data (Thimphu city bus and the regional bus services between Thimphu and Paro) would be useful to compare to bus capacity and understand the services that are over and under capacity. There is a new smart card ticketing system for the city buses, which could hopefully help with this data.</p>
Parking survey	<p>Parking occupancy and turnover.</p>
Household travel survey	<p>To understand travel patterns and mode choices.</p> <p>Data should be collected regularly, e.g. annually, using the same questionnaire and a statistically representative sample of households.</p>



ACTION	DESCRIPTION
Transport GIS Layers	<p>Pedestrian network:</p> <p>Footpaths/laneways: ideally presence, width, and condition</p> <p>Crossings: location of road crossings, location of river crossings</p> <p>Locations of inaccessibility for mobility impaired people (e.g. stairs, footpath gaps, open drains etc)</p> <hr/> <p>Road network: Sealed sections, Unsealed sections,</p> <hr/> <p>Bus infrastructure: Bus stop facilities: presence of shelter, signage, sealed footpath</p> <hr/> <p>Taxi infrastructure: Pick up areas</p> <p>Waiting/parking areas</p> <hr/> <p>Parking spaces:</p> <p>On street locations</p> <p>Off street locations</p> <hr/> <p>Electric vehicle charging stations:</p> <p>Location, operational status, usage statistics</p>
Collection of Observational and Anecdotal Info on Problematic Ground Conditions	Collection of observational and anecdotal information should be completed of areas which were affected by settlement or soft ground conditions. The information should be geospatially referenced, with a description and photos provided.
Complete High Resolution Topo Survey for Paro-Thimphu Region	It is understood that high resolution topographical surveys are being completed for the entire Paro-Thimphu region, including outside of the study area.
Source JICA Seismic Study Results	Provision of the results of the from the JICA seismic study at the Department of Culture. This information will be relevant to the developing understanding of the current seismic risk and potential mitigation measures.
Geological survey of the entire Paro-Thimphu Highway	An initial overall geological survey should be completed along the important infrastructure highway between Paro and Thimphu. Potential hazard areas should be identified, a further detailed assessment should be completed at each of the identified sites to determine where mitigation measures are required.
Flood Study for the entire Paro-Thimphu Region	Provision of the flooding risk assessments completed for the entire region and/or completion of such studies, ensuring they extend throughout the entire Paro-Thimphu Region.
Completion and Provision of Forest Inventory and Forest Fire occurrences up to current date	Provision of the full existing inventory study of the forest cover within the Paro-Thimphu region and the historical forest fires (spatially referenced) up to the current date.
Collection and Provision of Air Quality and Water Quality Raw Data for Baseline Assessment	Raw data associated with the air quality and water quality should be provided up to the current date, including as much historical data as possible to allow for establishment of baseline and historical trends.





Figure 1.3 Site of previous landslides Thimphu



# 4.2 Priority Projects

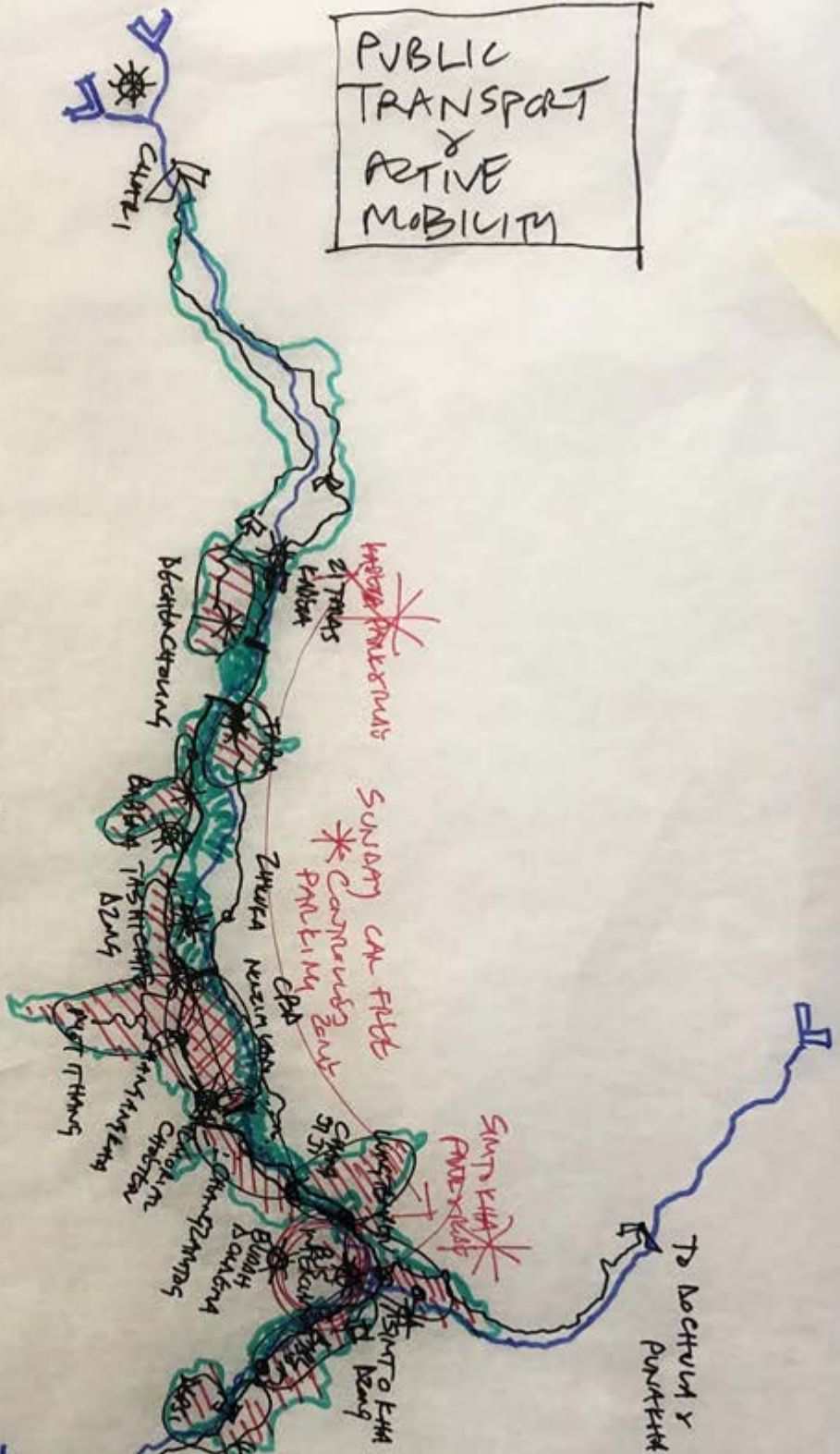
## 4.2.1 Overview

To end discussions on Project 1 and initiate the next phase of works, a workshop held on Friday 11th February explored possible priority projects for the region. Tables were split exploring priorities for Paro and priorities for Thimphu separately.

A summary of each discussion is included in the appendix. The possible top ten priority projects explored are summarised in the following headlines. These will be further defined and agreed as project 2 and 3 progress.

1. **Transforming movement - public transport, walking and cycling enhancements**
2. **River parks and green utilities infrastructure**
3. **Affordable, inclusive housing**
4. **Thimphu city centre action plan**
5. **Paro town centre action plan**
6. **Alternative models for conservation including third sector tourism**
7. **Urban neighbourhoods**
8. **Special economic and industrial areas**
9. **Local government fiscal and governance reform**
10. **Public realm and landscape beautification**

PUBLIC TRANSPORT & ACTIVE MOBILITY



\* THIMPHU \*  
 Royal Boulevard  
 From Deciduous to 4 Ficus spp  
 CAM-1 15 KM LONG  
 10(+)  
 + 15 MIN WALKS WITH BUS/WALKED NODE  
 500 → 1000 M A/D/I  
 WALKABLE ACTIVE PUBLIC REACH

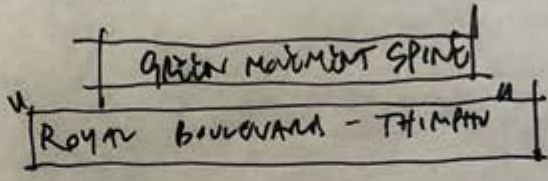


Figure 14 Public transport and active mobility in Phnom Penh



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# *Appendices*





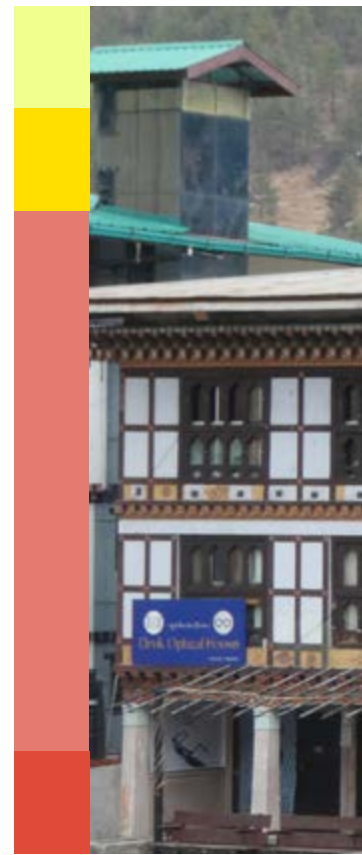


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# 5.1 Issues and Opportunities



## 5.1.1 Introduction

The first steps of Project 1 involved rapid assimilation of the current conditions by the consultant team through review of existing documents prepared by various Government departments across scales. This was summarised into key findings, issues and opportunities that were further revised through site visits and workshop discussions. These are grouped into ten themes outlined opposite.

Issues and opportunities are intended to be high level, more specific approaches that are to be taken forward are collated in the later stages of the report. In particular the objectives in chapter 3 and next steps and priority projects in chapter 4.

1. Population
2. Built Environment
3. Heritage and Culture
4. Housing and Social Infrastructure
5. Economy
6. Governance
7. Natural Environment
8. Transport
9. Geohazards
10. Utilities



Figure 1.1 Thimphu Clock Tower Square





Figure 1.2 Teenagers playing basketball

## 5.1.2 Population

Bhutan has a population of 754,000 according to the 2017 Census, with 23.5% of Bhutan's population living within the Thimphu and Paro Dzongkhags.

The populations however are growing due to rural to urban migration. According to the World Bank, the urbanisation rate of the country has been observed to be 5.7% per year between 2000 and 2010, one of the highest rates across south Asian countries.

As a consequence the population of rural areas within the two Dzongkhags and the predominantly rural Eastern Dzongkhags has decreased. The population theme covers challenges around these trends as well as changing social dynamics.

SUB THEME	KEY FINDINGS
Demographics and Migration	<ul style="list-style-type: none"><li>▪ Bhutan's population is projected to increase by 2047 as per Housing and Population Census Survey conducted in 2017 by the National Statistical Bureau.</li><li>▪ Thimphu Dzongkhag's population is projected to increase unless other strategies are taken:<ul style="list-style-type: none"><li>▪ 81,349 people in 2022.</li><li>▪ 263,152 people in 2047.</li></ul></li><li>▪ Paro Dzongkhag's population is projected to increase unless other strategies are undertaken:<ul style="list-style-type: none"><li>▪ 25,944 people in 2022</li><li>▪ 74,067 people in 2047.</li></ul></li><li>▪ Currently, 40% of the population live in urban areas. By 2047 more than 50% of Bhutan's population are projected to live in urban areas, primarily due to rural migration unless alternative strategies are undertaken.</li><li>▪ Declining and predominantly ageing rural population.</li><li>▪ The fertility rate is declining and below replacement level at 1.7 as per the 2017 census.</li><li>▪ Main reasons for rural migration are better access to employment and education opportunities in urban areas, as well as accompanying family members.</li><li>▪ 33% of Paro Dzongkhag and 23% of Thimphu Dzongkhag residents have never been to school.</li></ul>
Social life	<ul style="list-style-type: none"><li>▪ Families are becoming more nucleated in urban areas, with the average household size reducing to 3.9 persons in 2017 from 4.6 in 2005.</li></ul>



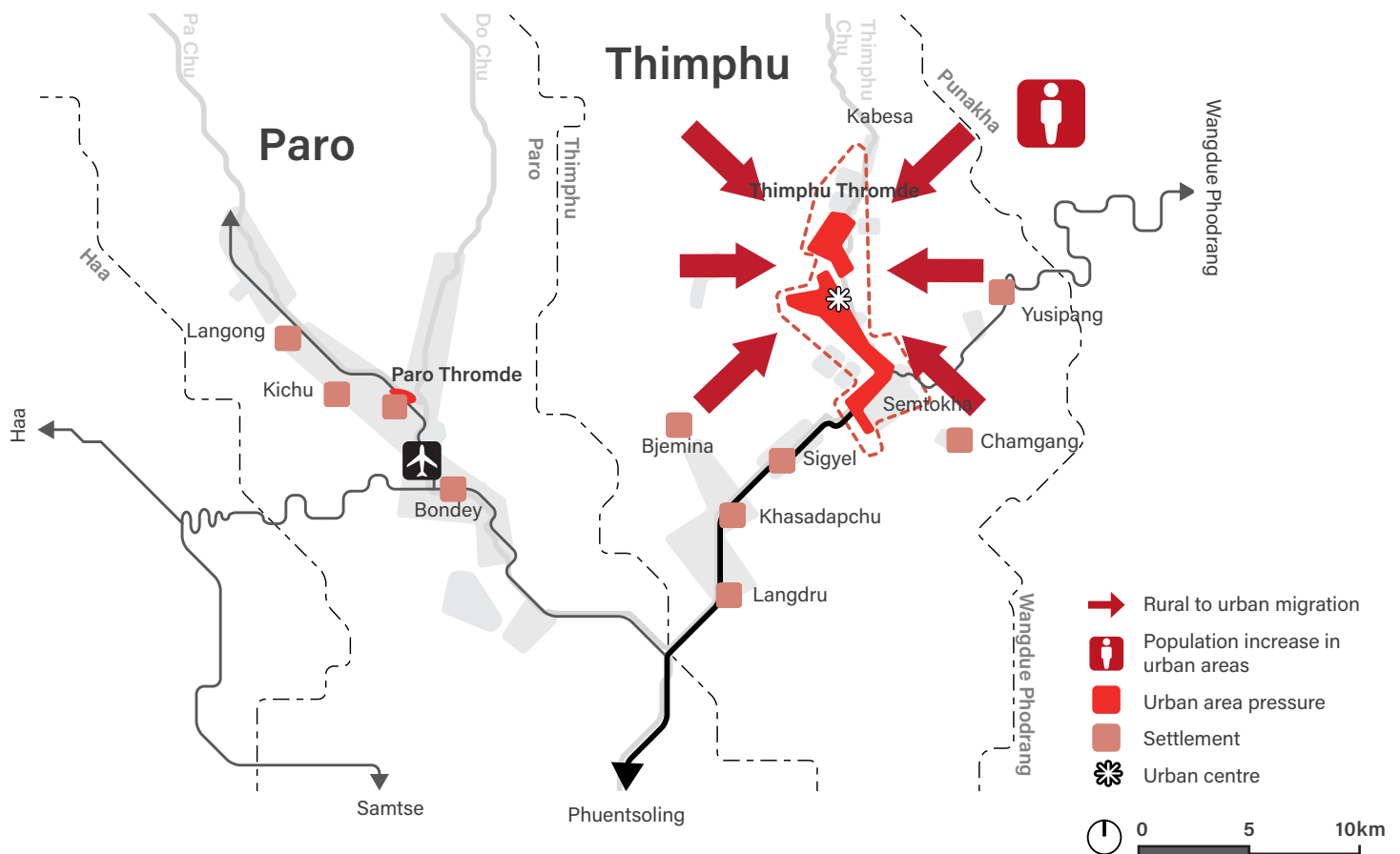


Figure 1.7 Population Issues

## ISSUES

### Demographics and Migration

- Diminishing rural population in eastern regions of Bhutan and Paro and Thimphu Dzongkhags.
- High rate of unemployment for young people.
- A growing population adds development pressure on Thimphu and Paro Dzongkhag's spatially constrained urban areas and is likely to radically alter surrounding cultural landscapes, protected areas and heritage sites.
- Decreasing fertility rates across the whole country.
- Growing proportion of ageing population in rural areas with younger population migrating to the urban centres.
- Population growth distribution has to be carefully balanced against:
  - Protection of heritage and sacred assets, both buildings and landscapes (Dzongs, Lhakhangs)
  - Protection of green and blue infrastructure (forests and river basins)
  - Provision of clean water supply and waste water treatment systems
  - Protection of agricultural areas and cultural landscapes (paddy fields)
  - Access to mass transit
  - Pedestrian access to schools and community facilities
  - Topographic constraints
  - Natural hazards risks

### Social Life

- Existing disparity between urban and rural happiness as per GNH analysis.
- The conviviality of life in villages and Bhutanese ways of life is being lost through urbanisation.
- The significance of cultural and spiritual elements is being lost.
- Bhutanese cities are losing the Buddhist character.

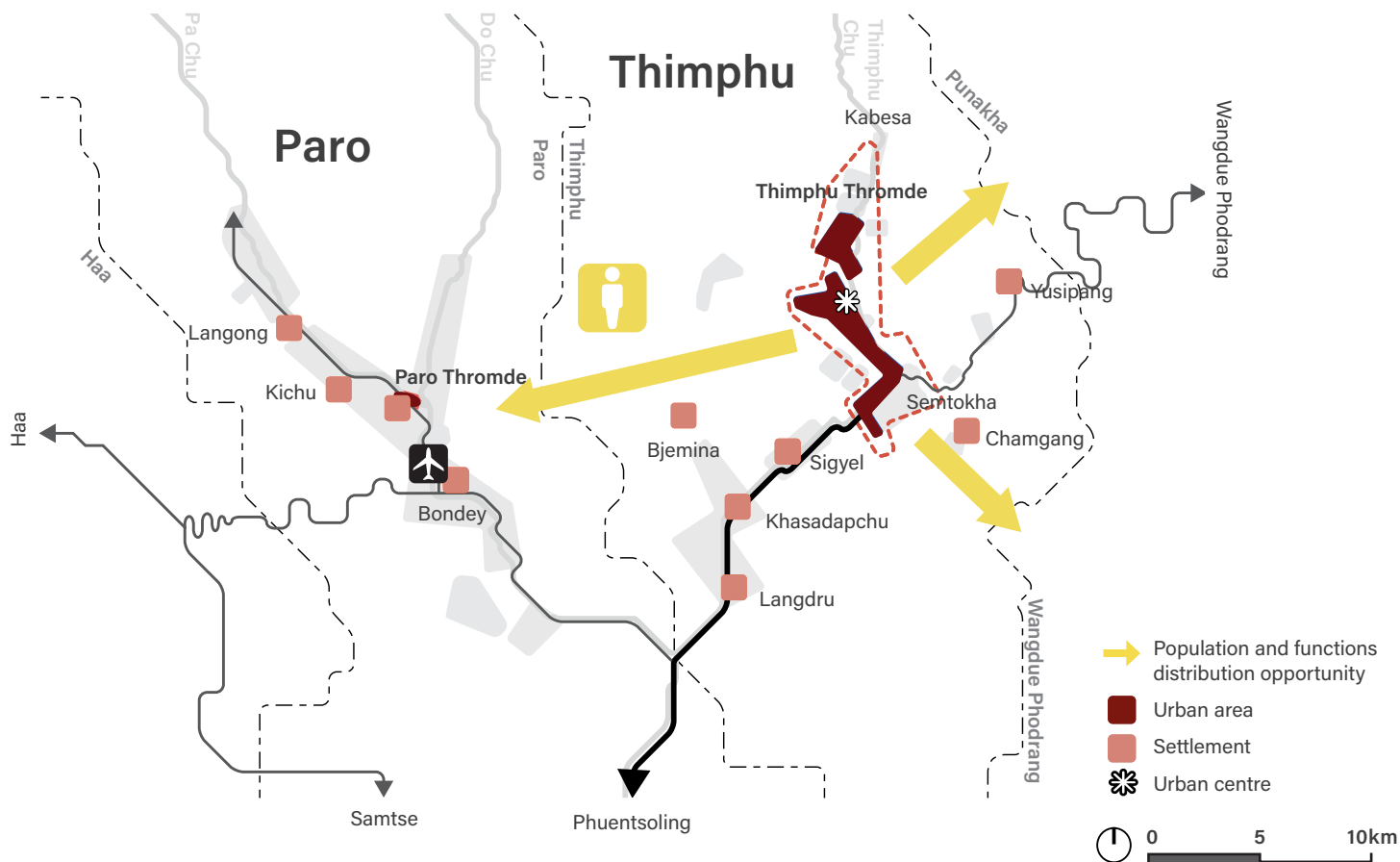


Figure 1.8 Population Opportunities

## OPPORTUNITIES

### Demographics and Migration

- Slow the growth of Thimphu Thromde by distributing functions to other towns/districts including Paro Thromde.
- Revisit existing building regulations to facilitate high density development in Thimphu Thromde and regeneration areas in Paro Valley, while preserving more open and community spaces.
- Accommodate part of the immigrating population growth in the Paro Dzongkhag to alleviate pressure from Thimphu.
- Identify areas in Paro Dzongkhag such as Bondey suitable for regeneration and the creation of new centres with higher densities, rather than the current pattern of sprawl.
- Create employment and economic advancement opportunities for young people in rural areas across the two Dzongkhags such as Kabesa or Bjemina.
- Improve access to social infrastructure such as health and education for both rural and urban residents.

### Social Life

- Explore new models of living, like co-housing, multi-generational housing, live work and collaborative forms of home ownership.
- Protect and promote unique Bhutanese cultural and spiritual facilities in both urban and rural areas.
- In collaboration with local residents, design and develop the physical communal infrastructure to support the traditional rich Bhutanese social life in urban and rural areas.





Figure 1.9 Paro Town



## 5.1.3 Built Environment

The built environment theme refers to settlement patterns including the distinction between urban and rural areas. It also explores character and sense of place through exploration of building typology, construction methods and the network of public realm and public spaces that connect.

Finally, the theme considers land use patterns and planning to create neighbourhoods that support good quality of life.

SUB THEME	KEY FINDINGS
Built form	<ul style="list-style-type: none"><li>▪ The built form of Thimphu is shaped by the tight valley, expanding linearly north and south. The city consists of a central core with many historic and cultural sites including areas characterised as traditional villages surrounded by more contemporary construction.</li><li>▪ Paro is characterised by the broad valley with distinctive agricultural landscapes although the presence of Paro International Airport and connections to Thimphu is resulting in rapid urbanisation.</li><li>▪ The Lhakhangs, Chhortens, agricultural fields and natural environment play an important role in shaping the structure of such settlements. Settlement patterns are heirarchical with Lhakhangs often occupying the topmost location and the agricultural fields on the lowest flat elevation.</li></ul>
Building typology and construction	<ul style="list-style-type: none"><li>▪ Protections exist for designated heritage structures, heritage precincts and traditional villages. However, many typical traditional vernacular buildings are being replaced by contemporary apartment blocks.</li><li>▪ Construction has to comply with building standards which include minimum room sizes, however there is limited ability to enforce if construction does not comply.</li><li>▪ Contemporary construction can lack space and/or facilities to support Bhutanese cultural and social life and the buildings are not energy efficient. However, there is preference among many young Bhutanese to live in contemporary buildings.</li></ul>
Land uses	<ul style="list-style-type: none"><li>▪ The Thimphu Structure Plan proposed two urban hubs and 14 neighbourhood nodes to focus the delivery of infrastructure and deliver higher densities. Most of these are unimplemented with land set aside lost and developed for other uses.</li><li>▪ The Paro Valley Development Plan splits the valley into a cultural landscape zone and a built environment zone. Development is encouraged along a north south urban spine that will create and connect pockets of medium to high density development hubs or neighborhood nodes along its way.</li><li>▪ A land pooling tool is used to secure up to 30% of the land area from individual land owners to deliver services including infrastructure and neighbourhood nodes.</li><li>▪ Land in urban areas is characterised as registered (owned by private or public sector), unregistered (forest areas, streams, roads, paths etc) and pooled (to be used for infrastructure).</li></ul>
Public realm	<ul style="list-style-type: none"><li>▪ Public realm including streets and open spaces is minimal and disjointed.</li></ul>



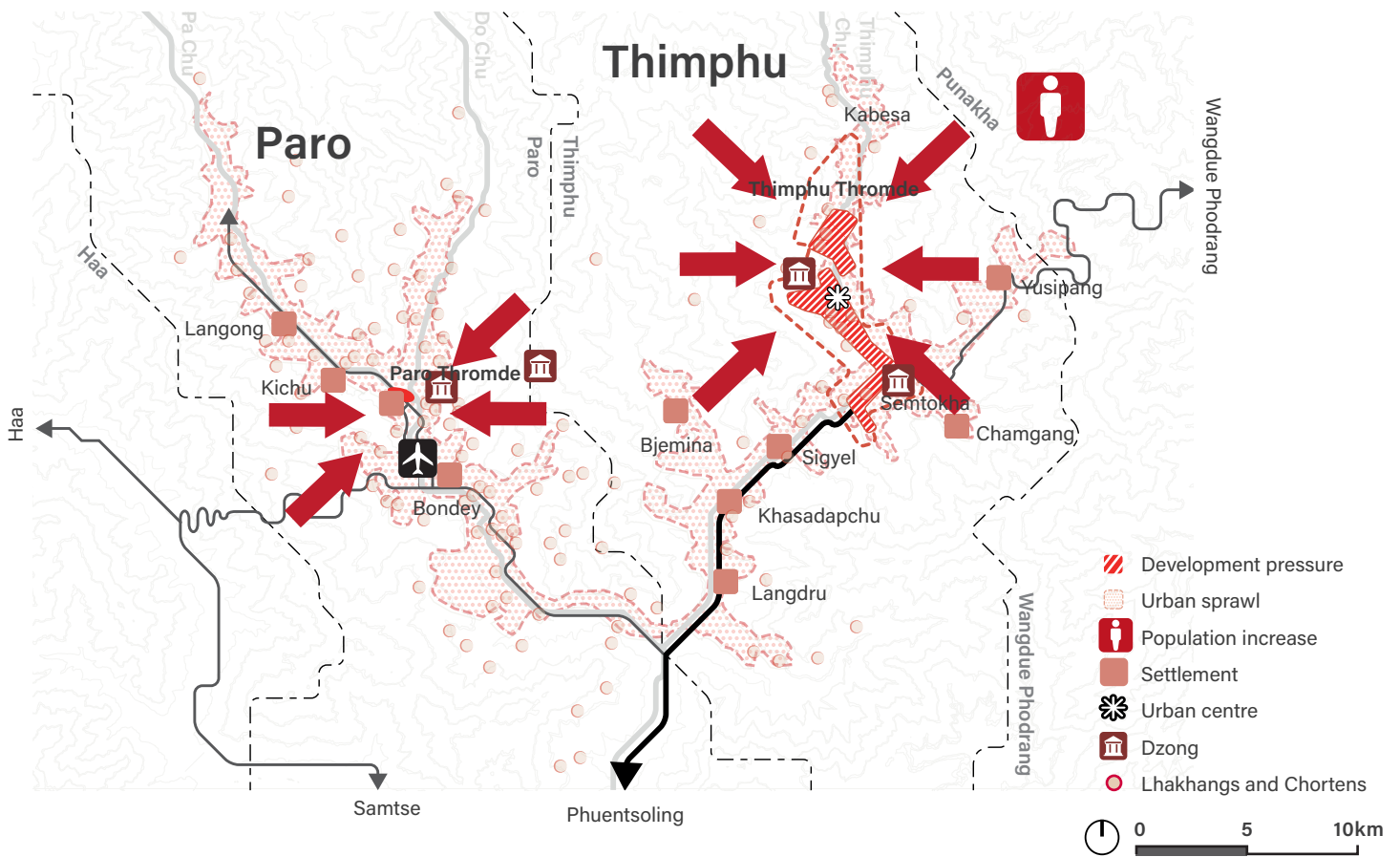


Figure 1.10 Built Environment Issues

## ISSUES

### Built form

- Rapid urban sprawl in Thimphu and Paro which is disruptive to natural systems, results in loss of habitat and agricultural land and can be detrimental to spiritual and heritage features including traditional villages.

### Building typology and construction

- Contemporary construction can be detrimental to local character and buildings are both less energy efficient and more vulnerable to natural disasters due to poor seismic design.
- There is limited capacity to enforce illegal or inappropriate development due to lack of human resources, capital and confusion over roles and responsibilities.
- Limited capacity to protect heritage structures in private ownership or to protect from neighbouring development.

### Land uses

- There is a rapid conversion of buildings from residential to other uses.
- Lack of land use planning has resulted in uneven distribution of services and undesirable collocation of services resulting in pollution and degradation of environments.
- The current land pooling process is ineffective. The approach resulted in failure to implement the majority of neighbourhood nodes with most land captured used to deliver infrastructure.
- Land pooling can be hard to coordinate between the large number of land owners and different agencies and authorities.

### Public realm

- Incidents of human wildlife conflict are increasing.
- Public realm is fragmented with limited space for pedestrians and cyclists.
- Proliferation of boundary walls restricts opportunities for social integration.

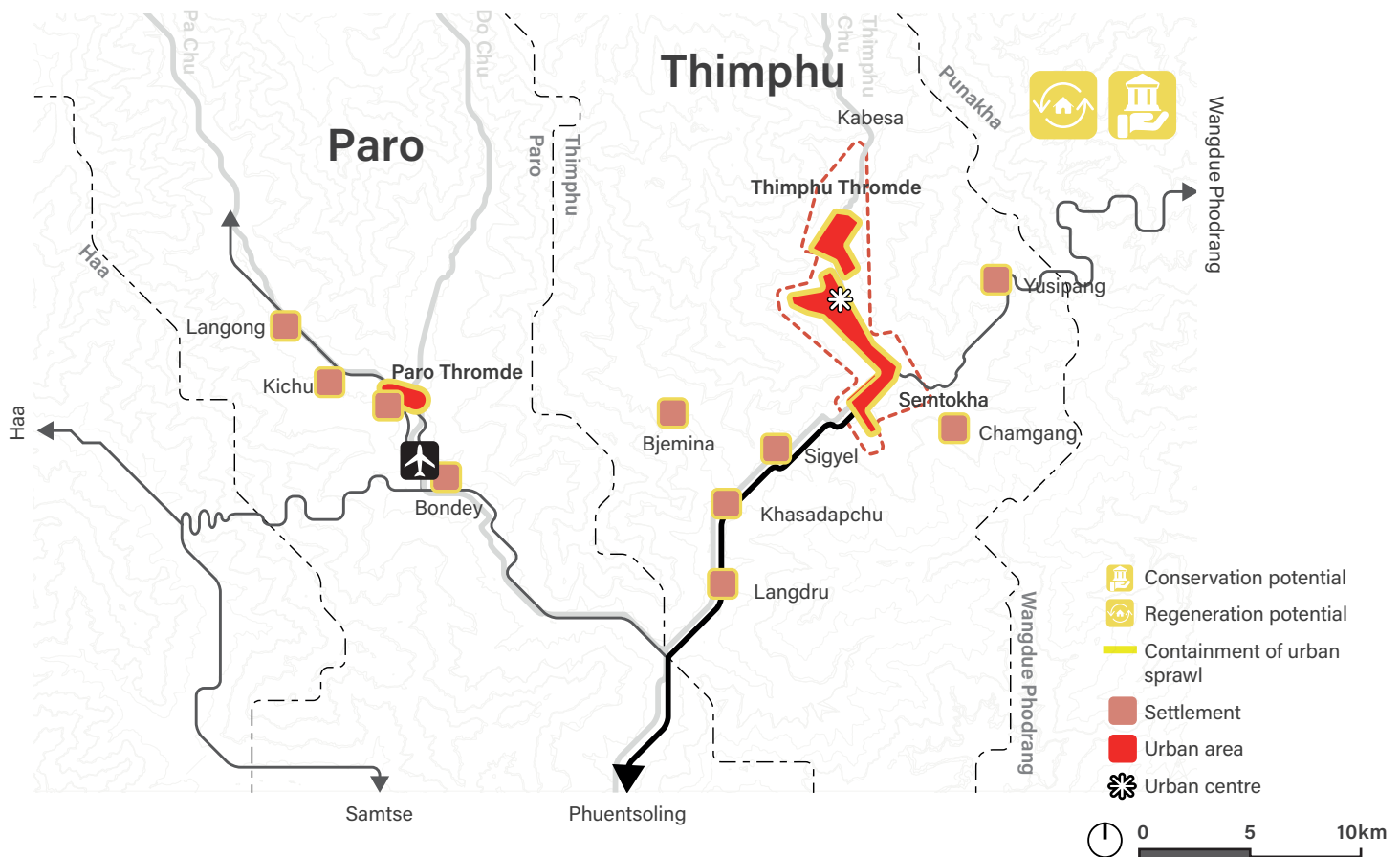


Figure 1.11 Built Environment Opportunities

## OPPORTUNITIES

### Built form

- Effective land use planning across the region that clearly defines well served and connected development clusters as well as clearly defined preservation zones will improve the balance between urban and rural and protection vs development.
- Identify potential regeneration of sites at higher densities and urban infill, including plots of Government owned land within Thimphu such as land belonging to the Armed Forces.

### Building typology and construction

- Facilitate the green building economy with sustainable traditional and emerging building techniques and material re-use. This could be an area of focus for Khasadapchu.
- Retrofit traditional and contemporary construction to be resilient to geohazards and improve energy efficiency.

### Land uses

- Support placemaking, protection and enhancement of local character by designing and implementing urban villages and neighbourhood nodes that provide a consistent level of access to food, health, education, spiritual spaces, open space, mass transit, and respond to local need and their unique characteristics.
- Reassess the land pooling process to better achieve desired outcomes and coordinate with land owners.
- Continue to build on the COVID-19 pandemic responses in which markets and sources of food were decentralised increasing accessibility from urban neighbourhoods. This releases Thimphu's central market site for redevelopment.

### Public realm

- Design new and protect existing open spaces and public realm across the two regions in ways that foster conviviality and connectivity.





Figure 1.12 Tashichhoe Dzong showing features of traditional buildings

## 5.1.4 Heritage and Culture

Bhutan is one of the richest countries in the world in terms of tangible and intangible heritage, with many of the most significant sites falling within the Thimphu Paro valley. Heritage sites include religious and governance structures, traditional buildings as settlement patterns and their surrounding cultural landscapes. Natural elements

such as rivers or forests are also considered sacred according to the Buddhist faith.

The heritage and culture theme considers protection mechanisms, building types and settlement patterns as well as intangible heritage.

SUB THEME	KEY FINDINGS
Protection	<ul style="list-style-type: none"> <li>▪ The Thimphu Structure Plan establishes an inventory of heritage structures and classifies them according to type of importance (historic, socio-cultural, religious, architectural) and level of importance.</li> <li>▪ The Paro Valley Development Plan defines Cultural Landscape Zones comprising of the chhuzhing, places of religious importance and environmentally sensitive areas where development is restricted.</li> </ul>
Building and Settlement Types	<ul style="list-style-type: none"> <li>▪ Dzongs are typically religious, administrative and governance centres for communities. Tashichho Dzong is defined as the most sacred national asset of Bhutan. Lhakhangs or temples are important religious but also social and cultural centres for communities. Chortens are religious monuments and places of gathering and meditation.</li> <li>▪ Thimphu has the highest concentration of heritage structures including Tashichho Dzong (King's office and government offices), Simtokha Dzong, Memorial Chorten, Changangkha Lhakhang and Dechen Phodrang Monastery.</li> <li>▪ Paro maintains areas of paddy fields, heritage sites such as Taktsang Monastery and traditional buildings and settlement types in rural areas and along the Paro Town high street.</li> <li>▪ Thimphu lost traditional built form character through new development. Paro has preserved areas of traditional built form and settlements but it is now under development pressure from private land owners.</li> <li>▪ Newer buildings use imported materials and non-traditional construction techniques and only maintain traditional facade elements such as decoration and window frames.</li> <li>▪ Settlement patterns historically reflect the traditional uses of space by communities and family units. Cultural and religious buildings are located at the highest points of settlements. Vernacular buildings includes spaces for livestock on the ground floor, living spaces for a family unit on the upper floor as well as storage areas for cattle fodder on the attic (referred to as "shambarnang" in Dzongkha language)</li> <li>▪ Traditional village clusters are surrounded by organic patterns of paddy fields, now defined as cultural landscapes.</li> </ul>
Intangible Heritage	<ul style="list-style-type: none"> <li>▪ Intangible heritage such as traditional songs, dances and etiquette define the Bhutanese identity.</li> </ul>
Settlement patterns	<ul style="list-style-type: none"> <li>▪ Settlement patterns reflect the traditional uses of space by communities and family units.</li> <li>▪ Cultural and religious buildings are located at the highest points of settlements.</li> <li>▪ Dzongs host both the religious and administrative centre of communities.</li> <li>▪ Village clusters are surrounded by organic patterns of man made paddy fields.</li> <li>▪ A traditional building includes spaces for livestock on the ground floor, living spaces for a family unit on the upper floor as well as shelter for crops under the roofscape.</li> <li>▪ Religious structures define and protect the perimeter of Thimphu Thromde. Tashichho Dzong is defined as the most sacred national asset of Bhutan.</li> </ul>



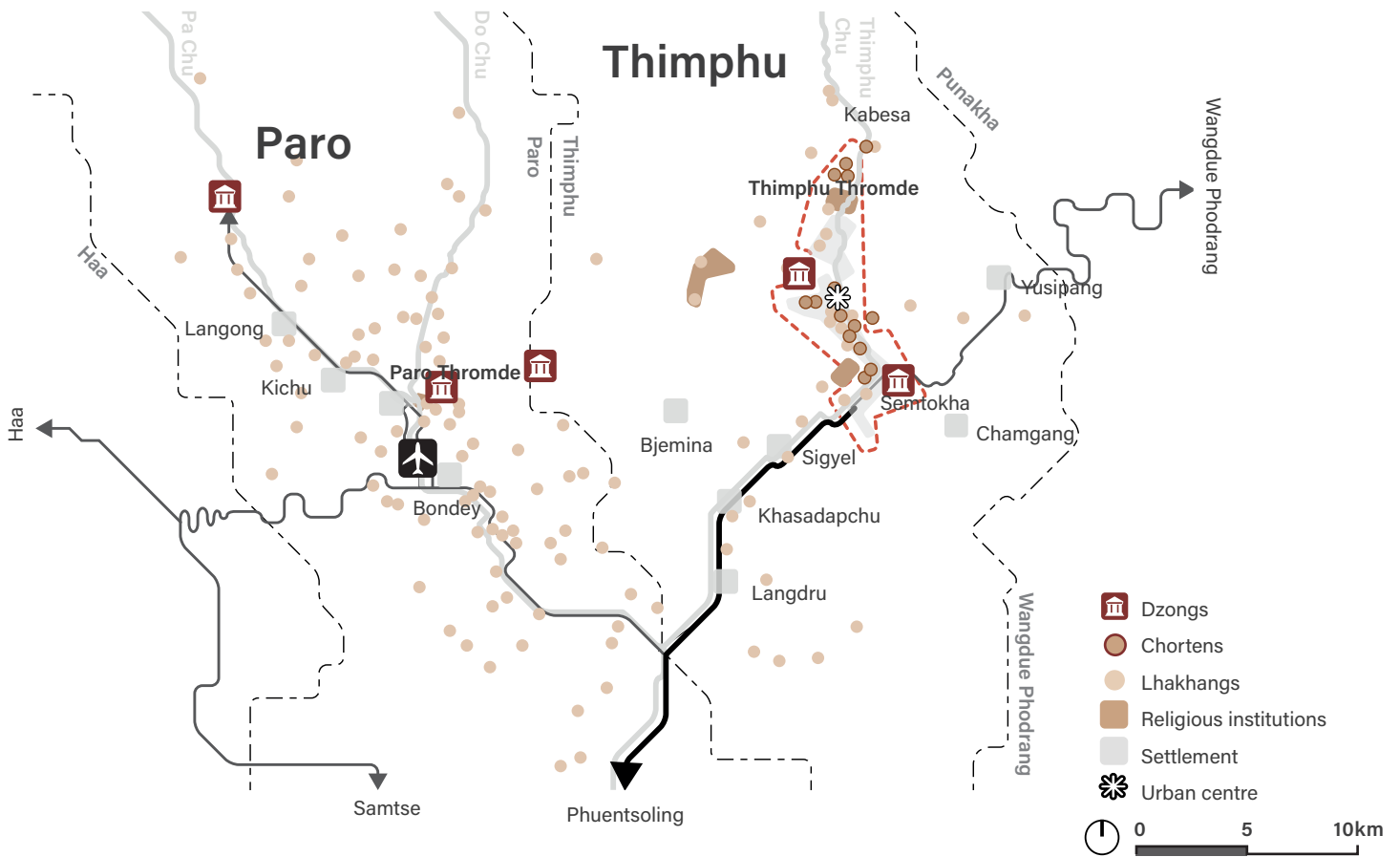


Figure 1.13 Heritage and Culture Issues

## ISSUES

### Protection

- Existing protection plans have not been implemented.
- Complex decision making and lack of accountability for heritage conservation.
- Increasing demand for built development over paddy fields agricultural areas.
- Low income farmers bear the cost of cultural landscape preservation without receiving significant economic benefits.
- Limited incentives available for conservation and heritage renovation efforts.
- Uncontrolled development on private land overshadows significant heritage structures.
- Lack of guidelines or regulations to preserve traditional villages buildings and surrounding paddy fields.

### Building Type

- Modern construction techniques and materials impact traditional settlements and cultural landscapes.
- Urbanisation and high density construction is done at the cost of losing traditional buildings.
- Few good examples of contemporary Bhutanese architecture.
- Limited availability of traditional building skills.
- New neighbourhoods not reflective of Bhutanese and Buddhist culture.

### Settlement Type

- New neighbourhoods lack opportunities for communal experiences.

### Land Uses

- Young people are less interested in heritage including traditional song, dance and Zorig Chusum (13 arts and crafts).

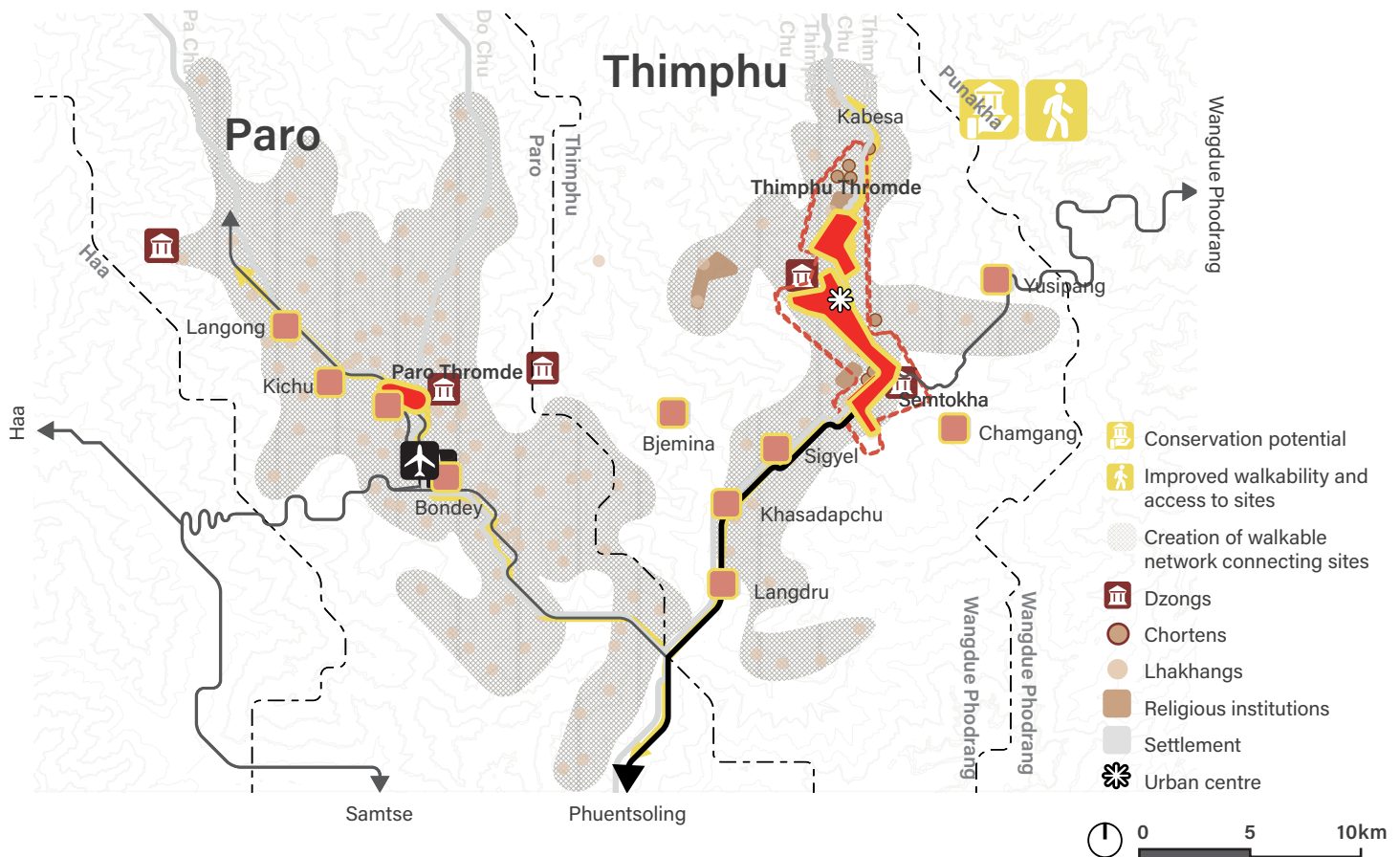


Figure 1.14 Heritage and Culture Opportunities

## OPPORTUNITIES

### Protection

- Develop and refine conservation areas and buffers across the region through the planning process.
- Explore the optimal protection area for Paro's paddy field cultural landscape considering its value in relation to the agriculture and tourism industries.
- Define clear limits to Thimphu and Paro Thromde's urban growth through a 'Green Belt' type designation.
- Devise appropriate measures allowing the conversion of agricultural land in a balanced manner in key locations.
- Incentivise those involved in the protection of agricultural land by offering alternatives such as land swap or transfer of development rights.
- Create heritage management plans for important heritage.
- Understand and seek UNESCO World Heritage Site designation where appropriate.

### Building Type

- New buildings to respond to spatial and landscape context.
- New buildings to reflect site requirements and local heritage.

### Settlement Type

- Design new and existing open spaces and public realm in ways that foster conviviality.

### Land uses

- Integrate heritage structures into the neighbourhood nodes to serve as communal facilities and places of interaction supporting community vitality.
- Provide multi-use open space that can be used for cultural expression.
- Develop a third sector of heritage tourism such as agritourism and spiritual tourism to support the sectors.





Figure 1.15 Contemporary building

## 5.1.5 Housing and Social Infrastructure

The housing theme explores quality of life within the Thimphu Paro Region. This includes housing provision and delivery models. The theme also explores challenges around housing affordability. Social infrastructure addresses other uses required to support daily life including education and health.

SUB THEME	KEY FINDINGS
Housing Provision and Affordability	<ul style="list-style-type: none"><li>▪ In Thimphu Thromde around 80% of dwellings are rental and only 19% are owner-occupied.</li><li>▪ The mean household size of Thimphu Thromde is 4.3.</li><li>▪ The median household income for Thimphu Thromde is BTN 22,000, with a median monthly rent of BTN 8,000.</li><li>▪ Housing is primarily delivered by the private sector, on a plot by plot basis by individual developers with short term financial gain motivation.</li><li>▪ Rent can be as much as half average monthly household incomes. It is a particular burden on young people, economic migrants and domestic workers.</li><li>▪ The National Housing Development Corporation Limited (NHDCL) is mandated to provide and maintain affordable housing to all as per the National Housing Policy. Provision of affordable housing is currently focused on Government workers and provided they meet certain criteria is then provided on a first come first serve basis. However, there are small programmes in place to deliver further homes. Limited affordable housing is available for young people.</li></ul>
Social Infrastructure	<ul style="list-style-type: none"><li>▪ The Comprehensive National Development Plan establishes a hierarchy of centres and proposes requirements for social infrastructure. These are proposed in accessible centres aiming to generate social interaction.</li><li>▪ There has been a proliferation of private schools across the region. These are often poorly located.</li><li>▪ In Thimphu Dzongkhag there are 36 schools, 20 government schools and 16 private schools, with 25,000 students. There are five hospitals, three satellite clinics, two BHUs (facilities for observation only and there is no inpatient facility) and two private diagnostic centres. Four new hospitals (ten bedded) are planned in Thimphu Dzongkhag.</li><li>▪ Paro Dzongkhag has 28 schools, nine of which are private, one district hospital, three BHUs, one indigenous unit and 25 out-reach clinics.</li><li>▪ In Paro Dzongkhag projections indicate that one more Lower Secondary School and five neighbourhood commercial centres are needed to serve the future population. There is no plan for any new health facility.</li></ul>
Settlement Pattern	<ul style="list-style-type: none"><li>▪ The Thimphu Structure Plan proposed two urban hubs and 14 neighbourhood nodes to focus infrastructure delivery and build higher densities. Most of these are unimplemented with land set aside lost or developed for other uses.</li><li>▪ A land pooling tool is used to secure up to 30% of the land area from individual land owners to deliver services including infrastructure and neighbourhood nodes.</li><li>▪ Land in urban areas is characterised as registered vacant (owned by private or public sector), unregistered vacant (forest areas, streams, roads, paths etc) and pooled (to be used for infrastructure).</li></ul>



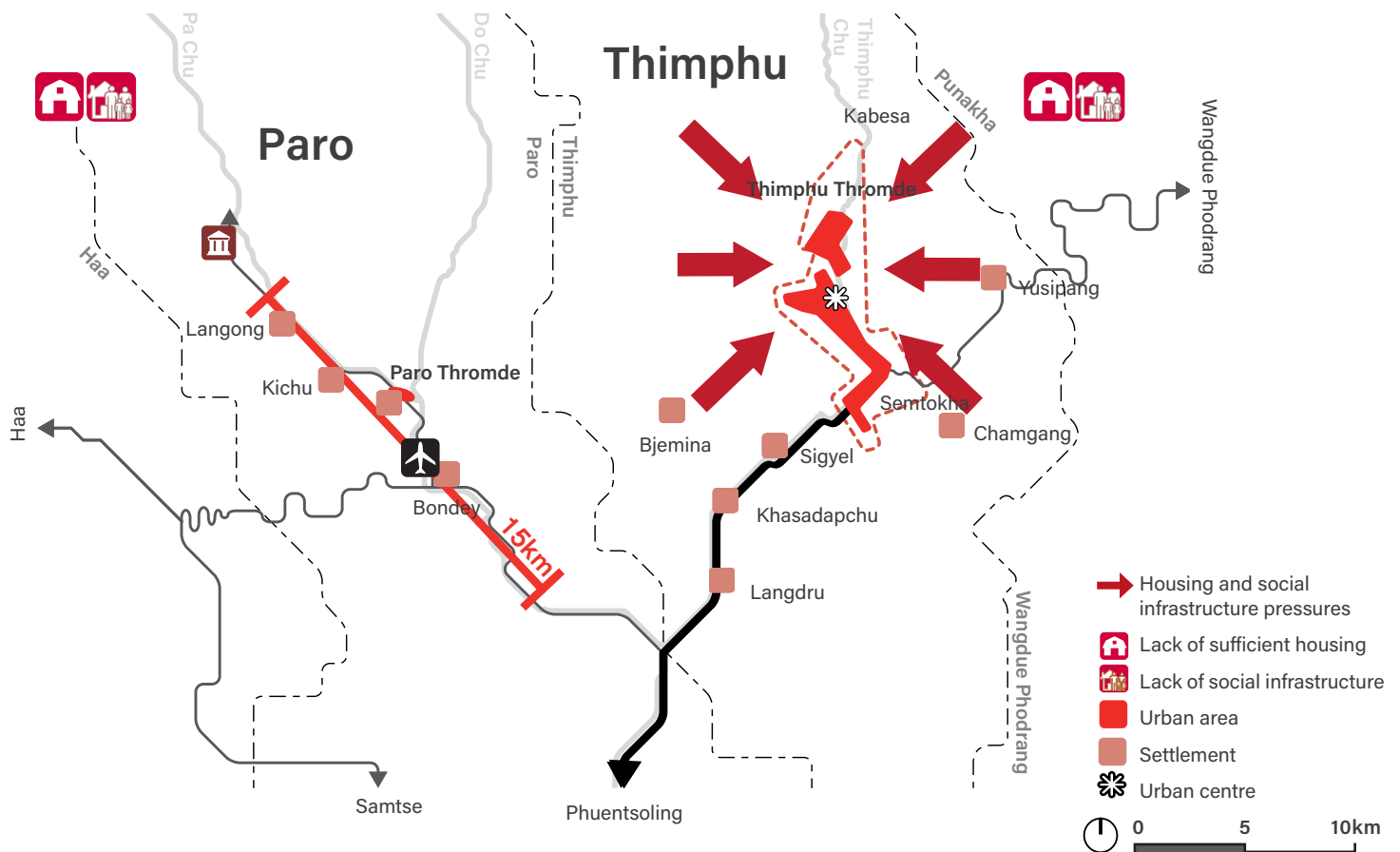


Figure 1.16 Housing and Social Infrastructure Issues

## ISSUES

### Housing Provision and Affordability

- Housing market is driven by private developers. These tend to be led by the individual with limited potential for economies of scale.
- Complex land ownership patterns make coordination difficult.
- Homes can be overcrowded, particularly in rural areas which results in a lack of privacy and preference to relocate to urban areas.
- Land and building owners prioritise economic returns and this combined with shortage of homes and high lending rates (7.98% and above) for housing loans results in high rents which can be a particular burden for young people.
- Unclear process for financing and regulating affordable housing.
- Land speculation, conversion of residential units to other uses and vacant and/ or underdeveloped land further restricts availability.

### Social Infrastructure

- Health facilities are not adequate for the ever growing population of Thimphu resulting in long wait times.
- Only one veterinary hospital within the Thimphu Thromde which faces a lot of pressure due to high demand.
- Schools in Thimphu face increased rates of student admissions.
- School facilities need quality and accessibility improvements.
- Poor location of private schools placing pressure on transport and resources.
- Poor and unequal provision of community facilities and outdoor spaces including play spaces.

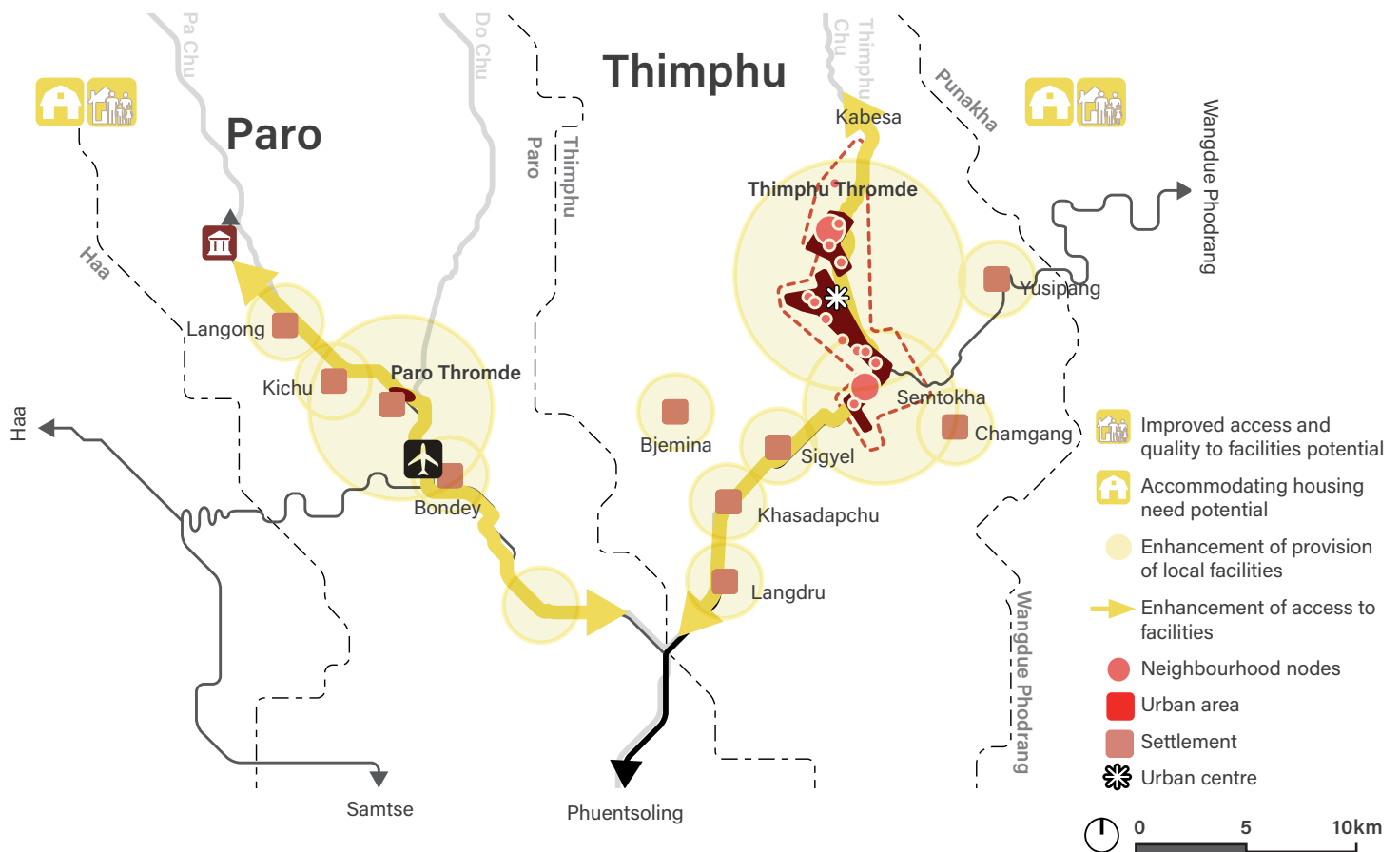


Figure 1.17 Housing and Social Infrastructure Opportunities

## OPPORTUNITIES

### Housing Provision and Affordability

- Varied models of living/housing types and tenures, including multigenerational housing, clustered housing, co living and homes for elderly.
- Explore the impact of the 2019 revision to the Tourism Rules and Regulations in terms of the amount of accommodation that has been freed up for other local uses.
- Government support through the transfer of development rights, flexible zoning and provision of enabling infrastructure.
- Financial institutions support through the adoption of fiscal measures such as low interest rates to private house builders.
- Diversify approaches to the delivery of affordable housing including incentives for the private sector and the development of a not for profit.
- Large quantities of public land within Thimphu Thromde with the potential for redevelopment to increase mixed income housing provision.

### Social Infrastructure

- Model social infrastructure requirements according to population and distance to better understand requirements.
- Promote flexible design of social infrastructure so it can adapt according to demand.
- Provision of more primary schools at neighbourhoods to improve walkability to these facilities in Thimphu.
- Explore how to bring the vitality and conviviality of Bhutanese village life to urban centres.





Figure 1.18 Paddy fields



## 5.1.6 Economy

Economic growth, diversification and productive employment are required to achieve the national aspiration of becoming a high-income economy by 2030.

A clear and time bound economic development strategy will need to be developed for the Thimphu and Paro Region, that is aligned and supports the next national Five Year Plan (13th) and beyond.

The strategy should balance the rural and urban economy – enhancing livelihoods, retaining and attracting talent, whilst protecting the environment and promoting Bhutan’s unique culture and qualities. The national context is provided before analysis of the issues and opportunities related to the Thimphu and Paro Region.

SUB THEME	KEY FINDINGS
National Context	<ul style="list-style-type: none"><li>Over the last two decades there has been a steep decline in poverty levels from 32% to 8%.</li><li>Accordingly, there has been sustained growth in per capita income .</li><li>Covid-19 and delays to major hydro-projects have led to a recent deceleration of growth rates.</li><li>Bhutan is classed as a 'least developed country' (LDC) according to the UN and targeted graduation from the category of LDC in 2023. This has now been postponed as a result of Covid-19.</li><li>Graduating from an LDC means that Bhutan would lose access to some level of external grants and concessional finance, meaning alternative sources of funding and finance will be required – most likely from internal revenue (tax) and the private sector.</li><li>There is a national aspiration for Bhutan to become a 'high income' economy based on the World Bank definition and to achieve GDP of \$10bn by 2030 (currently \$2.5bn).</li><li>It is currently a 'lower-middle income' economy and would need to move through the status of 'upper-middle-income' economy to reach the highest level of a 'high income' economy, where a Gross National Income (GNI) per capita of +\$12,536 is achieved.</li><li>The current tax base is low and reform is needed.</li><li>Out of the many reforms that are underway, the implementation of the GST Act 2020, is the most important reform and is expected to boost sales tax revenue by 69%.</li><li>Property tax in the Thromdes is levied based on the 1992 urban taxation policy at BTN 0.25/sqft for residential and BTN0.50/sqft for commercial property in class A Thromdes). This should be updated to a value-based system.</li></ul>
Key Risks at a National Level	<ul style="list-style-type: none"><li>Youth unemployment is high at 16% with new entrants coming into the market.</li><li>Low participation rates for women.</li><li>Asymmetry between share of employment and GDP per sector.</li><li>Under-utilised power sector (hydro).</li><li>Rapid economic growth will damage the environment and natural/ heritage assets.</li></ul>



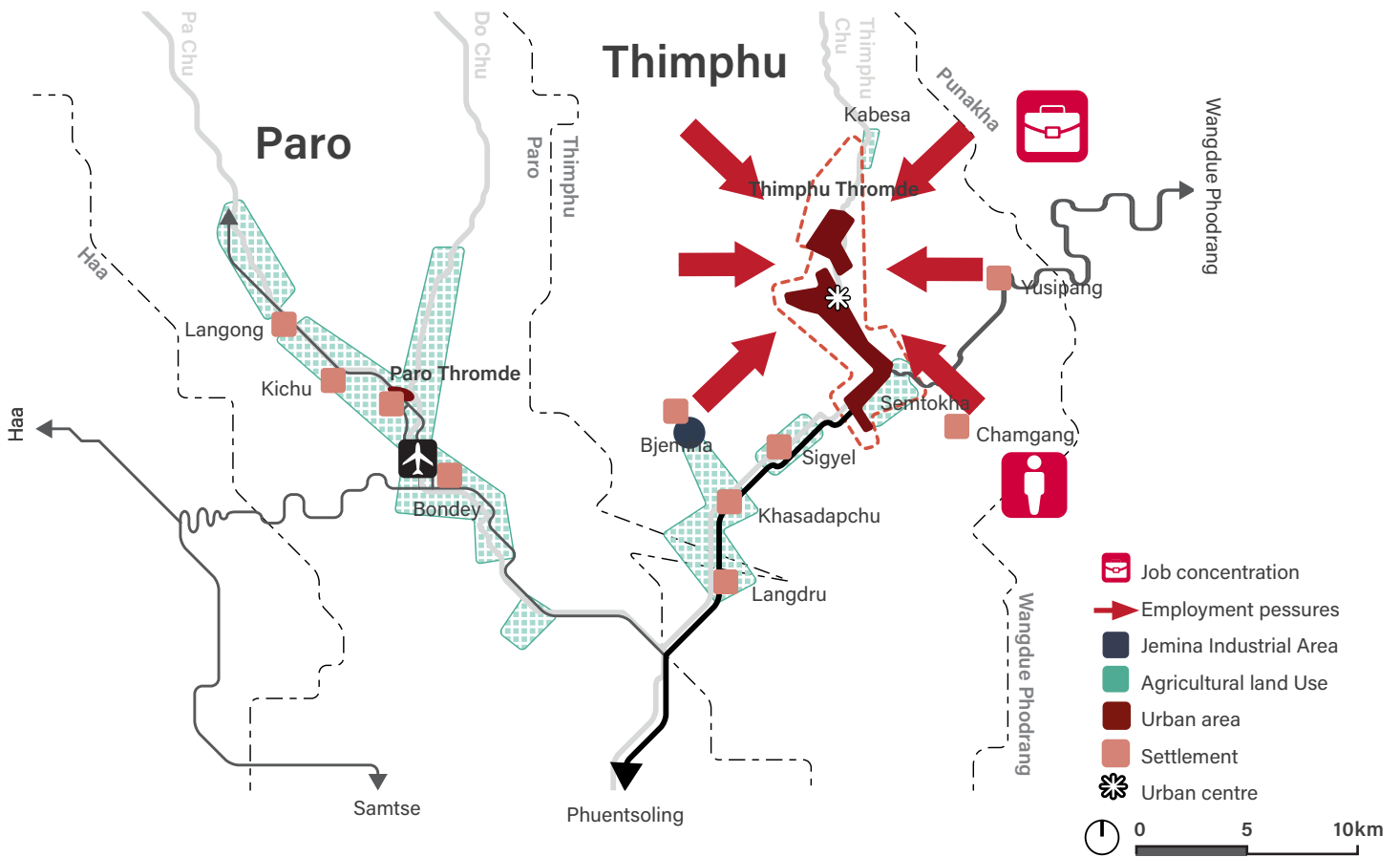


Figure 1.19 Economy Infrastructure Issues

## ISSUES

### Services

- At a national level the service sector accounts for 42% of GDP and 35% of labour.
- In Thimphu, the services sector employs 70% of the labour market, with public administration/ security accounting for the largest component (34%), followed by wholesale/ retail trade (15%) and hospitality (10%).
- In Paro, the services sector employs 51% of the labour market, with public administration/ security accounting for the largest component (25%), followed by hospitality (20%) and wholesale/ retail trade (13%).
- High value low volume tourism is being eroded by the influx of regional tourists.
- The tourism market is also limited by seasonality, regional imbalance and a lack of diverse products and offerings.
- Limited financial services sector, with less than 2% working in finance/ insurance within Thimphu or Paro.

### Industry

- At a national level the industrial sector accounts for 41% of GDP and 12% of labour.
- In Thimphu, the industrial sector employs 25% of the labour market, with construction accounting for the largest component (63%).
- In Paro, the industrial sector employs 19% of the labour market, with construction accounting for the largest component (79%).
- Seasonal peaks and troughs for production of energy from hydro and limited/ no storage capacity in the grid.
- Import of kerosene.
- Reliance on foreign low skilled construction workers.
- Reliance on imported materials and machinery for construction.
- Manufacturing dominated by Cottage & Small Industries.
- Low value exports.

### Agriculture

- At a national level the agriculture sector accounts for 17% of GDP and 54% of labour.
- In Thimphu, the agricultural sector employs 5% of the labour market.
- In Paro, the agricultural sector employs 30% of the labour market.
- Reliance on imported produce – meat (60%), rice (50%), cereals (30%), vegetables (15%).
- Low value exports with limited processing.
- Import of chemical fertilizers is still widespread.
- Land fragmentation and ownership has historically restricted large-scale commercial agri-business.
- Water scarcity in some areas due to constrained supply capacity, despite abundant resources.

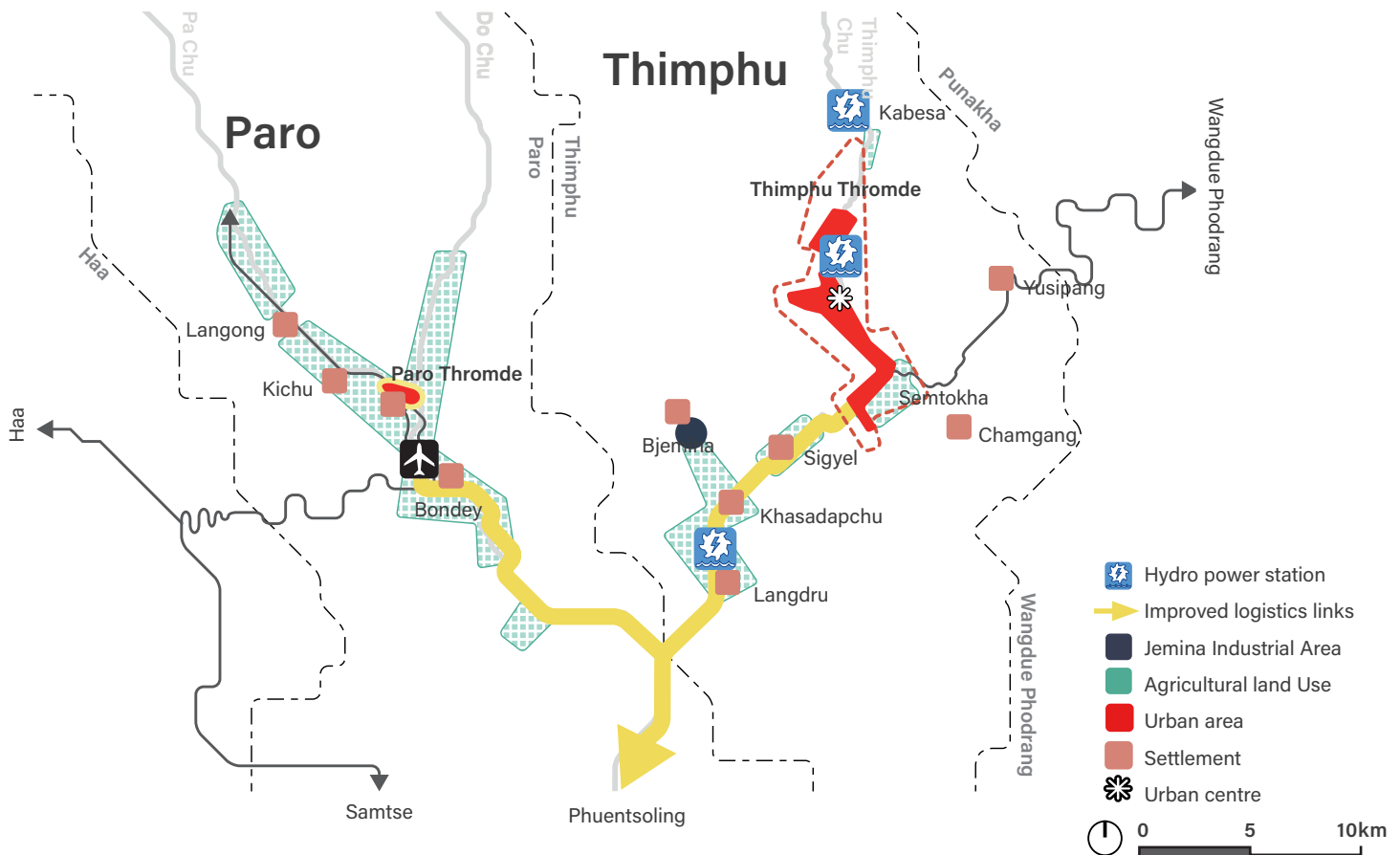


Figure 1.20 Economy Opportunities

## OPPORTUNITIES

### Services

- Leverage the significant investment in basic education and new entrants to the job market.
- Diversification of tourism products and offerings/ events for example, shorter treks, trail running and mountain biking.
- Data and IT – improved telecoms and tech, including 5G across both Dzongkhags.
- Financial services sector, potentially expanding Thimphu Tech Park at Babesa.
- Knowledge sector.
- Attract international talent for example through links to the new Centre of Bhutan and GNH Studies and Tech Park.

### Industry

- Value additive manufacturing and production.
- High-value exports.
- Local materials and skills – green building economy including improvements to energy efficiency
- Recycling and the circular economy, with better processing at existing and future waste sites.

### Agriculture

- Achieve national aspiration to establish and maintain a fully organic agricultural system.
- Create high-value organic products from agricultural produce including medicinal plants.
- High-value exports.
- Wood based exports and bio-prospecting, potentially based at Khasadapchu.
- Storage and processing, potentially based near Paro Airport.
- Urban agriculture.





Figure 1.21 Paro Dzong

## 5.1.7 Governance

Urban planning and development is relatively new to Bhutan and has been mainly driven by individual initiatives. New regulations aim to provide a planning framework and define a hierarchy of plans.

Governance explores the planning system and challenges involved with implementation including participation, coordination and leadership, roles and responsibilities and enforcement.

SUB THEME	KEY FINDINGS
Participation	<ul style="list-style-type: none"> <li>▪ Voting can only be held where a person owns land and is registered, with the majority remaining registered in their home town or village. This means the number of voters within Thimphu is limited. In the most recent Thimphu Thromde elections 2020, out of a total population of approximately 114,000 people, just 8007 were eligible to vote and 4410 voted.</li> <li>▪ There are seven to ten elected representatives for each Thromde, lines of communication between Government and the population is therefore limited.</li> <li>▪ Engagement with the Plan Making process is most effective for the production of Local Area Plans where a consensus has to be reached for plans to be adopted.</li> </ul>
Coordination and Leadership	<ul style="list-style-type: none"> <li>▪ Bhutan proposes a three tier planning system, at a national, regional and local level.</li> <li>▪ In the absence of specific legislation pertaining to spatial planning, urban planning takes support of Local Government Act, 2009 and the Land Act, 2007.</li> <li>▪ The National Human Settlement Strategy 2017 looks into ensuring an integrated and regionally balanced development and establishes a roadmap for the development of settlements, both rural and urban. The Spatial Planning Standards, 2017 was prepared to guide and set the minimum standards that can be applied to the planning and design of future human settlements. The Spatial Planning Bill sets the overall framework for planning and was submitted in 2019 to the Cabinet for further submission and deliberation in the Parliament.</li> <li>▪ Other relevant regulations are the Bhutan Building Regulation, 2018 and the Land Pooling and Readjustment Regulation, 2018.</li> <li>▪ The Department of Human Settlement under the Ministry of Works and Human Settlement develops policies and strategies, coordinates national and regional plans, audits compliance reviews and provides technical backstopping to government agencies.</li> <li>▪ The National Land Commission is responsible for the overall efficiency and effectiveness of delivering public services related to ownership, security and tenureship of land. This is achieved through activities such as; survey land conveyances, conversion, acquisition, substitution, land exchange, land lease, LUC and issuing of land title certificates.</li> <li>▪ The Royal Commission for Urban Development (RCUD) was established on the 23rd October 2021 as the apex body responsible for urban planning. Among other things, the body is mandated to coordinate across various agencies (including private/corporate entities) and deliver integrated outcomes pertaining to urban development.</li> </ul>
Enforcement	<ul style="list-style-type: none"> <li>▪ Monitoring and enforcement of development plans is conducted by monitoring teams at the Thromde and Dzonghag level. Enforcement can be a challenge due to lack of resources and decisions getting over turned by local representatives and higher level government.</li> </ul>





## ISSUES

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### Participation

- Weak representation of the resident population within Thimphu Thromde.
  - Land pooling and readjustment regulations 2018 requires the consultation and consensus of landowners but, the interests and concerns of the other resident population such as business entities, renters, etc. are not adequately considered.
  - Lack of interest in planning processes and participation in engagement activities, partially due to limited scope to inform or make change.
  - Challenges coordinating various stakeholders including landowners.
- 

### Coordination and Leadership

- The land tax system has not evolved since 1992, with rates based on area not value resulting in inequalities and a restriction in potential income streams.
  - Small numbers of elected officials.
  - Poor coordination and information sharing between departments and agencies including different ICT data management systems.
  - Lack of digitised data, especially between the stretch of Thimphu & Paro and Paro Dzongkhag in its entirety.
  - Progress and funding reports of agencies are not produced or shared publicly.
  - Overlapping roles and responsibilities within agencies lead to unclear decision making process and duplication of efforts. Different sectors within the Dzongkhag and the Thromdes have mandates that are sometimes not clearly defined or duplicated.
  - In absence of a long term planning and integrated developmental approaches, the infrastructure developments are carried out in an ad hoc basis and in silos resulting in the duplication and wastage of resources.
- 

### Enforcement

- Insufficient capacity to effectively monitor and enforce. Systems/ fines are in place but there is a lack of staff to review.
  - Enforcement decisions can be overturned by pressure from local representatives.
-

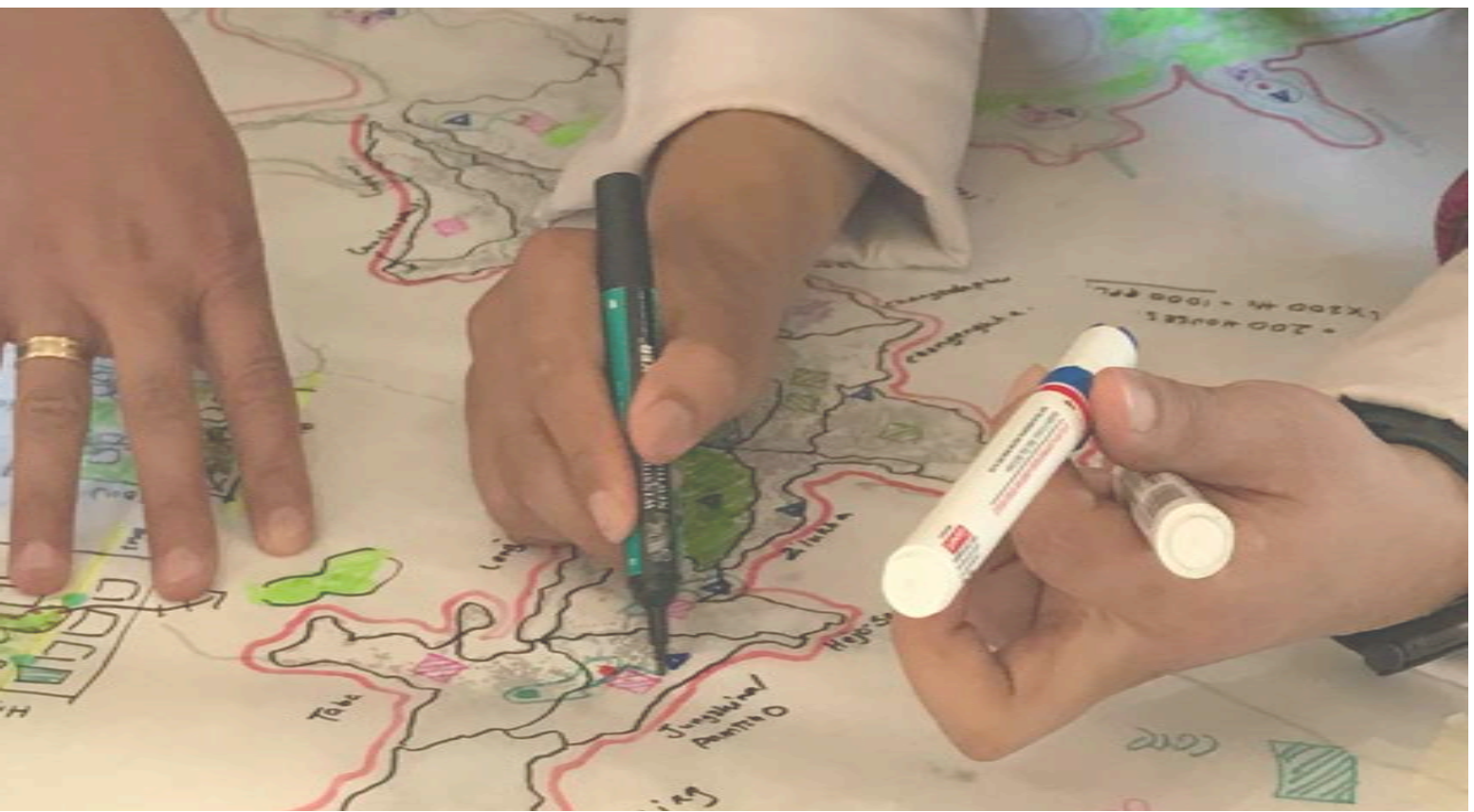


Figure 1.22 Workshops

## OPPORTUNITIES

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### Participation

- Reconsideration of approach to voting to increase participation.
  - Right to information through open data and fact sharing (e.g. plans) open to the public.
  - Digital services to enhance the process and collaboration between agencies.
  - Start of a trend towards greater interest and engagement with politics, planning and decision making.
- 

### Coordination and Leadership

- The Royal Commission as a tool for cross agency dialogue and decision making, to facilitate and coordinate / align various activities to the overarching national goal.
  - Implementation of a value based land taxation system to increase income.
  - Increase the autonomy of the Thromde's with regard to HR and financing.
  - The Royal Civil Services Commission has begun streamlining with Organisational Development exercises and consolidating certain roles but there is scope to improve efficiency of the process to improve its effectiveness.
  - Establishment, enhancement and funding of a dedicated programme for addressing skills shortages at all levels.
- 

### Enforcement

- Adequate financing and resourcing of enforcement teams.
  - Implement stricter consequences if failing to comply with local plans and regulations including loss of power, financing, and removal of labour permits.
-



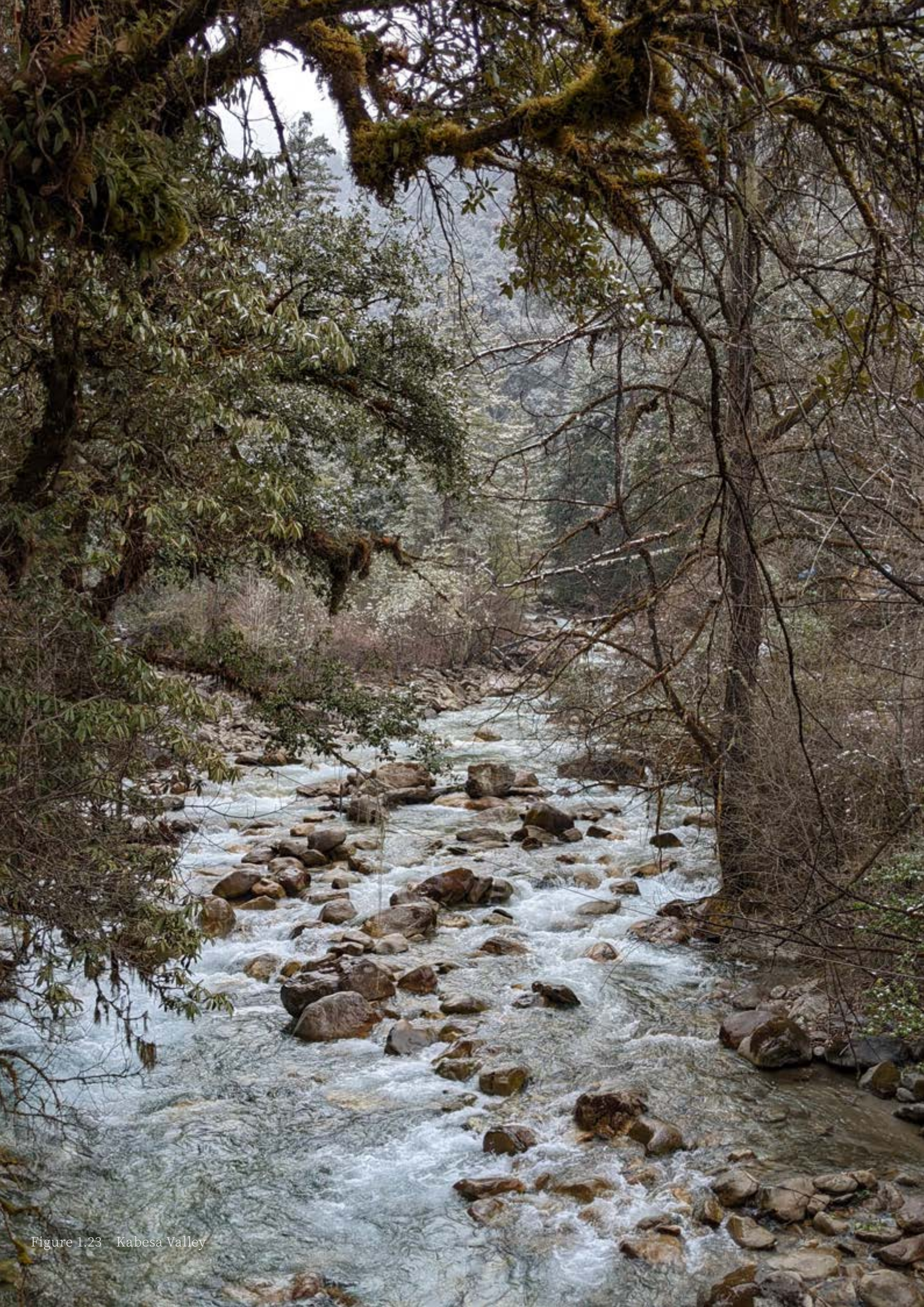


Figure 1.23 Kabesa Valley



## 5.1.8 Natural Environment

The natural environment including forest, rivers and streams play an essential part of Bhutanese culture. However, rapid urbanisation is resulting in negative impacts. This theme explores green and blue infrastructure and landscapes, biodiversity, carbon emissions and air pollution.

SUB THEME	KEY FINDINGS
Green and Blue Infrastructure	<ul style="list-style-type: none"><li>• The National Environment Commission is responsible for regular monitoring of river and stream quality.</li><li>• Rivers and streams are considered sacred landscapes however urban development is resulting in degradation.</li><li>• The Bhutanese constitution states forest cover should not drop below 60%, and is currently at 71%. Protected areas at present cover 51% of the country, which only includes forests.</li><li>• Other protected areas in the region include paddy fields/ protected agricultural landscapes and community forests.</li><li>• The original Thimphu Structure Plan sought to secure green infrastructure and open spaces within neighbourhood nodes.</li><li>• However given the challenges faced by the country, provision of green infrastructure is a low priority with few resources allocated.</li><li>• Forest, rivers and streams have religious and spiritual significance. However this connection is weakening, in part due to changing educational practices.</li></ul>
Biodiversity	<ul style="list-style-type: none"><li>• Rapid urbanisation is resulting in habitat loss and declining biodiversity.</li><li>• The National Environment Commission is responsible for monitoring. However mapping and management initiatives are undertaken by the Ministry of Agriculture and Forests.</li></ul>
Carbon Emissions and Air Pollution	<ul style="list-style-type: none"><li>• The country's forests currently sequester 9.5 million tonnes of carbon. Emissions are currently at 4.5million tones and increasing. At the current rates the country will cease to be carbon neutral by 2050.</li><li>• The Country has committed to remain carbon negative and is focusing on transport, human settlement, industry and agriculture.</li><li>• The biggest contributing sectors towards emissions include human settlement, industry, agriculture and livestock.</li><li>• The only monitoring of air quality is conducted in Thimphu. This shows that air pollution is worsening but the data may be inadequate to make accurate assessments.</li><li>• Air quality is still mostly within National Standards but PM2.5 levels can be poor in winter due to dust, car emissions, lack of rain and forest fires.</li></ul>



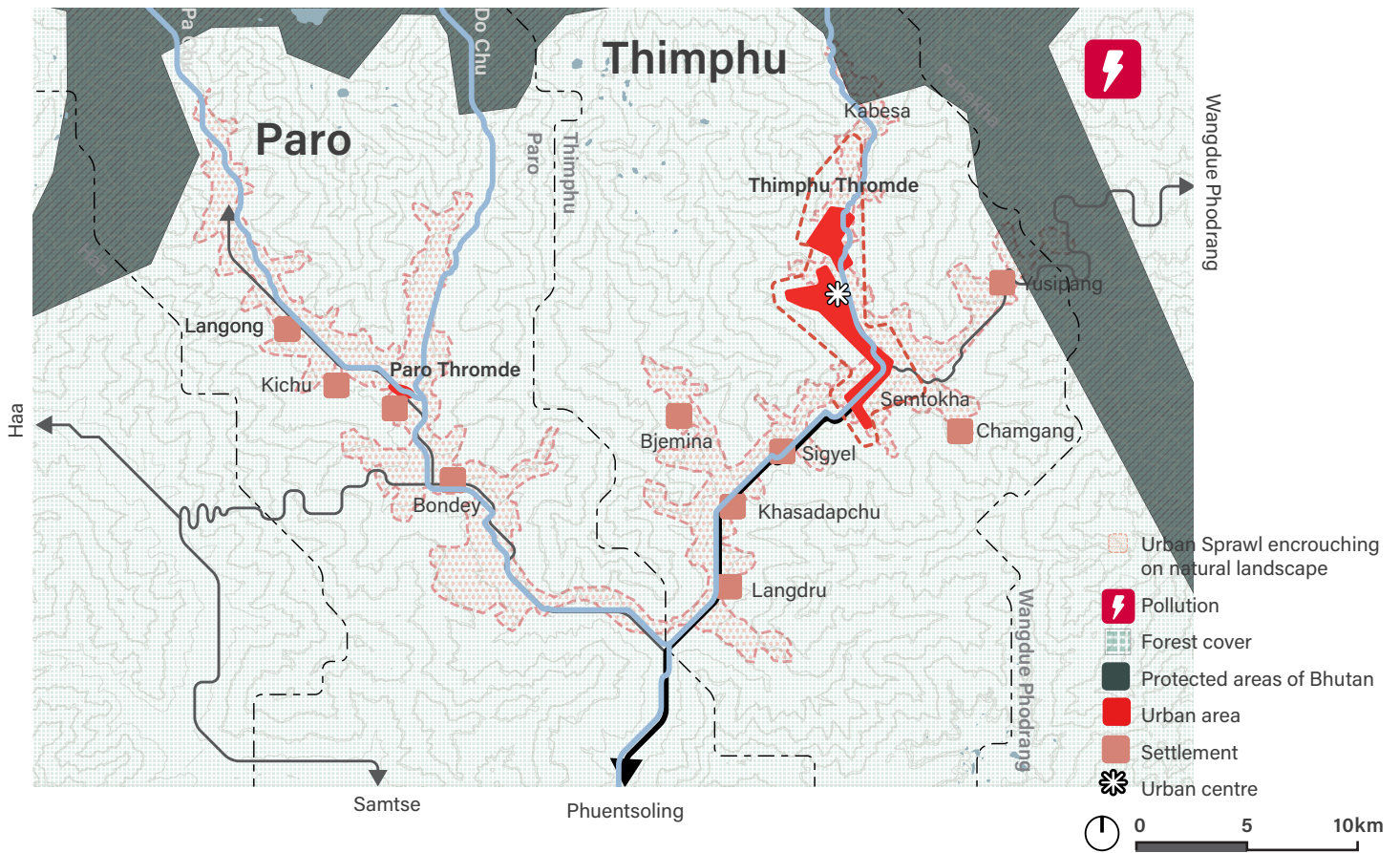


Figure 1.24 Natural Environment Issues

## ISSUES

### Green and Blue Infrastructure

- Green open space in urban environments is decreasing.
- Forest cover, wetland habitats and agricultural landscapes are being lost to urban sprawl.
- There is limited guidance to encourage and inform how to implement novel forms of urban greening such as green roofs.
- The water quality of rivers and streams adjacent to human settlements and industrial land uses such as the Thimphu automobile workshop is decreasing.
- Buffers were proposed along the banks of rivers and streams but have not been well implemented.
- There has been an increase in impermeable surfaces.

### Biodiversity

- Increased instances of human wildlife conflict.
- Urban sprawl and unsustainable management practices resulting in habitat loss.
- There is limited green biodiverse spaces within urban areas and neighbourhoods.

### Carbon Emissions and Air Pollution

- Carbon emissions are increasing within urban environments. This is due to transport, energy use, increasing consumption and the contemporary construction industry.
- Rise in private car ownership, particularly older models is increasing air pollution.
- Poor construction practices and pavement materials generate dust.

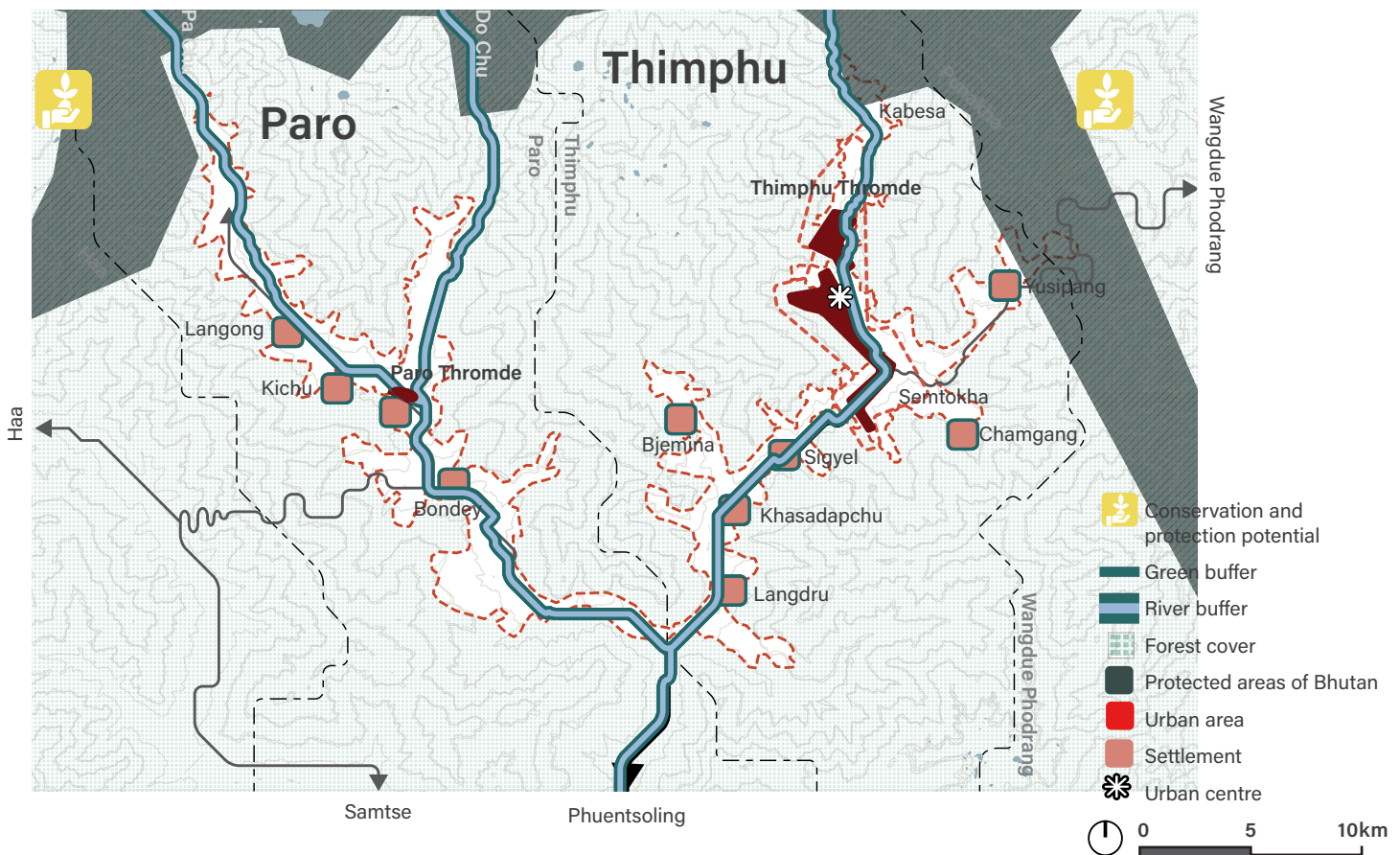


Figure 1.25 Natural Environment Opportunities

## OPPORTUNITIES

### Green and Blue Infrastructure

- Reintroducing natural green and blue systems within urban areas.
- Reforestation of degraded areas.
- Expansion of community forest management models to other environments.
- Definition of clear limits to Thimphu and Paro Thromde's urban growth through a 'Green Belt' type designation.
- Incentives to protect environments in private lands.
- Retrofit urban areas with sustainable urban drainage systems.

### Biodiversity

- Prioritising native species in planting schemes to support biodiversity and reduce maintenance requirements.
- Secure waste management practices to reduce instances of wildlife conflict.
- Creating a network of green spaces, particularly along rivers and streams in both Dzongkhags, where a policy of buffers is already in place, and to connect schools, sacred and heritage sites.

### Carbon Emissions and Air Pollution

- Financial incentives to retrofit existing buildings improving energy efficiency.
- Promotion of traditional construction techniques and low carbon contemporary practices such as timber frames.
- Promotion of public transport and active travel to reduce private vehicle usage.





Figure 1.26 Thimphu multi storey car park

## 5.1.9 Transport

Currently the road network is centred along the valleys, with most movement by private vehicles. Achieving sustainable rural and urban development

will require significant improvements to public transport and walking and cycling infrastructure.

SUB THEME	KEY FINDINGS
Connectivity	<ul style="list-style-type: none"> <li>Travel within the region is largely car based at 75%, taxis are 20%, heavy vehicles 2.4%, buses are 0.5%. Cars carried an average of 2.4 people, taxis 3.5, and buses 9.4.</li> <li>Around 6,000 people travel between Paro and Thimphu daily.</li> <li>International tourists arrive at Paro International Airport and travel using services provided by tourism operators. Regional tourists from India and Bangladesh bring their own vehicles.</li> <li>The highway network connects the region to the Haa Province in the west, to the Chukha region and the city of Phuentsholing (and the Indian border) to the south, and with central and eastern regions to the east.</li> <li>Key destinations throughout Thimphu and Paro have good road access with the exception of some heritage sites accessed via hiking trails.</li> <li>The road network generally consists of sealed roads with farm and access road in the peripheral areas. Most of the roads are two lanes with a four-lane express way from Babesa Zero Point to Lungtenzampa main bridge, and from Memorial Chorten to Dechencholing.</li> <li>The difficult terrain, particularly steep slopes, means that road construction and maintenance is costly.</li> <li>Car ownership in Bhutan is growing quickly with increasing incomes.</li> <li>Policies limiting the import of used cars aim to minimise environmental impacts of older vehicles. Less than one percent of vehicles are electric.</li> <li>Road accidents have increased related to the growth in car ownership.</li> <li>There is currently a lack of transport demand, accident, and asset data available on the transport system in the region.</li> </ul>
Parking	<ul style="list-style-type: none"> <li>Public parking is available both on and off street but most people use on street parking which can contribute to traffic congestion.</li> <li>Some informal parking occurs in urban areas, which can affect pedestrian access and amenity. Traffic police aim to regulate this but there is a lack of resource capacity.</li> </ul>
Public Transport	<ul style="list-style-type: none"> <li>Public transport takes the form of buses. Most inter regional services are private but there are some managed by the Government.</li> <li>Thimphu is serviced by the City Bus Service (with 68 vehicles) carrying up to 8,000 passengers a day, and there is no local bus service in Paro.</li> <li>There is currently a lack of infrastructure for buses and for passengers accessing and waiting at bus stops, but there are plans for improvements.</li> <li>With no dedicated on-road space allocation for buses, the bus service can be affected by congestion in centres but still costs less than half of a taxi.</li> <li>A smart card ticketing system for the Thimphu City Bus Service will provide data and simplify the experience.</li> </ul>
Walking and Cycling	<ul style="list-style-type: none"> <li>Generally footpaths are provided on main and secondary roads, and there are some paths through the valleys. The condition, width and connectivity of the footpath network can be poor in places. There has been a lack of investment in walking and cycling infrastructure, which has contributed some challenges.</li> <li>The pedestrianisation of Norzim Lam is proposed.</li> <li>Walking has declined over the past 10 years associated with a rise in car ownership.</li> </ul>
Freight	<ul style="list-style-type: none"> <li>The Phuentsholing – Thimphu Highway connects the region with the southern border to India, and accounts for 40% of the cars and four-wheel-drive vehicles, 55% of the trucks, and 28% of the buses travelling between Bhutan and India each day.</li> <li>Long travel times affect the efficiency of freight both internationally and domestically.</li> </ul>



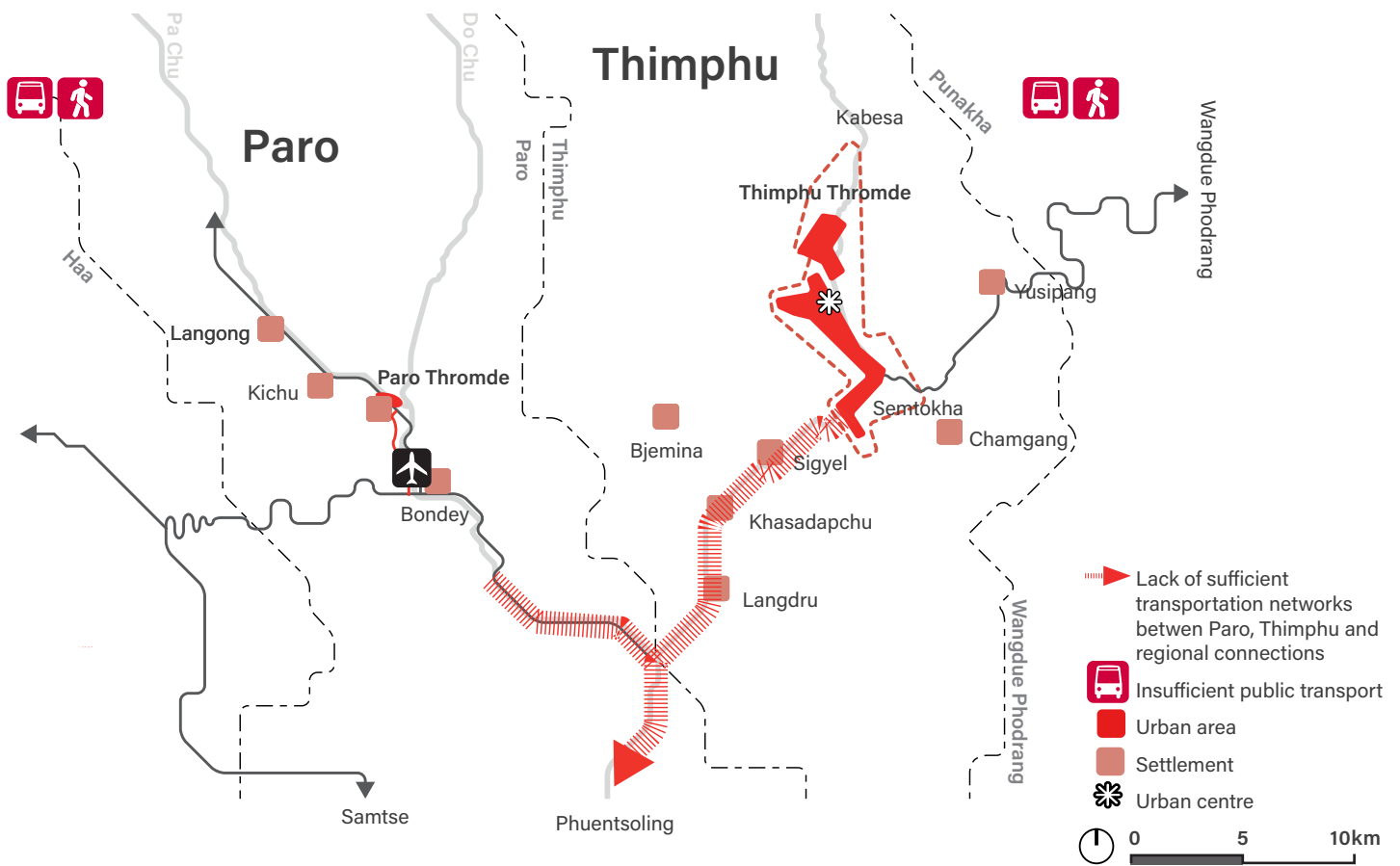


Figure 1.27 Transport Issues

## ISSUES

### Connectivity

- Increasing urban populations and aspirations will grow vehicle ownership increasing congestion and parking issues. Low public transport mode share means that people rely on cars and taxis for travel.
- Increasing tourism demand with international air passengers tripling since 2010. Regional tourists bring their own vehicles contributing to issues.
- People have a lack of knowledge about transport options.
- Hilly terrain leads to longer, indirect routes between towns and cities. Connectivity to other regions, and the border with India is inadequate.
- Development pattern results in a transport network focused on core corridors through valleys, with settlements outside requiring large investment to improve/extend the network.
- Lack of last mile connectivity for people using public transport.
- Limited higher order road network through the region including in the north of valleys.
- Varying quality of road surfaces, particularly all weather roads in rural areas.
- Motor vehicles often have priority over pedestrians.
- Unequal car ownership with low income households far less likely to own a vehicle.
- Very few EVs, despite some Government incentives.
- Congestion in Thimphu, and school pick up in cars causes particular areas of congestion.
- Planning has several stakeholders: Road Safety Authority, Bhutan Police, Thimphu Thromde, they can have overlapping responsibilities and a lack of wider network planning.
- Recent increase in accidents and lack of detailed accident data.
- Lack of transport data and information.



Figure 1.28 Excessive parking and poor pedestrian routes

## ISSUES

### Parking

- Car parking in Thimphu's core contributes to congestion. Some drivers have preference for parking near their destinations, rather than using the multi-storey car parking provided.
- Some informal parking on footpaths affects other road users and street amenity.
- Lack of designated parking other types of vehicles including motorcycles, taxis, and buses.

### Public Transport

- High use of taxi, and low mode share for buses as they take longer.
- Poor perception of buses, that they are unreliable and for people of low economic status.
- Lack of access to bus stops and lack of infrastructure for buses and passengers including bus lanes, bus stops and shelters, bus terminals and parking bays with barriers to implementation.
- Issues with regional service frequency, convenience, passenger information, and comfort.
- Diesel powered fleet contributes to air pollution and carbon emissions.
- Responsibility for the City Bus service changes frequently and lacks resources.

### Walking and Cycling

- Footpaths are narrow/discontinuous and not segregated and are inaccessible for differently able, senior citizens, and other vulnerable people in urban areas.
- Cycling is not used for transport, considered more a leisure activity and lacks infrastructure.
- Hilly terrain, weather conditions, and formal dress can be challenging.
- Informal parking affects footpaths blocking pedestrian space.
- Walking mode share has decreased (Thimphu) from 48% in 2009 to 28% in 2019.

### Freight

- Road freight will continue to increase with population growth and economic development.
- Travel times affect the efficient movement of goods, both internationally and domestically.



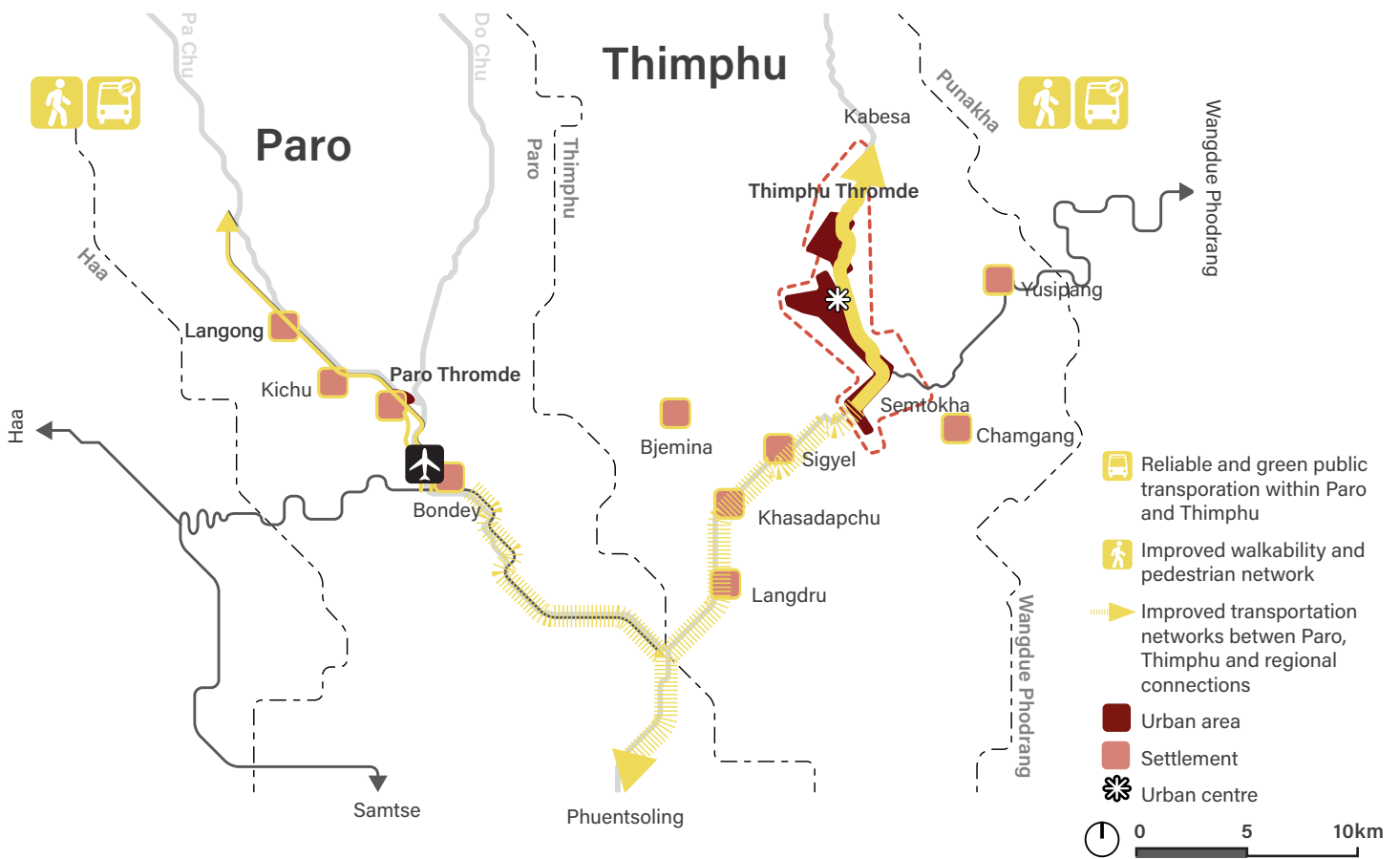


Figure 1.29 Transport Opportunities

## OPPORTUNITIES

### Connectivity

- Alternative travel choices such as quality public transport and shared mobility.
- Increase peak period public transport capacity in Thimphu.
- Provide real time information on public transport services and shared mobility options.
- Plan efficient travel options for international tourists.
- Support work-from-home or work locally opportunities.
- Enhance connectivity and accessibility across the region, and with other regions. Connect current and future settlements, areas and destinations with a quality public transport service and pedestrian network.
- Support shorter, local non motorised trips through co-location of land uses.
- Support last mile connectivity, quality pedestrian infrastructure and potentially shared micro mobility options.
- Investigate alternative connectivity for places inaccessible via roads.
- Plan future coherent road hierarchy (in line with the Roads Act Classifications) across the region and upgrade road network to all-weather road standard.
- Prioritise non-motorised transport and public transport in urban areas.
- Reduce polluting vehicles; this could start with electric vehicles for Government fleets, and continued initiatives and incentives for electric taxis, tourist operator vehicles, private buses and delivery vehicles.
- Locate shared vehicles in neighbourhoods to reduce private car ownership.
- Implement road design standards across the network.
- Collect better accident data to understand cluster locations and causes and target safety projects at accident cluster locations.
- Identify the data collection needs and coordinate collection across agencies and operators.
- Use data to monitor performance of the transport system.
- Intelligent Transport System and options to pilot new transport technologies and innovative systems.

### Parking

- Provide off-street parking at city periphery and encourage/enforce usage.
- Provide dedicated parking and pick up zones for buses and taxis in centres, close to key destinations, and in/near neighbourhood nodes.
- Provide dedicated rest areas and pullover bays for inter-regional travel.
- Tailor development parking requirements to location and available transport options.



Figure 1.30 Four lane highway with crossing

## OPPORTUNITIES

### Public Transport

- Plan a quality and low emissions public transport service (consider light rail, bus rapid transit) connecting key destinations in the region.
- Reduce polluting vehicles; growth of the bus fleet could be with electric buses.
- Enhance public transport experience through shelter, upgraded terminals, travel times, reliability, and ease of planning travel.
- Prioritise public transport on key transport corridors through urban areas where possible.
- Plan and regulate bus services for equitable coverage and minimum service levels.
- Expand bus services such as the school bus network, local bus services in Paro, on-demand services.

### Walking and Cycling

- Prioritise people through pedestrianisation of core centre streets, and prioritise non-motorised transport over vehicles.
- Walking connectivity between educational, cultural and religious sites.
- Identify key walking routes and provide quality pedestrian infrastructure including footpaths and crossings.
- Plan walkable neighbourhoods where people can access local destinations comfortably and safely on foot.
- Ensure new land developments provide appropriate pedestrian infrastructure connecting to the wider network.
- Investigate public e-bicycle sharing scheme and encourage e-bicycle purchases.
- Electric step through mopeds like vespas can address challenges with cycling.

### Freight

- Support efficient freight movements.
- Plan freight terminals that cater to the future needs.
- Provide freight routes in urban areas away from people and general traffic where possible.





Figure 1.31 View of road cutting into slopes

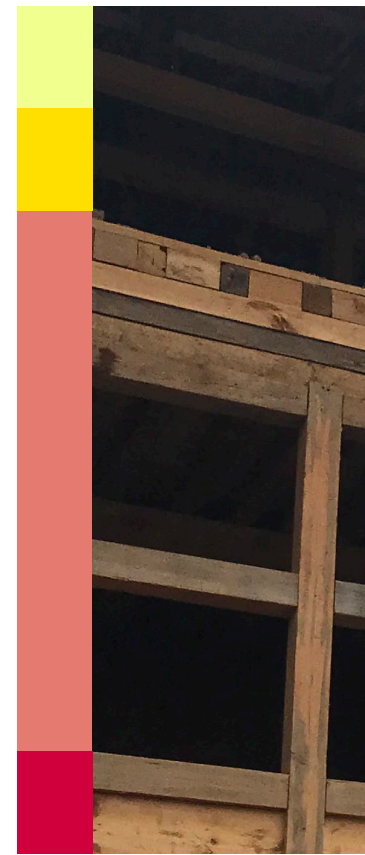
## 5.1.10 Resilience

Resilience relates to hazards including fires, droughts, landslides and seismic events and how to protect urban and rural populations across

Thimphu and Paro from these risks. Rapid rates of urbanisation and modern construction methods have made residents more vulnerable.

SUB THEME	KEY FINDINGS
Problematic Ground Landslides	<ul style="list-style-type: none"> <li>▪ The Department of Disaster Management (DDM) have indicated current planning to develop a Multi-Hazard Risk Information System.</li> <li>▪ Problematic ground can consist of expansive, compressible and/or liquefiable soils. The regional geology presents the potential for soft alluvial materials, saturated sands and weathered rock formations.</li> <li>▪ Currently, the best available engineering geology mapping for both Paro and Thimphu consists of 1:50,000 scale mapping, which is insufficient to detect zones of problematic ground. Further studies are to be completed.</li> <li>▪ Liquefaction prone soils typically consist of saturated sandy and silty soils which may be present, particularly along the watercourses. However, a study of liquefaction potential has not been completed for Paro-Thimphu.</li> <li>▪ The Global Landslide Hazard Map Project Report (2020) classify landslide hazard of Bhutan as high with 640 estimated average annual number of significant rainfall-triggered landslides between 1980 and 2018 and 110 estimated average annual number of significant earthquake-triggered landslides.</li> <li>▪ The assessment of slopes was completed for Paro, as part of the Paro Valley Geotechnical Investigation Report (2015), and for Thimphu as part of the Strategic Environmental Assessment for the TSP (2018). However, both assessment focus solely on the slope angle for determining hazard zones.</li> <li>▪ Landslide hazard is impacted by various other factors e.g. slope curvature, elevation, aspect, overburden type and thickness.</li> <li>▪ An important component for landslide hazard mapping is collection of the landslide inventory, this is ongoing.</li> <li>▪ Human activities are causing or accelerating rockfall and landslides. A common practice noted slope cutting to produce a flat surface causing instability. Whilst restrictions are in place, unregulated development occurs.</li> <li>▪ Reduction in vegetation due to development also reduces the infiltration potential of the soil and can further destabilise soils.</li> </ul>
Seismic	<ul style="list-style-type: none"> <li>▪ The Himalayan Frontal Thrust fault system, which runs along the southern border of the country, poses the greatest source of seismic hazard.</li> <li>▪ Superficial reviews of the seismic hazard have been completed but further studies are required.</li> <li>▪ The existing building codes of Bhutan have adopted the Indian Seismic Zonation (2002), with the peak ground acceleration (PGA) value of 0.36g has been uniformly applied across the entire country of Bhutan. Recent research conducted by Stevens et al. (2020) and Ghione et al. (2021) suggest that the PGA value should be twice the current value for a 10% or 2% probability of exceedance in 50 years.</li> <li>▪ JICA are currently undertaking the SATREPS project for the Evaluation and Mitigation of Seismic Risk for Composite Masonry.</li> </ul>
Flooding	<ul style="list-style-type: none"> <li>▪ Flood Hazard Map has been completed for sections of Pa Chhu, Do Chhu for a return period for 25 years, incorporating 2050 climate change projections. Flood Hazard Maps were also generated for some extent of Thimphu Chhu, and Olarongchu and Chubachu streams. One potentially dangerous glacial lake within the Pa Chhu basin was recorded.</li> </ul>
Forest Fires	<ul style="list-style-type: none"> <li>▪ Data is available for the location of historical fires until 2011.</li> <li>▪ Fire season is classified for the months of November to March, which are typically dry. The causes of forest fires are indicated to be mainly due to human activities and human negligence, transmission lines and transformer boxes in close proximity to forest cover.</li> <li>▪ A two fold increase in forest fires is predicted due to climate change</li> </ul>





## ISSUES

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### Problematic Ground and Landslides

- Lack of hazard mapping of certain geohazards or need to consider other influencing factors and cascading effects.
- Lack of sufficient hazard and risk data for geohazards which limits the ability to make scientific designation of hazard zones – requires robust strategy which relies upon design process to determine risk and mitigation.
- Unclear understanding and mapping of problematic ground and poor enforcement means construction occurs on problematic ground.
- Soil degradation and soil sealing through development.
- Removal of forest cover due to forest fires / human activities.
- Unregulated / excessive development on unstable slopes increasing risk of failure.

### Seismic

- Evidence from recent research that current seismic codes underestimate the current seismic hazard within Paro and Thimphu.

### Flooding

- Development in flood prone areas or areas which may be susceptible to geohazards, where such developments are ad-hoc or unregulated.
- Increased rainfall runoff from developed land and corresponding flooding risk - need for more sustainable solutions (e.g. water harvesting and infiltration).

### Forest Fires

- Main source of fires noted are due to irresponsible human activities and negligence.
  - Faulty transmission lines/boxes in close proximity to tree cover can spark fires.
  - Fire suppression activities result in build-up of natural fuel source.
-



Figure 1.32 JICA Earthquake testing

## OPPORTUNITIES

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### Problematic Ground and Landslides

- Use of observational and anecdotal information to (very high level and unscientific approach)
- Central database of geohazard related data and monitoring.
- Sustainable harvesting of natural resources.
- Implementation strategy of development restrictions to ensure safety of population and natural environment.
- Reforestation in degraded areas.
- Creation/retention of green belt within the development areas.
- Protection of forests in private lands.

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### Seismic

- Review of standards for design, construction and maintenance to promote safe and sustainable practices.

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### Flooding

- Protection of catchment areas and water quality.
- Risk informed planning and development restrictions to protect against development in floodplains.
- Avoid and/or reduce impervious development in floodplains.

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### Forest Fires

- Consideration of the wildland urban interface to protect against the spread of fires.
  - Strategic spatial consideration of utilities, and maintenance strategy for existing utilities, to reduce potential for forest fires.
-





Figure 1.33 Stormwater drainage

## 5.1.11 Utilities

Utilities relates to the various infrastructures and services that support the basic functioning of urban and rural areas and is essential for sustainability. This includes water supply and treatment, power, telecommunications and waste disposal methods.

SUB THEME	KEY FINDINGS
Water	<ul style="list-style-type: none"> <li>▪ Thimphu suffers from open drain waste dumping, and ad-hoc unplanned construction.</li> <li>▪ Greywater discharge to storm drains.</li> <li>▪ Increased paved areas with new development.</li> <li>▪ Paro's stormwater drains in poor condition and lacks proper maintenance. Irrigation channel water mixes with stormwater drains.</li> <li>▪ Surface water runoff in sloped areas. Inadequate design for storm events.</li> <li>▪ In the Thimphu Municipality, 30% of connections receive 24hr supply, 70% receive 3-8 hours per day. Small and scattered areas uncovered and rely on community or private supply. Substandard quality of infrastructure.</li> <li>▪ Significant water loss in the network. Ecoli present at WTPs and reservoirs. Inadequate storage capacity in water tanks.</li> <li>▪ In Paro, Water supply is impacted by low reservoir storage – intermittent supply (12 hour). Disruption in summer season.</li> <li>▪ Water scarcity in higher elevations, such as Dotey and Shaba. Water sources are not enough for the growing population.</li> <li>▪ No uniform act/guideline for water supply, for example, some villages charge Nu.80,000 and some Nu.50,000 to a new resident in the village.</li> <li>▪ In Thimphu, a mix of public sewer network and private septic tanks (in areas beyond reach)</li> <li>▪ Frequent discharge of grey water / overflow from septic tanks to water bodies. STPs under capacity by 2021. The increase in population needs upgrading sewer pipes.</li> <li>▪ As for Paro, sludge and effluent are directly dumped into the environment. No sewer network, or centralised treatment system exist.</li> </ul>
Power	<ul style="list-style-type: none"> <li>▪ In winter, Thimphu experiences more power outages and power quality issues due to overloading of the power system network.</li> <li>▪ The development of Thimphu city is not properly planned, there are no service ducts. This leads to a direct burial method, hard to repair.</li> <li>▪ As for Paro, during Monsoons, the overhead power lines above the road slide down due to unstable slope after excavation on the road.</li> <li>▪ In winter, Paro experiences more power outages and power quality issues due to overloading of the power system network.</li> </ul>
Telecommunications	<ul style="list-style-type: none"> <li>▪ Thimphu faces faults relating to overhead lines, and interference between power and telecoms lines.</li> <li>▪ 5G commercial network launched in the core town areas of Paro, although only few phone models connect to it.</li> </ul>
Waste	<ul style="list-style-type: none"> <li>▪ There is landfill facilities at both Paro and Thimphu although the Thimphu site is now at capacity</li> <li>▪ There are no recycling processing plants within Bhutan.</li> </ul>



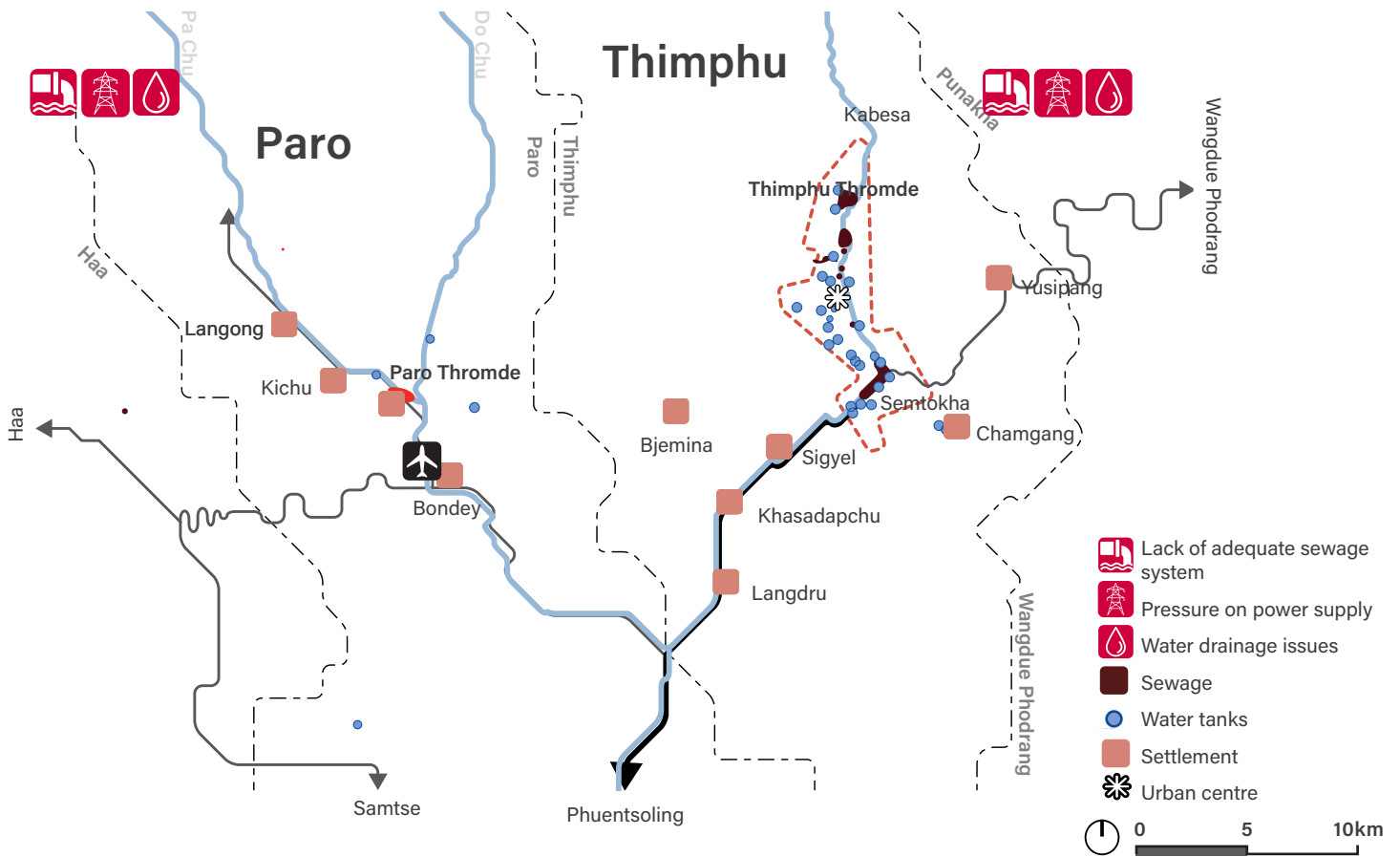


Figure 1.34 Utilities Issues

## ISSUES

### Water

#### Thimphu

- Recent policy (Thimphu Thromde Development Control Regulations, 2016) allows higher hard surface coverage.
- Topography makes water supply difficult. Difficult access to groundwater, high altitude and lower groundwater table level.
- Poor definition of roles /responsibilities in water sector including lack of monitoring.
- Non-functional bulk meter at the reservoir
- Community water supplies are not monitored
- Illegal dumping and poor condition /maintenance of septic tanks
- Space constrains for STP upgrades and issues with training and retaining staff.

#### Paro

- Stormwater drains in poor condition and lacking proper maintenance
- Irrigation channel water mixed with stormwater drains surface water runoff in sloped areas
- Inadequate design for storm events.
- Frequent dumping of solid waste/grey water despite advocacy programmes in place
- Part of Paro is not covered by stormwater network.
- High turbidity affects water treatment capability due to construction works, quarry and mining activity nearby water sources.
- Potential contamination of water due to the landfill.
- Flat topography but limited land availability for waste water management.
- No road access to some areas
- Lack of community awareness on public health risks, lack of capacity of emptying services and lack of monitoring.
- No mapping of wastewater networks existing



Figure 1.35 Thimphu Landfill

## ISSUES

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### Power

- Difficulties upgrading aging infrastructure and investment required to expand system to meet future demand may lead to unaffordable tariffs.
- The generation cost per unit from other renewable sources is much higher than hydro.

### Telecommunications

- High cost to provide optical fibre network.
- Availability of space is limited and it is difficult to get approval to lay fibre.
- Limited coverage and capacity.
- 5G commercial network launched in the core town areas of Paro, although only few models seem to support it.

### Waste

- The Thimphu landfill site is now at capacity.
  - Recycling systems and composting of food waste are ineffective and involve sending recycling to india for processing.
  - There has been a rise in littering.
  - Ineffective waste disposal is resulting in a rise in human animal conflict.
-



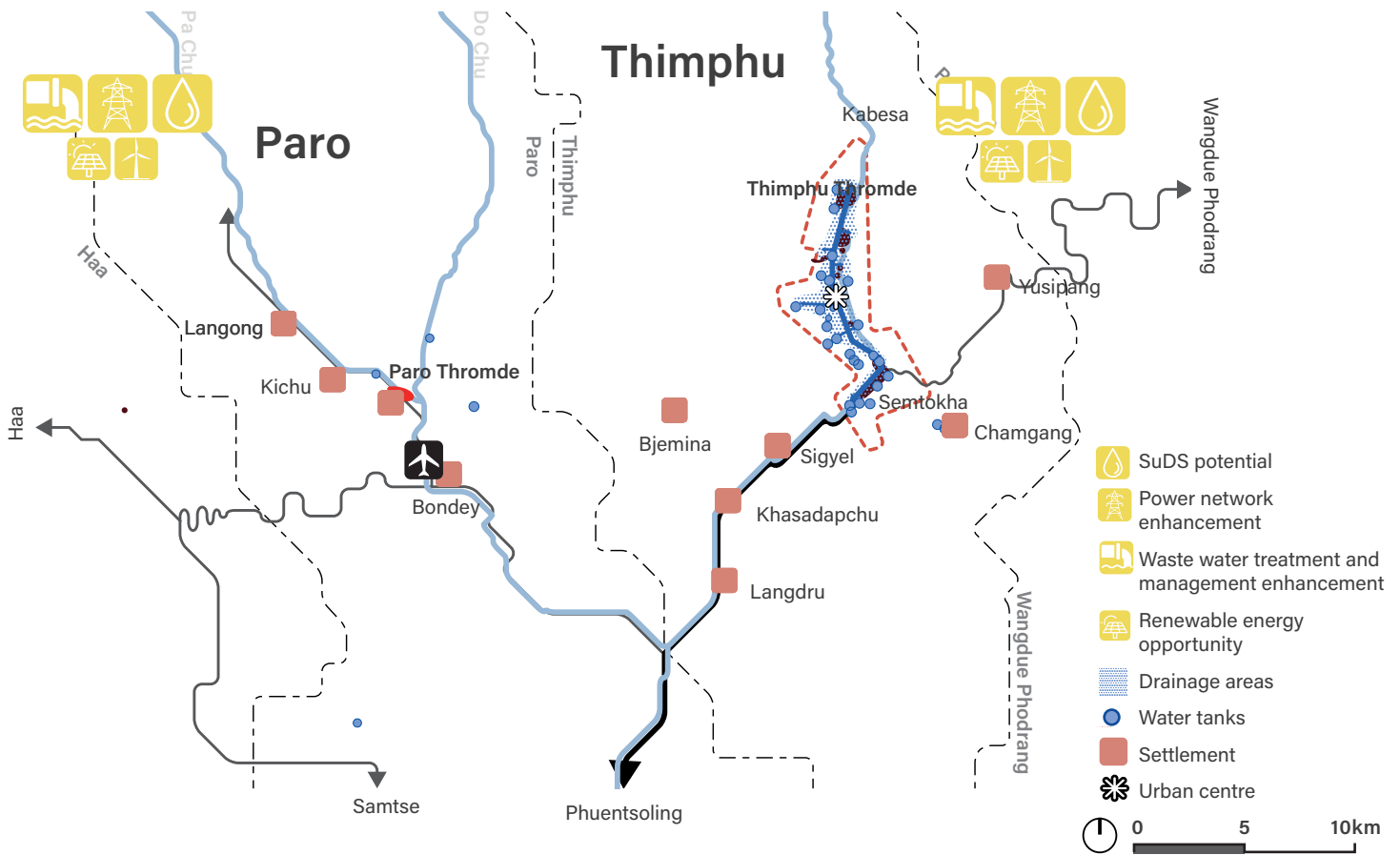


Figure 1.36 Utilities Opportunities

## OPPORTUNITIES

### Water

#### Thimphu

##### Stormwater

- Implementation of affordable Sustainable Urban Drainage systems.
- Reuse water for irrigation.
- Treatment measures and management of river outlets.
- IT-based monitoring systems.
- Implement existing guidelines for stormwater drainage design and an Operations and Maintenance Plan.
- Raise community awareness.

##### Water Supply

- Improve the water networks design and implementations.
- Develop an integrated water management plan for Thimphu.
- Reduce water loss.
- Full treatment on all the supplies.
- Increase the capacity of water utility teams to improve their technical and business skills and governance systems.
- Develop and establish monitoring mechanisms to control and ensure adequate services of the water utility.

##### Waste Water

- Expand the sewer network in the Thromde and increase septic tanks to meet immediate and future requirements.
- Upgrade sewage treatment plants to meet demand, allowing for phased growth including production of management plans and awareness campaigns.
- Ensure adequate emptying services are provided (enough capacity and access to required areas)

## OPPORTUNITIES

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### Water

#### Paro

##### Stormwater

- Develop a stormwater network and management plan.
- Implement LID/ SuDS that are affordable.
- Reuse water for irrigation.
- Separation of solid waste and waste water.
- Reduce solid waste dumping through implementation of services (ongoing).

##### Water Supply

- Establishment of a proper watershed management and safety plan.
- Use of bore wells and other sources to meet demand.
- Monitor water quality, leakages and non-revenue water through online monitoring systems.

##### Water treatment

- Monitor community water supplies.
- Upskill labour to better observe and manage the network.
- Continue community awareness.

##### Waste Water

- Master plan for sewer network.
  - Centralised wastewater treatment systems for core urban area.
  - Implement a decentralised fecal sludge management plants for rural areas with septic tanks (Paro Dzongkhag) with adequate emptying services.
  - Reuse of sludge and greywater.
  - Community awareness campaigns.
- 

### Power

#### Thimphu

- Address system overloading in winter through managing peak demand and/or increasing capacity
- Underground, ducted cabling in new developments
- Diversify sources of power to improve resilience – wind, hydro, solar and pumped hydro, plus storage
- Install rooftop Solar PVs on new/existing buildings with microgeneration capability to the main grid
- Solar Water Heating Systems (SWHS)
- Waste to Energy (WtE) from landfills / Sewage Treatment Plants
- Conversion of overhead to underground lines
- Smart grid technologies for efficiency of transmission and Observations and Management

#### Paro

- Address system overloading in winter through managing peak demand and/or increasing capacity
  - Underground, ducted cabling in new developments
  - Diversify sources of power to improve resilience – wind, hydro and solar, plus storage
  - Install rooftop Solar PVs on new/existing buildings with microgeneration capability to the main grid
  - Solar Water Heating Systems (SWHS)
  - Waste to Energy (WtE) from landfills / Sewage Treatment Plants
  - Biogas technology to convert cattle dung to energy, replacing firewood and Liquefied Petroleum Gas
- 

### Telecommunications

#### Thimphu

- Conversion of overhead to underground lines
- Expand smart networks including 5G and the Internet of Things.
- Expansion of underground network in growing / future dense areas.

#### Paro

- Ongoing negotiations with the Apple and Samsung companies to make BT's 5G service accessible through their mobile phones
- 

### Waste

- Facilitate the transition to the circular economy, particularly through consideration of the construction industry and composting of biodegradable waste.
  - Reduce the use of single use plastics
  - Implement volunteer programmes to clean up rural areas.
-



# 5.2 Priority Tasks

Following the study tour and workshops held between 31<sup>st</sup> January and 11<sup>th</sup> February 2022, the Consultant Team has identified a series of priority tasks that are required to inform the development of the Thimphu-Paro Regional Strategy and the Thimphu Structure Plan.

These are summarised as follows:

## *National Spatial Data Infrastructure*

Various different departments and organisations collect and house geospatial data. However, it is evident that the structure / format of the data can be inconsistent, and accessibility can be limited.

A successful national approach to holding data will facilitate data-informed integration and collaboration between departments and between stakeholders within these departments. New or improved insights can be uncovered when using cross-department data. A strategy can allow for structure to be placed on tools and workflows which will increase efficiencies in data analytics. A well developed strategy will also allow for integration of new technologies or data formats.

The following recommendations could be explored:

1. All Ministries and Central agencies to ensure that they develop central database related to their core mandates, that would contain all geocoded data and information. For example:
  - The MoEA should develop single source database on trade, commerce, SCIs, mines, minerals, disaster etc
  - The MOWHS should develop single source database on human settlement, urban areas, buildings, dwelling units, building use etc
  - This should extend to all the Ministries and Central Agencies whereby each of them should develop, update and maintain a geocoded database.
2. The NLCS, being the national mapping agency, should be responsible for developing standards, guidelines, and SOPs for maintaining all types of geocoded data. It shall also work on National Spatial Data Infrastructure and in monitoring all the spatial databases.
3. The DITT, MoIC shall develop APIs for each database so that the APIs are made inter-operable.

## *Civil Infrastructure*

Inventory of Civil Infrastructure Assets in GIS Format and a recognised coordinate system

- Thimphu Water Supply
  - Paro Water Supply
  - Solid Waste Drop Off Locations
4. Engineering drawings for the water intake systems in Paro and Thimphu
  5. Hydrological Modelling Results
  6. Any standard or guidelines from the Department of Engineering Services
  7. Water tank capacities

## *Built Environment*

Building Systems Technical Summary/Paper – we would like to receive information on any research in Bhutan into the following technologies. Ideally a technical paper covering all relevant issues such as the story behind the establishment of the industry, Bhutanese and International technical partners, Bhutan and International code and guidelines used, QA/QC regime, scale of operation, input and output volumes, cost and benefits, technical issues, successes & lessons learnt, future plans, etc.:

- a. Gluelam timber element production
- b. CLT proposed project
- c. Any Engineered Bamboo Research
- d. Double glazed door and window production
- e. Rammed earth wall research
- f. Stabilised Earth Bricks and other alternative brickwork.
- g. Underfloor heating systems
- h. Any domestic/institutional Solar Thermal research including manufacturing in Bhutan
- i. Domestic/institutional Solar cell electricity generation research
- j. Domestic/village scale micro hydro
- k. Ground source heat pump research
- l. Air source pump research
- m. Domestic/village scale waste to energy research
- n. Any insulation systems research
- o. Any acoustic panel systems research (e.g. for classroom acoustic quality)
- p. Alternative Roofing systems (non CSG)
- q. Water harvesting systems
- r. Any other relevant building systems

If available, provide a technical paper on the JICA seismic study of traditional building systems and if a BIM implementation plan been adopted for the construction industry and if it is used.

## *Planning and Governance*

Observations and areas for the Royal Commission for Urban Development and the project team to explore further as part of/ alongside Project 2 and 3.

Each of the points raised should be considered carefully, noting that these are initial observations, and the benefits and disbenefits should be fully assessed before any further action is taken.

- The current tax base for land and property is low and this needs to change
- The basis for valuing land and property should be updated to reflect international standards and best practice
- The planning process requires reliable and transparent information to ensure an effective balance between supply and demand
- Transaction data should be made available to the public
- Enforcement of existing building codes and neighbourhood plans must be improved
- There is an urgent need for affordable housing in Thimphu
- Greater protection for tenants is needed
- Opportunity to use public purchasing power to change market behaviours
- Financial institutions could do more to control the quantum and quality of development
- Energy efficiency and retrofit should be prioritised



## Transport

Data Collection	Description	Project 2 Requirements	Project 3 Requirements
Traffic counts	<p>Traffic counts (all modes including pedestrians) at key locations throughout the region would help the development of the regional plan and the Thimphu Structure Plan. This would have to occur at a time when all activity is back to normal (no COVID restrictions). Ideally when tourism is back as well.</p> <p>Note: the traffic counts don't need to include stopping cars with a questionnaire. I can discuss the design of the traffic counts with the client team if these are agreed to.</p>	<p>Required for:</p> <p>Key locations on the road network to inform review of road hierarchy.</p> <p>Unsealed roads to inform potential upgrade recommendation</p>	<p>Yes – for understanding movement patterns within Thimphu.</p>
Bus capacity and demand	<p>Collection of bus passenger volume data (Thimphu city bus and the regional bus services between Thimphu and Paro) would be useful to compare to bus capacity and understand the services that are over and under capacity. There is a new smart card ticketing system for the city buses, which could hopefully help with this data.</p>	<p>Yes, For:</p> <p>Paro to Thimphu</p> <p>Thimphu City Bus Routes</p>	<p>Yes, For:</p> <p>Thimphu city bus routes. All passenger volume data (e.g. smart card and cash payments)</p>
Parking survey	<p>Parking occupancy and turnover.</p>	No	Yes
Household travel survey	<p>To understand travel patterns and mode choices.</p> <p>Data should be collected regularly, e.g. annually, using the same questionnaire and a statistically representative sample of households.</p>	No is a general recommendation	No is a general recommendation
GIS Layers	<p>Pedestrian network:</p> <p>Footpaths/laneways: ideally presence, width, and condition</p> <p>Crossings: location of road crossings, location of river crossings</p> <p>Locations of inaccessibility for mobility impaired people (e.g. stairs, footpath gaps, open drains etc)</p>	No. Although locations of river crossings would be useful.	Yes – if possible. It's a big and time consuming task to collect this data.
	Road network: Sealed sections, Unsealed sections,	Yes	
	Bus infrastructure: Bus stop facilities: presence of shelter, signage, sealed footpath	No	Yes
	Taxi infrastructure: Pick up areas	No	Yes
	Waiting/parking areas		
	Parking spaces:	No	Yes
	On street locations		
Off street locations			
Electric vehicle charging stations:	Yes		
Location, operational status, usage statistics			

## Natural Environment

Action	Description	Purpose
Collection of Observational and Anecdotal Info on Problematic Ground Conditions	Collection of observational and anecdotal information should be completed of areas which were affected by settlement or soft ground conditions. The information should be geospatially referenced, with a description and photos provided.	Due to the existing lack of subsoil or engineering geology mapping at an appropriate scale, it is necessary to try and develop a high-level understanding of problematic ground. While this process is unscientific, it will provide an initial understanding of potential areas which would impact future development.
Complete High Resolution Topo Survey for Paro-Thimphu Region	It is understood that high resolution topographical surveys are being completed for the entire Paro-Thimphu region, including outside of the study area. Access to the data is desired at the earliest opportunity.	Topographical data is essential for a range of different geohazards. The higher the resolution, the more accurate the assessment can be of potential geohazards.
Source JICA Seismic Study Results	Provision of the results of the from the JICA seismic study at the Department of Culture.	Important information relevant to the developing understanding of the current seismic risk and potential mitigation measures.
Geological survey of the entire Paro-Thimphu Highway	An initial overall geological survey should be completed along the important infrastructure highway between Paro and Thimphu. Potential hazard areas should be identified, a further detailed assessment should be completed at each of the identified sites to determine where mitigation measures are required.	While a landslide risk assessment should be completed for the entire region, the time required to complete this would likely extend beyond the period of this project. The main highway between Paro and Thimphu is an important link, which also contains potential sites for future landslide events. Therefore, to work simultaneously with the risk assessment, a targeted assessment should be completed along this important link.



## Natural Environment

Action	Description	Purpose
Flood Study for the entire Paro-Thimphu Region	Provision of the flooding risk assessments completed for the entire region and/or completion of such studies, ensuring they extend throughout the entire Paro-Thimphu Region.	The current flooding information is focused within some of the Paro region and some of the Thimphu region. It is understood that a further study has been completed within Thimphu which extends further than the study completed in 2017. Provision of this data is important to understand the flooding potential within the region.
Completion and Provision of Forest Inventory and Forest Fire occurrences up to current date	Provision of the full existing inventory study of the forest cover within the Paro-Thimphu region and the historical forest fires (spatially referenced) up to the current date.	Historical forest fires data is available until 2011. A discussion with the Department of Forests and Park Services suggested that a current exercise is being completed for historical events up to 2021. Provision of the latest information, and inventory of the forest cover, will ensure that all protected areas and potential hazard areas are identified.
Collection and Provision of Air Quality and Water Quality Raw Data for Baseline Assessment	Raw data associated with the air quality and water quality should be provided up to the current date, including as much historical data as possible to allow for establishment of baseline and historical trends.	Water quality data is available for pre and post monsoon in 2020 and 2021 for Paro and Thimphu respectively. A summary of air quality information for Thimphu was provided from 2017-2019. Raw data over a longer historical period will allow for a better understanding of historical trends and ensure that problematic areas are identified, and an informed baseline can be set.

## Natural Environment

Geohazard Sub Themes	Recommendations
Readiness	Development and adoption of a geoscience policy which sets out the requirements associated with data collection and research to inform on landuse planning and development.
Problematic Ground	Higher resolution engineering geology (e.g. 1:25,000 or less), calibrated with targeted ground investigation and geophysical surveys, to establish location of problematic soils in order to allow for optimised development
Seismic	<p>Aeromagnetic survey at regional scale to understand the lineaments and fault systems at a regional level for incorporation in a seismic hazard map.</p> <p>Higher resolution bedrock geology mapping (e.g. 1:25,000 or less) in order to establish the rock characteristics throughout the region at an appropriate scale</p> <p>Development of a seismic risk map, which incorporates both the hazard, vulnerability and exposure. This will allow for determination of seismic characteristics for the region and key or vulnerable developments which require retrofit.</p>
Landslides	<p>Higher resolution engineering geology and geology mapping (e.g. 1:25,000 or less) in order to establish the slope morphology and ground conditions for incorporation in landslide hazard mapping.</p> <p>Development of a landslide risk map, which incorporates both the hazard, vulnerability and exposure. This will allow for determination of critical areas requiring strategic intervention.</p> <p>Where immediate attention is required, for example important infrastructure links, a process of slope geological logging could identify key locations for strategic intervention for the reduction of the potential for future catastrophic events</p>
Flooding	<p>Mitigation measures were noted in the Flood Management Plan for Paro Dzongkhag, including forecasting / early warning systems and structural / non-structural measures. These mitigation measures should be implemented to ensure flooding protection.</p> <p>Completion of the Thimphu region flood management plan, including risk assessment, in order to establish mitigations measures and completion of the implementation of such measures.</p>
Paro Taktsang	<p>During the hike to Paro Taktsang on the 14th February, a large piece of rock, which had become disconnected with the main rockmass, was pointed out within one of the temples of the monastery. Further observations identified developing hazards with respect the potential rockfall along the cliffside.</p> <p>It is recommended that a sufficiently detailed investigation and assessment is completed to fully understand the rockfall potential and determine what appropriate mitigations measures can be employed. A seperate technical note is being finalised which provides a high level scope of works to undertake this investigation and assessment.</p>



Observation	Description
The current tax base for land and property is low and this needs to change	<p>A value-based tax system for land and property should be developed to ensure that more tax can be collected at a local level and directed back into local services.</p> <p>The Property Tax Bill has been drafted and this should be put before the Parliament of Bhutan and debated.</p> <p>The Bill adopts the methodology developed by the Property Assessment and Valuation Agency, currently used for public acquisition of land and compensation.</p> <p>The PAVA methodology for valuing land currently distinguishes land based on whether it is in a rural or urban setting, taking into consideration the following factors in each case.</p> <ul style="list-style-type: none"><li>▪ Rural land = market rate and/ or income producing assets (fruit trees and cash crops)</li><li>▪ Urban land = a combination of market rate, existing rate ascribed by the Government for the location, and any bank loan(s)</li></ul> <p>There is a question regarding the definition of rural and urban areas and in some locations the boundary may not be clear, particularly in peri-urban areas which have gone through rapid development. The boundaries and definition should therefore be reviewed on a regular basis.</p> <p>Adopting the PAVA methodology would help to increase the tax base by moving beyond the unit-based system currently in place. However, the PAVA methodology is unlikely to reflect the true market value of land and further steps should be taken to move to a system that takes account of the market value for each plot of land and to use this as the basis for taxation, recognising that each plot and the building(s) on it are unique – see note below on valuation.</p> <p>Consideration should also be given to all other taxes that a building owner may be liable for to assess whether the methodology for these taxes should also be updated to reflect market value. It is understood that the following taxes would apply to a building owner:</p> <ul style="list-style-type: none"><li>▪ Goods and Services Tax – for any business activities, collected at a national level</li><li>▪ Income/ corporate tax – to capture rental income (from residential or commercial assets), collected at a national level</li><li>▪ Property tax – collected at a local level</li><li>▪ Building tax – collected at a local level</li><li>▪ Property transfer tax – collected at a local level</li></ul>

Observation	Description
The current tax base for land and property is low and this needs to change	<p>Other tax and legal measures could also be explored to capture value, including:</p> <ul style="list-style-type: none"><li>▪ Thromde Tax – to cover municipal services</li><li>▪ Community Infrastructure Levy – to cover specific large scale infrastructure projects at a city/ regional level</li><li>▪ Capital Gains Tax</li><li>▪ Inheritance Tax</li></ul> <p>In addition, it may be possible to consider further taxes and legal measures to disincentivise negative behaviours that impact the city and city users. For example, for transport models this could include:</p> <ul style="list-style-type: none"><li>▪ Multi-vehicle tax – explore potential to increase</li><li>▪ Vehicle mileage tax – by weight</li><li>▪ Toll fees for certain stretches of road</li><li>▪ Congestion/ clean air zone for key parts of the city</li><li>▪ Tax on fuels – remove existing subsidies</li></ul>
The basis for valuing land and property should be updated to reflect international standards and best practice	<p>It is understood that banks in Bhutan typically lend on two bases for real estate development:</p> <ol style="list-style-type: none"><li>a) Homeowners loan, whereby a landowner may be able to borrow up to 90% of the cost of construction works</li><li>b) Commercial loan, whereby a landowner may be able to borrow up to 70% of the cost of construction works</li></ol> <p>In each case the cost of construction works is based off a standard rate set by the Government of Bhutan. Income is assessed by way of a Loan to Value metric to ensure that the borrower has sufficient funds to repay the capital and interest.</p> <p>It is not clear how the cost of acquiring land is accounted for in a loan (if at all) and this will need to be considered.</p> <p>As the market matures, the following valuation methodologies should be explored to understand how they could be applied in Bhutan for taxation and loan purposes:</p> <ol style="list-style-type: none"><li>1. Investment method – where there is an income stream i.e., a property is tenanted</li><li>2. Residual method – where land has development potential</li></ol>



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Observation	Description
The basis for valuing land and property should be updated to reflect international standards and best practice	<p>Valuation methodologies should be aligned to international standards as set out by the Royal Institution of Chartered Surveyors (RICS). In total, the RICS describes five methodologies used for valuing land and property.</p> <p><a href="https://ww3.rics.org/uk/en/journals/property-journal/apc-5-valuation-methods.html">https://ww3.rics.org/uk/en/journals/property-journal/apc-5-valuation-methods.html</a></p> <p>It is understood that developing a market for valuation experts within the relevant Government Ministries and Departments and the private sector (banks and insurance companies) requires resources – human capital and financial resources. Once the methodology and application has been agreed then a skills programme should be developed alongside institutional capacity.</p>
The planning process requires reliable and transparent information to ensure an effective balance between supply and demand	<p>A buildings database and development pipeline should be created. This should be accessed and shared by all Government Ministries and Departments to ensure a unified and transparent information set.</p> <p>The database should identify existing buildings (size, area and use – residential, hotel, office and administrative etc.) and quantify the pipeline of development coming forward through the planning process.</p> <p>The comprehensive database could be linked to existing land data and presented in GIS.</p> <p>This will provide an understanding of supply and demand trends and will inform all future planning decisions, phasing and allocation. The Thromde would then be in a strong position to determine the number of homes, beds, commercial floor space that can come forward at a given location over a specific timeframe, rather than letting the market speculate.</p> <p>The need for robust information and data sets also arises from a concern that there may already be enough supply to meet demand in both the short and long term in Thimphu and Paro. Without information it is hard to be certain but there are large numbers of loan defaults and distressed sales, and there is a real risk that this pattern could increase.</p>

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## Economy

Observation	Description
The planning process requires reliable and transparent information to ensure an effective balance between supply and demand	<p>Specific comments on individual uses:</p> <p>Residential – it appears that there is limited ability to assess whether the development pipeline will exceed demand. The Report on Housing Market Demand Survey, July 2021 – prepared by ADB, suggests there could be an oversupply of residential accommodation based on current projections in both Thimphu and Paro (Annexure 10).</p> <p>Hotels – there is no assessment or database capturing the number of beds in the market and coming forward in any area. It is understood that a licence for development of a new hotel is issued by Ministry of Economic Affairs which allows construction to start and materials to be procured. Any application for a new hotel should be reviewed by the Ministry of Finance and the Department for Tourism and there should be a collective assessment of needs before issuing a licence.</p> <p>Offices – there is a concern that buildings with consent for residential uses are being converted for commercial uses to benefit from higher rent (income). Any change of use should be strictly controlled and where a change of use is approved this should be reflected/ updated in the database.</p>
Transaction data should be made available to the public	<p>Transaction data should be registered at the point of sale, as well as details currently captured on the purchaser, plot and date.</p> <p>This information should be recorded in an online system that is made available to the public at a cost, to cover administrative costs much like the Land Registry in the UK. This will help to make the market more transparent and efficient. It will also help move to a clearer basis for establishing market value, whilst increasing the tax base.</p>
Enforcement of existing building codes and neighbourhood plans must be improved	<p>The Thromde should stop any development which does not comply with building codes and regulations and to retrospectively apply enforcement rights – where necessary demolishing buildings that are built on wetland, exceed approved storey/ height limits or are different to the consented land use.</p> <p>The Thromde may also wish to place a moratorium on all new development in certain neighbourhoods within Thimphu and Paro (for both residential and commercial uses) until the plan is established and market information is collated.</p> <p>The burden of cost and compliance should be on the landowner. A review of the application and building control process could help to increase capacity and resources. This should include consideration of the fee for submission/ review of documentation and for site visit(s).</p>



Observation	Description
There is an urgent need for affordable housing in Thimphu	<p>The Government of Bhutan is well placed to drive a programme of affordable housing in Thimphu – and beyond as required.</p> <p>This programme would need to start with a legal definition of affordable housing (beyond the current understanding of housing for civil servants), and a mechanism for identifying and allocating housing to those in need. This could be incorporated into the proposed Housing Bill which is currently being drafted.</p> <p>The National Housing Development Corporation (NHBC), which is already in existence, could be the delivery agency responsible for affordable housing. The NHBC could benefit from loans from ADB and World Bank and receive rent from tenants to pay off loans and cover ongoing maintenance costs.</p> <p>Land for development of affordable housing could come from religious institutions and existing public land holdings. There is also the potential for the NHBC to acquire distressed assets from the banks – at auction.</p> <p>Planning obligations could be established as a way to deliver affordable housing. For example, any new development of [+5 or 10 tbc] residential units should provide an agreed % of affordable housing. This could be on site, or by way of a financial contribution to the NHDCL.</p>
Greater protection for tenants is needed	<p>Revisions to the Tenant Act (or a new Landlord and Tenant Act) should be made to clearly set out the legal relationship between both parties and to give adequate protection for tenants.</p> <p>A landlord licencing programme could be explored, whereby a landlord would require a licence to operate. This would be provided to the landlord on satisfactory approval of all required actions – to include health and safety, lease details and insurance.</p> <p>A landlord would be required to pay an agreed fee for the licence, which would then be valid for a set number of years (3-5 years typically). This would help to regulate landlords' behaviour, improve housing standards and increase revenue to the Thromde.</p> <p>Depending on the success of revisions to the tax base, rent caps and controls could be explored in Thimphu to control the market and ensure rents remain affordable. It is worth noting that such programmes developed in other cities around the world have had mixed results and, in some cases, have driven perverse behaviours. Any such programme should therefore be considered carefully so that the benefits and disbenefits are fully assessed. A pilot scheme could also be used to test the application and appropriateness of any such intervention.</p>

## Economy

Observation	Description
Opportunity to use public purchasing power to change market behaviours	<p>There is an opportunity to use the public purchasing power of the Government of Bhutan to drive scale and markets in the green building economy.</p> <p>Regulations could be developed that would require all new administrative buildings to be made of X% local materials, timber etc. This could also be expanded to government led programmes for affordable housing and energy efficiency.</p>
Financial institutions could do more to control the quantum and quality of development	<p>Banks may also wish to stop lending to key sectors such as new hotels where there is risk of oversupply or a concern regarding the business plan. This goes back to the earlier point regarding transparency of data and information.</p> <p>In the absence of regulation, banks may also require buildings to be made of X% local materials, timber etc.</p> <p>In the UK there has been a strong move towards green finance, whereby a borrower is incentivised to hit agreed KPIs linked to environmental management and performance (e.g. carbon reduction) in order to achieve a lower borrowing rate. This approach could be adopted in Bhutan to drive energy efficiency and the move to local materials, timber etc.</p> <p>It is understood that insurance providers offer protection for natural disasters for an additional premium. The understanding and take-up of this product should be reviewed.</p> <p>In addition, consideration should be given to expectations of insurance providers in relation to health and safety, energy efficiency and other measures, as there could be an opportunity to uplift the existing housing stock through financial mechanisms – much like the landlord licensing programme.</p>
Energy efficiency and retrofit should be prioritised	<p>A comprehensive programme should be developed at a city/ national level to retrofit existing buildings through energy efficiency and renewable technologies (solar PV and thermal).</p> <p>A green investment bank could be created to offer finance products and/ or manage funding programmes (if available).</p>



# 5.3 Summary of Workshops

## 5.3.1 Spatial Options 9-10<sup>th</sup> February

To begin the development of spatial options, scenarios were prepared based on potential estimated population projections, outline in the table opposite.

- Regarding Thimphu, it was not felt that the city could accommodate a population growth of approximately 135,000, growth of 25,000 was suggested to be more feasible given the limitations of the city.
- Paro baseline is grounded in the current population projections of the Paro Valley Development Plan, proposing only minor growth. This was not tested as it was felt to be lower than what could be accommodated.
- Paro max accommodates the maximum growth scenario, to explore the impacts that this would have on the region.
- Paro mid assumes a mid point between the baseline and maximum growth scenarios.

From these population growth scenarios, estimations of the number of homes and land area requirements were calculated. This was established using an excel model, which included a number of assumptions on matrices such as density. These are summarised in the second table opposite.

The following pages outline four different growth scenarios and the approximate number of homes and land required to accommodate each. Breakout groups were established and explored how these scenarios could be accommodated spatially including consideration of the implication.

Post the testing of spatial options, it was agreed an alternative approach would be explored to establish a preferred approach for the Regional Spatial Strategy. This will be grounded in site capacity studies and the consideration of population projections across the region. This testing and evaluation process forms Project 2.

LOCATION	DESCRIPTION	2016/17	2035	2050	TOTAL GROWTH
THIMPHU	Transformation and regeneration within existing urban footprint	160,000		185,000	+ 25,000
PARO (base)	Minor growth scenario, aligned with PVDP projections	27,000	35,000	42,000	+ 15,000
PARO (mid)	Moderate growth scenario, aligned with PVDP zoning capacity	27,000		67,000	+ 40,000
PARO (max)	Maximum growth scenario, accommodating NSB projections	27,000		127,000	+ 100,000

**Notes:**

In "mid" - 75-80,000 people do not migrate to the region

In "max" - The maximum projected population migrates

Figure 1.37 Population Projections

LOCATION	HOUSEHOLD SIZE (NUMBER)	UNITS BY BUILDING (NUMBER)	AVERAGE UNIT SIZE	EFFICIENCY	FAR
THIMPHU (Base 2022)	3.9	4.0	85m <sup>2</sup>	85%	1
THIMPHU (Max)	3.8	4.0	85m <sup>2</sup>	85%	1
PARO (Base 2022)	3.5	4.0	150m <sup>2</sup>	100%	0.25
PARO (Business as Usual)	3.5	4.0	80m <sup>2</sup>	85%	1

Figure 1.38 Model Assumptions



## Thimphu A

### Thimphu A

+ 25,000 people  
+ 7,000 homes  
+ 350 Ha urban land



infill/regeneration capacity

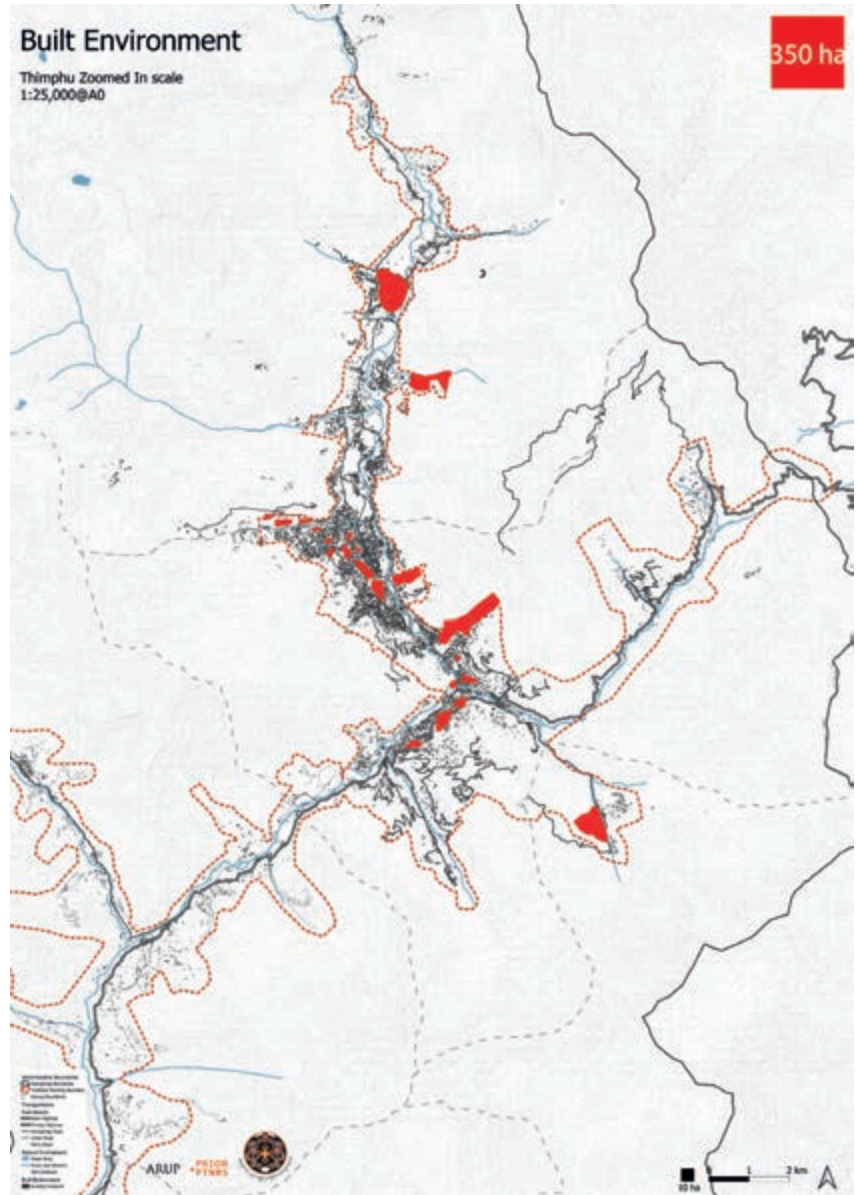


Figure 1.39 Thimphu A Spatial Option


### Notes on Spatial Option

Method - Identify open space, heritage sites and their buffer and public land.

Concentrate housing growth in the center of Thimphu, particularly through regeneration and focus on public lands. Establish green spaces along the river and movement corridors connecting centers.

**Thimphu B**

+ 25,000 people  
+ 7,000 homes  
+ 350 Ha urban land



infill/regeneration capacity  
neighbourhood unit

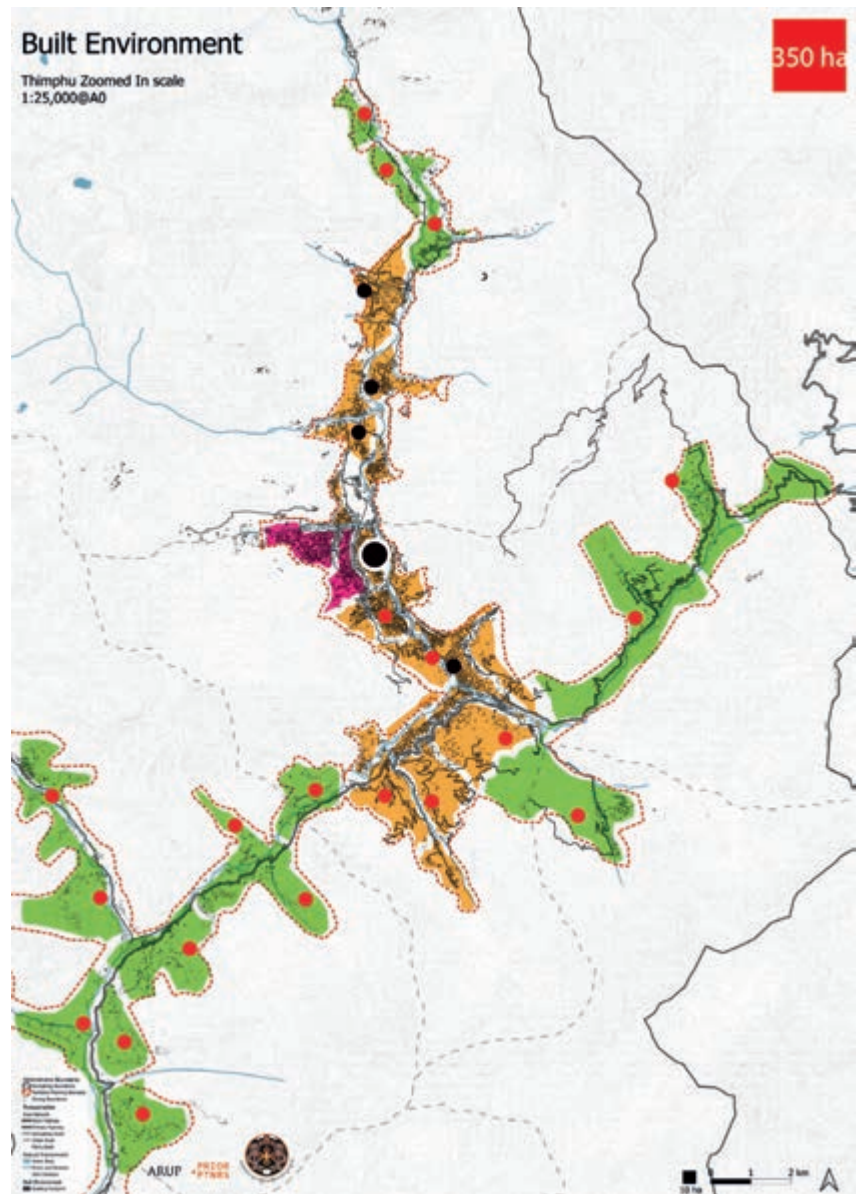


Figure 1.40 Thimphu B Spatial Option

### Notes on Spatial Option

Method – Identify neighborhoods and define the capacity for each for accommodating growth and density of growth through new development or regeneration.

Establish the existing and potential distribution of different scales of urban centres.

Disperse housing growth across the wider Thimphu area. Focus centers adjacent or well connected to heritage sites.

Peri urban centers – shared among residential clusters in walking distance and adjacent to public transport routes.

Urban centers – Focused around a central green space with facilities including public transport routes within and around the central green space.

Urban centers are linked through green corridors and transport routes.



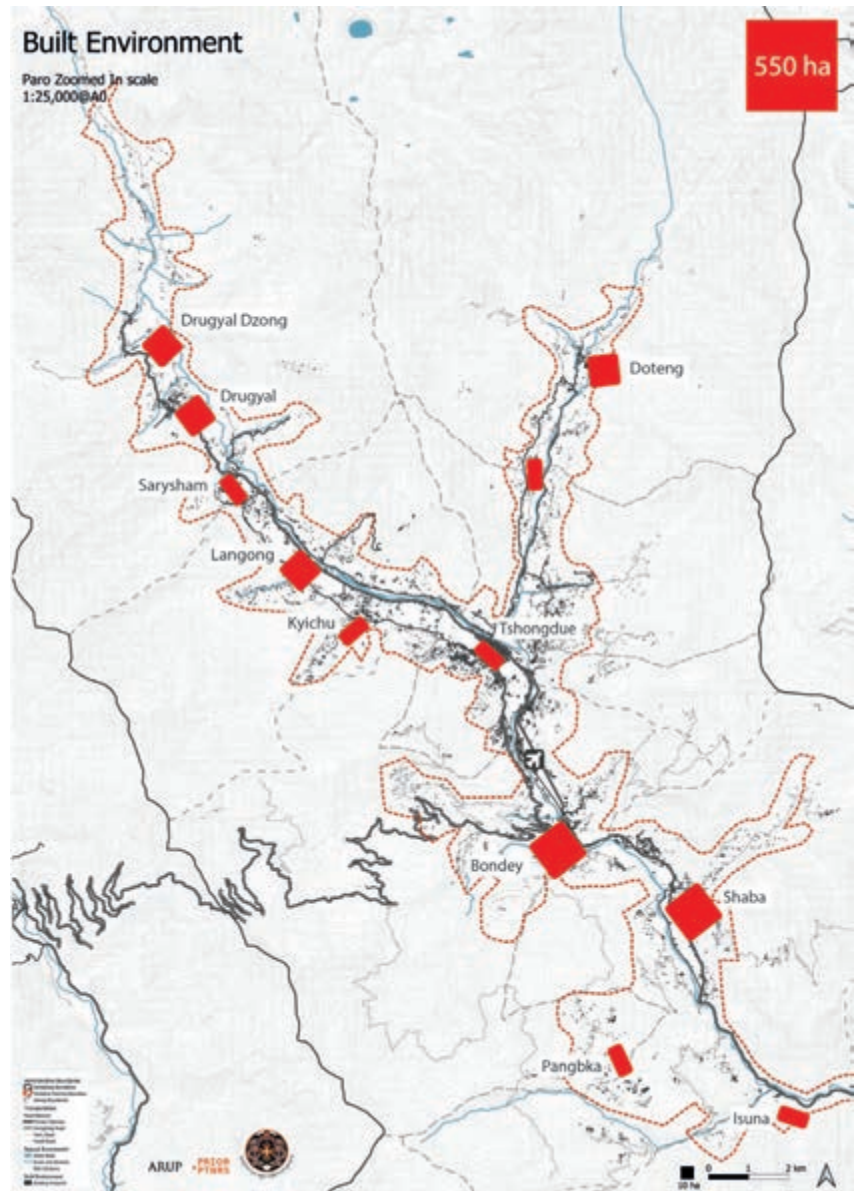
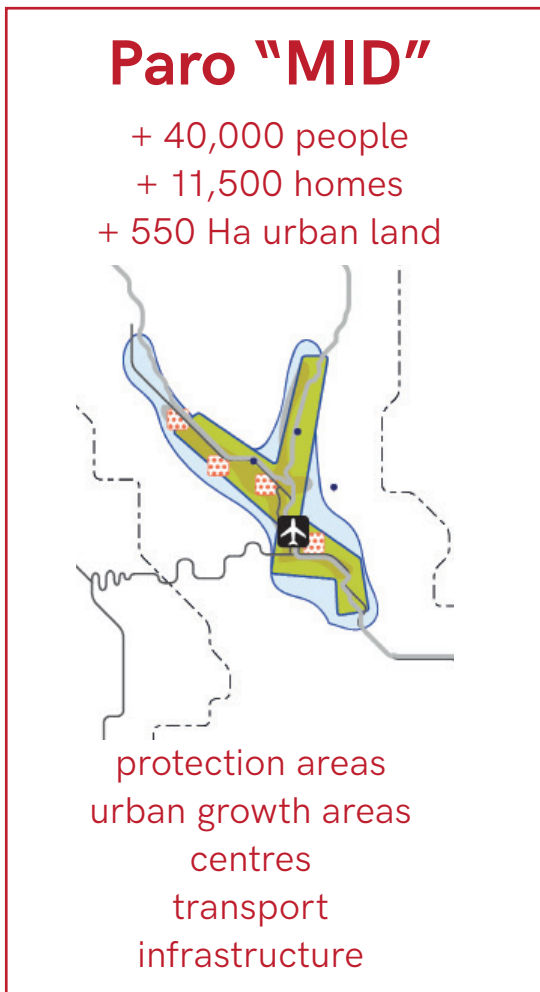


Figure 1.41 Paro Mid Spatial Option

**Notes on Spatial Option**

Method - Identifies river basins, slopes and forests as development constraints.

Defines heritage and cultural landscape/ paddy fields protection areas and buffers.

Defines primary and secondary transport routes.

Defines existing and proposed town centre and neighbourhood centres across Paro Valley.

Distributed the projected growth considering the setting, location and capacity of each neighbourhood node and town centre.

Distributes development along the main transport corridor with a focus on communities between Paro and Thimphu.

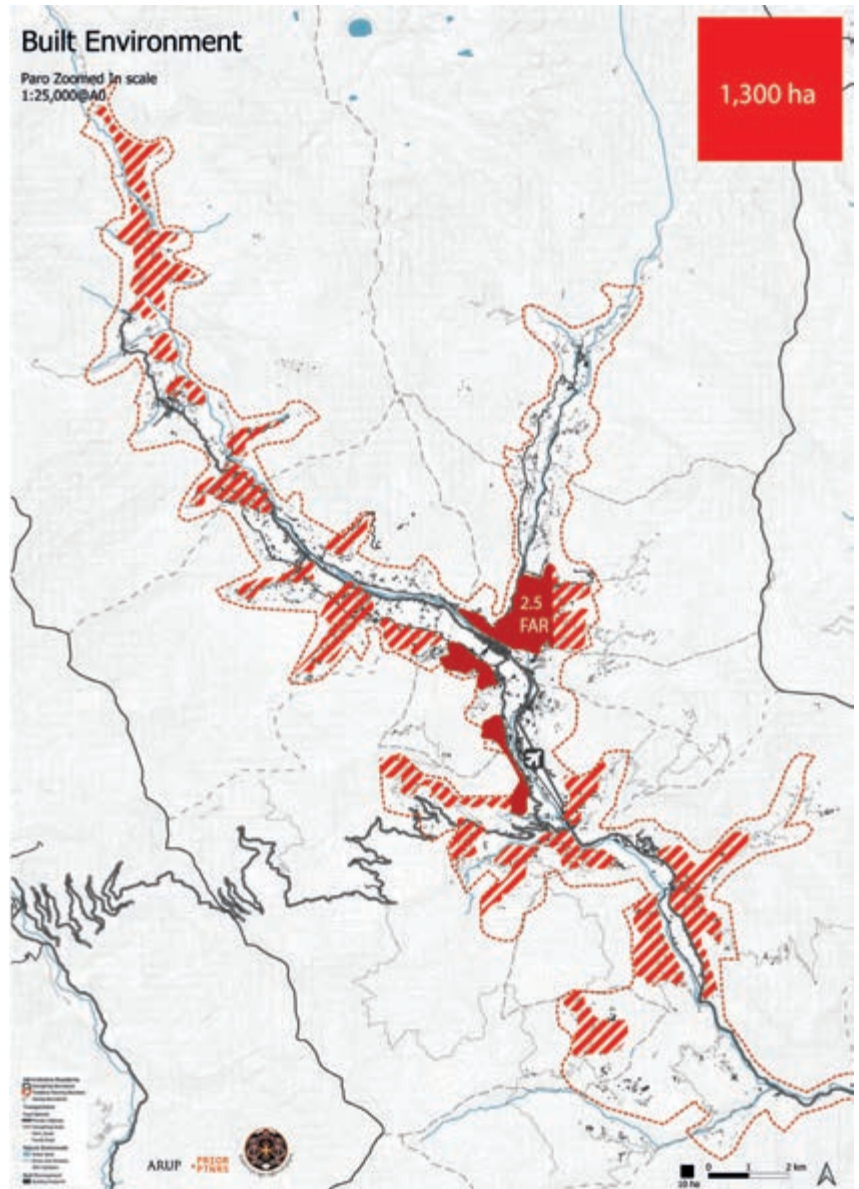
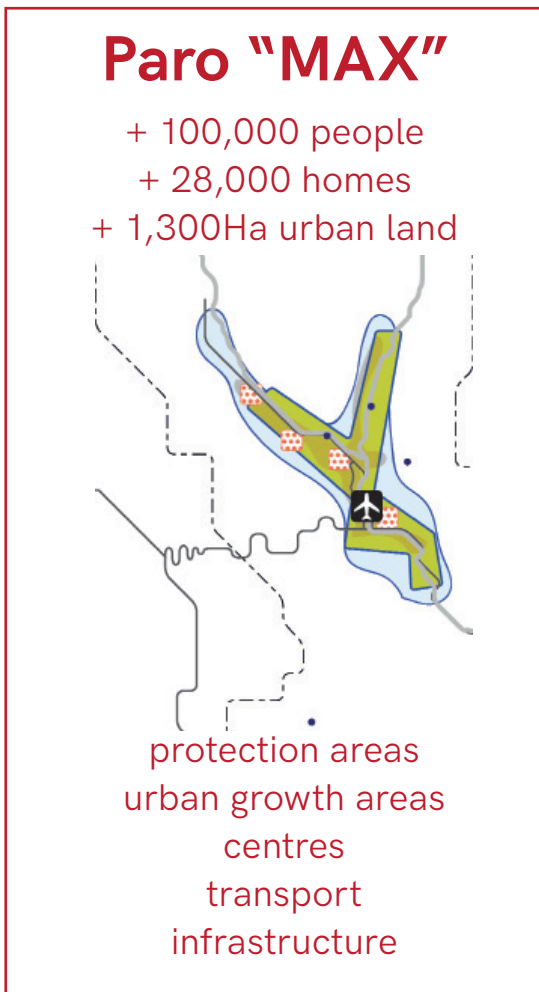


Figure 1.42 Paro Max Spatial Option

**Notes on Spatial Option**

Method - Map out non developable land, major infrastructure/ municipal uses and existing and proposed primary and secondary centers. This resulted in identification of 2,300 ha of developable land, reduced to 1,600ha taking into consideration existing development and environmental constraints. Developable land was then ranked according to accessibility to transport and jobs.

Maximum growth through development at FAR of 1 can be accommodated but would result in coverage of 70-80%.

Higher densities at a FAR of 2.5 around land with greater accessibility, and lower densities across other areas would still result in a coverage of 70-80%.



## 5.3.2 Ideas and Projects 11<sup>th</sup> February

To wrap up the two weeks of in country workshops, participants sub divided into groups to discuss potential ideas for the two valleys. This includes two groups discussing top ideas for Paro, two discussing top ideas for Thimphu and a final table exploring implementation methods. The following pages summarise these ideas

### *Thimphu A*

#### 1. Learning from the world

A stadium shall not be only designed to serve a sole purpose or delinked from the city. Sydney Stadium, for instance, has economically failed due to its location and integration with other functions of the city.

Learning from such experiences, the stadiums of Manchester City, Athens, Beijing, London, Rio, Tokyo, Singapore, ect... are designed in such a way that it has multiple functions and has important roles in City Revitalizations.

#### 2. Redesign of the National Stadium

The Stadium shall be redesigned for hosting international events apart from national events. The existing national stadium shall be redesigned on the western and eastern side. The eastern side of the stadium shall be detachable so that it can be erected only when required. Thus not obstructing the natural scenarios on the other side of the river.

#### 3. Revitalization of the Chang Lam

The ground floor of the stadium facing the Chang Lam shall be proposed for commercial/recreational activities such as;

- Cafes and restaurants which can be operated on a daily basis
- Night Entertainments on weekends
- Conferences and seminars when required.
- This shall enrich the vibrancy of the streets specially the Chang Lam, and the Norzin Lam.

#### 4. Reclamation of land for Riverfront Development

The current Chanlingmethang parking shall be reclaimed and proposed for river front development thereby connecting the settlements on the other side of the river through a Bazam, while the existing parking shall be proposed underground attached to the stadium.

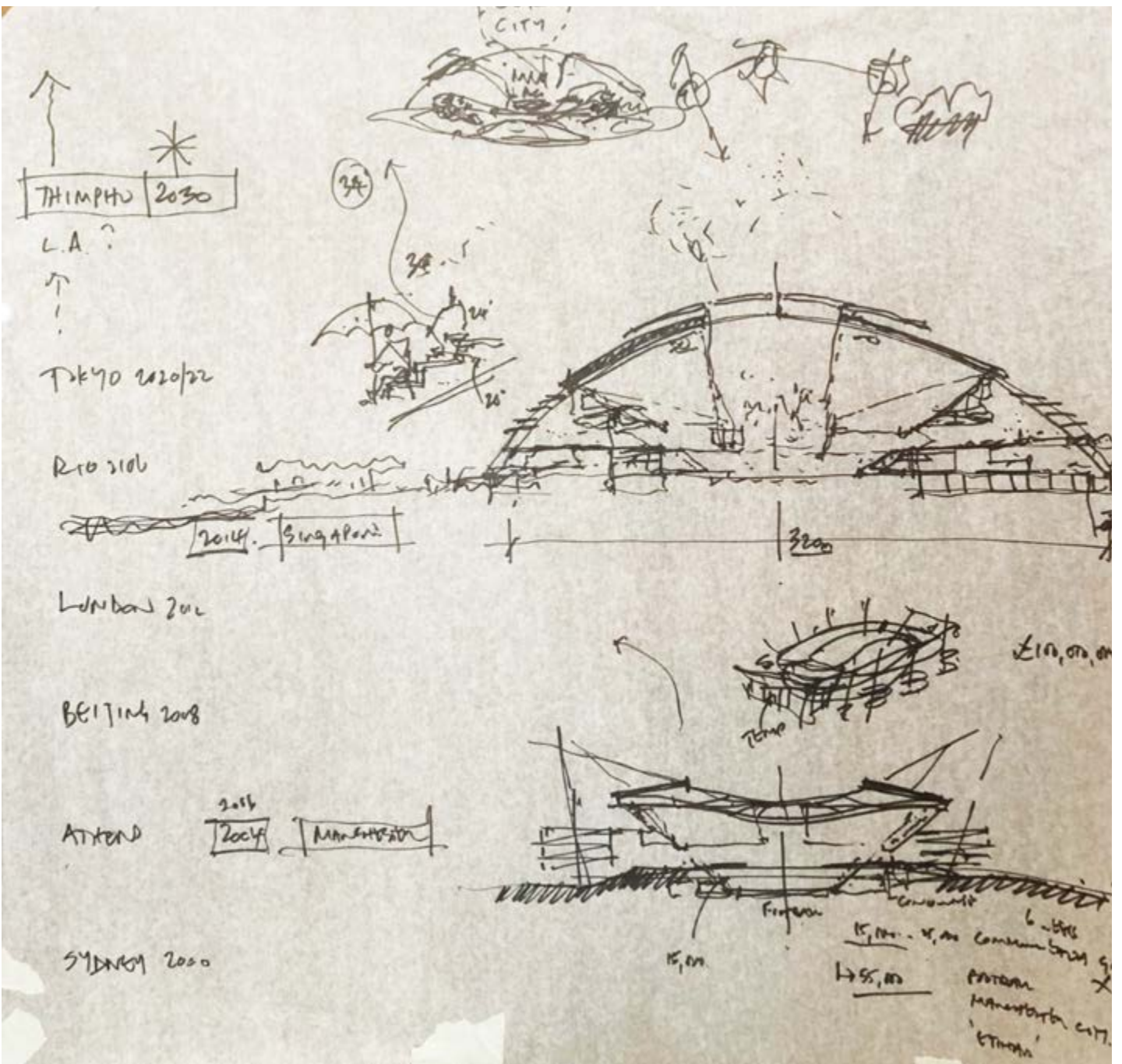
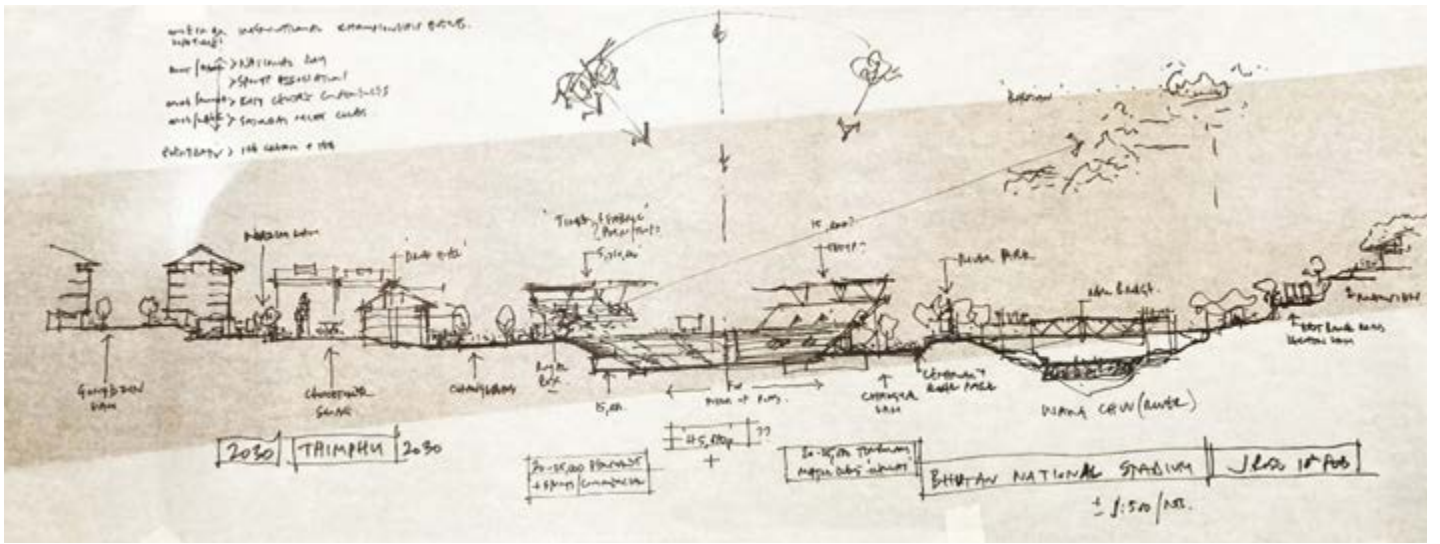


Figure 1.43 Stadium Sketches



## Thimphu B

In order to respond, mitigate, or for that matter, challenge the inevitability of growth and development in the Thimphu -Paro region, the team discussed the potential areas in Thimphu that could cater to the same. Whilst doing that, the team recognised the importance of understanding the neighborhood level need and potentials that could eventually lead to the identification of strategies or the so called 'Big ideas' at the city level.

To do that, the team recognised that, in fact a smaller version of the donough model proposed for the entire region could be proposed to identify the potentials of the neighborhood which altogether could lead to city level strategies and proposals.

Like the doughnut model, the neighborhood doughnut model consists of a outer circle representing the ecological limits, which in spatial terms would be the environmental buffers like the forest and a rivers that delineate these neighborhoods, while the inner part of the doughnut, could spatially represent the neighbourhood centres with the required social amenities. In between the circles are the aspects of a neighbourhood that evinces various potentials for a particular neighbourhood to upgrade or develop to accommodate various different strategies and proposals.

Following the testing of the neighbourhood doughnut model, a series of ideas for Thimphu were developed. These are classified into priority:

- High Priority (Within next 5 years)
- Medium Priority (Within next 15 years)
- Low Priority (Within next 25 years)

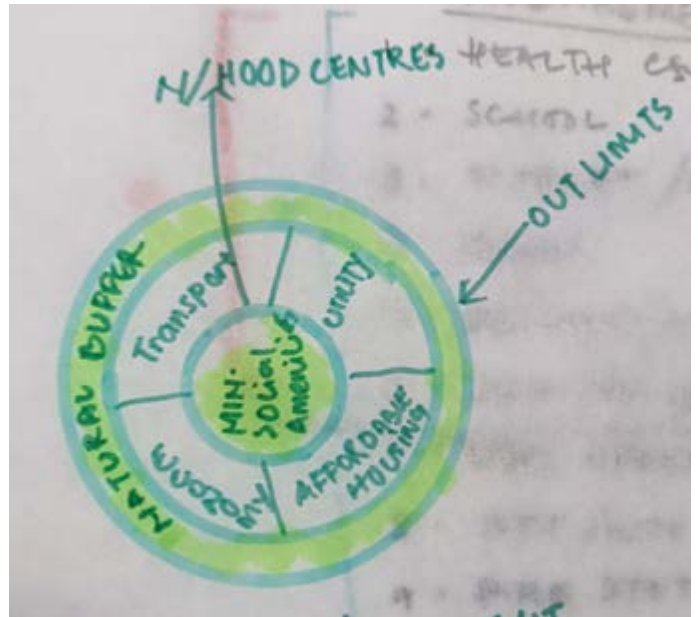


Figure 1.44 Neighbourhood Doughnut

### 1. Northern Thimphu (Kabisa)

- Low-density cultural village
- Riverfront Development
- Agro-Tourism Economy
- High Priority (5 Billion)

As the Kabisa area is confronted with immense pressure from the public given the delay of the plan, it is recommended that this area be released for the development of a low-density cultural village. This area has the potential for Agro-Tourism and Riverfront Development. This proposal is categorised as High-Priority with an estimated budget of 5 Billion

### 2. Central Thimphu

- High-Density Residential
- Pedestrianisation of Norzin Lam
- Redevelopment of Clock Tower
- National Public Library (possibly at the Centenary Farmers market)
- Improvement of Walkability, Accessibility and Mobility in the Urban Core
- High Priority (Nu. 2 Billion)

The existing low-density housing above Doeboom Lam could be redeveloped into high-density residential housing. The pedestrianisation of Norzin Lam and the redevelopment of the Clock Tower are also recommended for this area. The aforementioned proposal will improve the walkability, accessibility and mobility of the urban core. Moreover, this area is suitable for the development of the National Public Library. These proposals are categorised as High Priority with an estimated budget of Nu. 2 Billion.

### 3. National Stadium

Although there is a need for enhancing the existing stadium into international standards, the congestion of uses at the urban core of Thimphu may make the need unfeasible, therefore, in order to suffice the need and considering the larger vision of Regionally Balanced Development, the olympic/international standard stadium and affiliated housing and economic activities could be established in areas such as Bumthang or Paro.

### 4. Integrated Open Space along the River

Transport/ Pedestrian/ Cycle Corridor along the Wangchhu

### 5. Inter-District Bus Terminal

Implementation of the Inter-District Bus Terminal near Olakha Automobile Workshop is classified as High Priority, i.e. to be implemented within the next five years. The estimated budget is Nu. 500 Million

### 6. Distribution of Automobile Workshops across the city

Despite the existing proposal to relocate the Olakha Automobile Workshop (due to the congestion and environmental issues) to the periphery, it is probable that the relocated area might be confronted with similar problems associated with Automobile Workshops. Given this possibility, the working of Automobile workshops need to be explored and the existing automobile workshops could be distributed to other neighbourhoods.

### 7. Development of the vacant land next to Info Tech Park

The existing vacant land under the ownership of MoIC could be developed into I.T. Neighbourhood, which is walkable and mixed-use. This I.T. Infrastructure could be networked to other IT colleges across the country. This proposal is classified as High Priority with an estimated budget required of Nu. 5 Billion.

### 8. Yusipang and Hongtsho Area

Given the predominant land use being agriculture, these areas could specialise in high-value agricultural and livestock products.

### 9. Bjemina Area

Given the existing agglomeration of industries in this area, it is suitable for the establishment of the timber Manufacturing Plant for the potential timber-based construction industry

### 10. Education City Area

The vacant land at the Education City Area could be used for future endowments, relocation and investments such as relocation of the existing uses or establishment of the solar industry.



# Built E

Thimphu Zo  
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Figure 1.45 Thimphu B Sketches

## Paro A

1. Develop an agri-based industry hub:
  - Focus on crafting a small range of high-value, low volume, sought-after products.
  - Cluster around existing Farm Missionary Commission Limited (FMCL) and the Druk Seed Corporation (seeds and saplings).
  - Upgrade existing cold storage facility.
  - Develop complementary processing facilities/factories to craft the high-value products.
  - Establish a training college/academy with a focus on latest technologies and state-of-the-art mechanisation to train local farmers in efficient and viable agriculture practices (this function could be located within the existing Paro College (PCE).
2. Undertake a Town Centre Action Plan for the Tshongdue/Paro Town Centre.
  - Upgrade runway and/or terminal facilities to accommodate appropriately sized cargo aircraft.
  - Develop cargo/logistics facilities and complementary businesses to support efficient export of local products.
3. Undertake a Town Centre Action Plan for the Tshongdue/Paro Town Centre.
  - Establish and protect the existing Paro Town conservation area.
  - Prepare a masterplan for an expanded Paro Town centre, including mixed-use commercial, retail and residential activities.
  - Integrate public realm and green spaces, and connect these to the surrounding regional green infrastructure network.
  - Pedestrianise the High Street and establish an alternative route for through traffic.
4. Enhance model rural villages and establish as sensitive tourist destinations
  - Attract visitors and enhance quality of life and prosperity for residents in the northern valleys (Chuba and Ramthangka).
5. Create a green-blue recreation and active movement network along the river corridor
  - Encourage small-scale, eco-friendly farm-stay tourism.
  - Establish complementary recreation facilities, potentially including horse riding and/or mountain biking circuits.
  - Create a consistent and connected network of publicly accessible green space along the river corridor.
  - Establish riverside and on-river recreation facilities/activities at key points along the river (e.g., bbq facilities, rafting).
  - Create a trunk walking and cycling corridor that connects the valley from north to south.



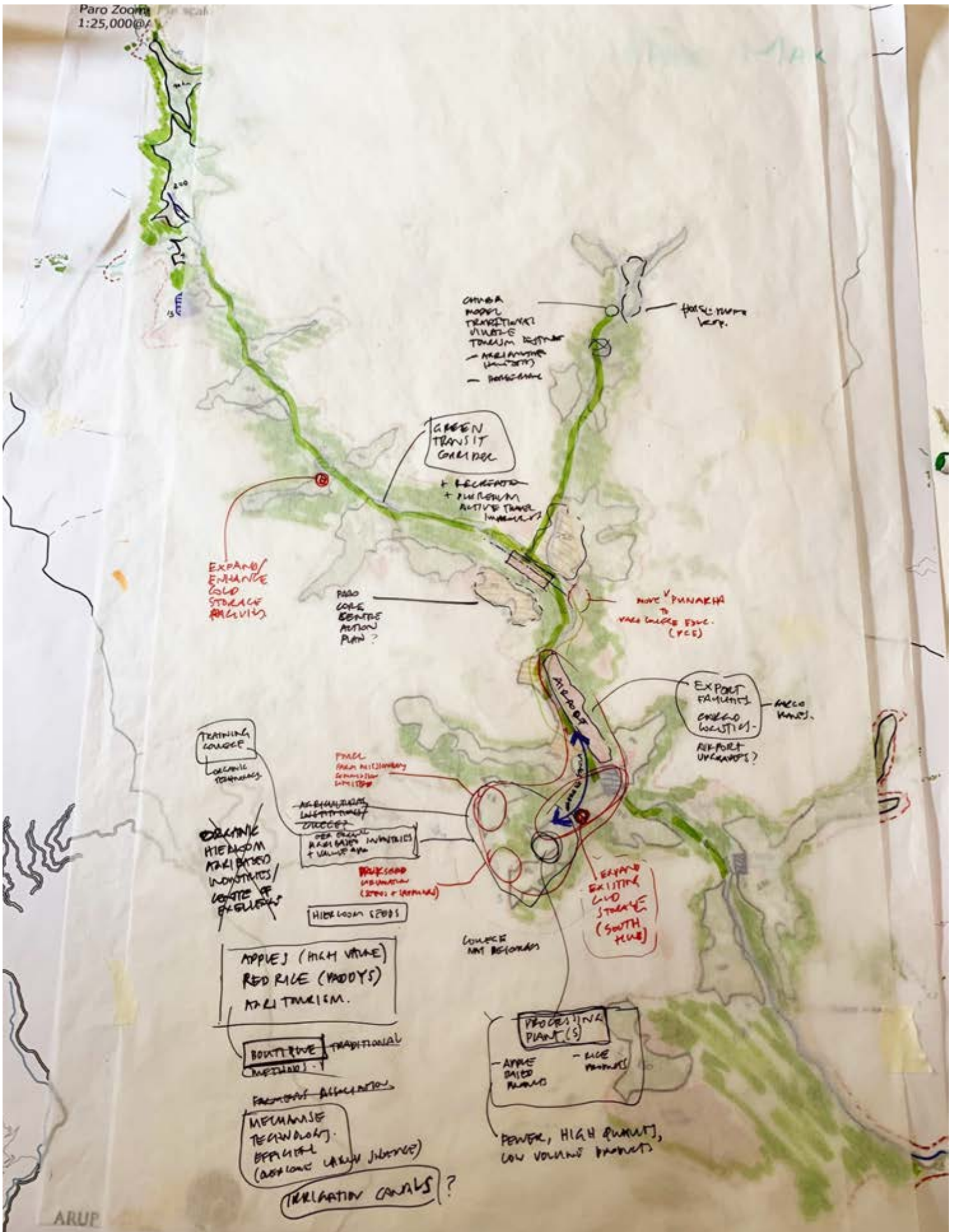


Figure 1.46 Paro A Sketches

## Paro B

### 1. Develop Paro Town Center (Tshongdue) as a Tourism Hub:

- Relocate current uses such as groceries and convenience stores, sales, etc, to the neighborhoods.
- Promote appropriate uses such as arts and crafts show rooms, restaurants and eateries, plazas, etc.
- Pedestrianization of the main street to ensure vitality and vibrancy of the area.
- Upgrade public realm quality across the Town center to link main destinations
- Relocate the existing automobile workshops and non-confirming uses to appropriate locations.
- Protect the existing traditional houses or the streetscapes along the main street of the town.

### 2. Airport:

- Promote appropriate land uses in the vicinity of the airport to capitalize on the opportunities related to the airport.
- Develop the community next to the airport airport as a center of the attraction through the air redevelopment wherein the architecture of the houses are glorified and celebrated.
- Establish a tourist information center at the arrival portion of the airport.

### 3. Cultural landscape and heritage structures:

- Connect the heritage structures of high values such as the Rinpung Dzong and kyichu Lkhhang with hiking/trekking trails. The trails will run across the heritage villages, the steep slopes and the paddy fields engendering different experiences and emotions for the pilgrims.
- To develop existing heritage villages as model villages showcasing the rich culture and traditions of Bhutan but at the same caters to the tourism in the form of home stays, culture exhibitions, etc.
- The Drugyal Dzong/fortress which is currently being reconstructed to be developed as a cultural and religious center.
- Promote agritourism as a way to experience local production techniques
- Enhancement of existing villages, providing experience of local products as part of Spirit of

Bhutan, with different products from villages

### 4. Education or Knowledge city:

- The Pangbisa area has a potential to develop as the Education and Knowledge city considering the Location and existing setting of the site. It is located away from the main valleys and already accommodates the two imperative institutes (The Royal Academy and The JSW Law School).
- Provision of education centers in other areas of Paro which are centered around agriculture / sustainability / climate change.
- Agri-tourism with experiences of local styles of production.

### 5. Sports and Adventures Facilities:

- Hiking trails between major heritage sites, perhaps with different trails providing different levels of difficulty – note trails within valley slopes will need to be sufficiently developed to reduce risk of destabilisation of slopes
- Use the proposed hiking/trekking routes to develop adventure sports such as cycling, ziplining
- Rock climbing and rappelling along the steep slopes and cliffs.
- Recreation along the Pachhu and Dochhu river in the form of riverfront development.
- Small developments or villages can exist along trails to provide authentic eating experience while providing economic opportunity for local residents.



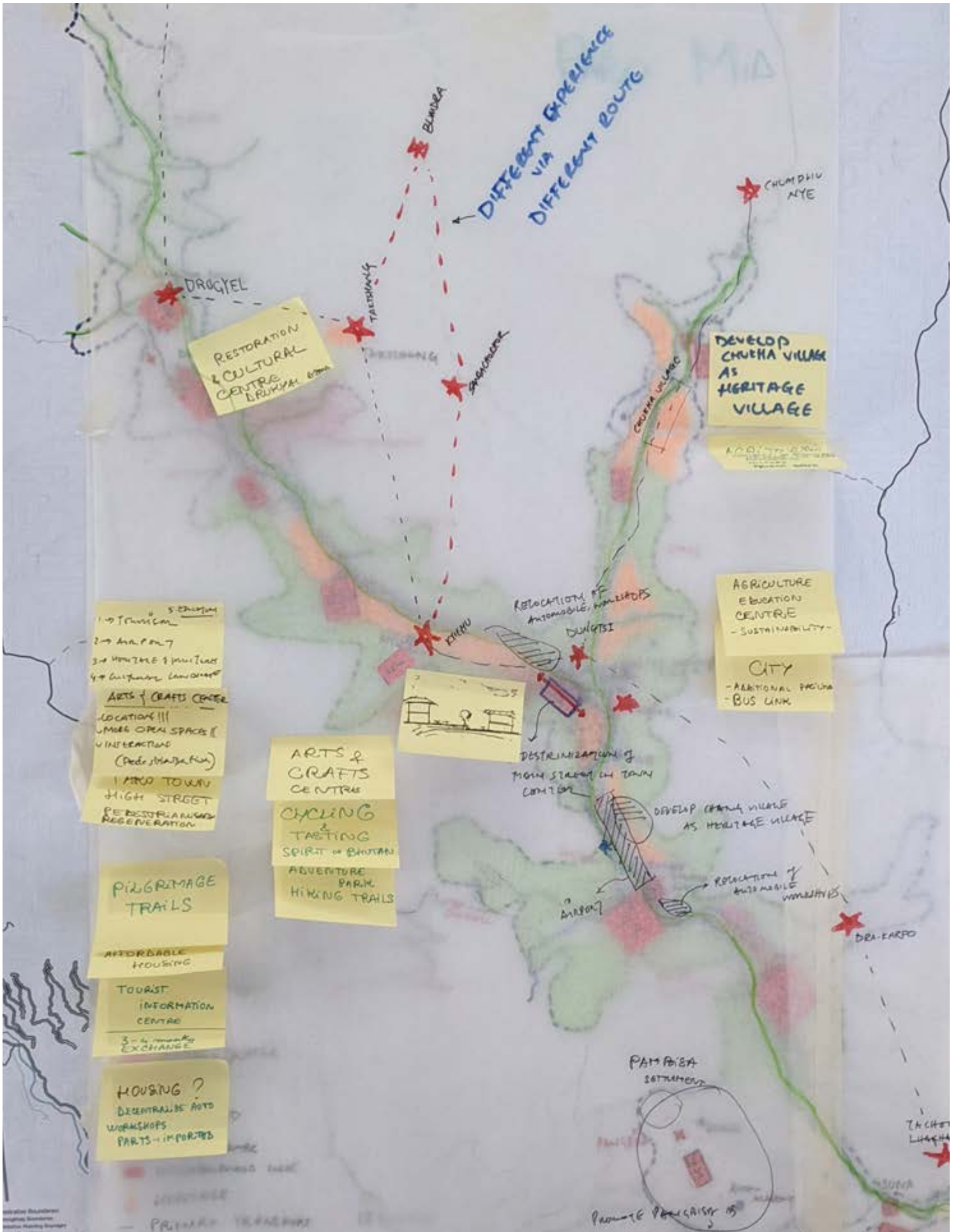


Figure 1.47 Paro B Sketches

## *Economics and Implementation*

### Priority projects:

- National stadium
- Gateway to the city
- Norzim Lam beautification
- Pedestrianisation
- Regeneration of area around the clocktower
- Public art
- Green open spaces
- MICE space – international
- National museum

### Five key areas:

#### 1. Focus on education

Use the knowledge sector as a driver for growth and innovation, to attract national and international talent. Explore opportunities to partner with leading international institutions (e.g. Oxford, MIT, Stamford etc.) through competition – public procurement. Partnerships between national institutions and international institutions could include knowledge sharing (e.g. secondment of lecturers and/ or faculties), or funding of new campus facilities. This could be targeted towards specific sectors e.g. IT and digital (blockchain), finance, climate change.

#### 2. Public procurement

Use the public purchasing power of the government to drive scale and markets. Establish regulations to require all new administrative buildings to be made of X% local materials, timber etc. This could also be expanded to government led programmes for affordable housing and energy efficiency.

#### 3. Affordable housing

Government of Bhutan to drive a national programme delivering affordable housing. This should start with a legal definition of affordable housing (beyond current understanding of housing for civil servants), with a mechanism for identifying and allocating housing to those in need. The National Housing Development Corporation (already established) could be the delivery agency responsible. The corporation could benefit from loans from ADB and World Bank and retain revenue from tenants to pay off loans and cover ongoing maintenance costs. Land for development of affordable housing could come from religious institutions and existing public land holdings.

#### 4. Green Buildings

Comprehensive programme to retrofit existing buildings through energy efficiency and renewable technologies (solar PV and thermal). A green investment bank could be established to create finance products and/ or manage funding programmes (if available).

#### 5. Climate change as a driver for economic growth and jobs

Utilise Bhutan's USP as a leader in managing environmental assets and as one of only three countries in the world to be carbon negative to create an economy around climate change and carbon markets. Catalytic uses could be established by attracting institutions such as ICIMOD or UNFCCC to establish an office here. Opportunities could include establishing the global carbon trading platform, financial products linked to carbon trading, consultancy services, and digital assets around our understanding of climate change – e.g. apps/ software tracking forest cover, carbon sequestration and biodiversity.





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