



Master Plan

# Bumthang Valley Bhutan



Stadt Zürich



# Content

Foreword	4
Existing Situation	10
Master Plan	40
Areas of Focus	74
Tourism	88
Implementation	98
Appendix	104

# Foreword Zurich

You hold in your hands the outcome of an exceptional collaboration between the Kingdom of Bhutan and the City of Zurich. This is the result of long-standing, excellent relations between Bhutan and Switzerland, and is the expression of a mutual exchange of ideas beyond our borders. The collaboration started with the exhibition shown in the Rietberg Museum in 2010 called “Bhutan – Sacred Art from the Himalayas”, from which a regular, intercultural exchange arose.

In 2011, the then Minister of Agriculture and Forests in Bhutan, Dr. Pema Gyamtsho, requested support from Switzerland for the preservation of cultural assets in his country. In ensuing discussions with politicians, planners and local representatives, the necessity for a spatial development plan for the Bumthang Valley emerged, which at a later point in time will serve to pioneer development in other valleys.

The Master Plan for the Bumthang Valley has arisen from an intensive exchange of ideas and knowledge transfer since June 2012. The aim is to facilitate moderate, structured growth and, at the same time, to protect the invaluable cultural assets and natural resources of the valley.

The City of Zurich – represented by the Structural Engineering Department and the Rietberg Museum – has supported Bhutan with the preparation of the Master Plan for the Bumthang Valley. This collaboration was characterised by a frequent and respectful exchange of ideas and mutual learning. We would like to extend our heartfelt thanks to all those involved – both from the administration and from third parties – who have contributed knowledge, time and much personal dedication. Special thanks must be extended to the planning teams in Thimphu and Zurich, who, through tireless commitment, have been able to grasp the concepts of a complex subject area within a short space of time, and have brought it to an impressive conclusion.

Following two intensive years, the handing over of the Master Plan marks the end of this successful collaboration. With the upcoming implementation of the Master Plan, the authorities in Bhutan have another demanding task ahead of them. We are convinced that the Master Plan offers a helpful basis for high-quality development of the Bumthang Valley, and that the valued, personal contacts that were characterised by respect and appreciation will persist.

Corine Mauch  
Mayor of the City  
of Zurich

Dr. André Odermatt  
Head of the Structural  
Engineering Department

Zurich, August 2013

# Foreword Thimphu

Bumthang is one of the most beautiful places in Bhutan. Its rich environment, fertile land, sacred sites, unique festivals and traditional cultures make it an attractive destination for the local people and the tourists alike. Consequently, tourism and farming are the main drivers of the local economy. The success of the economy is leading to enhanced socio-economic development with many implications for the spatial quality in Bumthang Valley. Therefore, the preparation of a development plan has become imperative.

A new planning approach was adopted in Bumthang on a pilot basis wherein the entire valley is included within the planning boundary. This approach is not only in keeping with the objective of promoting an integrated planning and development of an urban centre and its hinterland but also ensures efficient and shared use of the resources and the infrastructure services. More importantly, this planning method would promote a holistic and planned development of the valley. It would also ensure effective land budgeting and release, prioritized investment in infrastructure services, and therefore, the phased development.

As is the practice, the Plan was started as a joint project between the Bumthang Dzongkhag Administration and the Ministry. However, the planning process and the product in this case were enriched by the collaboration with the City of Zurich, Switzerland who provided technical expertise and support. We remain grateful to the Hon'ble Mayor, the Head of the Structural Engineering Department and their

teams at the City of Zurich for considering our request for collaboration and we look forward to continued good relations. We also thank the University of Applied Sciences and Arts, Basel (FHNW) for their inputs and support to the planning team.

The Plan sets out the general direction and the objectives for the development of Bumthang Valley. It provides for the protection of the sensitive areas – environmental, spiritual, historical, scenic views, etc. The Plan makes a clear distinction between the development and preservation areas, making clear intention to promote developments in specific areas while restricting them in other areas. We are confident that these planning objectives are very consistent with Bhutan's overall goals for promoting a balanced and a sustainable development. The lessons and good practices from this project will be applied to other similar projects across Bhutan.

The Master Plan and its provisions establish a strong foundation for the preparation of the Structure Plan and the Local Area Plans for the various areas within the Bumthang Valley. These plans which have direct implications for the land and property owners will be prepared in close consultation with the stakeholders. As set out in the Master Plan document, the Plan will be adapted and detailed out to facilitate its effective implementation and the realization of the vision and objectives set out therein.

Dorji Choden  
Minister, MoWHS

Thimphu, August 2013



Chamkhar Chu

Chamkhar  
Town

Chamkhar  
Village

Jakar Dzong

# Existing Situation

In the last decades Bhutan has been undergoing a process of dynamic transformation. This manifests itself particularly through moderate, yet continuing, population growth and a growth in the tourism sector. In the future, urban areas will grow even stronger as a consequence of emigration from rural areas. The Bumthang District is situated in the central-eastern region and is declared as an “Urban centre with development potential” in the “National Urbanization Strategy” (Royal Government of Bhutan, Ministry of Works and Human Settlement, March 2008).

Bumthang has a unique identity, and is on the brink of increased development. The Bumthang Valley is greatly appreciated over the whole country. It is considered to be a sacred valley worthy of protection and shows good potential for moderate tourism and population development. According to the latest estimate, the maximum population increase is assumed at approximately 20 000 people. This is more than double the current population.

The present tourism model, with its indigenous tourist guides and flat-rate daily fees, shall in principle be maintained. Tourism, even though seasonally limited, is an important catalyst for development. In addition, other industrial sectors should be nurtured in order to offer the local population a diverse means of earning a living which is not dependent on the season.

In the Bumthang Valley – as is the case in the whole of Bhutan – the challenge is to protect the existing cultural heritage whilst at the same time harmoniously bringing together current and pending development.

The master plan functions as a planning guide which formulates goals and regulations on the basis of these premises, and which could lead the way for other valleys in Bhutan. It should become a binding administrative instrument. As such, the master plan will support the planning authorities on a national, regional and local level.

# Facts and Figures



2005	634 982
2030	886 532

Population projections for Bhutan (National Statistics Bureau, Bhutan)

Chhoeckhor	8756
Chhumey	3591
Tang	1816
Ura	1953
Total	16 116

Population of Bumthang (Dzongkhag at a Glance, Bumthang Dzongkhag 2012, Statistics section, Dzongkhag Administration, Jakar, Bhutan)

Chhoeckhor:	
2012	8756
2022	14 000
2032	22 000
Growth rate	1.6

Population projection for Chhoeckhor (Growth rate: Dzongkhag population projections 2006–2015, National Statistics Bureau, June 2008, Bhutan)

The master plan encompasses an area (planning perimeter) of approximately 9 km in length surrounding Jakar, the main town in the Bumthang area (Dzongkhag) and the main valley of Chhoeckhor. The other three valleys belonging to Bumthang – Chhumey, Ura and Tang – are located downstream from Chhoeckhor or run sideways from it. These four valleys provide Bumthang with great agricultural and cultural diversity. Around 16 000 people live in Bumthang; in the Chhoeckhor Valley there are around 8800 people. It is estimated that by 2032, approximately 22 000 people will be living in this valley.

Chhoeckhor Valley, which is the focus of the master plan, runs to the north up to the heights of the Himalayan Mountains. The river Chamkhar Chu and the adjoining plains can be found ca. 2600 m above sea level. The adjacent wooded hillsides climb to a height of up to 4000 m. Along with the main town of Jakar/Chamkhar, Chhoeckhor Valley is situated along the main connecting route from the east to the west of Bhutan. With the construction of a new bypass this direct connection will no longer be in place, however, on the upside the main town of Chamkhar will be relieved of through traffic.

← General map of Bhutan  
Valleys of Bumthang

# Bumthang Identity



1



2

1 Chamkhar and Jakar Dzong, 1981

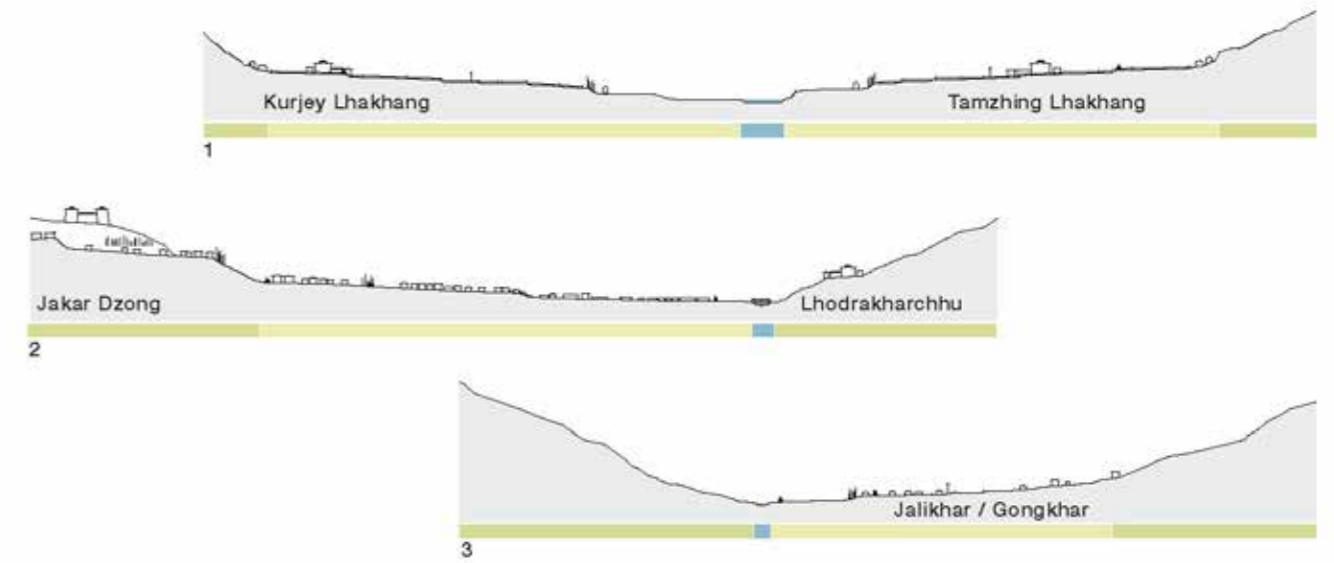
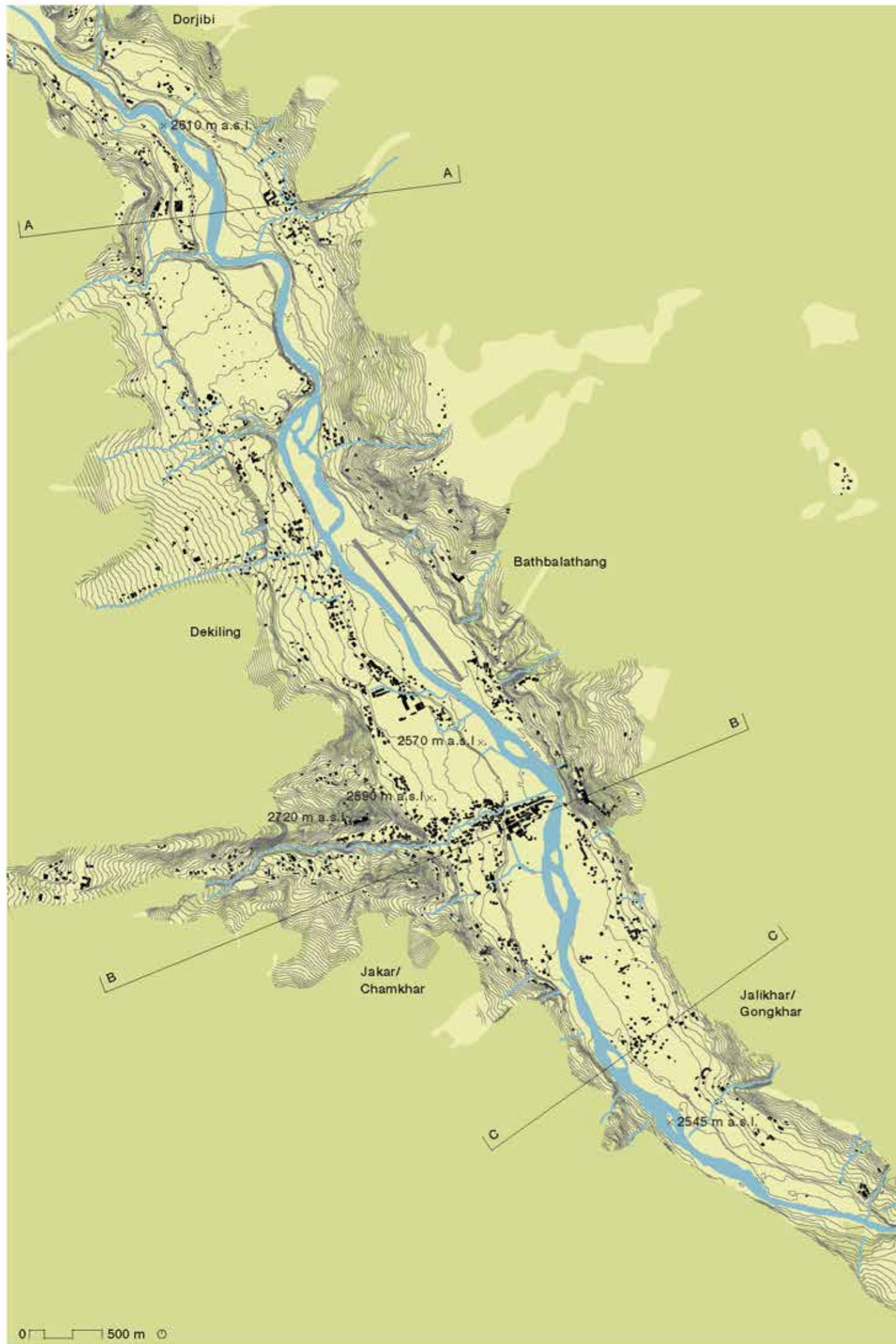
2 Chamkhar and Jakar Dzong, 2008

The open, terraced river landscape is nestled between gently rolling hillsides with thick coniferous forests. Bumthang's identity is based on its diversity of landscapes and agricultural customs with traditional, rural houses. The numerous Buddhist facets are ubiquitous, be it the monasteries and temples which can be seen for miles around, or the many prayer flags and chorten. The valley has changed spatially over the past two to three decades due to advanced settlement development but also due to increased forestation. The south of the valley is more densely populated than the north. The Jakar Dzong is particularly distinctive, overlooking all sides of the valley from its hilltop position.

More recent constructions which shape the character of the valley are, in particular, the airport built in 2011 which is situated in the river basin, as well as Chamkhar Town as the commercial centre of the valley. Foods and many different kinds of goods are available here. Chamkhar Town remains an important gateway – even after the bypass has been completed.



# Topography

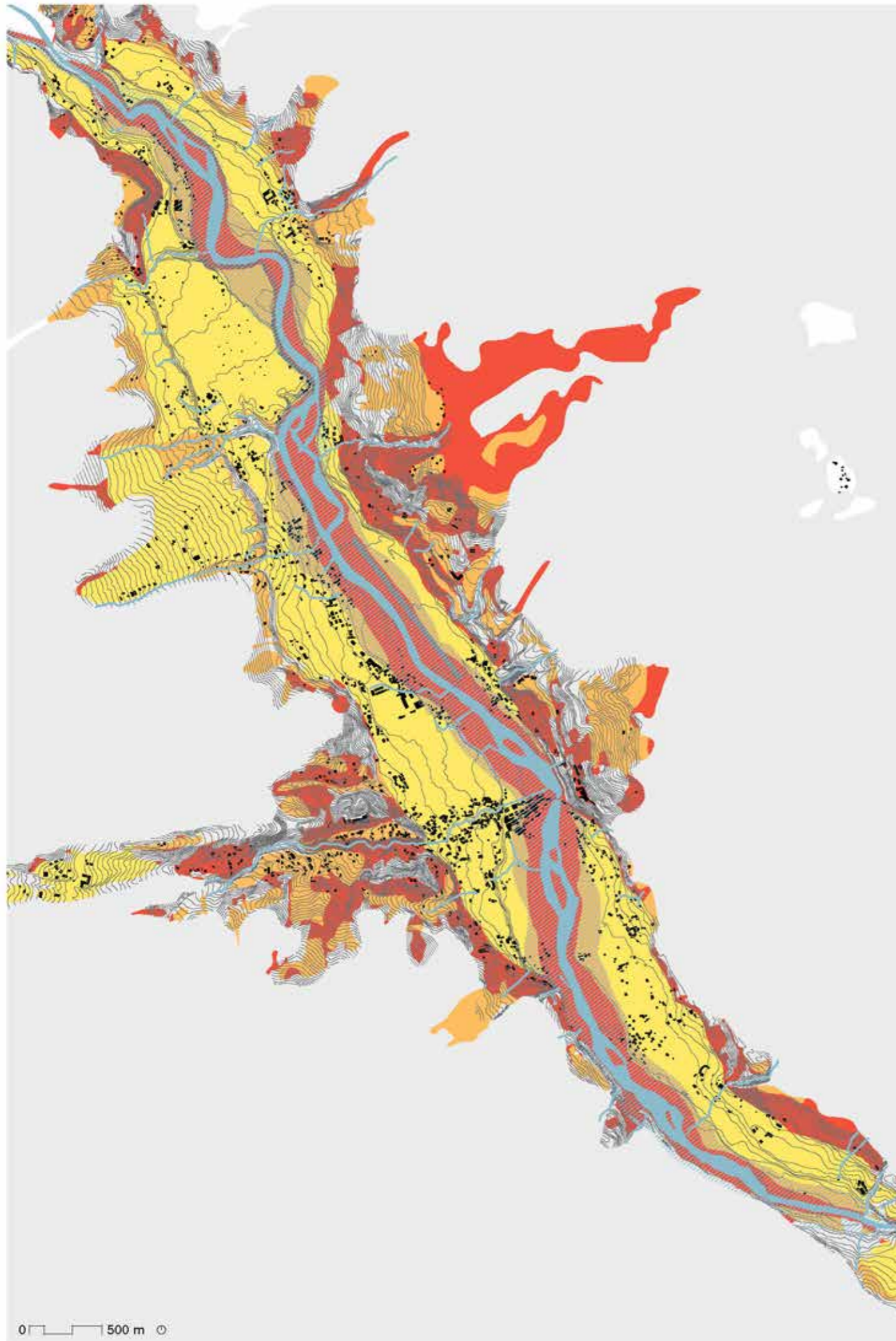


1 Section A-A  
2 Section B-B  
3 Section C-C

- ← Topography
- Contour: 5 m
- Forest
- River
- Cultivated area (agriculture/settlement)

The open space of the Bumthang Valley, which is constricted only by Dorjibi to the north and Jalikhar to the south, is characterised by the meandering course of the Chamkhar Chu. The river's dynamics have, over time, created an impressive terraced landscape with clearly visible edges and plateaus. The water level, which changes according to the season (the main rainy season is from May to October), the jagged forest boundary as well as the changing topography all constitute, albeit in different ways, broad, usable cross-sections of the valley. Whilst to the north near Dorjibi and to the south near Jalikhar the usable section of the valley floor lies east of the river, agricultural and populated terraces – centrally located between Chamkhar and Dekiling – are to be found to the west of the river. All plateaus, including the lowermost plains of the riverbed, vary in agricultural use. Alongside the cultivation of wheat, buckwheat and barley, potatoes are also grown and, since 2004, rice.

# Hazard Zones

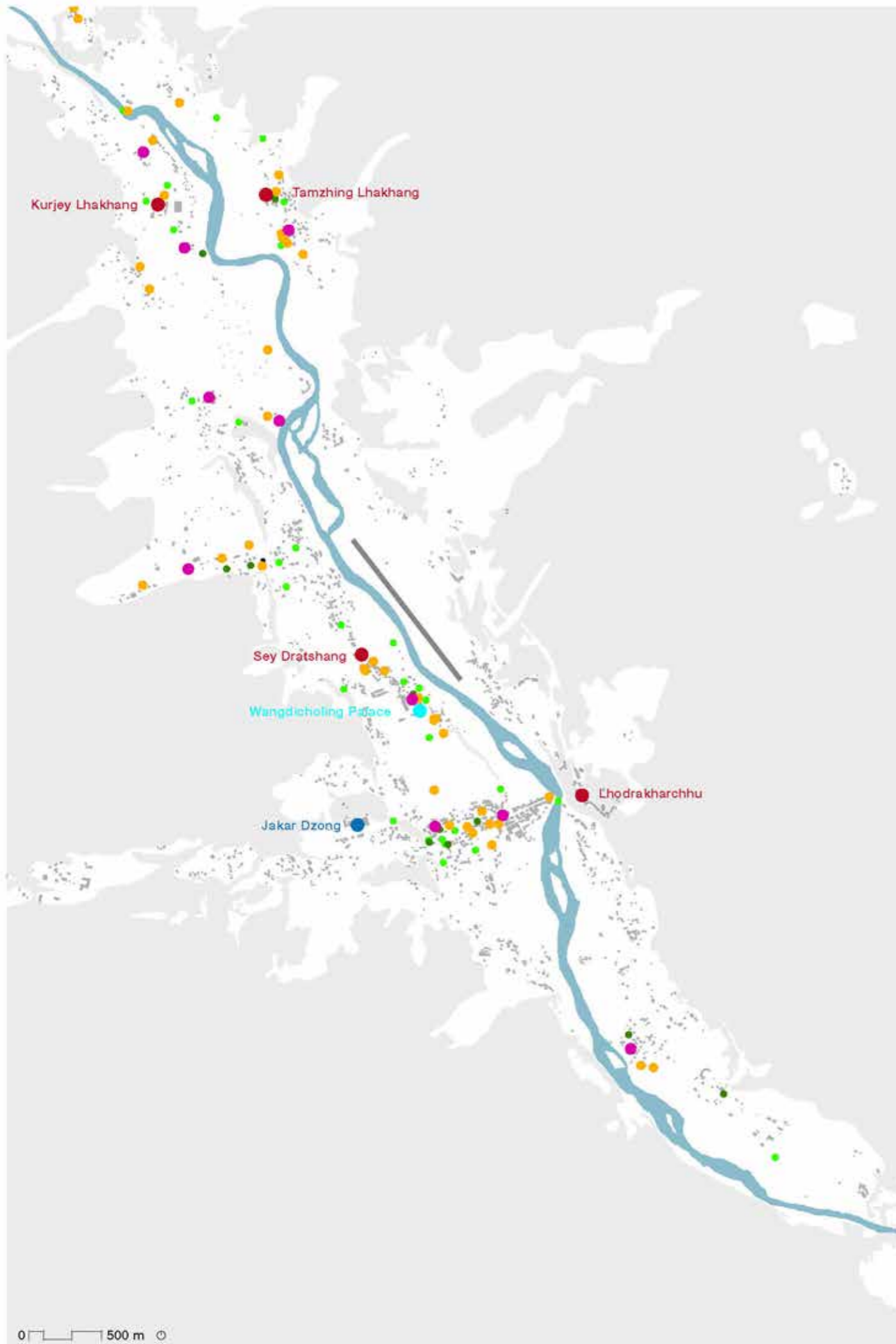


- ← Hazard zones
- Low ( $< 20^\circ$ )
  - Medium ( $20-30^\circ$ )
  - High ( $> 30^\circ$ )
  - Flood hazard

The hazard zones outlined in the master plan are the result of a comprehensive geological study undertaken in 2013. The main defining criteria of the different classes of hazard are the height (flood plains) and the hill gradient (landslides). In relation to the risk of earthquakes, Bumthang has been classified as lower risk compared to the rest of Bhutan.

With advancing climate change increases the danger that glacial lakes could burst their banks (glacial outburst flood) and great volumes of water could plunge into the valleys below with great force.

A comparison of the map of hazard zones with the settlement population shows that numerous buildings are situated within medium and high hazard zones. For the creation of the master plan, it was necessary to meticulously coordinate the future settlement development areas with the hazard zones.



# Spiritual and Cultural Landscape



1

1 Jakar Dzong



2

2 Kurjey Lhakhang

## ← Spiritual buildings and elements

- Dzong
- Monastery
- Wangdicholing Palace
- Temple
- Chorten
- Prayer wheels
- Prayer flags

Religion and tradition are an inherent part of daily life in Bumthang. Each household has a corner or room housing an altar. Rituals and religious celebrations represent only a small, yet visible, part of Buddhism in Bhutan. However, many religious elements and rituals can only be accessed through the knowledge of residents, scholars and the clergy.

Religious symbols can be seen spatially in different forms and according to different criteria. The red cornice on whitewashed brickwork is indicative of the religious significance of the structures. The powerful Dzong, the monasteries and temples in strategic places as well as the numerous smaller structures (prayer wheels) and sacred elements such as chorten and stupas shape the scenery. Memorial and prayer flags waving in the strong north-south wind are closely linked to the landscape and elements of the natural world, as well as holy stones, which, for the uninitiated, can hardly be differentiated from the riverbed.



1



2



3



4



5



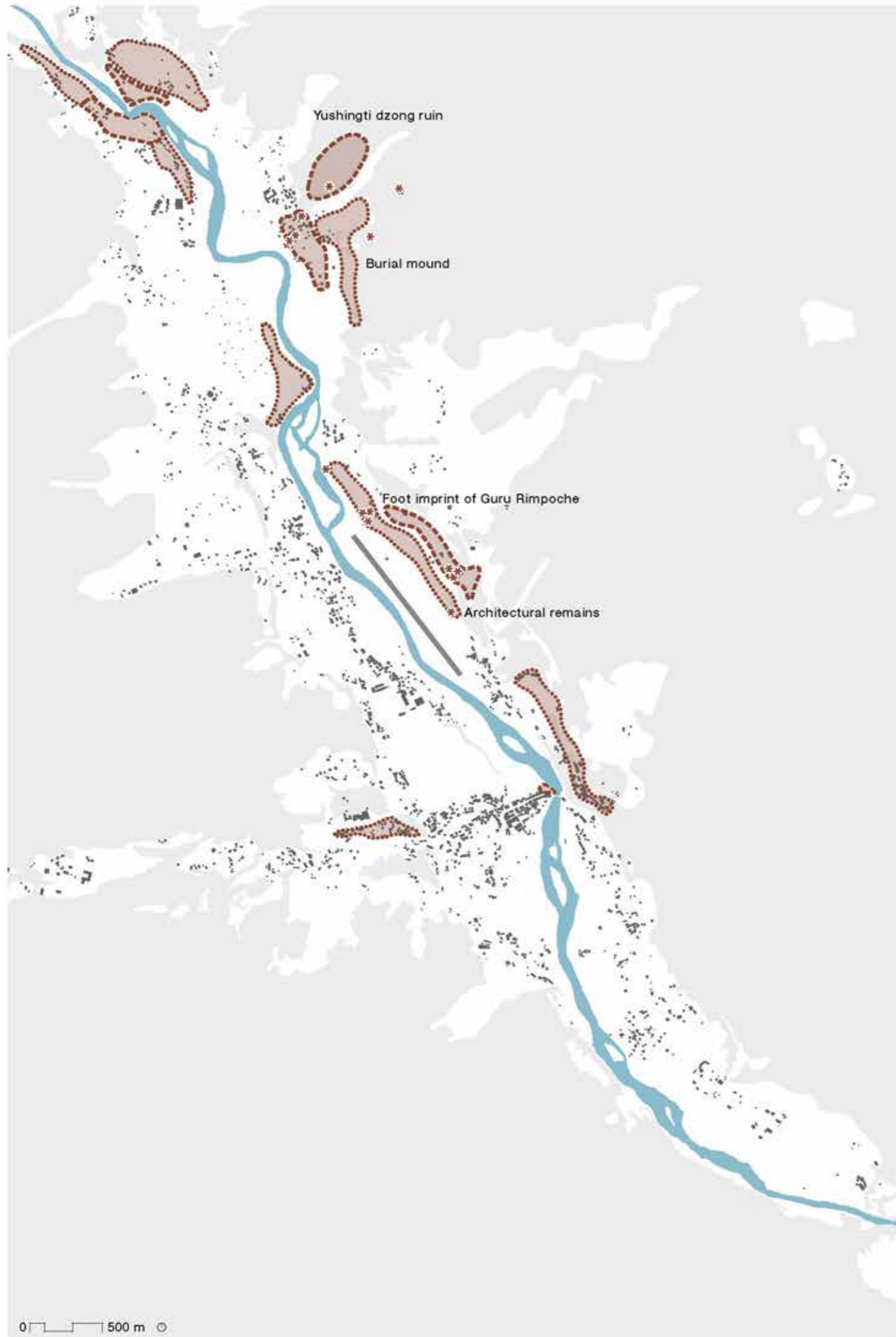
6

- 1 Chorten, Jalikhar
- 2 Prayer flags, Kurjey Lhakhang
- 3 Jalikhar Lhakhang
- 4 Wangdicholing Palace, entrance
- 5 Jakar Palace
- 6 Traditional house in Jalikhar

The vis-à-vis position of the Jakar Dzong with the Lhodra-kharchhu Lhakhang in the south of the valley, as well as the Kurjey Lhakhang with the Thamzhing Lhakhang in the north is striking. These two pairs form a clearly recognizable spatial bracket over the river. A prominent structure is the Wangdicholing Palace built in 1857. This was the birthplace of the first king, King Ugyen Wangchuck, and plays an important part in the history of the royal family. The palace is a solitary figure, elevated over the river, surrounded by a large garden and a wall. The palace will hopefully be renovated thanks to support from the Bhutan Foundation, Washington, and the Rietberg Museum, Zurich. A part of the palace is planned to be used as a museum, with a permanent exhibition of the local patron saint Pema Lingpa which would represent a spiritual focal point in Bumthang. The palace would also be a suitable place for an information centre, and a gateway for historical excursions.

Alongside the spiritual and historic cultural assets, there are also architecturally valuable residential buildings. In addition to systematic recording, strategies for both preservation and usage of these secular buildings must be formulated, since they also contribute significantly to the cultural heritage.

The different aspects of landscape in Bumthang have been analysed in depth by students of the University of Applied Sciences, Basel (FHNW), under the lead of Andreas Nütten. They studied the spiritual, agricultural and social dimension of landscape according to its function. The results of these term papers were included in the master plan.



# Archaeology



1



2



3

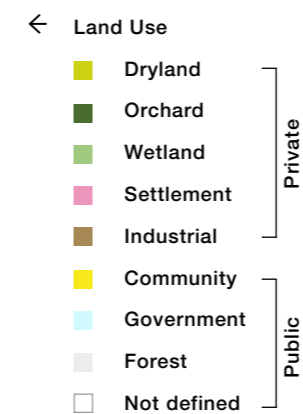
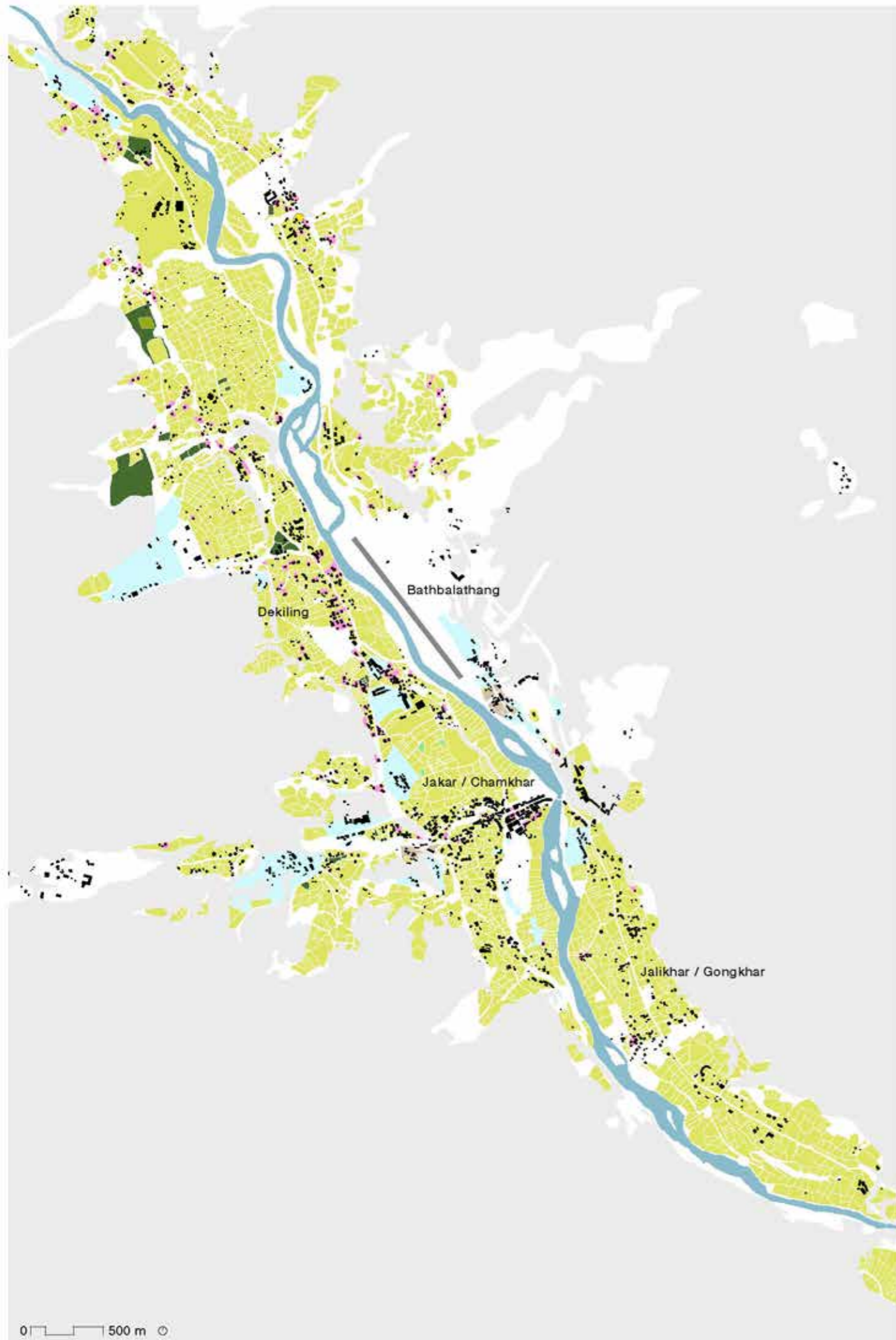
- 1 Examination of a potential prehistoric site near Jakar
- 2 From 2008 to 2010 the first archaeological excavation was conducted at the fortress ruins of Drapham Dzong in the upper Jakar valley.
- 3 Bhutanese and Swiss archaeological teams

Since 2008, the Swiss-Liechtenstein Foundation of Archaeological Research Abroad (SLSA), based at Zurich's Rietberg Museum, has been financing and coordinating the Bhutan-Swiss Archaeology Project, in close collaboration with Bhutan's Division for Conservation of Heritage Sites under the Ministry of Home and Cultural Affairs. Investigations in Bumthang up to now have shown that the area is archaeologically rich. In 2012, an initial archaeological survey of the area revealed a range of important findings on the left-hand side of the valley. Among the 18 mapped findspots there are classical archaeological elements such as an enormous ruin of a Dzong in the forest, walled structures and prehistoric burial mounds. There are also cultural-specific areas such as cup-marked stones, mythical wells and rock formations in the shape of humans and animals, all of which could be described as areas of "natural holiness". These play an eminent role in the mythological and religious history of the valley. In the second phase of the project (2011–13), the focus is set on education and training – notably in archaeological fieldwork – and on the setup of the legal framework, zoning plans and management workflows.

← Archaeological sites detected and mapped during a field survey teaching module. Note: This map is not complete. It represents the current state of knowledge.

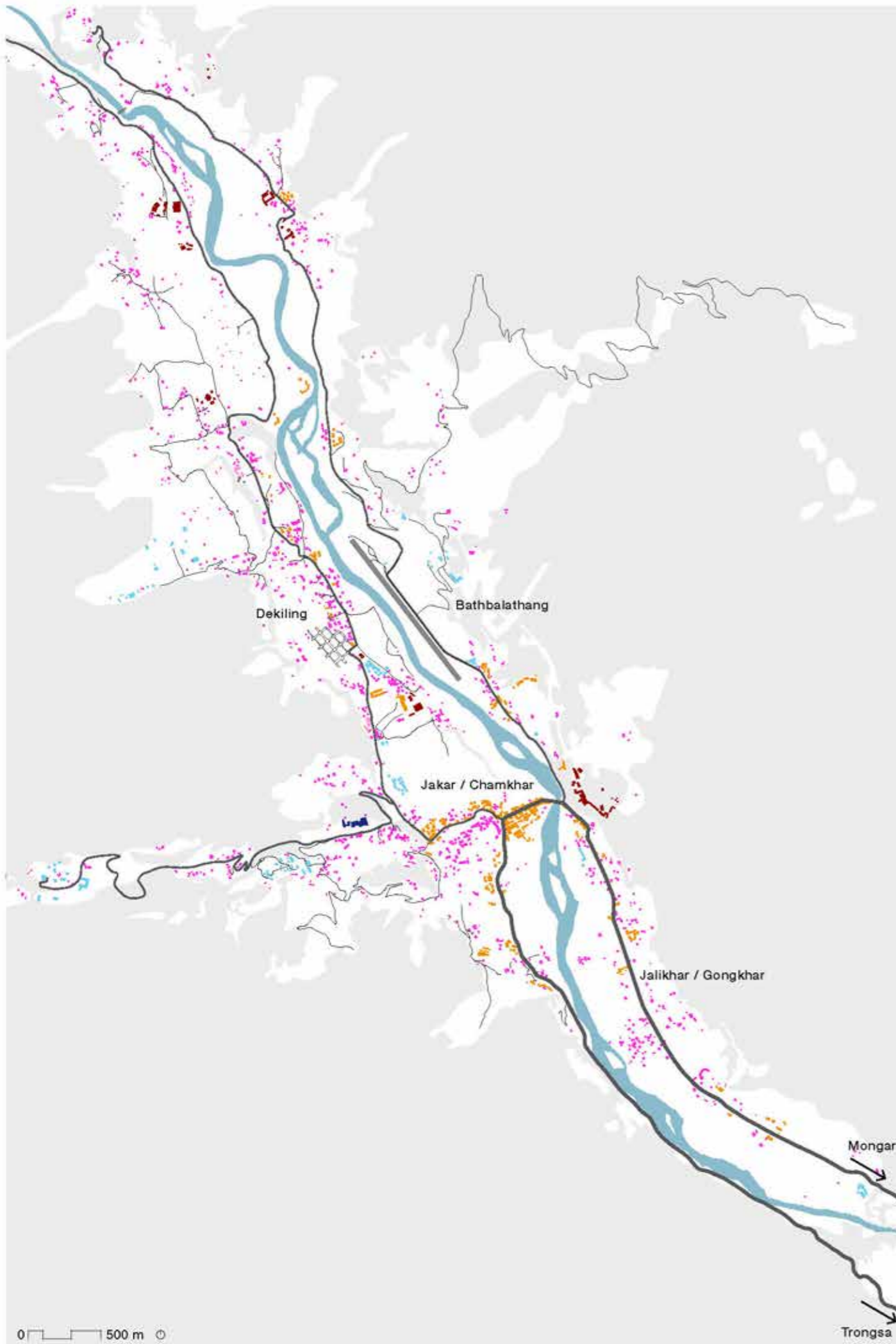
- \* Explored sites
- Known sites
- Predicted sites

# Land Use



The plan manifests the land use and division of the plots as they exist on the ground today. The majority of the land is categorized as dry land though there are patches of other land uses such as orchard, wetland, industrial land, etc. There is also some government land, mostly used for institutional purposes. A comparison of the current land use with the existing buildings shows that a large number of structures and houses are located on dry land (ideal for farming) rather than on residential/settlement areas. Only a few areas that have already been built on are actually within registered settlement areas (pink). The master plan will work towards a situation whereby larger-scale, contiguous settlement entities (zones, clusters) and landscape areas can develop. It is imperative to have an overall planning guide so that the settlements can develop while also promoting the development of agricultural and green spaces. This should lead to plan for zones that differentiate between the main settlement and non-settlement areas.

# Road System and Building Use



1

1 Chamkhar bridge



2

2 Airport



3

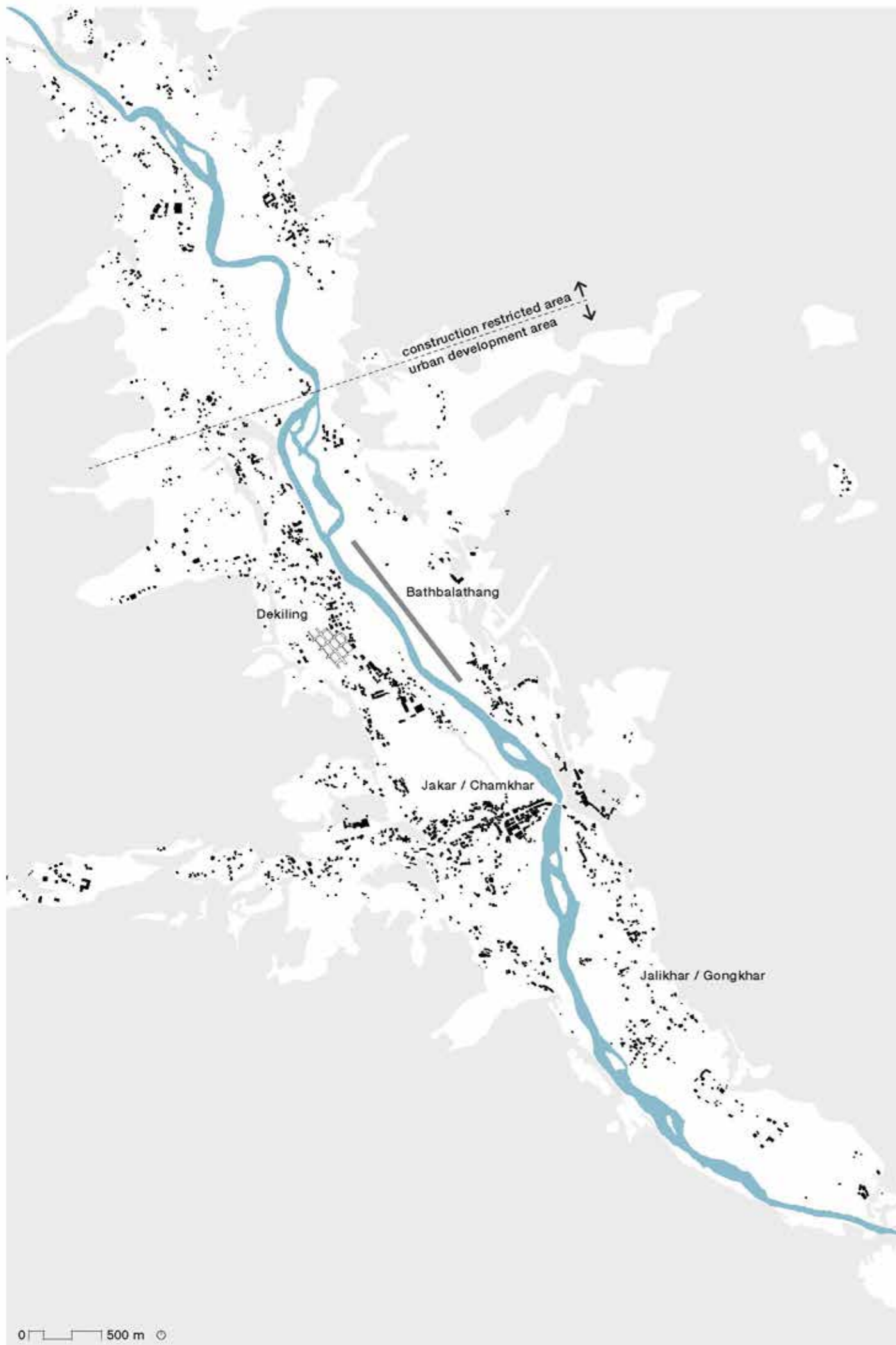
3 Dzongkhag road

Both sides of the river up to Chamkhar are easily accessible via the loop of the national road between Trongsa and Mongar. From here, minor roads continue northwards on both sides of the river; however, only a few kilometres of these roads have asphalt surfaces. It is only possible to cross from one side of the river to the other far up in the Chhoekhor Valley (around 2 hours travelling time). Therefore, many residents here have long journeys, for example, children who have to cross the river as part of their route to school.

To the north, the connection route from Chamkhar to the monasteries and temples runs through sensitive settlement areas, in particular on the western side. Traffic constitutes a large burden, particularly during festival times. Additionally, the anticipated increase in population and in tourism means that the plan should offer relieving proposals. Pedestrians and cyclists are especially vulnerable on these busy roads, since there are no designated lanes for non-motorised traffic. Since 2011 Bumthang has an airport for domestic flights.

Building usage according to the plan gives an indication of the distribution of primary uses, and of their frequency.

- ← Road system and building use
- Spiritual
  - Dzong
  - Government (school, hospital, ...)
  - Commercial
  - Residential
  - Primary (National) road
  - Secondary (Dzongkhag) road
  - Tertiary (Farm) road



# Settlement

The 2012 settlement structure shows the distribution of many smaller individual buildings over the whole valley. This picture of settlement reflects the fact that Bumthang has a predominantly agricultural usage. Smaller villages and hamlets can be found over the whole valley, even though the concentration of these is slightly higher to the north of Chamkhar. Larger and denser clusters can be seen in Chamkhar itself and in Dekiling. Bigger, mainly freestanding facilities and buildings such as monasteries, government institutions, and individual palaces (e.g. Wangdicholing Palace) are also clearly visible. Particular large-scale, exposed resort complexes are also noticeable as they are built in a very individual style and considerably mar the landscape.

The master plan will serve to counteract this unregulated and dispersed settlement development pattern – particularly in view of considerable population growth over the next few years. Even today, the dividing line between “construction restricted area” and “urban development area” is indicative of the desired limitations of developing settlement areas to the north. The constructed, grid-like development complex Dekiling was previously to have been used as a substitute location for shops and commercial operations (small firms, hotels, bars, etc.) in Chamkhar. In the meantime, however, concerns are expressed on the envisaged plans for development by the authorities as well as by the residents of Bumthang. Plans from the same time period, which were implemented, for example, in Bajo Town in Wangdiphodrang, also show the disadvantages of this type of settlement. The challenge now is to sensibly utilise the development which is already in place, as well as to plan a development that fits well with the overall picture of Dekiling.



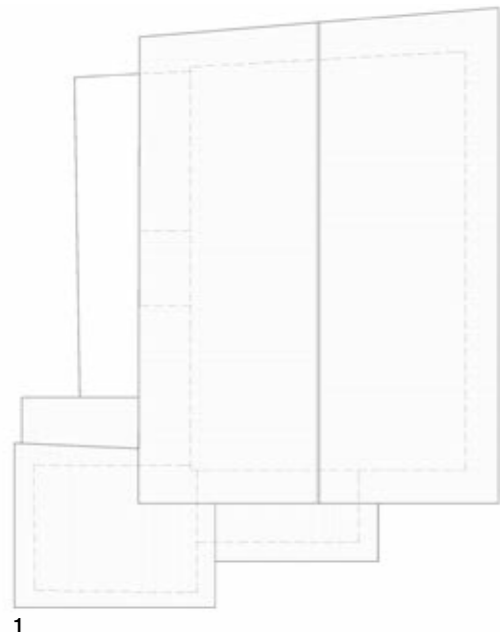
# Village Cluster Chamkhar



- 1 Group of houses forming a cluster
- 2 Ground floor, space inbetween
- 3 Typical two-storey residential houses
- 4 Space inbetween used for daily life
- 5 Situation in Chamkhar

Small, intact villages can be found over the whole of Bumthang. What marks them out is their obvious integration into the landscape. The buildings are seemingly haphazardly placed in relation to one another, yet form clearly defined, shared outdoor spaces. Buildings and outdoor spaces form one entity, which gains additional strength through the choice of building materials, methods of construction etc. Usually, the courtyards belonging to the buildings are separated from streets and roads using dry-stone walls. The copings often are formed by neatly ordered piles of firewood. Each village has a temple which is situated in a specially chosen area.

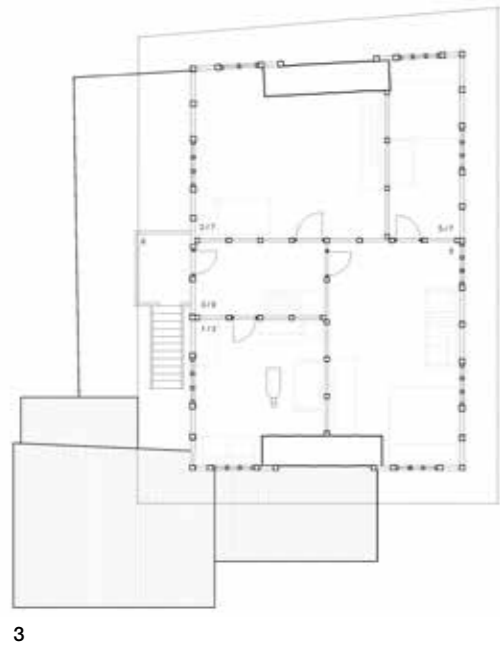
# Traditional Architecture



1



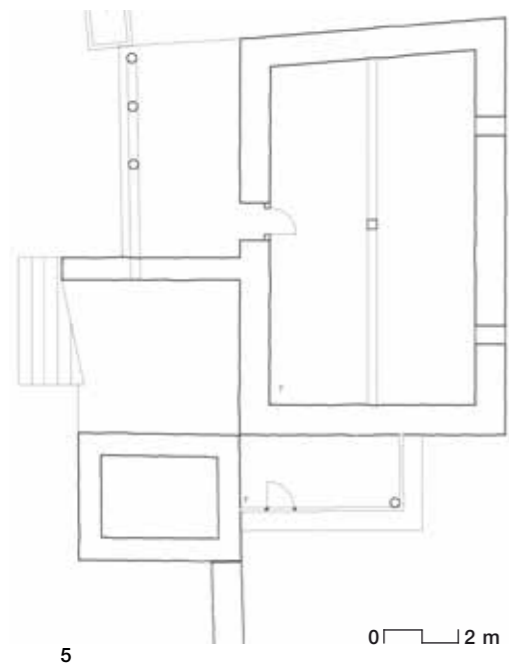
2



3



4



5

0 2 m



6

- 1 Roof
- 2 Facade west
- 3 First floor
- 4 Facade south
- 5 Ground floor
- 6 Situation

Traditional architecture is still very common in Bumthang. At first glance, it is not easy to differentiate new buildings from original buildings. This is due to the fact that the same architectonic repertoire is always resorted to: a vertically structured facade with plinths, central blocks and roof substructures. Probably the most definitive features of these buildings are the timber frameworks of the windows which protrude from the facade, the “flying” roof and the paintings on the facade. Despite their sophisticated construction design and rich decoration, they are nevertheless often hand-made individually.

New buildings are constructed – with the same window elements and roof formations – using cob, stone or concrete. The big architectonic challenge for the future is the further development of traditional architecture with new dimensions, materials and typologies. Traditional architectural basic patterns and elements should still be recognizable – without becoming folkloristic. Conversely, new creations should be possible – locally rooted and without renouncing tradition.

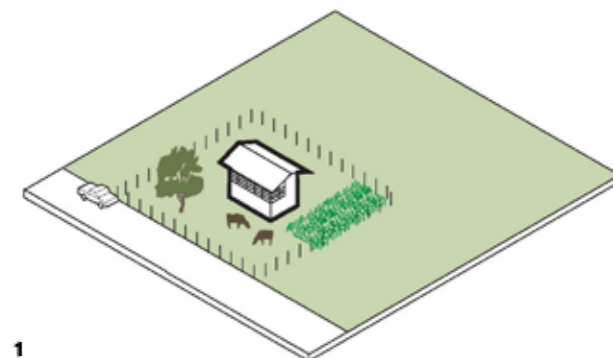
# Typology and Environment

The farmhouse depicts the hitherto customary building format and, as a general rule, is two-storied. The ground floor is used as a storage space or workshop; the open roof area is used for storage of grains and cattle feed. The veranda, often combined with the steps up to the living space, forms the link between the building and outer space. The latter is used as a vegetable or fruit garden, or for cattle.

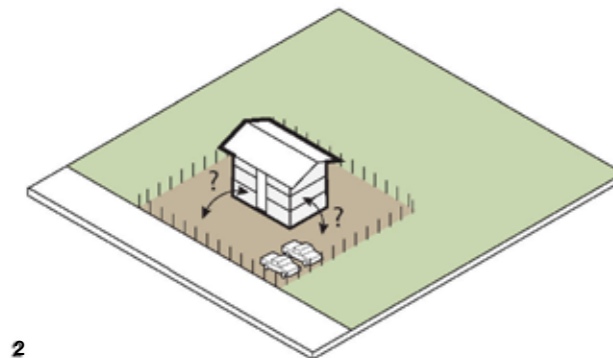
Increasing immigration and other means of earning a living bring with them new and different building formats. Larger three, or even four, storey single-family houses and apartment blocks replace small single-family houses and farmhouses. Modified living styles and often also economic considerations impact both building style and the way in which the outdoor space is used. The ground floor is increasingly used as living space, limiting the roof to protecting against the weather. The staircase is used as a single-function element. The surrounding open space remains uncultivated and serves, at most, as a car park. There are hardly any common outdoor spaces left, nor a distinct connection to the streetscape.

The historic structure of villages in Bumthang can offer a valuable approach for the further development of settlement patterns. As was described in the Section “Village Cluster”, apartment blocks should be grouped around one, common space. The outdoor grounds associated with the apartment blocks would thus be utilized and maintained.

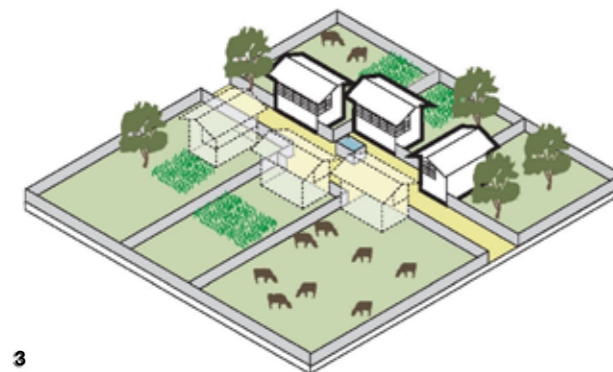
Bajo Town in Wangdiphodrang is justifiably regarded as a negative example for future settlement development in Bhutan. Anonymity, monotony, a lack of relevance to the area and unusable outdoor spaces are all consequences of this type of development pattern.



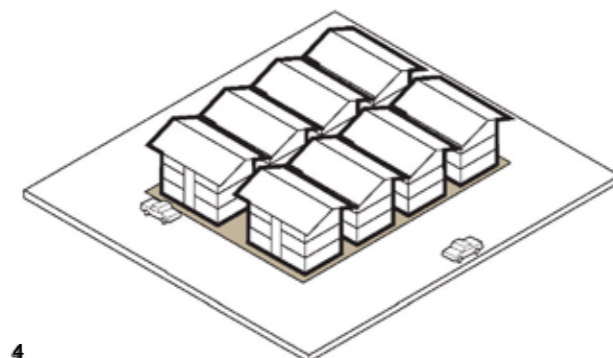
1



2



3



4



- 1 Traditional single house
- 2 New apartment building
- 3 Traditional cluster
- 4 New Bajo Town



Chamkhar  
Town

Chamkhar  
Village

Jakar Dzong

Wangdicholing  
Palace

# Master Plan

Bumthang is to undergo long-term development which allows for growth, and offers a good standard of living for the diverse and varied population.

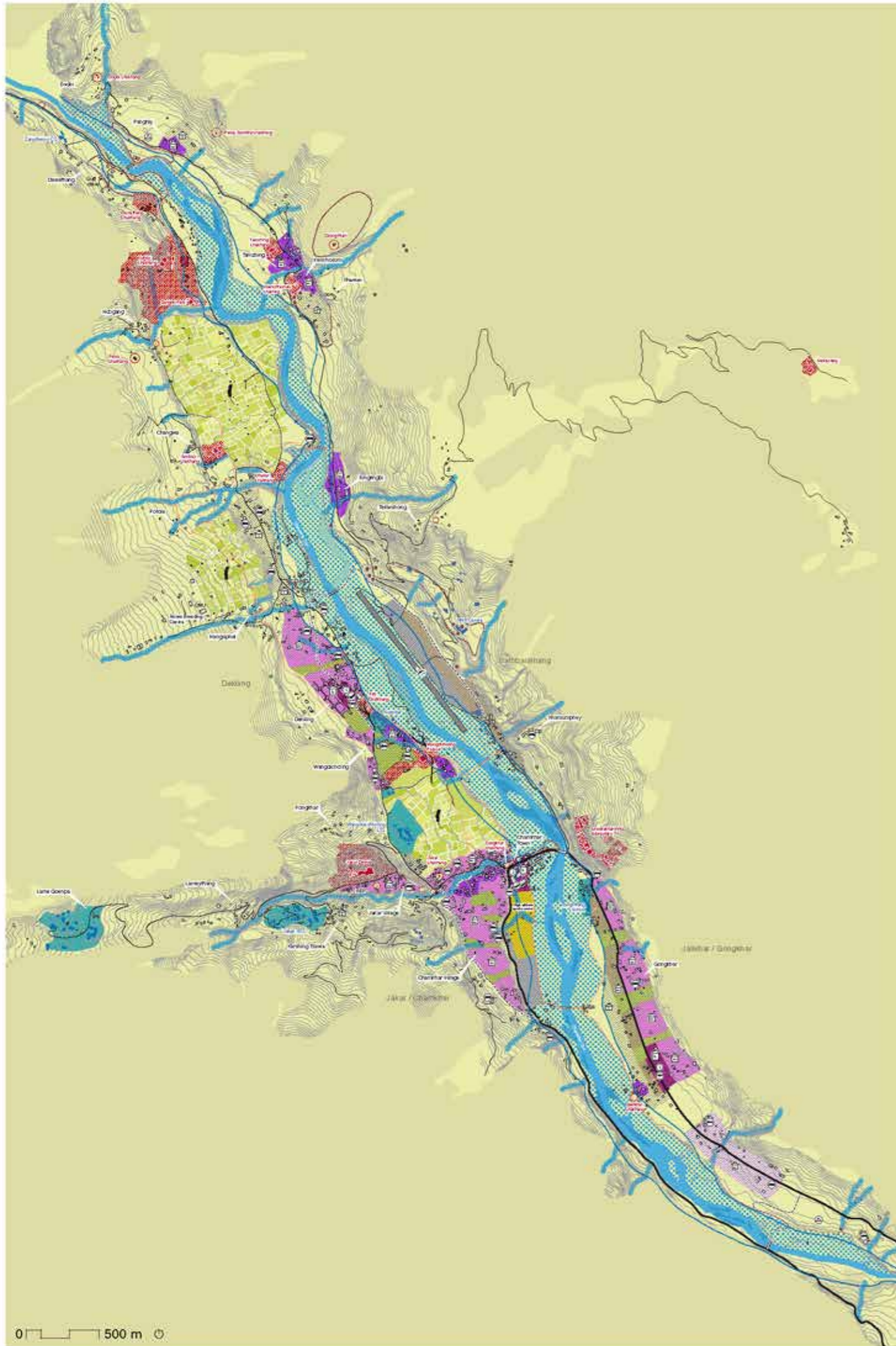
The aim of the master plan, therefore, is to formulate spatial principles, aims and regulations and to manifest the ways in which the space will be developed in the long-term: the organization of settlement areas and non-settlement areas, the distribution of land use and the enhancement of the existing infrastructure, e.g. through new bridges and sections of road. The master plan builds upon the existing unique identity of the Bumthang Valley and on the quality of its subspaces in order to develop these further. In particular, this identity consists of the formative terraced and river landscapes, the many cultural assets and holy sites as well as the existing villages.

The Master Plan for Bumthang consists of the present master plan and the corresponding guidelines. The plan contains propositions regarding use of space with respect to zoning, settlement, landscape, infrastructure and usage, with indications as to the sphere of influence (preserve, protect, develop) and to the density level (high, medium, low). The guidelines set out these aims and strategies in concrete terms and manifest the possibilities and limits of development within the different zones. Possible settlement structures are shown for three main areas of development, which build upon the framework of the public space.

The master plan gives directions regarding the implementation of planning by the authorities. This planning-related foundation will have to be adapted to and approved by the current ownership structure, as well as the existing laws and procedures. Cooperation of the affected stakeholders is therefore an important part of the approach.

In addition, a necessary next step is to create detailed plans of the territory and the area in order to concretise and execute the plan (Urban Development Plans).

Based on the premise that Bumthang is striving for growth and development and that the tourism sector is the driving force, the following overriding principles describe the fundamental attitudes towards the desired development of the landscape and the settlement. Concrete objectives and directives for long-term development can be derived from these principles.



# Zoning

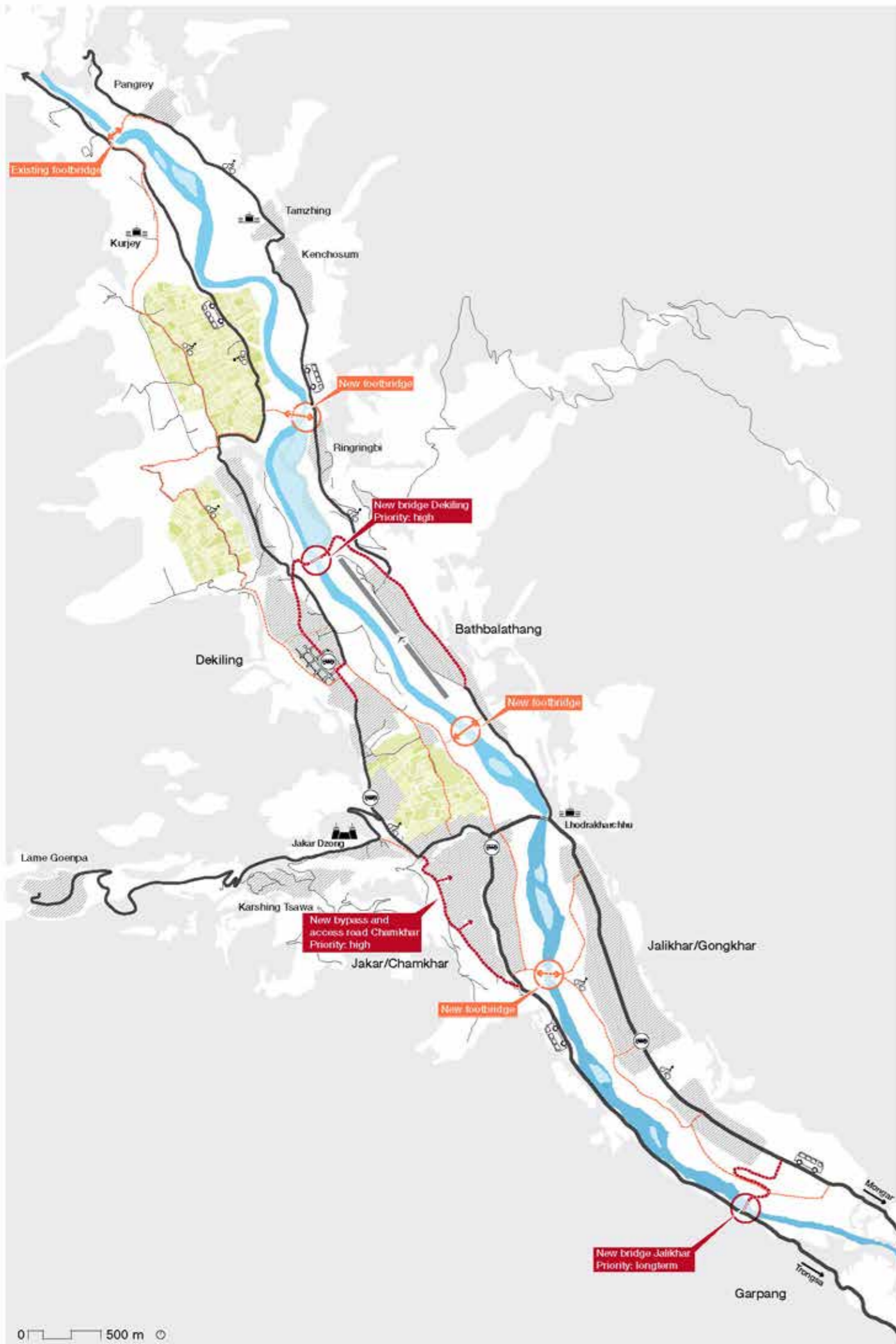
	Type	Objective (Density)	Strategy
Landscape	Cultivated landscape / Agriculture	Preserve	
	Forest	Preserve	
	River landscape	Protect	
	Agriculture / Paddy fields	Protect	
	Sacred sites	Protect	
Settlement	Historic village	Protect / Add (medium)	
	Main development zone	Develop (medium)	
	Centre zone (commercial, offices, culture, ...)	Develop (high)	
	Scattered settlement zone	Preserve (low)	
	Industrial zone (workshops, small industries, logistics)	Develop (medium)	
	Zone for infrastructure (supply, disposal of water + waste)	Develop	
	Institutional zone (schools, administration, ...)	Preserve / Add (low / medium)	
	Zone for outdoor activities (high altitude sports centre)	Develop	
	Open spaces within settlement areas	Preserve	
	Reserve zone	Develop (medium)	

# Principles



1. Prohibit settlement in the most sensitive landscape areas (flood zone, slope, forest, agriculture/paddy field).
2. Draw a clear line between settlement and open space. Concentrate and organize the settlement in different typological patterns.
3. Strictly protect the holy sites and the cultural heritage.
4. Keep agricultural areas for local food supply and for the specific landscape scenery.
5. Promote walking, cycling and public transportation. Enhance accessibility to and awareness of the landscape scenery.
6. Promote sustainable tourism development with benefits for the local population.
7. Provide opportunities for different economies. Offer job opportunities in addition to the tourism economy.
8. Promote Bumthang as an important regional centre with three subcentres (Dekiling, Chamkhar, Jalikhar).
9. Provide infrastructure for waste management, networks for water supply and sewage treatment for the development of the focus areas and use renewable energy.
10. Offer public spaces for use by the community, particularly in the new settlement areas.

# Mobility



- ← Mobility
- New road sections
- - - Main paths for pedestrians and cyclists
- ⊙ Bus terminal
- ▨ Settlement zones

The overriding long-term development goals constitute an intricately woven pattern of infrastructure and connecting routes for all road users within the central area as well as good accessibility to the three main areas of development Chamkhar, Jalikhar and Dekiling. However, good links and accessibility to the holy sites and cultural assets are also important objectives.

With respect to traffic systems, the focus is on improved connectivity between the two sides of the river, development in a north-south direction and the introduction of an appropriate and efficient public transport system. In order to achieve these goals, various measures are proposed. The building of bridge structures will have high priority.

1. In designated places, new connecting bridges are proposed over the Chamkhar Chu – for both motorised as well as non-motorised vehicles and pedestrians. The new bridge to the north of the airport is important for the expansion of the settlement area of Dekiling, but also to ease the burden on Chamkhar Village. A new bridge to the south of Gongkhar will facilitate the long-term development of the industrial and residential quarters of Gongkhar/ Jalikhar. In addition, the new connection routes over the river allow for public transport circuits (bus-loops 1 and 2) and provide a link between more remote settlement areas and the new centres. For touristic as well as local development, new footbridges are very valuable. With a specific design, they will be able to contribute to the identity and recognisability of the valley.





← Public transportation system, circulation of mini-buses

2. To ease the burden on existing bottleneck areas and to bring about new areas of development, designated new sections of road shall be created – in accordance with the respective settlement area. The new road western Chamkhar Village will on the one hand relieve pressure on the village and, on the other, will support the new development area of Chamkhar.

3. Transportation conditions will be improved and developed for pedestrians and cyclists – both for tourists as well as for the local population. In this regard, existing roads have to be extended and new connection routes have to be put in place. This will enable a cohesive network of routes for non-motorised traffic to be created. Especially in the settlement areas, pedestrians and cyclists will be able to pass along safe and attractive routes.

4. In order to make the central area accessible by public transport, using small-sized vehicles, is recommended. Of particular importance here is the linking of the three centres, good accessibility of public services (e.g. schools) – particularly for those living in remote areas as well as for the purposes of tourists and those making pilgrimages. The introduction of electric vehicles is recommended. Through these new standards regarding a sustainable transport system could be put in place.

5. Greater acceptance and use of public transport can be brought about through the establishment of transportation access points covering a large catchment area, strategically placed interchanges and central open-air parking facilities. Further, these measures will lead to a reduction in the number of cars in residential areas.

6. Seasonal peak times (the tourist season, the festival season, pilgrimages) can be responded to through suitable official regulatory procedures such as the closing of roads to private vehicles, diversions, increasing the frequency of public transport and the employing of extra buses.



# Landscape and Settlement

In the Bumthang Valley, settlement structures are blended into the landscape. Areas of settlement are embedded in the landform; aspects of the landscape organise and shape the settlement areas; structural details such as walls and fences sculpt the farmland; there are tree-lined roads etc. The specific identity of the Bumthang Valley arises from the harmonious relationship between both the existing and the new settlements and landscapes. The present plan aims at a long-term moderate development strategy for the valley as a whole, which lays equal importance on settlement, landscape and culture. Ways of dealing with the threat of natural hazards and protecting the landscape from urban sprawl constitute urgent challenges. Certain areas must be excluded from the impending development in order to protect the landscape and settlement zones. Both the settlement zones and the landscape are subject to continuous change. The objective of the master plan is to enable development of the settlement and the landscape in balanced measures.

## Landscape

The landform of the Bumthang Valley is significant in a number of ways. On the one hand, because of the beauty and attractive nature of its landscape, the valley is a gateway for tourism development. On the other, as an agricultural space, the valley is a means of existence for

the local population. The development of the society, the economy and the environment in Bumthang depends on preservation, careful usage and design of the landscape. Protection of the landscape, but also shielding the population from natural hazards, means preserving primary elements such as rivers, forests and farmland. The broader river landscape along with the flood area must not be modified.

### **Settlement**

In light of population growth, development of the settlement should take place in a concentrated manner, that is, in large-scale, dense entities. Due to the restricted area between the riverbed and the wooded hillside, the development needs to be approached economically. There is enough space alongside the bigger settlement entities for preservation and development of the agricultural, spiritual and cultural landscape. The expansion of existing smaller settlement zones with new zones means that varying areas of settlement can be formed which, depending on exact location, are shaped in a rather more rural or a more urban manner (more public space in conjunction with a combination of various usages).

The main development is envisaged on sites which are topographically suitable and where there are existing site developments, settlement structures, and areas available for exploitation. This potential for development is seen in the three main areas of Chamkhar, Gongkhar/Jalikhhar and Dekiling which have been put forward for development. No concentrated settlement development is planned for the area north of Dekiling. The natural landscape and the spiritual landscape will, in the long term, determine the characteristics of this valley to the north.

# Public Infrastructure

In general, there is a guaranteed supply of electricity in Bumthang. Occasionally, however, there are interruptions in the electricity supply (grid overloading, wire faults).

In Bumthang water is drawn from streams. The municipality has tapped two sources (Lamegoenpa & Nangsiphel) and the supply network covers most of the town area.

Areas not covered by the municipality have rural water supply scheme or their own supply from smaller streams or springs.

A sufficient supply of drinking water can be guaranteed in most areas. In the future, particular consideration must be given to preserving the quality of the water (protection zones for the springs encompassing vegetation), suitable pressure ratios (division into different pressure zones), and protection against fire (water for extinguishing fires).

In general, there should be separate systems for drainage; i.e. for untreated waste water and rainwater, different drainage systems are to be planned. Unpolluted rainwater can be run directly into the nearest suitable outlet channel. Simple road drainage systems and water outflow pipes from the roof are also effective measures against erosion in public spaces. Untreated waste water from dense building areas should be collected separately and preferably diverted down a decline to a site suitable for a future, centrally-located sewage treatment plant. In less dense residential areas, the cleansing and leaching of sewage can take place in septic tanks. A suitable site should be secured for the location of the sewage treatment plant.

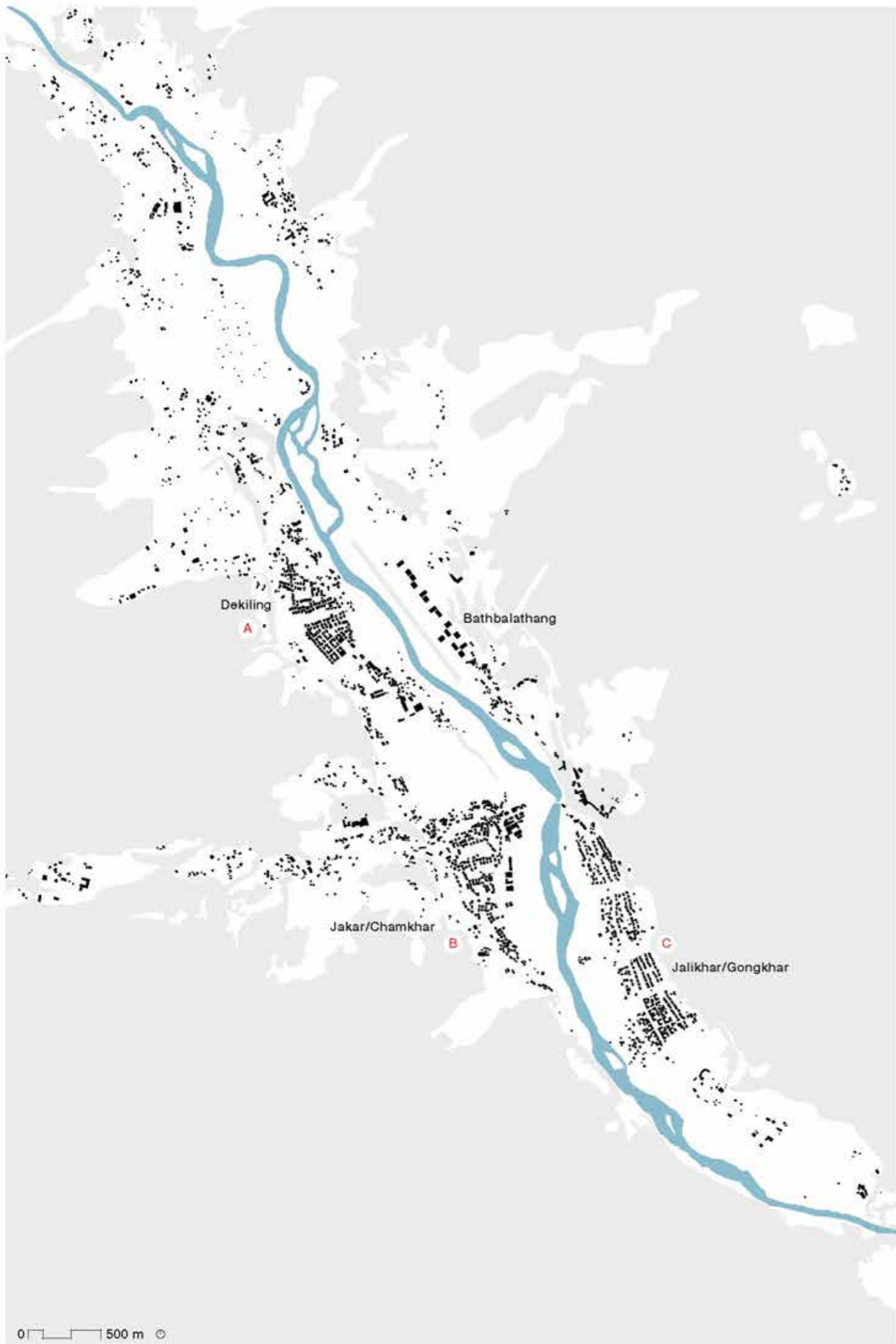
When considering the environmentally-friendly disposal and recycling of household waste, it is important that

different types of rubbish be collected separately. The most important groupings are: glass, metal, green waste and residual waste. Glass and metal can be recycled; green waste can be composted (as fertilizer or to improve the humus). Residual waste can be brought to a landfill or can be burned.

For the provision of sources of heat (central heating and hot water) through renewable energy sources, solar thermal energy and wood fuel are particularly suitable. As a matter of fact, conditions are ideal for thermal usage of solar thermal energy through solar panels - in cold periods the weather is always good and there is a relatively high level of sunshine, the energy is available everywhere and can be used through simple technical means. Self-constructed solar panels and hot water tanks could also create additional income and jobs for the local industry. Solar-powered boilers in larger hotel, office and residential buildings can be supported by wood log heating at times of peak demand.

Even though electricity in Bhutan is plentiful and inexpensive, it is not advisable to use this extremely high-grade form of energy for purposes of heat production (central heating and hot water).

Where the expansion of development zones and new residential areas is concerned, the necessary infrastructure for provision of utilities and waste disposal has to be planned early on alongside the development of roads. Long term, ideas are particularly necessary for the discharging of untreated waste water and for the supply of drinking water (including reserves for extinguishing fires).



Assumptions:
4.6 people / household
4 residential units / building
100 m <sup>2</sup> per residential unit (inc. general expenses of development and construction)
Main settlement areas:
<b>A</b> + 3500 people
<b>B</b> + 2200 people
<b>C</b> + 2800 people
Total: + 8500 people
Further areas suitable for building:
+1500 people
Population 2013: 9000
Population future: 19 000
<b>Growth assumptions</b>

# Growth

Should the development be left to take care of itself, unbridled sprawl will scatter over the whole valley. In order to counteract this tendency, the development should be guided with the help of planning and strategic measures.

If made early enough, public investment (e.g. public facilities, development of roads, public spaces, provision for maintenance and sanitation) is able to facilitate and advance development in appropriate places. The development should be concentrated mainly in the three proposed areas through planned intervention and incentives.

It is recommended that spatially restricted units (neighbourhoods) be defined. The new areas of development will be substantively similar to existing hamlets and villages regarding density and graining.

With the proposed settlement development, the population of Chhoekhor will be able to increase from the current 9000 to approximately 19 000. In this way, an additional 8500 residents can be concentrated in the main development areas and roughly 1500 people in the other areas.

The numbers that can be employed cannot be stated at this stage since data on development areas and numbers of people vary greatly according to the type of business involved. It is to be assumed that smaller companies will become established in the industrial area of Gongkhar, while in the area of Bathbalathang, businesses requiring more ground space will be set up.

# Landscape Rules



- ← Categories of landscape
- Cultivated landscape / Agriculture
  - Forest
  - River landscape
  - Agriculture / Paddy fields
  - Sacred sites

## Characteristics

The diverse and beautiful landscape of the Bumthang Valley is unique and constitutes the basis for the prospective development in the sense of a “Cultural Park Bumthang”.

To preserve the quality and potential of the valley, it is essential to categorically separate the landscape areas from the areas of settlement. The already existing division of the valley into the northern “construction restricted areas” and the southern “urban development areas” is an important basic rule. The demarcation up by the Chakar Lhakhang is correct and will be retained.

A general building ban applies to all landscape areas described subsequently. New buildings are permitted as an exception but not unless there exists an immediate connection to the surroundings landscape areas or use of the land. An unmitigated, absolute building ban applies in the sensitive and endangered areas (river areas, hillsides) as well as in the three large-scale areas of agriculture/ paddy fields.

Elements and measures which contribute to the diversity of the landscape and are compatible with the overall appearance of the landscape will be promoted (hiking trails, sign posting, walls, plantations for the purposes of draft shield). All measures and interventions working against the described objectives are to be prevented.

### **Cultivated landscape / Agriculture**

The character of the open landscape is to be preserved in its entirety. As an economic basis for agriculture and tourism, this area is to be spared. Various agricultural uses (e.g. arable farming, orchards, apiculture) are possible.

Small-scale structures for agricultural purposes (farming and cattle sheds), as well as access roads, are permissible. The conversion of existing farmhouses for sole residential purposes is not allowed.

As an exception, locally operated, small-scale tourist uses are permissible (e.g. guesthouses, agritourism, restaurants, sale of local products).

### **Forest**

As a contiguous area, the forest most notably shapes the hillsides and at the same time offers protection against landslides. The existing forestland and the forest boundary should be preserved. No buildings may be erected in the forestland, with the exception of the purpose of tending to the forest. The zone around the forest edge should be kept free of development. Within the open space between forest and settlement, there are scenic spots, which can be turned into viewpoints or scenic walks. New buildings must be built with a minimum distance (around 30 metres) from the forestland.

### **River landscape**

Due to the danger of flooding and the river landscape being worthy of protection, new buildings are not permitted. In the medium term, existing buildings and the resident population should be relocated to secure areas.

Infrastructures to connect both sides of the river as well as public footpaths are permitted.

Protection measures in the river basin are permissible for existing and new infrastructure (e.g. to connect both sides of the river), as well as for the safeguarding of existing buildings (provided resettlement is not urgent or possible). New control structures which are absolutely necessary

are to be implemented sensitively and must be harmoniously integrated into the natural landscape (an example here is Paro Valley). The river itself may be used for outdoor activities such as rafting or fishing. Uses which do not require built structures are allowable in the river basin (e.g. sports grounds, picnic areas). The same rules apply to the areas where there are smaller streams.

According to today's legislation in Bhutan, buildings must be erected at a minimum distance of 30 metres from the river, and a minimum distance of 15 from a stream.

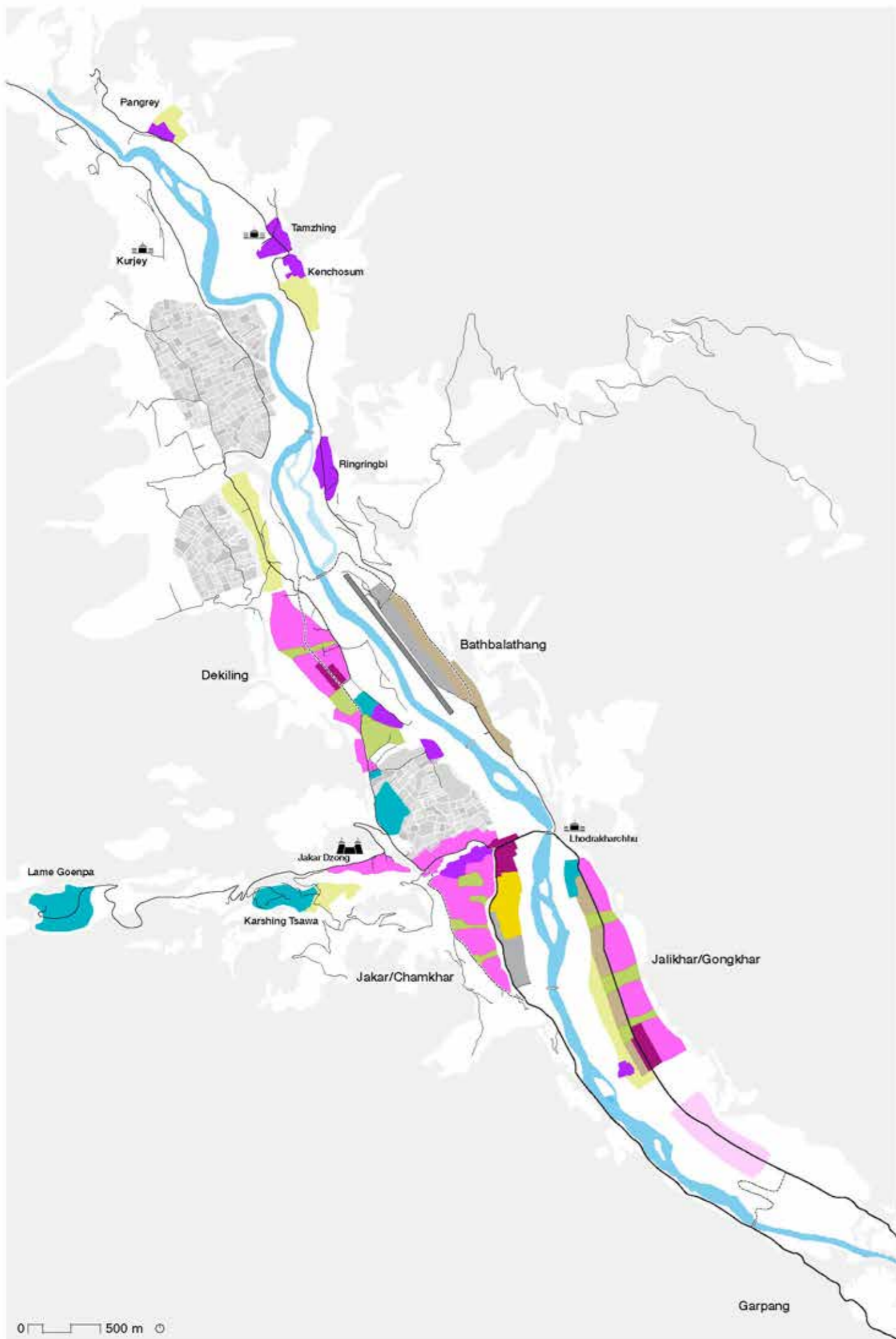
### **Agriculture / Paddy fields**

The three large-scale, connected areas of agriculture are a crucial part of the identity of the Bumthang Valley. Additionally, these constitute the economic foundation (supply) for the local population and are of significance to tourism (the hotel industry, agritourism). These areas are to be protected. In the three areas of agriculture described, the cultivation of rice, wheat, barley and potatoes has priority. The compartmentalised structure of the fields should be preserved. As a matter of principle, buildings and infrastructure will be prohibited. Exceptions, only for agricultural purposes, include small-scale buildings and infrastructures as well as linking paths.

### **Sacred sites**

The main value of sacred sites in Bumthang is their cultural richness. Extensions and facilities directly related to the sacred sites are allowed. Basic tourism infrastructure should be provided (e.g. information, toilets). A buffer area around each sacred site should be kept free of any construction. During the festival period, camping with basic facilities (water supply, bus bar, toilets) is allowed nearby the sacred sites. Good accessibility by public transport and the provision of related infrastructure are to be ensured. In suitable areas, a restricted number of parking areas can be provided.

# Settlement Rules



- ← Categories of settlement
- Historic village
- Main development zone
- Centre zone
- Scattered settlement zone
- Industrial zone
- Zone for infrastructure
- Institutional zone
- Zone for outdoor activities
- Open space within settlement
- Reserve zone

## Characteristics

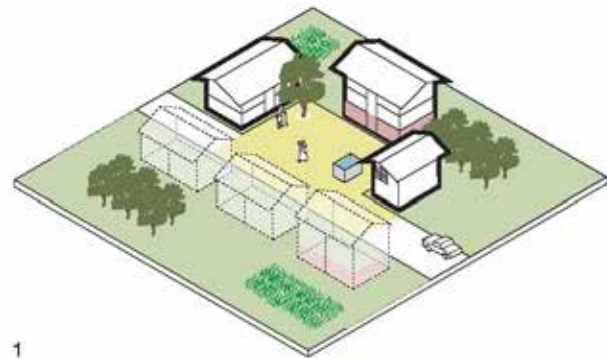
The main aims of the long-term development of settlement areas are the concentration of buildings in interrelated units in places fit for the purpose, as well as a clear separation between the settlement zones and the landscape. A well-balanced distribution of more large-scale, interrelated settlement developments is proposed. The stream next to Jambay Lhakhang and Chakhar Lhakhang marks the border for the new settlement developments to the north. Places that are suitable as future settlement areas are those which are already well-developed (both locally and regionally, near to bridges), with an advantageous topography, and which lie outside of danger zones (e.g. flood plains). A wide range of uses and settlement formats will be made possible. For each type of zone, clear policies concerning usage, density (height of buildings and plot coverage) and typology will be defined.



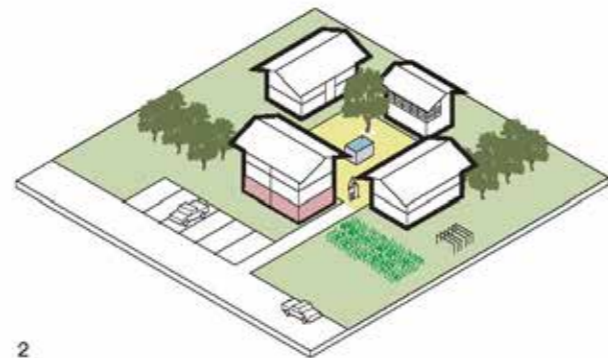
Objective	develop
Range of use	residential mixed uses
Main use	residential
Density	medium
Storeys	2–3*
Plot coverage	30–50 %
Typology	cluster new village new town

### Main development zone

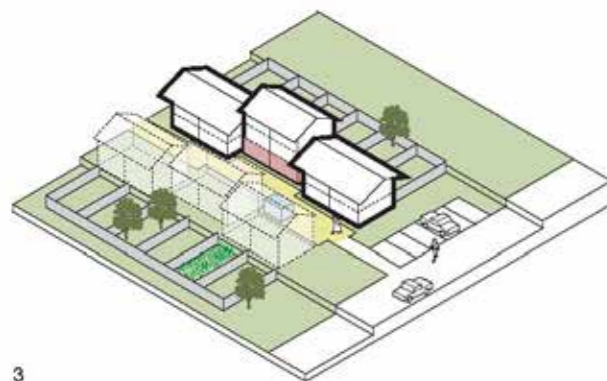
The development zones represent bigger settlement units. Within the settlement area as a whole in Bumthang, they exhibit the highest potential for development and consolidation. The new settlement units are based on the local conditions with regard to settlement typology (villages, clusters) and scale. New constructions should be planned in such a way that clusters of buildings are developed which work well with either the streetscape (open public spaces) or are arranged in communal courtyard-style. The rules pertaining to the number of floors permit two entire storeys. If at least half of the ground floor is used for commercial purposes, three\* complete storeys are permissible. Public facilities such as schools and kindergartens are also to be planned. Multifunctional parking areas on the periphery of the settlement area for use by the community enable the areas to remain traffic-free pedestrian zones. This area will be described in more detail in the section entitled “Area of Focus”.



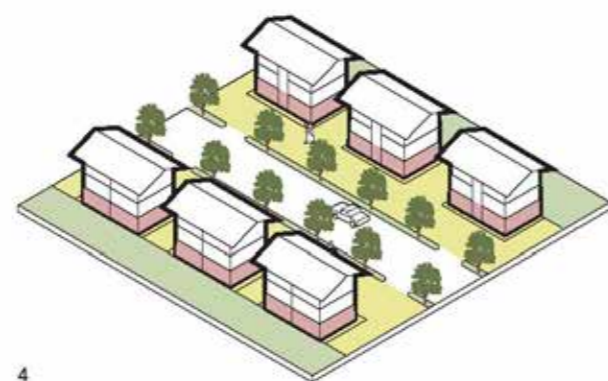
1



2



3

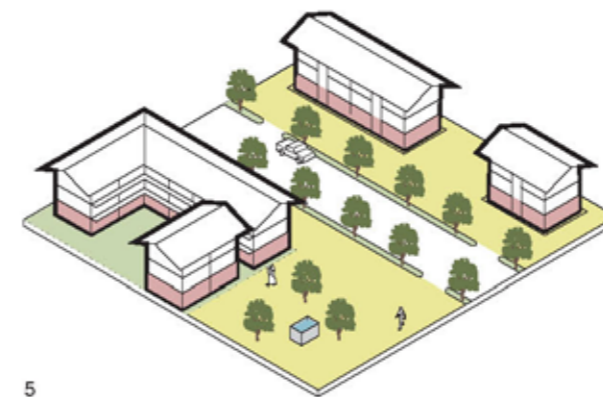


4

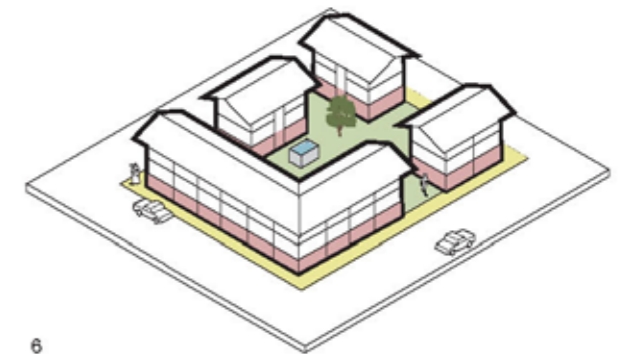
Objective	develop
Range of use	commercial public residential
Density	high
Storeys	3
Plot coverage	40–60 %
Typology	new village new town block

### Centre zone

Within each of the three main development areas of Jakar/Chamkhar, Jalikhar/Gongkhar and Dekiling, core areas are defined which function as both local and regional centres. These take on functions of local provision and are also important for large-scale public usages (e.g. covered markets, information centres, multi-purpose halls, bus terminals, etc.). There is a high concentration of urban commercial and public usage in the central areas. High-quality public spaces which bring together the various public usages are important (meeting rooms, facilities for social interaction, spaces for intercommunication). Buildings bordering on public areas should correspondingly have public ground floor usages.



5



6

- 1–3 Group of apartment houses with common space
- 4 Buildings along main road (mixed use)
- 5–6 Densification in the centres, mixed use and public space
- Public or common space
- Common or private space
- Commercial, public or office use

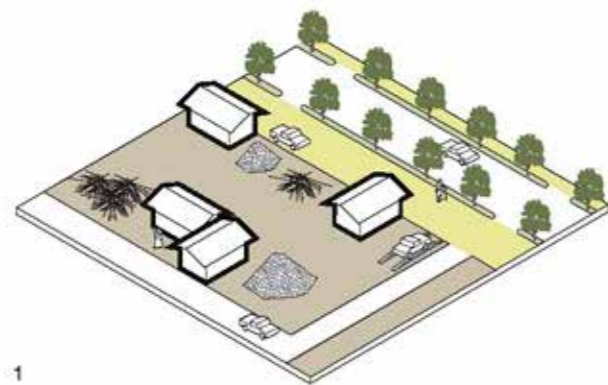
Objective	develop
Range of use	crafts
	industrial
	commercial
Density	medium
Height	7 m
Plot coverage	30 %
Typology	cluster
	single building

### Industrial zone

The working zone is mainly reserved for commercial and industrial purposes. The large connected area in Bathbala-thang is appropriate due to its position near the airport. There is potential here in particular for usages requiring a large area, but also usage which can benefit directly from the adjoining airport.

In the development area of Jalikhar/Gongkhar, existing workshops will be expanded upon. This area is suitable for smaller and medium-sized handicraft businesses. In exceptional cases, the area may also be used for residential purposes. On the streets there is a need for public commercial areas with a courtyard design in keeping with the area.

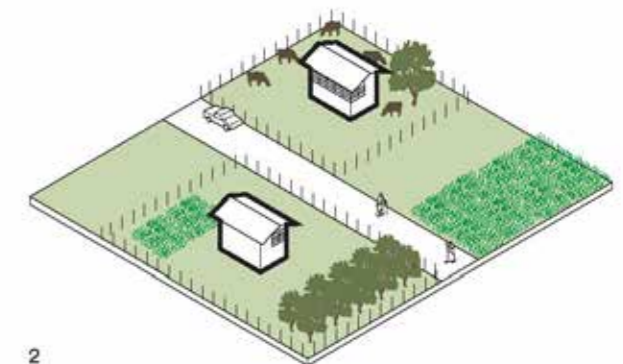
All working zones are very easily accessible from the main routes and are of regional importance.



Objective	preserve
Range of use	residential
	agricultural
Density	low
Storeys	2
Plot coverage	20 %
Typology	single house

### Scattered settlement zone

These areas are part of the (cultural) landscape, the character of which is to be preserved. The landscape dominates in these areas, the buildings are individual and are scattered at wide intervals. The distance between buildings is mainly historically determined, the usage agriculturally-oriented. It is possible to add individual buildings according to the village cluster typology. This zone offers the local population the possibility of a moderate level of development. Since the improving of individual parcels of land is a complex process, the plan aims at collaborative development (access roads, distribution network etc.).



- 1 Workshops
- 2 Single farmhouses
- Public space
- Private gardens, open space

Objective	protect/add
Range of use	mixed uses
Density	medium
Storeys	2
Plot coverage	30–40 %
Typology	village

### Historic village

The area is characterised by existing sensitive structures – mainly villages with a historic background worthy of protection. Within the designated area, individual buildings may be erected. These are influenced according to the criteria, typology and materiality, as well as the open space, characteristic of the historic buildings. Existing historic buildings may not be dismantled and replaced. They are to be preserved, and renovated and restored with the necessary care and attention. Newly built areas bordering on public ground will serve to make a contribution to the quality of public spaces, for example through public squares and other areas open to the public.

### Zone for infrastructure

This zone is reserved for the construction of basic infrastructure facilities needed for the advancement of the main development zones. The plan aims at central water supply and disposal (water, wastewater, energy) in the development of larger-scale areas. Locations close to areas subject to flooding must be checked in terms of their usability.

Objective	preseve/dev.
Range of use	school hospital administration
Density	low/medium
Storeys	3
Plot coverage	30–40 %
Typology	cluster campus

### Institutional zone

This area includes existing public facilities such as schools, hospitals, government buildings, etc. Expansion, supplementary buildings and transformation of the outside facilities are permissible as long as they resonate with the tone of the area. New public facilities such as schools are, however, also permissible in the three main development zones.

Objective	develop
Range of use	sports
Height	7 m
Typology	campus

### Zone for outdoor activities

This zone is reserved for special usages, particularly for sports and tourist facilities in the form of external amenities and buildings (e.g. high altitude sports centre). It is important to integrate these into the landform, for example through campus-like grounds. Sports fields are permitted within the areas subject to flooding, whereas buildings are only permitted outside of these areas.

Objective	preserve
Range of use	open space public uses temporary uses

### Open space within settlement areas

Also important is the amount of open space for use in the community within the new settlement areas, as well as connections to the surrounding landform. This can be achieved through a green corridor (Gongkhar) or through the inclusion of larger-scale open spaces within the main body of the settlement (Chamkhar). The publicly accessible communal green space can be variably used for gardens, play areas, recreational spaces, leisure, sport, etc. It can also form part of the spiritual landscape. Central to these open spaces is basic accessibility.

### Reserve zone

This zone is reserved on a more long-term basis for further development as necessary.

### Hotels and Guesthouses

New hotel facilities may not be constructed outside of the settlement areas. The expansion of existing hotel complexes is possible on a conditional basis (individual case review). Small-scale guesthouses and Bed and Breakfasts, and those integrated into the local settlement structure, are to be given preference in the interests of tourism (see also Tourism chapter).

### Cultural heritage

Alongside the protection and preservation of spiritual sites such as Dzongs, monasteries and temples, the preservation of secular buildings of historic interest must also be taken into account. The plan must take heed of how the new buildings surrounding such structures are presented (scale, number of storeys, materiality). It is recommended that an inventory for such buildings be drawn up (of local/regional/national significance) which will protect the buildings against modification and demolition until such time as a clear statement of protection is in place.

New uses for and dimensions of buildings necessitate further development of architectural terminology. The fundamental formation, facade elements and materiality should be retained. Equally, new technical challenges, usages and scales must be able to be handled in a manner befitting the purpose thus paving the way for a cautiously creative transformation which is indicative of tradition.

A symbiosis such as this constitutes an exciting challenge for young architects in Bhutan – the formulating of an enhanced, contemporary architectural typology through detailed knowledge of building traditions. This requirement needs to be starting point for a new school of architecture in Bhutan.

### Archaeology

In the future archaeology needs to be taken into consideration in overall planning in Bumthang. The danger is great, that within a short space of time, sources of cultural and regional history will be lost.

The master plan differentiates the following three areas according to the plan (p. 24/25):

- Known (and already partially surveyed) sites [marked by an asterisk]: these find-spots are determined and charted in the inventory as archaeological structures. Building activity is not to be undertaken here (protected areas), or alternatively is to be clarified comprehensively with those authorities concerned.
- Specific areas under scrutiny [bold dashed lines]: these areas mark the direct topographical environment of sites which are already known (clarification zones). There is a good chance of further archaeological structures here, and archaeological clarification must be sought in advance of any building activity.
- Potential areas under scrutiny [thin dashed lines]: these areas are marked because of their topographical location and by analogy with the specific areas under scrutiny (scrutiny zones). Even if they have not, up to now, yielded any sites, these are areas which are to be prospected and archaeologically supported during phases of building work.



Dekiling



Druk Seed



Bumthang  
Thang

# Areas of Focus

## **Concentration**

In order to preserve Bumthang's characteristic scenery, and to avoid increasing urban sprawl in the valley, the development will be concentrated in the main settlement areas of Jalikhar/Gonkhar, Chamkhar and Dekiling.

The three areas are suited for a concentrated settlement development since they are comparatively flat and are situated as far as possible from high-risk areas. In addition, they can be easily accessed from the existing main roads.

## **Neighbourhoods**

The new settlement areas will, on the whole, retain their rural characteristics and, as a result, will be developed stage-by-stage in a modest and sustainable manner. The buildings in all settlement areas will be structured in cluster formation, each of which forms a certain type of neighbourhood, and has a larger communal open space. Parking spaces for private cars will be concentrated in only a few places in order to enable settlement areas to be pedestrianized. Several clusters will share a communal parking area near to the main traffic route.

## **Town centre development**

Each of the three areas to be focused on has its own centre with varying emphasis of usage. Particularly in these centres, but also in the general public infrastructure environment (e.g. schools), the layout of public space is of great significance. Nowadays, Chamkhar/Jakar is the commercial centre. A few years ago, a new zone for the commercial area was planned in Dekiling and was prepared for construction. The grid-like area with eight

blocks remains unused even today; despite the destruction of Chamkhar town by three fires. The shops were still reconstructed where they had been previously. It is proposed that some shops be relocated to Dekiling and to Jalikhar/Gonkhar since the majority of buildings in Chamkhar Town are situated in areas subject to a high risk of flooding. The master plan defines the planning objectives necessary for this relocation.

## **Implementation**

The following proposed construction models for the three development areas manifest how the settlements will potentially look like in the future. Further development of the three areas will be influenced by types of ownership and the higher-ranking legal framework. Furthermore, it is wise to undertake the development stage-by-stage, complemented by the expansion of public infrastructure.



Objective	develop
Range of use	residential mixed uses
Main use	residential
Density	medium
Persons / ha	150
Plot coverage	30 %
Storeys	2-3
Typology	cluster new village

# Jakar / Chamkhar

Chamkhar Town and the historic centre of Chamkhar Village together will remain one of the most important focal points in Bumthang. The bridge access, the proximity to the airport and traditional trade form a good basis for consolidating the area as a whole and for reinforcing it with a residential area. The long, narrow area to the south consists of a number of green belts and patches. These areas, which already exist to an extent, can serve purposes in keeping with the rural landscape or can also serve as recreational areas.

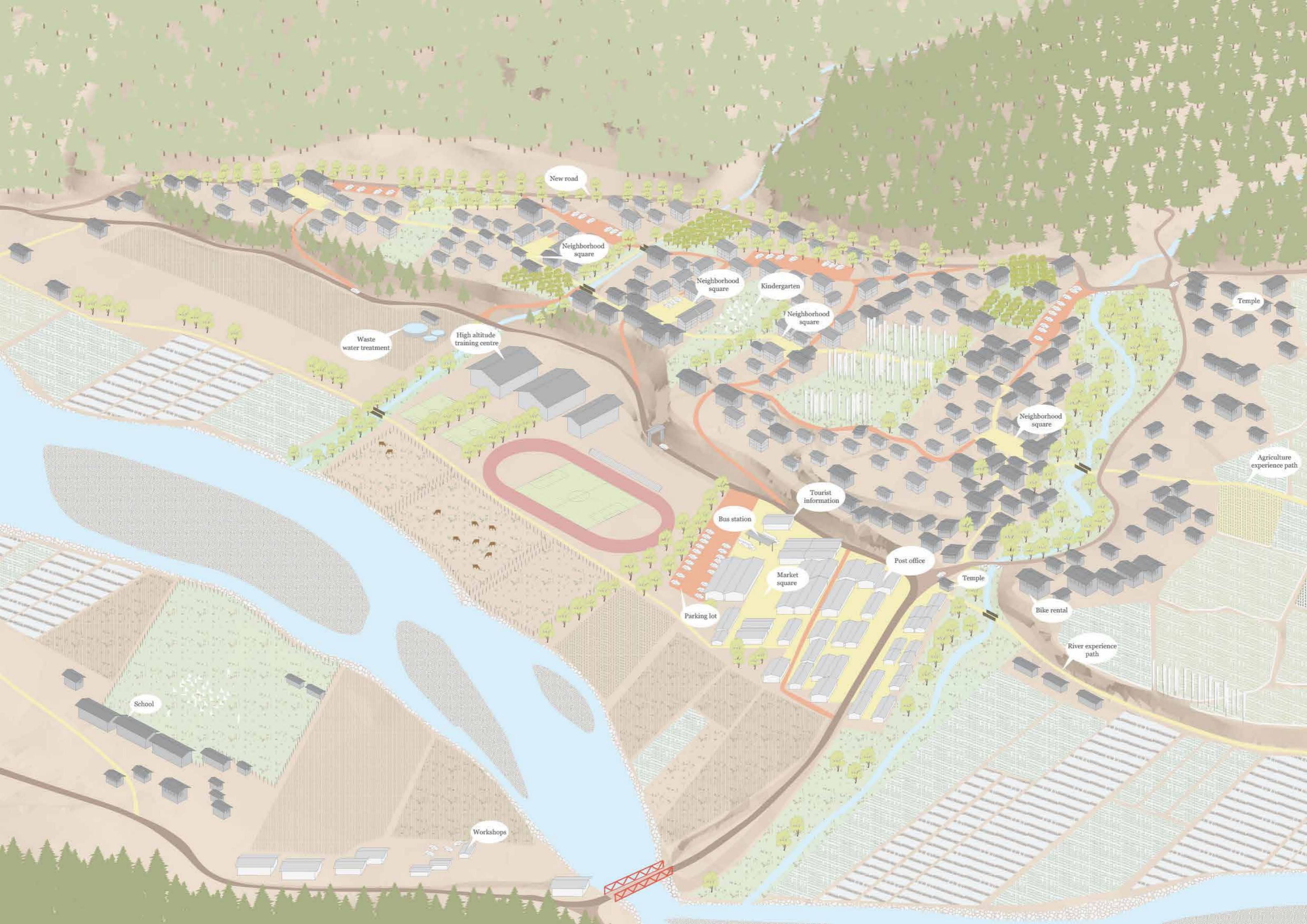
The area will be accessible by the new road on the upper slopes. There is a range of public recreational areas, green spaces and small squares, as well as public facilities (places of worship, schools, kindergarten, town centre) along the longitudinal axis.

References to the typological development can be found in Chamkhar with its village-like structure.

It is proposed that campus grounds be built down towards the river and bordering the centre of Chamkhar Town in a southern direction, creating a setting for the High Altitude Sports Centre and other sporting activities. Construction is only permissible, however, outside the flood plain limits. The plot which borders to the south is reserved for public utilities and waste management facility plants.

Chamkhar Town remains an important gateway, including for tourists. The existing bus station will, along with parking facilities, be expanded for the purposes of the mentioned Sports Centre.

- ← Chamkhar
- Garden area
- Open space
- Public space
- Campus
- Agriculture
- Existing buildings
- New buildings
- Public buildings
- Market
- Tourist information
- Bus terminal
- Hotel / Guesthouse
- Footpath
- Parking Lot



New road

Neighborhood square

Neighborhood square

Kindergarten

Neighborhood square

Waste water treatment

High altitude training centre

Neighborhood square

Temple

Agriculture experience path

Tourist information

Bus station

Post office

Temple

Parking lot

Market square

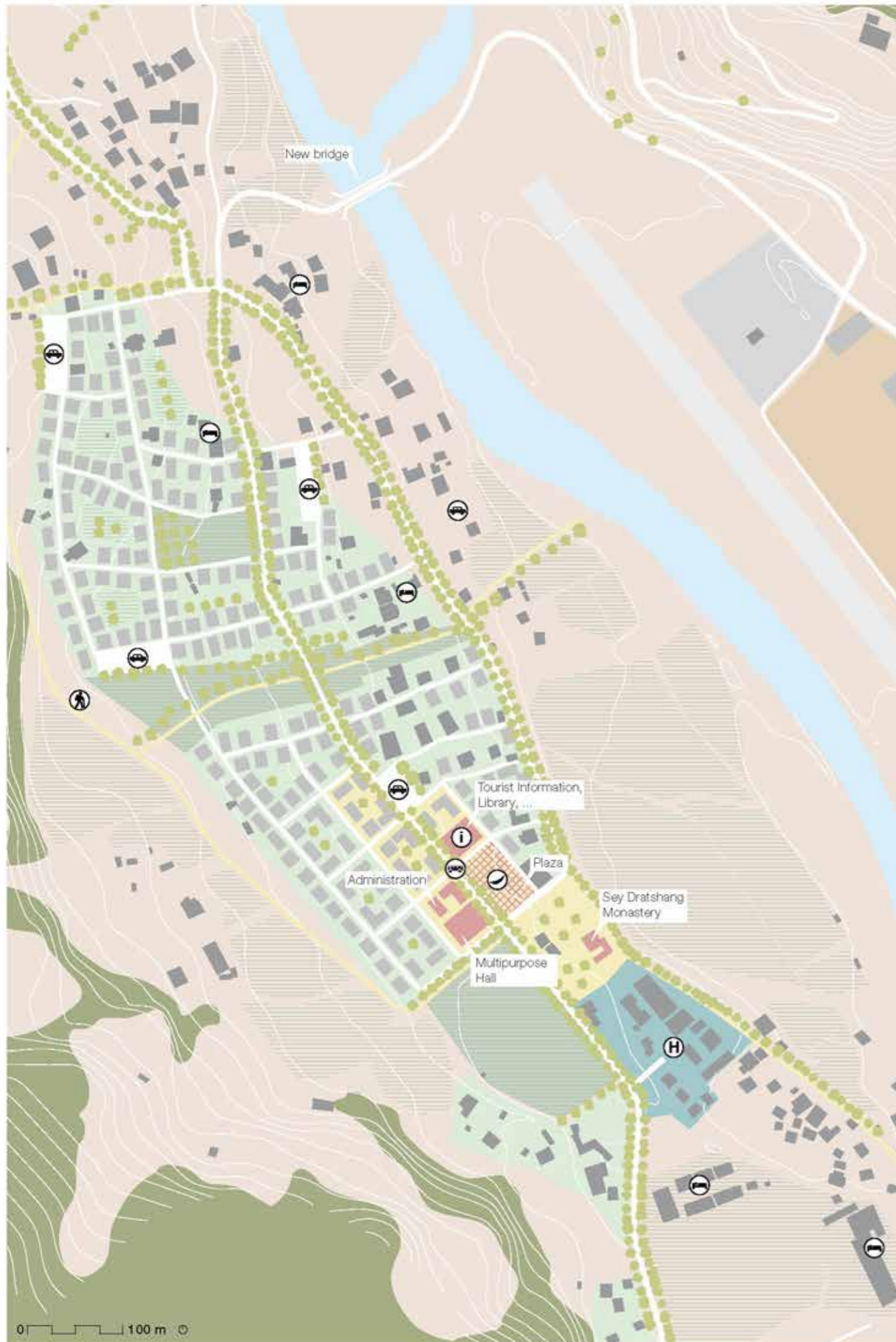
Bike rental

River experience path

School

Workshops





Objective	develop
Range of use	residential mixed uses
Main use	residential
Density	high/medium
Persons / ha	200
Plot coverage	35 %
Storeys	3
Typology	cluster new village new town block

# Dekiling

The already established but still unused development grid will become the centre of the development area of Dekiling. To the north, the development reaches as far as the new bridge over the Chamkhar Chu. To the east, the main road and the river valley border the development area. In the first stage of development, mixed usage facilities (apartments, shops, public uses) will be built on the fields in the existing development grid. In a later stage, the latter will be able to be extended over the fields to the north – following the shape of the topography. The grid-pattern building concept enables building to a greater density than in the other settlement areas. Public spaces with urban features can be developed: the streetscape is clearly defined; the public area at street level will be for public benefit, shops or similar.

The new centre of Dekiling will be established in the southern area of the existing orthogonal grid. This will contain multi-purpose halls and covered markets, and be suitable for public usage (an information centre, library, exhibitions) and for commercial usage. At the heart of Dekiling there will be a new spacious square (Dekiling Plaza) which can have many uses (markets, general socializing, events). The temple and the hospital border the square to the south and, as such, are part of the new centre.

In 2012/13, the University of Applied Sciences and Arts, Basel (FHNW), under the lead of Matthias Ackermann, extensively researched the building development in Dekiling. The findings from this research are considered in the master plan.

- ← Dekiling
- Garden area
- Open space
- Public space
- Campus
- Agriculture
- Existing buildings
- New buildings
- Public buildings
- Ⓜ Market
- ⓘ Tourist information
- Ⓜ Bus terminal
- Ⓜ Hotel / Guesthouse
- Ⓜ Footpath
- Ⓜ Parking Lot



Objective	develop
Range of use	residential
	mixed uses
	industrial
Density	medium
Persons / ha	150
Plot coverage	25 %
Storeys	2-3
Typology	cluster
	new village
	new town
	block

- ← Chamkhar / Gongkhar
- Garden area
- Open space
- Public space
- Working zone
- Agriculture
- Existing buildings
- New buildings
- Public buildings
- Market
- Tourist information
- Bus terminal
- Hotel / Guesthouse
- Footpath
- Parking Lot

# Gongkhar/Jalikhar

Gongkhar/Jalikhar is located en route from Jakar to Mongar. To the west over the Chamkhar Chu, the extensive development area is flanked by the distinctive terrain edge; to the east, it is bordered by the edge of the forest. Today, the partially tree-bordered main road has individual commercial buildings and workshops (carpentry, car repair centres, etc.) lined side-by-side, catering to the local catchment area. Further smaller and medium-sized handicraft businesses and commercial operations will be established along the main road and in stretches bordering the river to the west. It is proposed that the hillside to the east of the main road be used predominantly for small to medium-scale residential purposes.

Three major green corridors form part of the settlement area, permitting expansive views of the residential areas on the hillside, the forest and the valley floor. The new centre and the historic village of Gongkhar are both situated to the south of this area. The structure of the village of Gongkhar is of historic interest and will be protected and not integrated with the new development areas. The new centre, which will have commercial usages, as well as a central bus terminal, will be developed along the main road together with a spacious public square. This area also serves as a multifunctional meeting place edged by tree-lined avenues.

An attractive connecting footpath runs along the distinctive hillside ridges down to the river, which merges together and brings alive the history of the settlements, the spirituality of the landscape and the qualities of the river basin. The pathway is part of a larger network of paths which are important for tourists.



1



3



2



4

- 1 Dekiling Plaza in the future
- 2 Dekiling today
- 3 Jalikhar in the future
- 4 Jalikhar today

# References



1



2



3



4

## References for wooden constructions

- 1 Schützenmattpark, Basel, Switzerland,  
Barcelo Baumann Architects
- 2 New and traditional architecture in  
rural area, Switzerland,  
Bosshard Vaquer, Architects
- 3 Market hall, Aarau, Switzerland,  
Miller Maranta Architects
- 4 Public transport station, Filisur,  
Switzerland, Walter Bieler AG

# Tourism

## **Opportunities and threats**

The cultural and spiritual richness as well as the unique valley and river landscapes constitute the basis of long-term, sustainable development in Bumthang. All future settlement developments and adaptations within the area will have to go hand in hand with the protection and preservation of these core values. Already, Bumthang is an attractive tourist destination and an important pilgrimage site for the population of Bhutan. Many recent developments, such as hotel sites, the creation of an airport are visible results of the use of this potential. The early signs of building regulation breaches, a tendency towards urban sprawl, and non-indigenous hotel complexes manifest the risks attached to fast and uncontrolled development. The prospective growth of tourism's importance makes the definition of clear aims and objectives imperative.

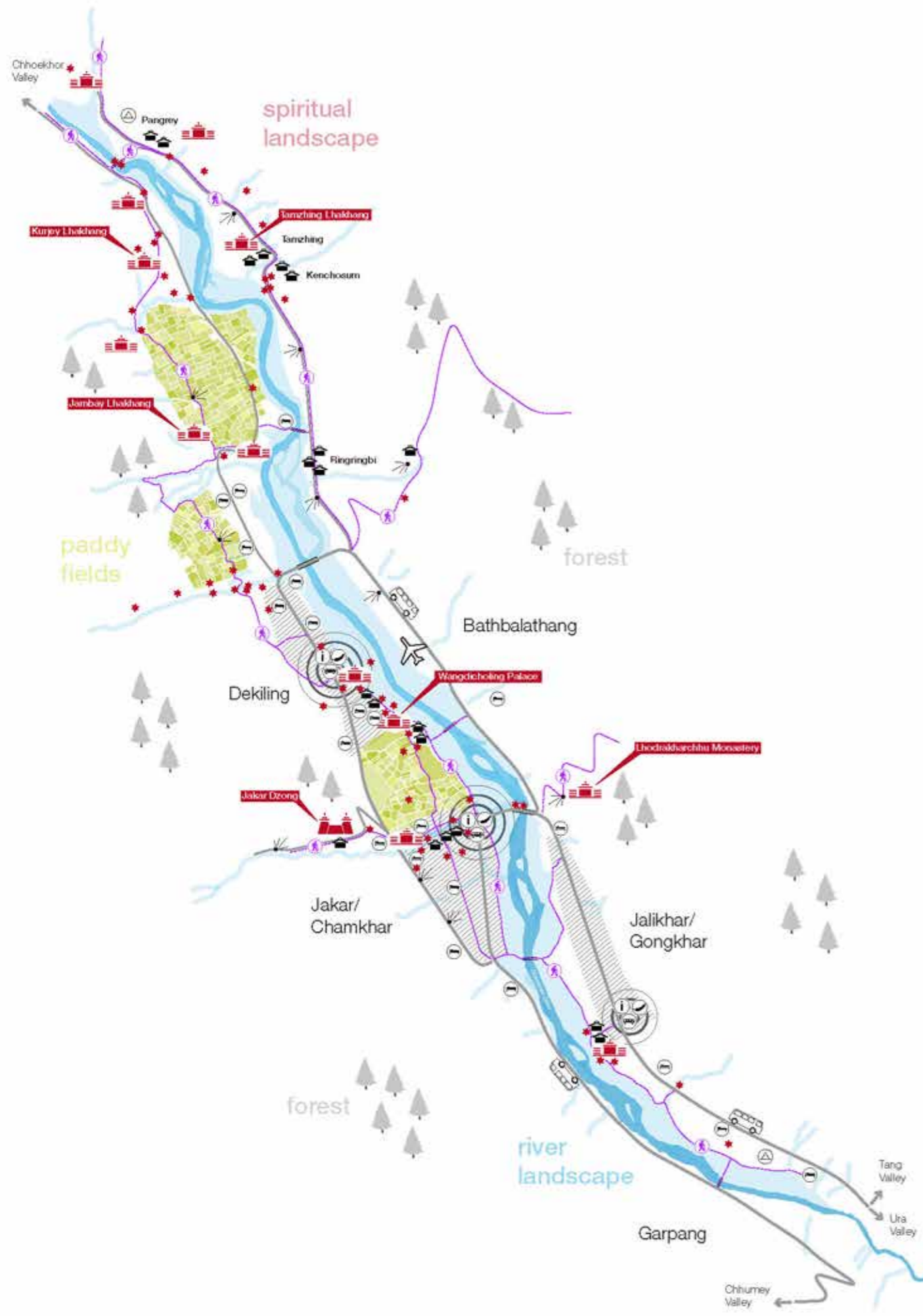
## **Diversification of activities**

Within the current scope of the master plan there are more than 20 hotels or guesthouses. However, these attract only very limited and sporadic usage over the year (on average 10 % of the year). On the one hand, this is influenced by the weather; on the other, today's tourism is geared towards the festival period. Even if Bumthang's cultural and spiritual richness were, in the future, to become the bedrock of tourism, the valley offers a multitude of further tourist possibilities and activities in order to attract varying target groups and to encourage visitors to stay longer. Further examples of sustainable practices include outdoor activities, merchandising of local products and handicrafts, relaxation, spirituality and wellness,

as well as seminar stays. All of these utilise the potential of the cultural and natural landscape. The spectrum of possible activities is outlined at the end of the Section, along with an indication of the necessary respective infrastructure.

## **Infrastructure, connections and information**

It is important to establish a basic tourist infrastructure. For this purpose, an attractive, cohesive and marked road network for both cyclists and pedestrian traffic is necessary. This road network can serve to interlink the various attractions and places of interest and link them spatially. Further measures are to include the provision of parking facilities, the linking of routes with public transport stops and the installing of resting places (benches, litter bins) as well as the supplying of information infrastructure (signage, signposts, information boards).



2005:	13626
2010:	40873

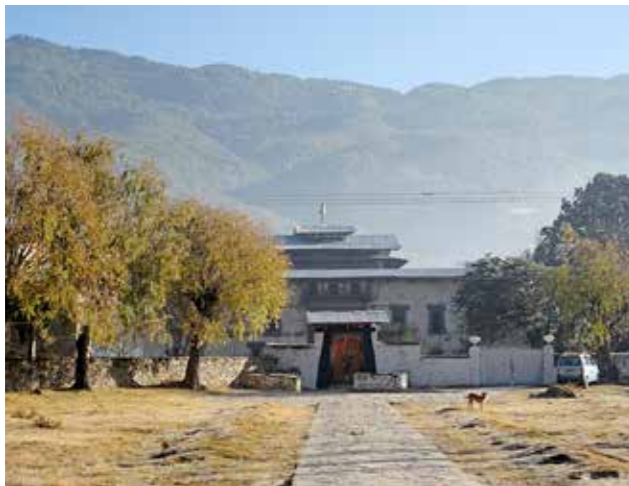
Visitor Arrivals in Bhutan  
(Source: Annual Report,  
Tourism Council of Bhutan, 2011)

### Organization and implementation

For the establishing of a long-term tourism strategy, the setting up of an on-site operational institution is necessary. This will take over the management and commercialization of the tourist region. Such a tourism strategy would have to acquire a clear image and title (e.g. "Culture Park Bumthang") in order to get its message across. A tourism strategy along the following lines is recommended:

- Sustainable development: long-term strategies and gradual development ("slow tourism").
- Details and specific criteria: involvement of the local population (agricultural products, accommodation, guided tours, etc.)
- Founding of local societies, cooperatives or charities.
- Permit scope and flexibility for creative ideas and concepts.
- Maintain focus on activities which always have a link to the context of Bumthang Valley's cultural landscape.
- Market all activities and proposals under one roof and under one name. The complete Bumthang Valley image.
- Hotel industry: prioritising of local investment; investment from abroad may only be accepted through compliance with clear rules and guidelines.
- No new hotels may be constructed outside of the settlement areas as detailed in the master plan.





1



2



5



6



3



4



7



8

**Attractions in Bumthang:**

- 1 Wangdicholing Palace
- 2 Pedestrian bridge, Pangrey
- 3 Religious festival, Tang Valley
- 4 Dried chillies, Gongkhar

**References:**

- 5 Signage, Switzerland
- 6 River rafting, Switzerland
- 7 Mountain biking, Flims, Switzerland
- 8 Hot stone bath, Paro, Bhutan

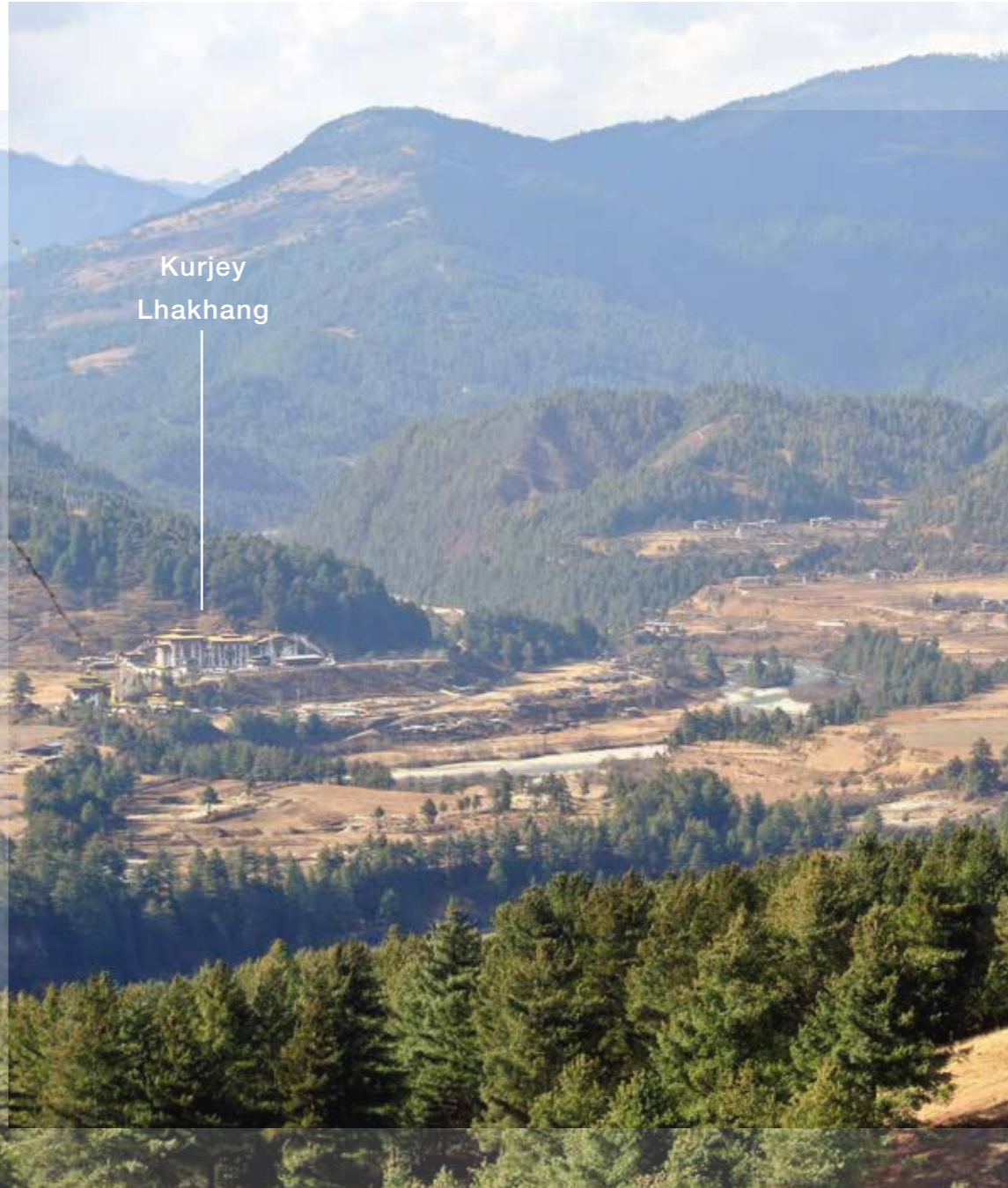




Bumthang  
Thang



Kurjey  
Lhakhang



Tamzhing  
Lhakhang



# Implementation

We propose the following steps of implementation:  
(See also p. 102/103)

## **Plan preparation**

The present master plan, comprising a plan and a report, is the result of exceptional collaboration between planning teams in Thimphu and Zurich from June 2012 to September 2013. It is aimed at those responsible for policy and planning in Thimphu and Bumthang.

## **Dissemination**

In October 2013, Corine Mauch (Mayor of the City of Zurich) and Dr. André Odermatt (Head of the Structural Engineering Department), will present the master plan to the minister responsible for planning, Lyonpo Dorij Choden, and other representatives and teams responsible for planning.

## **Public hearing**

On this basis, further talks with the concerned stakeholders about development goals in Bumthang can be carried out. The possible implementation of these goals can also be discussed.

## **Complementary studies / Adaptation / Adjustment to local planning system / Approval**

Hearings in Bumthang are necessary in order to reinforce the master plan, encompassing technical consolidation (e.g. infrastructure for maintenance and waste disposal, tourism, etc.) and conformation to relevant national and local laws. With the decision of the National Consultative Committee on Human Settlements (NCCHS) the master

plan will be approved. It directs the authorities in Thimphu and Bumthang respectively to support the further planning steps as detailed in the master plan.

## **Legal zoning map: rights and duties for land owners**

As one of the next stages, the master plan (which treats the land as one whole), or parts of the master plan, needs to be substantiated with detailed plans. These plans need to show (new and existing) plot boundaries, regulate the development of parcels of land, and establish possible remuneration for land-use charges, road charges or other liabilities carried by land owners or the authorities. These plans should be directly applicable for all land owners. It is advised that a system be established, and legally underpinned, whereby levies (value added tax in building zones) as well as road charges (freeholders share the cost of access roads and supply networks) are established in new building zones.

## **Preparation of urban development plans (Focus Areas) / Coordination with local stakeholders**

Dekiling, Jakar/Chamkhar and Jalikhar/Gongkhar will be designated as development areas. These are to be developed using a planning mechanism which is yet to be defined. Possible mechanisms include Public Private Partnerships, special use plans, etc.

## **Initial public investment**

Public investment can serve to stimulate individual areas, thus boosting development. These stimuli include measures put in place for the road network (new bridges for

Dekiling; new roads for Chamkhar) and public usages (indoor markets, multi-purpose halls, schools, kindergartens). They can also include investing in the development and design of public spaces (Dekiling Plaza, new footpaths, streetscape design etc.).

### **Organization**

Not only is it important to determine the legal framework and correct planning mechanisms, but also to ensure the continuity of development phases through active supervision from the authorities and expert committees.

A committee established especially for the purposes of the master plan could, for example, supervise and assess individual follow-up plans and projects right up to the implementation stage. Further, if need be, such a committee could draw inferences for the master plan. Institutionalized cultural heritage preservation would also be important, and could undertake appraisal of the structural inventory by means of a transparent policy and formulate measures for its preservation.

### **Participation**

It is important that local stakeholders and residents are included early enough in the process, on the one hand to create an understanding of the necessary planning measures and on the other, to seek feedback from those concerned on their needs. This can take place via public hearings in the affected areas, at which people will be informed of current developments and can have their questions answered, and where discussions can be held.



# Collaboration



The planning team from the City of Zurich embarked upon the master plan in 2012 and was fascinated by Bhutan and the Bumthang Valley, and delighted with the hospitality found there. Reciprocal visits and a prolific cultural exchange with the planning team in Bhutan each served to facilitate access to this challenging task.

The collaboration lasting from June 2012 – October 2013 was shaped by new, enriching experiences. Fascinating discussions concerning questions of spatial planning, society and building culture made the collaboration a worthwhile learning process for both teams.

Trip June 2012 Zurich – Thimphu/Bumthang  
Clarification of the starting point for collaboration with various ministers as well as government officials in Thimphu and Bumthang (delegation: representatives from

the Structural Engineering Department of Urban Construction and the Rietberg Museum).

September 2012 Thimphu – Zurich  
Discussions of initial propositions for the development of Bumthang with those responsible for planning in Thimphu. Two workshops with different experts (Bhutan and planning themes). Excursion to Graubünden with focus on tourist development.

November 2012 Zurich – Thimphu/Bumthang  
Numerous and extensive inspections in Bumthang and Tang Valley. Review of propositions from previous work phase. Authorities in Thimphu and Bumthang give initial feedback on development goals for Bumthang. Planning team from Zurich is accompanied by two representatives from the University of Applied Sciences (FHNW), Basel.

June 2013 Thimphu – Zurich  
Discussion of the draft of master plan with representatives from the planning authorities in Thimphu and the planning team in Zurich. Workshop with a panel of experts (“Bhutan connoisseurs”). Participation in the final critical review of preliminary version of “Dekiling” document at the FHNW in Basel.

October 2013  
A delegation from the City Council in Zurich will pass the master plan over to the relevant ministers and those responsible for planning in Bhutan.

1 Visit to Bhutan June 2012

2 Visit to Switzerland September 2012

3 Visit to Bhutan November 2012

4 Visit to Switzerland June 2013

# Acknowledgments

Many thanks to all who have supported us in the creation of the master plan, both in Switzerland and in Bhutan. You have shared your rich knowledge and experience of Bhutan, and particularly of the Bumthang Valley, and also your detailed knowledge of planning-related topics in Switzerland.

## Zurich / Switzerland

Matthias Ackermann, University of Applied Sciences and Arts (FHNW), Basel; Frank Argast (AfS); Manuela Baur (AfS); Marianne Frei; President Society Switzerland-Bhutan (SSB); J.P. Furler, Transcultural Communication; Rebecca Göpfert, University of Applied Sciences (ZHAW); Gudrun Hoppe, quadra gmbh, Landscape Architecture & Planning; Simon Keller, Office for Urban Development (STEZ); Jonas Hunziker (AfS); Ursula Hürzeler (FHNW); David Janczak (AfS); Werner Külling, Former President of Helvetas Bhutan; Hans Lamp, Zurich Disposal and Recycling Services (ERZ); Dr. Andreas Mäder, Bhutan-Swiss Archaeology Project Partner; Peter Noser (AfS); Françoise Pommaret, Bhutan Expert, Centre national de la recherche scientifique Paris (CNRS); Tijana Radic, City Council Project Office (PSS), Ernst Reinhardt, Former President Society Switzerland-Bhutan (SSB); Karsten Schwarz, Legal Services, Structural Engineering Department (HBD); Christoph Suter, Civil Engineering Office, Zurich (TAZ).

## Bumthang

Mr. Sangla, Chhokhor Gup (DT Chairman); Mr. Yeshey Dorji, Dzongkhag Engineer; Mr. Tharchen, Municipal Engineer, Ms Rinzin Wangmo; Engineer, Mr. Nidup Gyeltshen, Building Inspector; Mr. Karma Lekdhen, Thromde Thuemi; Mr. Pema Jamtsho, Thromde Thuemi

## Thimphu

Mr. Meghraj Adhikari, DHS; Ms Tashi Wangmo, DHS; Mr. Chhado Drukpa; DHS, Mr. Tashi Penjor, DHS; Mr. Kesang Jigme, PPD, MoWHS; Ms Bhawana Chhetri, DHS; Mr. Tshering Dorji, DHS; Mr. Ashim Chhetri, DHS; Mr. Yeshey Jamthso, DHS; Mr. Sonam Dorji, DHS; Mr. Sushil Kumar, DHS; Mr. Chandraman Tamang, DHS

## Steering board (project advisors):

Zurich: Corine Mauch, Mayor; Dr. André Odermatt, Head of the Structural Engineering Department; Martin Vollenwyder, Head of the Department of Finance (up to May 2013); Norbert Müller, City Council Project Office (PSS); Suzanne Steiner, City Council Project Office (PSS); Patrick Gmür, Director of the City Planning Office (AfS); Dr. Albert Lutz, Director of the Rietberg Museum (MRZ); Anna Schindler, Director of the Department of Urban Development (STEZ)

Bhutan: Lyonpo Dorji Choden, Hon'ble Minister of MoWHS; Dasho (Dr.) Sonam Tenzin, Secretary of MoWHS; Lyonpo Yehsey Zimba, Former Minister of MoWHS; Mr. Kinzang Norbu, Director of DHS; Mr. Sangay Thinlay, Dzongdag Bumthang; Mr. Sonam Tshering, Dzongrab, Bumthang

## Project leadership and editing:

Zurich: Birgit Kurz, Christoph Durban, City Planning Office (AfS)  
Bhutan/Thimphu: Ugyen M. Tenzin, Ministry of Works and Human Settlement (MoWHS)

## Text inputs:

Archaeology: Peter Fux (MRZ); Dr. Philippe Della Casa, University of Zurich (UZH)

Public Infrastructure: Bruno Hösli, Planar AG, Urban and Spatial Planning

## Collaborators:

Andreas Nütten, University of Applied Sciences and Arts (FHNW), Basel; Sander Kool (AfS)

## Maps and Illustrations:

p. 17/32/34: FHNW, Basel

All other maps and illustrations: AfS, Zurich

## Scale maps:

p. 14/16/18/20/24/26/28/30/42/46/50/56/58/62: 1:33 000

p. 76/80/82: 1:5000

## Map base and geodata:

MoWHS, Thimphu, Bhutan

## Translation:

Dr. Caroline Hyde-Simon

## Layout:

Dennis Amstutz (AfS)

## Print:

Dokulink, Zurich

Picture credits:

- p. 8–9/38–39/72–73/96–97 Panoramas: © Andreas Nütten
- p. 15: © Françoise Pommaret
- p. 21: 1; p. 22: 1,2,3; p. 29: 2; p. 33: 4; p. 36: 3; p. 84: 2; © Andreas Nütten
- p. 25: 1,3: © Philippe Della Casa, Peter Fux
- p. 86, 1: Kathrin Schulthess, © Christoph Merian Stiftung
- p. 86, 2: © Alessandro Mattle, Zurich
- p. 86, 3: © Ruedi Walti, Basel
- p. 86, 4: © Ralph Feiner, Chur
- p. 95, 6: © Kanuschule Versam
- p. 95, 7: © Graubünden Ferien
- p. 95, 8: © [www.comohotels.com/umaparo](http://www.comohotels.com/umaparo)
- All other Pictures: © AfS

Bibliography:

- MoWHS 2013: Report on the Geotechnical Study for Bumthang Valley.
- Tourism Council of Bhutan. 2011: Bhutan Tourism Monitor, Annual Report 2011.
- Infrastructure Professionals Enterprise, (P) Ltd., India; Gyaltsen Consultancy Services, Bhutan. 2008: Bhutan National Urbanization Strategy.
- Della Casa, Ph.; Fux, P.; Diggelmann, H.; Walser, C. 2012: Bhutan-Swiss Collaboration to Institutionalise Archaeology in Bhutan: Report on Activities in 2012. In: SLSA Annual Report 2012
- Della Casa, Ph.; Fux, P.; Mäder, A. 2012: Bhutan-Swiss Collaboration to Institutionalise Archaeology in Bhutan. In: SLSA Annual Report 2011: 173–186
- Institut Architektur, FHNW 2013: Bumthang, Haus-Siedlung-Landschaft / House-Settlement-Landscape
- Institut Architektur, FHNW 2013: Dekiling, Glücklich Wohnen im Bumthangtal / Living happily in the Bumthang Valley
- Pommaret, F. 1998: Bhutan (10., aktualisierte und korrigierte Aufl.). Bremen: Edition Temmen
- Lutz, A. 2012: Wangduechoeling Palace as a Museum, Concept for the partial use of the Palace, Stadt Zürich, Museum Rietberg