



**Royal Government of Bhutan  
Ministry of Agriculture and Forests  
Department of Forests and Park Services  
Social Forestry and Extension Division**



# **Survey and Mapping of Degraded and Barren Areas in Bhutan**

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Royal Government of Bhutan**

**December 31, 2021**



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P.O Box 130, Thimphu

Bhutan

## Foreword

With the start of the first Five Year Plan in 1961, the Department initiated measures for conservation of the forestry resources in the country. The National Forest Policy (1974) supported prescribing the long-term national goals and objectives to forest conservation, ensuring to maintain 60% forest cover for all the time to come. The Department has given priority to larger-scale afforestation and reforestation, conservation and maintaining the principles of sustainable forest management. The national plantation strategy (2010 and 2019) served as an instrumental tool for ensuring conservation of the environment. The Forest Policy (2011) has enhanced maintaining the long-term goals and policy objectives to production and conservation of forestry resources.

Currently, the country has 71% forest cover and 29% non-forest cover of the total geographical area (NFI Report, 2016). Though the country has very good forest cover, the Department is continuously taking initiatives to restock degraded and barren areas to enrich critical watersheds and sustain water flow and safeguard ecosystem. As of June 2021 a total of 19, 988.31 hectares of the forest land area has been brought under afforestation and reforestation programs.

However, the Department does not have a data-set for non-forest cover which needs to be surveyed, mapped and classified for strategic planning and implementation. The clear roadmap for future plantation programs is crucial for planning and implementation to strengthen and fulfilling the forest policy and ensuring the constitutional mandates. To digitize and categorize degraded and barren forest lands, Social Forestry and Extension Division in collaboration in collaboration with Forest Resources Management Division, Divisional Forest Divisions, and Protected Areas carried out survey mapping of degraded and barren lands across the country. The survey report (Survey and Mapping of Degraded and Barren Areas in Bhutan 2021) will serve as the roadmap guidelines for strategic planning and implementation of the plantation programs in the country.

The budget was supported by the World Bank (REDD+ Readiness additional Funding Project) maintained under Watershed Management Division.



Lobzang Dorji  
**Director**

## Executive Summary

The plantation program has been featured regularly in the FYP to maintain the principles of sustainability. During the 10<sup>th</sup> FYP plan, the survey and mapping of degraded and barren forest lands including the capacity building has been identified as one of the approaches to improve long-term planning and implementation of plantation programs. However, this could not be happened due to various reasons like financial constraints and lack of resources. Though, there was no master plan for plantation programs, the Department of Forest and Park Services has been regularly implementing the forest plantation programs with a substantial investments but the success of the plantations were mostly compromised. Hence, the documentation of the degraded and barren area mapping has become important for future planning and implementation of the plantation programs. The Department of Forest and Park Services has carried out survey and mapping of degraded and barren area, and categorized and documented for strategic planning and effective implementation of plantation programs.

In order to strengthen the success of plantation programs in the country, the Department of Forest and Park Services has come up with the survey and mapping of degraded and barren areas with the following objectives.

- i. To document degraded and barren areas in the country,
- ii. To identify and categorize potentially feasible sites for forest plantation in the country.

The degraded and barren site mapping was done based on the suitability criteria described in the methodology. The total area mapped is 7,679.154 hectares which is about 0.69% of the total forest cover of the county. The Divisional Forest Office Wangdue has the maximum area mapped followed by Paro, Trashigang, Jigme Dorji National Park and Mongar. The area mapped under Divisional Forest Offices is 6,345.127 hectares and under Protected Area is 1,334.027 hectares. A total of 472 degraded and barren sites are mapped all across Bhutan, and the Divisional Forest Office Mongar has the highest numbers of degraded and barren sites followed by Wangdue, Dagana, Trashigang, Paro, Bumdeling Wildlife Sanctuary and Thimphu. There are 367 degraded and barren sites under Divisional Forest Offices and 105 sites under Protected Areas.

### ***Limitations for degraded and barren area mapping***

- i. The degraded and barren sites having more than 46% existing vegetation cover and more than 60% slope gradient are excluded in the mapping.
- ii. The biophysical parameters used for the categorization of the sites are visually assessed and validated during the field-truthing.
- iii. The soil types are limited to those sites that are very dry, rocky and marshy areas (excluded).
- iv. The survey and mapping polygons less than 0.5 hectares are not included for cost effectiveness (economical reasons).

### ***Way forward recommendations***

- i. To make the plantation programs more impactful and successful, the *focused area plantation program* should be encouraged based on the suitability criteria prescribed in this report.
- ii. The focused area plantation shall be initiated annually based on the degraded and barren area mapping report by selecting only few Divisions or PAs in a financial year.
- iii. The plantation sites may be proposed based on the suitability criteria (firstly focus on the most suitable site, then moderately suitable and so on) to make the plantations more successful and climate smart sustainable management.
- iv. An ecosystem service of the barren area should not be altered by artificial intervention and management (e.g. microclimate alteration by planting foreign or alien species).
- v. This report 'in particular' does not include other types of plantations (such as mining site, avenue and roadside, urban recreation, river, and stream bank protection, heritage site, private forest) and accordingly, the DoFPS may consider accepting proposals depending on the importance, objectives, feasibility and availability of the budget and other external fund support.
- vi. The shapefiles for degraded and barren areas will be uploaded as plantation layers in the Spatial Decision Support System (SDSS) for future references and planning.

## Abbreviation

BFL	Bhutan For Life
BWS	Bumdeling Wildlife Sanctuary
CF	Community Forest
CFMG	Community Forest Management Group
DFO	Divisional Forest Office
DoFPS	Department of Forests and Park Services
FMU	Forest Management Unit
FRMD	Forest Resources Management Division
FYP	Five Year Plan
GBCL	Green Bhutan Corporation Limited
GRFL	Government Reserved Forest Land
JDNP	Jigme Dorji National Park
JKSNR	Jigme Khesar Strict Nature Reserve
JSWNP	Jigme Singye Wangchuck National Park
JWS	Jomotsangkha Wildlife Sanctuary
MoAF	Ministry of Agriculture and Forests
NRDCL	Natural Resources Development Corporation Limited
OSM	Open Street Map
PA	Protected Area
PNP	Phrumsengla National Park
PWS	Phibsoo Wildlife Sanctuary
RGoB	Royal Government of Bhutan
RMNP	Royal Manas National Park
SDSS	Spatial Decision Support System
SFED	Social Forestry and Extension Division
SRFL	State Reserved Forest Land
SWS	Sakteng Wildlife Sanctuary
WCNP	Wangchuck Centennial National Park

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# 1. Background

## 1.1. Introduction

The forest plantation in Bhutan dates back to 1947 and was initiated by the civil authorities (DoFPS, 2011). Prior to 1961, forest management was based on the traditional knowledge practice belief system and there was free access to forest resources. With the start of the first Five Year Plan (FYP) in 1961, the Department of forest initiated measures for conserving forest resources (SFED, 2010). In 1969, the forest resources in the country were nationalized to protect, manage, and control access to the forests (RGoB, 1969). The long-term national forest policy goals and objectives were prescribed to ensure maintaining 60% forest cover all the time to come (RGoB, 1974). In 1979, the Royal command to the Department of forest conceptualized the social forestry program which opened a way forward to paradigm shift from regulatory to participatory forest resources management approaches (DoFPS, 2011). Eventually in 1985, coinciding with the coronation day of His Majesty the Fourth Druk Gyalpo, 2<sup>nd</sup> June was declared as the 'social forestry day' and ever since the tree plantation within institutions and schools are carried out as an annual event (DoFPS, 2011). From the 1980s onwards, the forest plantation became one of the national forestry programs and was given high priority to forest conservation and maintained principles of sustainable forest management. In 1995, the forest resources were declared to be the government reserved forest land (GRFL) in the country (RGoB, 1995). However, the forests raised or naturally grown in the private registered lands shall belong legally to the landowner (RGoB, 2007).

The plantation programs play an important role in managing the forests sustainably, maintaining watersheds, and ecological balance (DoFPS, 2011). During 1996, the re-afforestation program was conceptualized in the country mainly to contribute towards watershed and environment protection, contribution to biodiversity conservation, and providing services to the industries (FSD, 1996). Further, the national plantation strategy for Bhutan 2010 was developed mainly to reinforce the national re-afforestation strategy for Bhutan 1996 and the inclusion of the community forests, the leasehold forestry, urban and recreational forest plantations. The systematic implementation of the plantation program was enhanced and enabled larger-scale forest plantation through afforestation and reforestation programs. The production and conservation of forestry resources have been

enhanced and achieved long-term goals and policy objectives (SFED, 2010). However, the national level production of timber resources from plantation forestry is negligible (SFED, 2010). Hence, to have a larger impact on timber resources through forest plantation programs, the reforestation and afforestation programs need to be strengthened mainly to enhance and expand forest cover sustainably (DoFPS, 2011).

## **1.2. Current situation**

The reforestation and afforestation (in degraded and barren lands) are the earliest national conservation initiatives in the country (SFED, 2010). The plantation program has been accorded high priority for the conservation of the environment, biodiversity, watershed protection, and landscaping and ensuring the constitutional mandates of maintaining 60% of forests cover for all the time to come. Currently, the total forest cover in the country is 71% of the total geographical areas and non-forest cover (water bodies, agricultural land, meadows, etc.) constitutes 29% (FRMD, 2016). The non-forest cover means an area without trees or trees less than 5 meters in height and less than 10% canopy cover. However, the Department does not have detailed documentation on degraded and barren areas for national level planning and implementation of the plantation program to enhance sustainable management of forests. The afforestation program has been featured regularly in the FYP and during the 10<sup>th</sup> FYP the mapping of degraded and barren forest lands including the capacity building was identified (SFED, 2010). The non-forested areas need to be mapped, categorized, and documented for strategic planning and implementation of the potentially viable plantation sites. Further, the degraded and barren area mapping is important to project and draw a clear roadmap for strategic planning and implementation of plantation programs (SFED, 2019b).

The growing population trend demands essential forest resource needs where the natural forests come under continuous pressure, developmental activities like road construction, hydropower, mining, quarrying, etc. (DoFPS, 2011). The degradation and deforestation of forests resources are happening at a faster rate and have become a global threat to combat current phenomena of climate change adaptation and mitigation measures (SFED, 2019a). The deforestation patterns in Bhutan are based on the different forest types, and 75% of the deforestation occurred within the broadleaf forest, 13% in mixed forests, and 12% in conifer forests (WMD, 2017). The deforestation rates are not significant and evenly distributed over

the slope gradient, however; the forest deforestation rates are higher in the closer distance to roads, and nearest to the settlements within the buffer (WMD, 2017). The deforestation largely occurred in forest areas outside the existing management regimes; however, 17% of deforestation occurred within protected areas (WMD, 2017). Currently, the country has about 64,111 hectares of deforested area which is equivalent to about 2% of the national forest cover (WMD, 2017). Whereas, the net area of forest plantations in the country is about 19, 988.31 hectares which is less than 1% of the national forest cover of the country (source, SFED). The plantation programs are mostly carried out on an ad-hoc basis without proper planning and implementation and hence, the successes of the plantations are compromised despite substantial investments (SFED, 2011b).

In 2017, the Department of Forest and Park Services (DoFPS) has established Green Bhutan Corporation Limited (GBCL), and ever since the implementation of the plantations are carried out by them. Though, the plantation programs have been somehow achieved in the past years however clear way forward strategic planning and implementation need to be strengthened. Therefore, the DoFPS has carried out survey and mapping of degraded and barren areas in the country which will serve as roadmap for planning and implementation of the plantation programs.

### **1.3. National forest policy goals and objectives**

The national forest policy (NFP) of Bhutan 2011 states the policy goal *“Bhutan’s forest resources and biodiversity are managed sustainably to produce a wide range of social, economic and environmental goods and services for the equitable benefit of all citizens and natural environment while still maintaining a minimum of 60% of the land under forest cover thereby contributing to Gross National Happiness”* (RGoB, 2011).

To achieve the policy goal, the broad plantation objective is to *“facilitate raising forestry crop on registered lands of individuals or institutions and accrue ecological, social and economic benefits”* (RGoB, 2011).

### **1.4. Objectives**

- i. To document degraded and barren areas in the country,

- ii. To identify and categorize potentially feasible sites for forest plantation in the country.

## **2. Methodology and approaches**

### **2.1. Methodology**

- i. Open Street Map (OSM) technology was used for survey and mapping of the degraded and barren areas,
- ii. The desktop survey mapping of degraded and barren areas of all land types was done by the respective jurisdiction of DFOs and PAs,
- iii. The copies of downloadable survey maps for degraded and barren areas/sites were saved in the OSM Web server,
- iv. The GIS (geographic information system) section under FRMD (Forest Resources Management Division) analyzed the OSM data and produced a draft degraded and barren area map,
- v. The draft desktop survey map was circulated to all the DFOs and PAs for further field truthing and validation,
- vi. The plantation focal officers of respective DFOs and PAs validated the draft map using the plantation suitability criteria and indicators (Table 1) and on-site field visits and ground-truthing,
- vii. Finally, all revalidated data were resubmitted to the SFED/FRMD GIS focal for final documentation.

### **2.2. Land category**

- i. The land under state reserved forest land (SRFL) was surveyed for mapping of the degraded and barren areas (e.g. an area falling under pasture land, forest management unit (FMU), community forest (CF), local forest management plan (LFMP), biological corridors (BC), protected area (PA), and existing failed plantation sites),
- ii. Potentially feasible plantation area mapped for strategic planning and implementation of the plantation program in the future.

### **2.3. Suitability criteria**

The most relevant biophysical parameters in our context were taken into consideration for ranking the particular sites and categorizing their suitability

for plantation. The following biophysical parameters are considered for land suitability categorization for plantations (Table 1).

Table 1. Biophysical parameters for land suitability categorization and score

SN	Parameters	Suitability category		
		Most suitable (Score 4)	Moderately suitable (Score 3)	Marginally suitable (Score 2)
1	Existing vegetation cover (%)	< 25%	26-35%	36-45%
2	Topography: Slope gradient %	0-30	30-45	45-60
3	Soil types	Loamy soil	Silt loam, Sandy loam, clay loam	Clay & silt
4	Altitude/elevation (masl)	0-1800	1800-2500	2500-3000
5	Aspect	North, North-west	North, North-east	East, West, South-west
6	Distance from the motorable road head (km)	<2	2-2.5	2.5-3
7	Distance from the nearest water source (meters)	<500	500-1000	1000-2000

During the ground-truthing and depending on the suitability category, the scoring matrix was used to validate maps on the ground. Each biophysical parameter was assigned with a scoring matrix for the land suitability category (Table 2).

Table 2. Suitability scoring matrix

SN	Parameters	Suitability scoring matrix			
		Most suitable (Score 4)	Moderately suitable (Score 3)	Marginally suitable (Score 2)	Total score
1	Existing vegetation cover (%)				

SN	Parameters	Suitability scoring matrix			
		Most suitable (Score 4)	Moderately suitable (Score 3)	Marginally suitable (Score 2)	Total score
2	Topography (slope gradient %)				
3	Soil types				
4	Altitude/ elevation (masl)				
5	Aspect				
6	Distance from the motor-able road head (km)				
7	Distance from the nearest water source (meters)				
<b>Total score</b>					

The total sum of score values from the suitability scoring matrix will determine the suitability category of each site (Table 3).

Table 3. Suitability category of land

SN	Criteria	Scoring range
1	Most suitable	25-28
2	Moderately suitable	20-24
3	Marginally suitable	14-19
4	Unsuitable	<13

### 3. Result and discussions

#### 3.1. Degraded and barren area

The degraded and barren area survey mapping was done based on the suitability category described in the methodology. The mapping was done based on the field truthing and validated data received from the field offices. As per the verified data received from the field offices, the total area of the degraded and barren area mapped is 7,679.154 hectares (Table 4, Figures 1 and 2) which is equivalent to about 0.69% under national non-forest cover

and about 0.20% of the total geographical area of the country. The area mapped, JDNP and Mongar (Table 4).

The mapping for the under DFO is 6,345.127 hectares and 1,334.027 hectares under PAs (Table 4). The DFO Wangdue has the maximum area mapped followed by Paro, Trashigang degraded and barren areas does not include the following sites in the country.

- i. Urban recreation
- ii. Mining site
- iii. Avenue and roadside
- iv. River and stream bank protection
- v. Heritage site
- vi. Private forest

Table 4. Area and number of sites under Protected Area and Divisions

Division/ Parks & Sanctuary	Marginally suitable area (2)		Moderately suitable area (3)		Most suitable area (4)		Total Area (ha.)	Total No. of sites
	Area (ha.)	No. of sites	Area (ha.)	No. of sites	Area (ha.)	No. of sites		
Bumthang	101.203	15	77.9	10			179.103	25
BWS	138.859	14	36.048	13	1.496	1	176.403	28
Dagana	26.21	5	366.59	33	103.202	4	496.002	42
Gedu	184.885	5	87.909	6			272.794	11
JDNP	401.088	10	326.639	8			727.727	18
JKSNR	12.755	3	112.95	5	25.733	3	151.438	11
JSWNP			19.905	9	15.713	10	35.618	19
JWS			52.604	5	12.905	1	65.509	6
Mongar	74.836	9	453.222	43	40.326	6	568.384	58
Paro	206.881	3	933.382	24	6.692	2	1146.955	29
Pema Gatsel	18.478	6	60.811	13	33.773	4	113.062	23
PNP	46.164	2	9.118	3			55.282	5
PWS			76.976	3			76.976	3
RMNP	6.469	1	9.818	4	13.351	6	29.638	11
Samdrup Jongkhar	75.207	2	121.132	12	72.03	4	268.369	18
Samtse	31.401	4	45.722	2	14.803	3	91.926	9
Sarpang			194.257	18	65.847	4	260.104	22
SWS			8.871	2			8.871	2
Thimphu	215.51	17	278.163	9			493.673	26
Trashigang	31.953	2	745.611	28	158.876	5	936.44	35
Tsirang	7.431	2	142.903	7	10.62	1	160.954	10

Division/ Parks & Sanctuary	Marginally suitable area (2)		Moderately suitable area (3)		Most suitable area (4)		Total Area (ha.)	Total No. of sites
	Area (ha.)	No. of sites	Area (ha.)	No. of sites	Area (ha.)	No. of sites		
Wangdue	1097.2	34	253.023	21	2.885	2	1353.107	57
WCNP	2.733	1			3.832	1	6.565	2
Zhemgang	1.618	1	2.636	1			4.254	2
<b>Grand Total</b>	<b>2680.88</b>	<b>136</b>	<b>4416.19</b>	<b>279</b>	<b>582.084</b>	<b>57</b>	<b>7679.154</b>	<b>472</b>
Area under Division	2072.81	105	3763.26 1	227	509.054	35	6345.127	367
Area under Protected Area	608.068	31	652.929	52	73.03	22	1334.027	105
<b>Grand Total</b>	<b>2680.88</b>	<b>136</b>	<b>4416.19</b>	<b>279</b>	<b>582.084</b>	<b>57</b>	<b>7679.154</b>	<b>472</b>

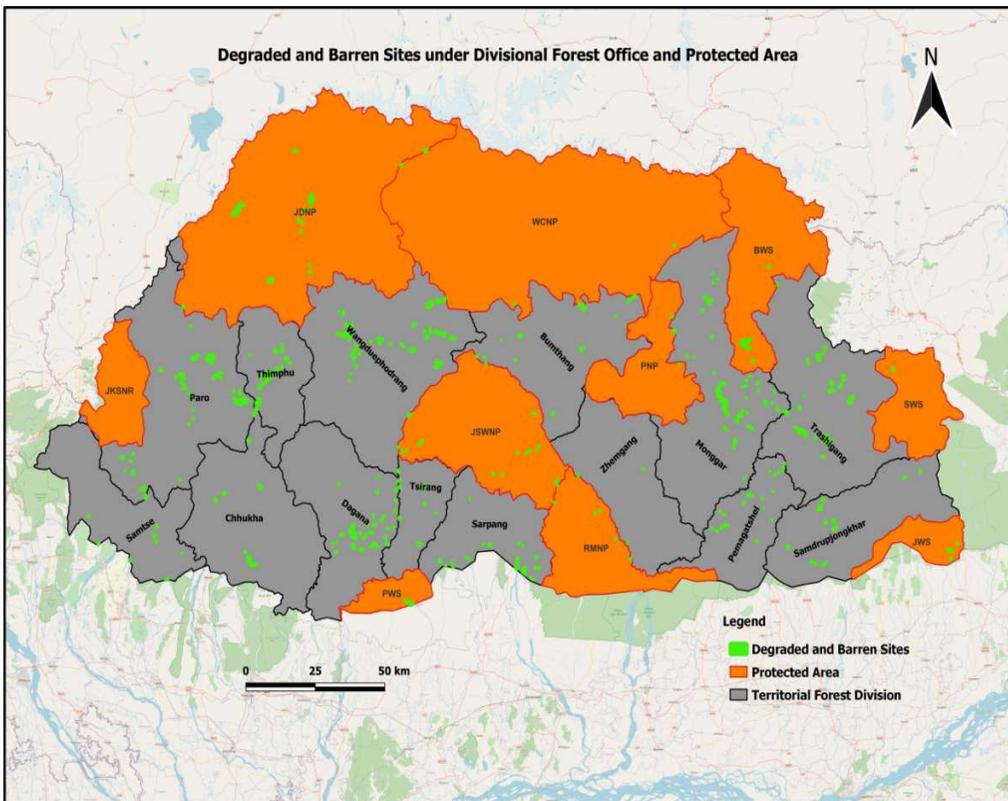


Figure 1. Degraded and barren area and sites in Bhutan

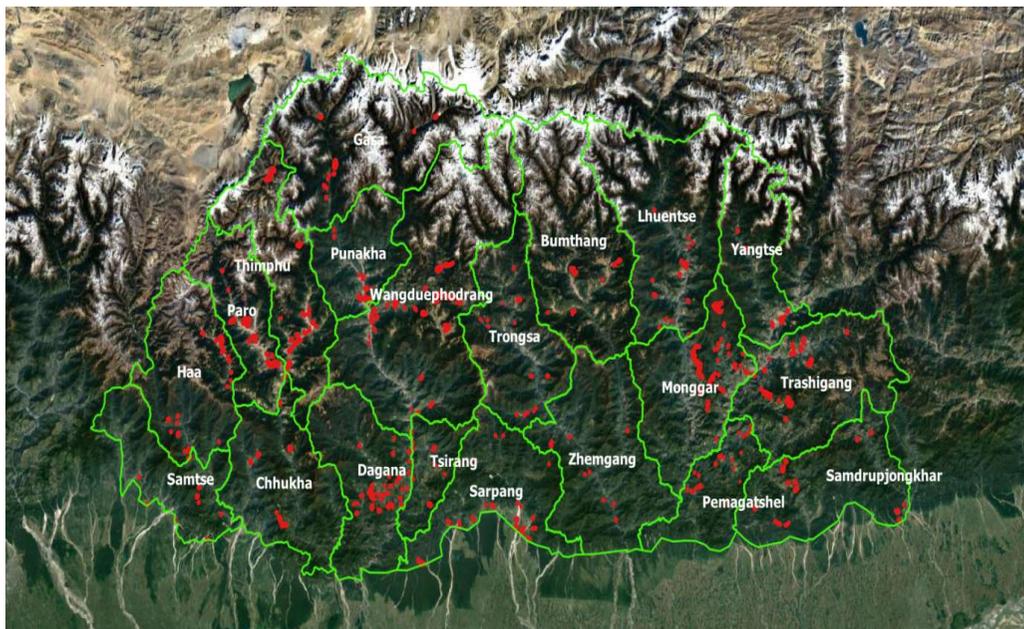


Figure 2. Satellite view of the degraded and barren sites

### 3.2. Number of degraded and barren sites

The degraded and barren sites are grouped into three suitability category (Table 3). A total of 472 numbers of degraded and barren sites were mapped across the country (Table 4, Figure 1 and 2). There are 367 sites under DFOs and 105 sites under PAs (Table 4). The DFO Monggar has the highest number of degraded and barren sites followed by Wangdue, Dagana, Trashigang, Paro, BWS and Thimphu (Table 4).

## 4. Degraded and barren area and sites under each Divisional Forest Office and Protected Area

### 4.1. Bumthang

Table 5. Degraded and barren area and sites under DFO Bumthang

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
Bumthang	Drakteng	3.216	Drakteng	3	Natural grazing area
Bumthang	Willing	20.857	Nubi	3	Falls in Nubi LFMP

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
Bumthang	Willing	13.765	Nubi	3	Falls in Nubi LFMP
Bumthang	Bjee	0.574	Nubi	3	Falls in Nubi LFMP
Bumthang	Tangsibji	3.090	Tangsibji	3	Falls under CFMU
Bumthang	Shobum	25.436	Tang	3	Rudongla FMU
Bumthang	Audit-I	1.938	Tangsibji	3	Falls under CFMU
Bumthang	Pangtoed Lhaxhang	0.729	Chumi	3	Karshong FMU
Bumthang	New Proposal	5.769	Chumi	3	Karshong FMU
Bumthang	New rposal	2.526	Chumi	3	Karshong FMU
Bumthang	Dorjeebe	18.352	Chokor	2	
Bumthang	Dorjibee	0.961	Chokor	2	
Bumthang	Dorjibee	26.817	Chokor	2	
Bumthang	Dorjibee	1.048	Chokor	2	
Bumthang	Chokor	5.501	Chokor	2	
Bumthang	Charkhab Changsa	3.224	Tang	2	
Bumthang	Above Gaytsa	3.903	Chumi	2	
Bumthang	Rodungla	12.213	Tang	2	Rudongla FMU
Bumthang	Rodungla	2.791	Tang	2	Rudongla FMU
Bumthang	Rodungla	1.775	Tang	2	Rudongla FMU
Bumthang	Rodungla	3.565	Tang	2	Rudongla FMU
Bumthang	Tangsibji CFMU area	2.286	Tangsibji	2	Falls under CFMU
Bumthang	Bayling	0.782	Langthel	2	BC 4
Bumthang	Bayling	17.371	Langthel	2	BC 4
Bumthang	Bayling	0.614	Langthel	2	BC 4
<b>Total</b>		<b>179.103</b>		<b>25</b>	25 sites
Most suitable area (4)					
Moderately suitable area (3)		77.900		10	
Marginally suitable area (2)		101.203		15	
<b>Total</b>		<b>179.103</b>		<b>25</b>	

## 4.2. Bumdeling Wildlife Sanctuary

Table 6. Degraded and barren area and sites under BWS

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
BWS	Umbrak	1.496	Khoma	4	Falls under Umbrak CF area
BWS	Zhabjaythang	0.617	Sherimuhung	3	
BWS	Durgang	3.495	Khoma	3	
BWS	Haling Lower	2.130	Bumdeling	3	Area falls under CFMG
BWS	Haling Upper	2.014	Bumdeling	3	Area falls under CFMG
BWS	Jabgang	5.027	Sherimuhung	3	
BWS	Jangkhar	4.995	Sherimuhung	3	Falls under CF area
BWS	Laishing brangsa	2.160	Sherimuhung	3	Falls under CF area
BWS	Lariwoong	1.364	Sherimuhung	3	
BWS	Mergola	2.034	Sherimuhung	3	
BWS	Muhung lake	1.635	Sherimuhung	3	
BWS	Pangkhar	1.003	Khoma	3	Falls under Pangkhar CF area
BWS	Shawagar toet	4.969	Sherimuhung	3	
BWS	Yengkhar	4.605	Bumdeling	3	
BWS	Betarijuma pangthang	3.279	Sherimuhung	2	
BWS	Chhubar	12.685	Sherimuhung	2	
BWS	Dungkarcholing	61.036	Sherimuhung	2	Falls within Tsamdro
BWS	Dungkarcholing top	2.403	Sherimuhung	2	
BWS	Langchengang	4.908	Sherimuhung	2	
BWS	Namdaling	12.750	Sherimuhung	2	Falls within Tsamdro
BWS	Pelrigonpa	19.712	Sherimuhung	2	Falls within Tsamdro
BWS	Phamrong	3.269	Sherimuhung	2	Falls within Tsamdro, religious, cultural sites
BWS	Sako	3.748	Sherimuhung	2	

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
BWS	Yangla pangthang	5.895	Sherimuhung	2	Falls within Tsamdro
BWS	Yangla pangthang	1.602	Sherimuhung	2	Falls within Tsamdro
BWS	Zangpokpa	0.678	Sherimuhung	2	Falls within religious, cultural sites
BWS	Zabchi pangthang	5.615	Sherimuhung	2	Falls within Tsamdro
BWS	Wadriwoong	1.279	Sherimuhung	2	Enrichment plantation, habitat for Hornbill
<b>Total</b>		<b>176.403</b>		<b>28</b>	28 sites
Most suitable area (4)		1.496		1	
Moderately suitable area (3)		36.048		13	
Marginally suitable area (2)		138.859		14	
<b>Total</b>		<b>176.403</b>		<b>28</b>	

### 4.3. Dagana

Table 7. Degraded and barren area and sites under DFO Dagana

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
Dagana	Phuesum CF	85.834	Kana	4	CF Area
Dagana	Phunsum Goshi CF	0.953	Goshi	4	CF Area
Dagana	Phunsum Goshi CF	7.859	Goshi	4	CF Area
Dagana	Soma	8.556	Khebisa	4	SFRL
Dagana	Balaygang Gongphel CF	10.044	Goshi	3	CF Area
Dagana	Balung CF	5.619	Laja	3	CF Area
Dagana	Bana Phunsum CF	12.055	Laja	3	CF Area
Dagana	Gatsholing CF	6.821	Khebisa	3	CF Area
Dagana	Gatsholing CF	6.096	Khebisa	3	CF Area
Dagana	Khagochen CF	26.887	Kana	3	CF Area
Dagana	Namchag CF	1.960	Tashiding	3	CF Area
Dagana	Namchag CF	6.395	Tashiding	3	CF Area
Dagana	Norbu Dungkar CF	9.807	Dorona	3	CF Area
Dagana	Patala Menchu CF	10.857	Drujeygang	3	CF Area

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
Dagana	Pungsi CF	3.939	Kana	3	CF Area
Dagana	Samdrup choling CF	3.023	Dorona	3	CF Area
Dagana	Samdrup choling CF	4.013	Dorona	3	CF Area
Dagana	Sertsho FC	49.894	Gesarling	3	CF Area
Dagana	Sorlum CF	11.980	Gesarling	3	CF Area
Dagana	Sorlum CF	7.003	Gesarling	3	CF Area
Dagana	Tashi Dargay CF	16.509	Drujeygang	3	CF Area
Dagana	Tashi Dargay CF	10.712	Drujeygang	3	CF Area
Dagana	TashiPhentab CF	11.769	Tseza	3	CF Area
Dagana	Tashithang CF	43.013	Gesarling	3	CF Area
Dagana	Thanamkhai dzong CF	7.249	Laja	3	CF Area
Dagana	Thanamkhai dzong CF	6.277	Laja	3	CF Area
Dagana	Thangna CF	14.809	Drujeygang	3	CF Area
Dagana	Thuenlam CF	3.572	Tshangkha	3	CF Area
Dagana	Upper Gangzor CF	0.815	Tshendagang	3	CF Area
Dagana	Upper Gangzor CF	17.058	Tshendagang	3	CF Area
Dagana	Yezserling CF	1.481	Tashiding	3	CF Area
Dagana	Yezserling CF	1.575	Tashiding	3	CF Area
Dagana	Above Haripokheri	18.354	Goshi	3	SRFL
Dagana	Below Migrater	7.675	Goshi	3	SFRL
Dagana	Dogak	16.989	Goshi	3	SFRL
Dagana	Lower Gangzor	4.740	Tshendagang	3	SFRL
Dagana	Lower Tsendagang	7.600	Tshendagang	3	SFRL
Dagana	Agochen Phunsum CF	5.818	Khebisa	2	CF Area
Dagana	Norbuling CF	2.416	Tashiding	2	CF Area
Dagana	Norbuling CF	6.004	Tashiding	2	CF Area
Dagana	Petekha CF	8.858	Tshangkha	2	CF Area
Dagana	Thuempa puenzhi CF	3.114	Drujeygang	2	CF Area
<b>Total</b>		<b>496.002</b>		<b>42</b>	42 sites
Most suitable area (4)		103.202		4	
Moderately suitable area (3)		366.590		33	

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
Marginally suitable area (2)		26.210		5	
<b>Total</b>		<b>496.002</b>		<b>42</b>	

#### 4.4. Gedu

Table 8. Degraded and barren area and sites under DFO Gedu

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
Gedu	Bumolakha I	7.711	Sampheling	3	
Gedu	Bumolakha II	6.394	Sampheling	3	
Gedu	Gangkha	12.912	Chapcha	3	
Gedu	Gumina	38.542	Metakha	3	
Gedu	Jawbari	8.003	Darla	3	
Gedu	Melamchu	14.347	Metakha	3	
Gedu	Barsa Elephant Habitat	86.884	Geling	2	
Gedu	Bjabcho Gonpa	65.359	Bjabcho	2	
Gedu	Chunzom I	26.917	Chapcha	2	
Gedu	Chunzom II	3.636	Chapcha	2	
Gedu	Jumja	2.089	Geling	2	
<b>Total</b>		<b>272.794</b>		<b>11</b>	11 sites
Most suitable area (4)					
Moderately suitable area (3)		87.909		6	
Marginally suitable area (2)		184.885		5	
<b>Total</b>		<b>272.794</b>		<b>11</b>	

#### 4.5. Jigme Dorji National Park

Table 9. Degraded and barren area and sites under JDNP

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
JDNP	Aethoang	239.466	Khatoe	3	
JDNP	Zamithang	0.910	Khatoe	3	
JDNP	Chuchup	3.566	Khatoe	3	Overlapped with Lunana
JDNP	Wangkuthang	0.780	Khatoe	3	RKCF
JDNP	Jabisa	3.781	Khame	3	
JDNP	Eusa	44.747	Naro	3	Barshong degraded area-1
JDNP	Eusawog	32.532	Naro	3	Barshong degraded

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
					area-2
JDNP	Tshorimo Komathang	0.857	Shari	3	
JDNP	Geza Ringu	25.457	Khame	2	
JDNP	Chongra Jab	10.083	Laya	2	
JDNP	Dachapsa	3.982	Laya	2	
JDNP	Boeza	45.659	Lingzhi	2	Lingzhi degraded area-1
JDNP	Langchulum	56.125	Lingzhi	2	Lingzhi degraded area-2
JDNP	Hongley	207.501	Lingzhi	2	Lingzhi degraded area-3
JDNP	Shangsaphakha	5.083	Lunana	2	
JDNP	Tshojong	28.321	Lunana	2	
JDNP	Secheyna	8.809	Shari	2	
JDNP	Gunitsawa	10.068	Tsento	2	
<b>Total</b>		<b>727.727</b>		<b>18</b>	18 sites
Most suitable area (4)					
Moderately suitable area (3)		326.639		8	
Marginally suitable area (2)		401.088		10	
<b>Total</b>		<b>727.727</b>		<b>18</b>	

#### 4.6. Jigme Khesar Strict Nature Reserve

Table 10. Degraded and barren area and sites under JKSNR

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
JKSNR	Tanga 1	5.947	Gakiling	4	
JKSNR	Tanga 2	11.264	Gakiling	4	
JKSNR	Yokha 1	8.522	Gakiling	4	Bio engineering works
JKSNR	Bebji Community Forest	3.308	Sombaykha	3	
JKSNR	Mochu Community Forest	44.896	Sombaykha	3	
JKSNR	Nakha Community Forest	45.641	Sombaykha	3	

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
JKSNR	Nakhekha Community Forest	12.710	Sombaykha	3	
JKSNR	Sektena	6.395	Gakiling	3	CF plantation
JKSNR	Ama Community Forest	2.800	Sombaykha	2	
JKSNR	Rangtse	2.508	Gakiling	2	CF plantation
JKSNR	Yokha 2	7.447	Gakiling	2	Bio engineering works
<b>Total</b>		<b>151.438</b>		<b>11</b>	<b>11 sites</b>
Most suitable area (4)		25.733		3	
Moderately suitable area (3)		112.950		5	
Marginally suitable area (2)		12.755		3	
<b>Total</b>		<b>151.438</b>		<b>11</b>	

#### 4.7. Jigme Singye Wangchuck National Park

Table 11. Degraded and barren area and sites under JSWNP

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
JSWNP	Kashilingjug	3.322	Korphu	4	SRFL with open area
JSWNP	Dalabi Nimshong	0.563	Korphu	4	Tsamdro area, open & degraded area
JSWNP	Phaling Nimshong	1.521	Korphu	4	Tsamdro area, open & degraded area
JSWNP	Dawara Reti	2.742	Jigmecholing	4	SRFL, open area
JSWNP	Wangling CF	0.695	Langthel	4	Inside Wangling CF, open tsamdro area
JSWNP	Wangling irrigation landslide area	3.248	Langthel	4	SRFL, landslide area along irrigation channel
JSWNP	Tongam Tama Tsamdro area	0.834	Trong	4	Tsamdro area of Tama
JSWNP	Gerichu Confluences	0.799	Athang	4	SRFL, barren land

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
JSWNP	Gedu Athang Tsamdro area	0.737	Athang	4	Tsamdro area
JSWNP	Lopokha Adha along river bank	1.252	Athang	4	Along river bank
JSWNP	Khardungjug	0.885	Korphu	3	Validation done in 2019, SRFL
JSWNP	Menchugang	0.608	Korphu	3	Validation done in 2019, SRFL
JSWNP	Phakhar Kophu	1.077	Korphu	3	SRFL with open area
JSWNP	Ngalakhajug Reti	3.515	Jigmecholing	3	SRFL, open area along river bed
JSWNP	Chapi DOR Camp	1.602	Trong	3	SRFL, barren land near DOR camp
JSWNP	Ranichamp Tama	1.526	Trong	3	SRFL, open area
JSWNP	Pemacholing CF Tama	2.754	Trong	3	Previously logged area inside Tama Pemacholing CF
JSWNP	Kashacheko	4.884	Athang	3	SRFL, degraded area
JSWNP	Migtena Pindru CF	3.054	Athang	3	Degraded area inside Migtena Pindru CF
<b>Total</b>		<b>35.618</b>		<b>19</b>	19 sites
	Most suitable area (4)	15.713		10	
	Moderately suitable area (3)	19.905		9	
	Marginally suitable area (2)				
<b>Total</b>		<b>35.618</b>		<b>19</b>	

#### 4.8. Jomotsangkha Wildlife Sanctuary

Table 12. Degraded and barren area and sites under JWS

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
JWS	Lauri	12.905	Lauri	4	
JWS	Bakasay	26.931	Langchenphu	3	

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
JWS	Chukarpo	1.888	Langchenphu	3	
JWS	Zangthi	8.693	Lauri	3	
JWS	Rongchuthang	8.377	Langchenphu	3	
JWS	Namchazor	6.715	Langchenphu	3	
<b>Total</b>		<b>65.509</b>		<b>6</b>	6 sites
	Most suitable area (4)	12.905		1	
	Moderately suitable area (3)	52.604		5	
	Marginally suitable area (2)				
<b>Total</b>		<b>65.509</b>		<b>6</b>	

#### 4.9. Mongar

Table 13. Degraded and barren area and sites under DFO Mongar

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
Mongar	Pangyokpa	4.355	Ngatshang	4	Korila FMU
Mongar	Jamsobrangsa	2.016	Ngatshang	4	Korila FMU
Mongar	Pangsela	7.731	Tsakaling	4	
Mongar	Kilikhar	0.793	Mongar	4	Korila FMU
Mongar	Kurshinang Chaskhar	6.291	Chaskhar	4	Korila FMU, non protection site
Mongar	Zunglen CF Karsong Rangthang Kholom	19.140	Drepong	4	Zunglen CF, existing plantation, <5% survival
Mongar	Changmashing	2.783	Mongar	3	Korila FMU
Mongar	Quechangma	1.568	Menbi	3	Rocky, fire prone area
Mongar	Dawanyelsa	23.352	Tsakaling	3	
Mongar	Takila	7.332	Menbi	3	Open, adjacent to plantation site
Mongar	Prachola	24.657	Tsakaling	3	
Mongar	Labrangsa	6.302	Ngatshang	3	Korila FMU
Mongar	Phatarijuk	3.694	Drepong	3	Zunglen CF
Mongar	Doleptang	1.597	Tsakaling	3	

<b>Div_Parks</b>	<b>Name/location</b>	<b>Area (ha.)</b>	<b>Gewog</b>	<b>Scoring</b>	<b>Remarks</b>
Mongar	Dawa Karpo	0.948	Tsakaling	3	
Mongar	Goleyseywang	5.594	Tsakaling	3	
Mongar	Goleyseywang	1.032	Tsakaling	3	
Mongar	Takchu 6	1.160	Mongar	3	Korila FMU
Mongar	Takchu 4	1.385	Mongar	3	Korila FMU
Mongar	Takchu 3	0.787	Mongar	3	Korila FMU
Mongar	Takchu 2	2.949	Mongar	3	Korila FMU
Mongar	Takchu 1	5.490	Mongar	3	Korila FMU
Mongar	Killikhar 2	1.081	Mongar	3	Korila FMU
Mongar	Killikhar 3	2.502	Mongar	3	Korila FMU
Mongar	Dungjuri Khalong CF	3.513	Narang	3	Khalong CF
Mongar	Gongrikokti	1.056	Drametse	3	
Mongar	Yayung Dozam CF	5.855	Drametse	3	Dozam CF
Mongar	Baging Pongachema	0.560	Drametse	3	
Mongar	Talam Dozam CF	4.358	Drametse	3	Dozam CF
Mongar	Zimchatpa	0.814	Chaskhar	3	Korila FMU, non protection site
Mongar	Kamgoi	13.013	Chaskhar	3	Korila FMU, non protection site
Mongar	Gungtongla	11.163	Tsakaling	3	Grazing land
Mongar	Nangsany badep	2.643	Tsakaling	3	Grazing land
Mongar	Ravabee	9.329	Tsakaling	3	Grazing land
Mongar	Thongjaa	14.567	Tsakaling	3	Grazing land
Mongar	Kektongbadep	54.691	Tsakaling	3	Grazing land
Mongar	Nawashing	91.072	Tsakaling	3	Grazing land
Mongar	Wongola	8.293	Tsakaling	3	Grazing land
Mongar	Gonpa Chulibi CF	49.347	Chali	3	Chubili CF
Mongar	Kesengma Chulibi CF	41.302	Chali	3	Chubili CF, Grazing

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
					land
Mongar	Kezangbadep	10.048	Tsakaling	3	Grazing land
Mongar	Broksarchekpu	29.304	Tsakaling	3	Grazing land
Mongar	Below NRDCL Depot	1.005	Ngatshang	3	Korila FMU
Mongar	Woong borangsa	1.374	Ngatshang	3	Korila FMU
Mongar	Tshotsang Lower	0.522	Ngatshang	3	Korila FMU
Mongar	Brangsachelo	0.626	Ngatshang	3	Korila FMU
Mongar	Phakpa Borang	1.486	Kengkhar	3	Murung CF
Mongar	Chaksazor A	2.064	Drepong	3	
Mongar	Chaksazor B	1.004	Drepong	3	
Mongar	Jabin	26.524	Menbi	2	Rocky, fire prone area
Mongar	Zarpangthang	4.114	Menbi	2	BC 8
Mongar	Thinleypang	9.824	Menbi	2	Dry, fire prone area
Mongar	Tshikhardemong	15.321	Minjey	2	Rongmang chu FMU
Mongar	Dramitse Satang	3.094	Drametse	2	Dozam CF
Mongar	Gumdrang	0.603	Tsakaling	2	
Mongar	Gumdrang	0.771	Tsakaling	2	
Mongar	Gumdrang	0.576	Tsakaling	2	
Mongar	Sezoko	14.009	Balam	2	
<b>Total</b>		<b>568.384</b>		<b>58</b>	58 sites
	Most suitable area (4)	40.326		6	
	Moderately suitable area (3)	453.222		43	
	Marginally suitable area (2)	74.836		9	
<b>Total</b>		<b>568.384</b>		<b>58</b>	

#### 4.10. Paro

Table 14. Degraded and barren area and sites under DFO Paro

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
Paro	Damtaepang	2.200	Samar	4	
Paro	Tshelungkha	4.492	Esue	4	
Paro	Sangchokor	27.942	Lamgong	3	
Paro	Near Uma	0.903	Wangchang	3	

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
	Resort				
Paro	Near Airport	3.835	Wangchang	3	
Paro	Wochu top	5.416	Luyeni	3	
Paro	Dra karmo	2.103	Shaba	3	
Paro	Lholing Fireburnt Area	39.279	SHaba	3	
Paro	Below Sangchokhor above Tsendona Village	39.657	Lamgong	3	
Paro	Above Sangchokhor	74.247	Lamgong	3	
Paro	Opposite to Sangchokhor	94.449	Lamong	3	
Paro	Tamchu Lhakhang	179.054	Dogar	3	
Paro	Opposit to Issuna Village	283.702	Dogar	3	
Paro	Below Singkapang	2.792	Bji	3	
Paro	Haatae Hotstone Bath	0.617	Bji	3	
Paro	Anakha	0.935	Samar	3	
Paro	Above Katsho Bridge	1.886	Katsho	3	
Paro	Above Guest House	3.339	Katsho	3	
Paro	Metrology below road	0.614	Katsho	3	
Paro	Near BOD	2.560	Katsho	3	
Paro	Singkana	3.414	Bji	3	
Paro	Tshapay Bjalo	0.734	Esue	3	
Paro	Tshapay	3.871	Esue	3	
Paro	Shari	0.781	Sama	3	
Paro	Zangkipang	2.838	Tsento	3	
Paro	Nichiphu	158.414	Tsento	3	
Paro	Bangeyna	3.276	Esue	2	
Paro	Opposite to Khangku Village	43.594	Wangchang	2	
Paro	Katsho Gongpa	160.011	Katsho	2	
<b>Total</b>		<b>1146.955</b>		<b>29</b>	29 sites
	Most suitable area (4)	6.692		2	

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
	Moderately suitable area (3)	933.382		24	
	Marginally suitable area (2)	206.881		3	
	<b>Total</b>	<b>1146.955</b>		<b>29</b>	

#### 4.11. Pema Gatsel

Table 15. Degraded and barren area and sites under DFO Pema Gatsel

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
Pema Gatsel	Nanong5	1.258	Nanong	4	
Pema Gatsel	Nanong6	1.474	Nanong	4	
Pema Gatsel	Yurung3	2.069	Yurung	4	
Pema Gatsel	Yurung4	28.972	Yurung	4	
Pema Gatsel	Denchi2	1.038	Shumar	3	
Pema Gatsel	Gamung	1.037	Shumar	3	Road runs through the site
Pema Gatsel	Khar6	10.036	Khar	3	
Pema Gatsel	Nanong3	1.101	Nanong	3	
Pema Gatsel	Nanong7	1.110	Nanong	3	Falls in CF
Pema Gatsel	Chimung	2.969	Chimong	3	
Pema Gatsel	Dungmin2	1.932	Dungmaed	3	Once used for cultivation & abandoned SRFL
Pema Gatsel	Dungmin4	4.696	Dungmaed	3	
Pema Gatsel	Dungmin6	8.510	Dungmaed	3	Water source plantation
Pema Gatsel	Dungmin7	7.322	Dungmaed	3	Enrichment plantation
Pema Gatsel	Dungmin8	3.555	Dungmaed	3	Enrichment plantation
Pema Gatsel	Dungmin8	16.430	Dungmaed	3	Falls in electric

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
					transmission line
Pema Gatsel	Zobel3	1.075	Zobel	3	Near the settlement, oak forest
Pema Gatsel	Khar3	0.761	Khar	2	Falls in electric transmission line
Pema Gatsel	Nanong1	1.235	Nanong	2	
Pema Gatsel	Nanong1	2.250	Nanong	2	
Pema Gatsel	Nanong4	0.960	Nanong	2	
Pema Gatsel	Dungmin5	2.242	Dungmaed	2	Falls on steep rocky cliff
Pema Gatsel	Yurung2	11.030	Yurung	2	Falls on steep rocky cliff
<b>Total</b>		<b>113.062</b>		<b>23</b>	23 sites
Most suitable area (4)		33.773		4	
Moderately suitable area (3)		60.811		13	
Marginally suitable area (2)		18.478		6	
<b>Total</b>		<b>113.062</b>		<b>23</b>	

#### 4.12. Phrumsengla National Park

Table 16. Degraded and barren area and sites under PNP

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
PNP	Sisingpeg	4.773	Metsho	3	
PNP	Bum Mathey	3.491	Jaray	3	
PNP	Gang Jab	0.854	Jaray	3	
PNP	Ngambera	1.060	Tsamang	2	
PNP	Zetho	45.104	Metsho	2	
<b>Total</b>		<b>55.282</b>		<b>5</b>	5 sites
Most suitable area (4)					
Moderately suitable area (3)		9.118		3	
Marginally suitable area (2)		46.164		2	
<b>Total</b>		<b>55.282</b>		<b>5</b>	

#### 4.13. Phipsoo Wildlife Sanctuary

Table 17. Degraded and barren area and sites under PWS

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
PWS	LowerGrassland	55.578	Senge	3	
PWS	MiddleGrassland	13.891	Senge	3	
PWS	UpperGrassland	7.507	Senge	3	
<b>Total</b>		<b>76.976</b>		<b>3</b>	3 sites
Most suitable area (4)					
Moderately suitable area (3)		76.976		3	
Marginally suitable area (2)					
<b>Total</b>		<b>76.976</b>		<b>3</b>	

#### 4.14. Royal Manas National Park

Table 18. Degraded and barren area and sites under RMNP

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
RMNP	Umling	1.532	Umling	4	
RMNP	Kunkhai	3.990	Trong	4	Bit rock and marshy area
RMNP	Matmatsho	1.714	Trong	4	50% CF area
RMNP	Udigang1	2.840	Phangkhar	4	
RMNP	Udigang2	0.844	Phangkhar	4	
RMNP	Yeshibee	2.431	Trong	4	Farm road runs through the area
RMNP	Kulumti	3.088	Phangkhar	3	
RMNP	Plot1	0.642	Tareything	3	Inside Thrunthung CF
RMNP	Plot2	4.880	Tareything	3	Inside Gayser Tashicholing
RMNP	Plot3	1.208	Umling	3	Near Army Outpost (SRF)
RMNP	Plot6	6.469	Umling	2	Inside Dangling CF
<b>Total</b>		<b>29.638</b>		<b>11</b>	11 sites
Most suitable area (4)					
Moderately suitable area (3)		13.351		6	
Marginally suitable area (2)		9.818		4	
Marginally suitable area (2)		6.469		1	
<b>Total</b>		<b>29.638</b>		<b>11</b>	

#### 4.15. Samdrup Jongkhar

Table 19. Degraded and barren area and sites under DFO Samdrup Jongkhar

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
Samdrup Jongkhar	Khechangpo	1.110	Phuntshothang	4	Community proposed for land exchange
Samdrup Jongkhar	Chunurung	3.548	Orong	4	
Samdrup Jongkhar	Fremiphu	64.665	Gomdar	4	
Samdrup Jongkhar	Jahar	2.707	Orong	4	
Samdrup Jongkhar	Ashikhar1	2.793	Dewathang	3	
Samdrup Jongkhar	Ashikhar2	2.923	Dewathang	3	SRFL but there are settlement
Samdrup Jongkhar	Coal Minig Area	1.135	Dewathang	3	Near Ashikhar coal minig area
Samdrup Jongkhar	Martang	1.222	Dewathang	3	
Samdrup Jongkhar	Zewang	3.257	Dewathang	3	
Samdrup Jongkhar	Barzorgonpa	14.638	Gomdar	3	
Samdrup Jongkhar	Chidungkhar	25.098	Gomdar	3	
Samdrup Jongkhar	Jomogonpa	25.049	Wangphu	3	
Samdrup Jongkhar	Kekari Sisingborang	34.521	Wangphu	3	
Samdrup Jongkhar	Namthaba	4.851	Orong	3	
Samdrup Jongkhar	Nychenphu	0.715	Orong	3	
Samdrup Jongkhar	Gerwa1	4.930	Dewathang	3	
Samdrup Jongkhar	Jukabrangsa Chongopa	30.801	Wangphu	2	
Samdrup Jongkhar	Khilabrangsa	44.406	Wangphu	2	
<b>Total</b>		<b>268.369</b>		<b>18</b>	18 sites
Most suitable area (4)		72.030		4	

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
	Moderately suitable area (3)	121.132		12	
	Marginally suitable area (2)	75.207		2	
	<b>Total</b>	<b>268.369</b>		<b>18</b>	

#### 4.16. Samtse

Table 20. Degraded and barren area and sites under DFO Samtse

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
Samtse	Dipu Dara	5.530	Sangacholing	4	Bamboo plantation
Samtse	Suntaley	1.462	Tading	4	
Samtse	Alipakha	7.811	Samtse	4	
Samtse	Pugli	19.517	Phuntshopelri	3	
Samtse	Kharapani	26.205	Dophuchen	3	
Samtse	Nawlamber Kuchi Daina Border	5.983	Yoeseltse	2	
Samtse	Deorali	5.448	Tading	2	
Samtse	Gangteykha CF	13.752	Dophchen	2	CF Plantation
Samtse	Gebji	6.218	Dungtoe	2	
	<b>Total</b>	<b>91.926</b>		<b>9</b>	9 sites
	Most suitable area (4)	14.803		3	
	Moderately suitable area (3)	45.722		2	
	Marginally suitable area (2)	31.401		4	
	<b>Total</b>	<b>91.926</b>		<b>9</b>	

#### 4.17. Sarpang

Table 21. Degraded and barren area and sites under DFO Sarpang

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
Sarpang	Bistey2	0.626	Gakidling	4	
Sarpang	Gelephu3	1.383	Gelephu	4	
Sarpang	Sershong	2.575	Shompangkha	4	
Sarpang	Chuzangang	61.263	Chuzagang	4	Over lapped with Umling Gewog
Sarpang	Above highway Samtenling	6.323	Samtenling	3	
Sarpang	Army OP	3.289	Sompangkha	3	

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
	Shompangkha				
Sarpang	Balibas	2.106	Gakidling	3	
Sarpang	Below highway Samtenling	4.851	Samtenling	3	
Sarpang	Bistey1	15.813	Gakidling	3	Over lapped with Senge Gewog and Gakidling
Sarpang	Dratshang	2.131	Sompangkha	3	
Sarpang	Kopchey	6.264	Samtenling	3	
Sarpang	Dekiling1	4.834	Dekiling	3	
Sarpang	Gelephu1	34.653	Gelephu	3	
Sarpang	Dekiling2	1.677	Dekiling	3	
Sarpang	Gelephu2	87.446	Gelephu	3	
Sarpang	Dekiling3	1.640	Dekiling	3	
Sarpang	Dekiling4	2.078	Dekiling	3	
Sarpang	Dekiling5	0.896	Dekiling	3	
Sarpang	Taklai	14.302	Sershong	3	Over lapped with Umling Gewog
Sarpang	Tirkhola	3.684	Chudzom	3	
Sarpang	Sarpang Khola	1.418	Sershong	3	
Sarpang	Sarpang Khola	0.852	Sershong	3	
<b>Total</b>		<b>260.104</b>		<b>22</b>	22 sites
	Most suitable area (4)	65.847		4	
	Moderately suitable area (3)	194.257		18	
	Marginally suitable area (2)				
<b>Total</b>		<b>260.104</b>		<b>22</b>	

#### 4.18. Sakteng Wildlife Sanctuary

Table 22. Degraded and barren area and sites under SWS

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
SWS	Damzamjab	1.258	Sakteng	3	
SWS	Ditharajbb	7.613	Sakteng	3	
<b>Total</b>		<b>8.871</b>		<b>2</b>	
	Most suitable area (4)				
	Moderately suitable area (3)	8.871		2	
	Marginally suitable area (2)				
<b>Total</b>		<b>8.871</b>		<b>2</b>	

## 4.19. Thimphu

Table 23. Degraded and barren area and sites under DFO Thimphu

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
Thimphu	Debsi	33.282	Chang	3	Dry and barren area
Thimphu	Education City	88.798	Mewang	3	Fire burnt area
Thimphu	Jamdo 2	12.492	Mewang	3	Dry and barren area
Thimphu	Lungtenphu	8.312	Chang	3	Possible problem of water availability
Thimphu	Above City Labor Camp	19.250	Kawang	3	Forest fire burnt area, Plantation, GBCL took over
Thimphu	Near Tsalumapehy Lhakhang	10.206	Chang	3	Plantation in 2016, survival of oak at site
Thimphu	Above Gidakom Hospital	25.116	Mewang	3	Above hydropower channel
Thimphu	Damtsang Pang	3.461	Mewang	3	Marshy area; Not recommended for plantation
Thimphu	Sisina	77.246	Mewang	3	Possible problem of water availability
Thimphu	Below BBS Tower	21.205	Kawang	2	Rhododendron, Oak and Dogwood recommended
Thimphu	Chuzom	20.867	Geney	2	
Thimphu	Kuensel phodrang	1.284	Chang	2	Above Guinness World Record Plantation
Thimphu	Samazingkha 1	8.346	Chang	2	Agroforestry; Oak and Chirpine recommended
Thimphu	Samazingkha 2	6.564	Chang	2	Agroforestry; Oak and Chirpine recommended

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
Thimphu	Samazingkha 3	14.941	Chang	2	GBCL plantation area; Destroyed by fire in 2020
Thimphu	Danglo	11.914	Mewang	2	
Thimphu	Jamdo 1	6.752	Mewang	2	
Thimphu	Khariphu	30.490	Mewang	2	
Thimphu	Khasadrapchu	9.411	Mewang	2	
Thimphu	Above BBS Tower 2	6.479	Kawang	2	Fire burnt area
Thimphu	Tsewang Lhakhang	7.985	Mewang	2	Plantation in June 2016 but failed
Thimphu	Above BBS Tower 1	3.019	Kawang	2	Forest fire burnt area
Thimphu	Langjopakha	6.901	Kawang	2	Forest fire burnt area
Thimphu	Simoo	27.909	Mewang	2	
Thimphu	Waluna 1	18.808	Mewang	2	GBCL plantation area; Blue pine recommended
Thimphu	Waluna 2	12.635	Mewang	2	Blue pine, Chirpine and Oak recommended
<b>Total</b>		<b>493.673</b>		<b>26</b>	26 sites
Most suitable area (4)					
Moderately suitable area (3)		278.163		9	
Marginally suitable area (2)		215.510		17	
<b>Total</b>		<b>493.673</b>		<b>26</b>	

#### 4.20. Trashigang

Table 24. Degraded and barren area and sites under DFO Trashigang

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
Trashigang	Tsheyphu	33.631	Radhi	4	
Trashigang	Phimsong	67.228	Phongmey	4	
Trashigang	Saling	13.652	Bidung	4	
Trashigang	Dogorom	11.708	Bidung	4	
Trashigang	Kanglung juk	32.657	Kanglung	4	
Trashigang	Yonphula	2.363	Kanglung	3	Barren area due to removal

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
					of exotic species
Trashigang	Yonphula	3.573	Kanglung	3	Barren area due to removal of exotic species
Trashigang	Zangpozor 1	15.365	Khamdang	3	Very dry area, prone to forest fires
Trashigang	Zangpozor 2	3.026	Khamdang	3	Very dry area, prone to forest fires
Trashigang	Way to Dangling Tsho	38.944	Khaling	3	Feasible, but Yak herding (winter) by Merak people
Trashigang	Tongzhang	3.528	Tomzhang tshen	3	Below Kuenzangling School
Trashigang	Yonphula 2	1.081	Kanglung	3	Barren area due to removal of exotic species
Trashigang	Kharungla	12.528	Khaling	3	
Trashigang	Barshong	8.298	Khaling	3	Feasible, but Yak herding (winter) by Merak people
Trashigang	Gomchu	7.416	Khaling	3	
Trashigang	Thriezor	73.369	Khaling	3	
Trashigang	Busor, Barshong	8.912	Khaling	3	
Trashigang	Khengthung mani	9.513	Khaling	3	
Trashigang	Khengthung mani top	37.773	Kanglung	3	
Trashigang	Phangchilo	77.535	Khaling	3	
Trashigang	Threngteng	70.478	Khaling	3	
Trashigang	Shizor	45.624	Khaling	3	
Trashigang	Bidung Juk	34.613	Bidung	3	
Trashigang	Retsanghpek	20.030	Bidung	3	
Trashigang	Kola shing puensum	59.854	Radhi	3	
Trashigang	Leyringmo	72.398	Shongphu	3	
Trashigang	Yallang below	30.695	Yallang	3	

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
	temple				
Trashigang	Yallang juk 1	11.731	Yallang	3	
Trashigang	Yallang juk	4.353	Yallang	3	
Trashigang	Gongza opposit 1	20.047	Yallang	3	
Trashigang	Chazam, Yangneer	1.619	Yangneer	3	
Trashigang	Zetpo woong	31.286	Kanglung	3	
Trashigang	Tshowoong Tek Bidung	39.659	Bidung	3	
Trashigang	Toetsho 1	6.839	Toetsho	2	Dry area and prone to forest fires
Trashigang	Toetsho 2	25.114	Toetsho	2	Dry area and prone to forest fires
<b>Total</b>		<b>936.440</b>		<b>35</b>	
Most suitable area (4)		158.876		5	
Moderately suitable area (3)		745.611		28	
Marginally suitable area (2)		31.953		2	
<b>Total</b>		<b>936.440</b>		<b>35</b>	

#### 4.21. Tsirang

Table 25. Degraded and barren area and sites under DFO Tsirang

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
Tsirang	Wakhleytar	10.620	Sergithang	4	
Tsirang	Alley	47.869	Patshaling	3	
Tsirang	Dangraygang	11.656	Semjong	3	
Tsirang	Hatidhunga	2.121	Dunglagang	3	
Tsirang	Jitpaltar	9.612	Sergihang	3	
Tsirang	Phalayday	60.547	Phungtenchu	3	
Tsirang	Subbagoan1	4.521	Rangthaling	3	
Tsirang	Subbagoan2	6.577	Rangthaling	3	
Tsirang	Kereni above road	3.067	Sergithang	2	
Tsirang	Kereni below road	4.364	Sergithang	2	
<b>Total</b>		<b>160.954</b>		<b>10</b>	10 sites
Most suitable area (4)		10.620		1	
Moderately suitable area (3)		142.903		7	

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
Marginally suitable area (2)		7.431		2	
<b>Total</b>		<b>160.954</b>		<b>10</b>	

## 4.22. Wangdue

Table 26. Degraded and barren area and sites under DFO Wangdue

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
Wangdue	Plantation41	1.797	Guma	4	Zomlingthang recreation area
Wangdue	Plantation35	1.088	Bapisa	4	
Wangdue	Plantation34	3.320	Theedtsho	3	Proposed satshab
Wangdue	Plantation19	5.543	Gasetsho wom	3	
Wangdue	Plantation17	0.655	Gasetsho gom	3	
Wangdue	Plantation18	5.110	Dangchu	3	BC8
Wangdue	Plantation9	7.197	Nyisho	3	Gangju CF, estimate submitted for TS 2019-2020
Wangdue	Plantation40	9.987	Chhubu	3	
Wangdue	Plantation39	0.719	Chhubu	3	
Wangdue	New PS CF Japhu	4.809	Ruepisa	3	Japhu CF
Wangdue	Wolakha	60.053	Guma	3	
Wangdue	Chimilhakhang	1.745	Barp	3	Old plantation
Wangdue	Samthang	14.055	Theedtsho	3	
Wangdue	Below RLDC	1.620	Rubesa	3	
Wangdue	Below RLDC	0.791	Rubesa	3	
Wangdue	Below RLDC	0.621	Rubesa	3	
Wangdue	Below Chimilhakhang	2.001	Barp	3	Old plantation
Wangdue	Toeberongchu	18.594	Guma	3	
Wangdue	Jimithang	56.825	Dzomi	3	
Wangdue	Gukarmo (above Satsham Chorten)	12.172	Limbukha	3	

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
Wangdue	Chimjeypang	34.711	Nyisho	3	
Wangdue	Jarona	4.520	Rubesa	3	Old plantation failure
Wangdue	Below Nyezergang Lhakhang	7.975	Rubesa	3	
Wangdue	Plantation36	2.816	Guma	2	
Wangdue	Plantation44	3.277	Dangchu	2	
Wangdue	Plantation3	101.975	Sephu	2	BC8
Wangdue	Plantation42	1.149	Daga	2	BC2
Wangdue	Plantation21	2.260	Ruepisa	2	
Wangdue	Plantation22	1.083	Ruepisa	2	Settlement needs cattle grazing
Wangdue	Plantation6	54.026	Sephu	2	
Wangdue	Plantation1	7.671	Sephu	2	BC8
Wangdue	Plantation2	2.998	Sephu	2	
Wangdue	Plantation4	31.250	Sephu	2	
Wangdue	Plantation43	5.830	Dangchu	2	BC8
Wangdue	Plantation7	8.262	Dangchu	2	BC8, existing plantation
Wangdue	Plantation8	19.166	Bjena	2	Cliff
Wangdue	Plantation14	7.099	Nyisho	2	
Wangdue	Plantation33	10.577	Nyisho	2	
Wangdue	Plantation23	10.461	Nyisho	2	
Wangdue	Plantation10	7.270	Nyisho	2	Jibdungsa CFMG not interested for plantation
Wangdue	Plantation11	8.000	Nyisho	2	Chadgang CF
Wangdue	Plantation27	6.565	Ruepisa	2	
Wangdue	Plantation31	7.713	Ruepisa	2	Reserved development activity by Gewog Adm.
Wangdue	Plantation15	26.587	Phangyuel	2	Existing plantation and private land
Wangdue	Plantation30	5.005	Chhubu	2	
Wangdue	Plantation46	3.188	Dzoma	2	

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
Wangdue	Plantation47	1.333	Lingmukha	2	CF
Wangdue	Plantation48	4.155	Lingmukha	2	CF
Wangdue	Plantation49	6.635	Lingmukha	2	Plantation established
Wangdue	Lawala	18.178	Gangtey	2	
Wangdue	Phobjikha	123.056	Phobjikha	2	
Wangdue	Phobjikha	44.426	Phobjikha	2	
Wangdue	Phobjikha	141.218	Phobjikha	2	
Wangdue	Lawala	28.306	Gangtey	2	Enrichment plantation
Wangdue	Dangchu	250.982	Dangchu	2	
Wangdue	Tomla	130.595	Dangchu	2	
Wangdue	Lawala	14.087	Gangtey	2	
<b>Total</b>		<b>1353.107</b>		<b>57</b>	57 sites
Most suitable area (4)		2.885		2	
Moderately suitable area (3)		253.023		21	
Marginally suitable area (2)		1097.199		34	
<b>Total</b>		<b>1353.107</b>		<b>57</b>	

#### 4.23. Wangchuck Centennial National Park

Table 27. Degraded and barren area and sites under WCNP

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
WCNP	Ney	3.832	Gangzur	4	
WCNP	Mangdechu top Trongsa	2.733	Nubi	2	
<b>Total</b>		<b>6.565</b>		<b>2</b>	2 sites
Most suitable area (4)		3.832		1	
Moderately suitable area (3)					
Marginally suitable area (2)		2.733		1	
<b>Total</b>		<b>6.565</b>		<b>2</b>	

#### 4.24. Zhemgang

Table 28. Degraded and barren area and sites under DFO Zhemgang

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
Zhemgang	KhomsarCF	2.636	Bardo	3	CF water source protection

Div_Parks	Name/location	Area (ha.)	Gewog	Scoring	Remarks
Zhemgang	Samcholing	1.618	Goshing	2	
<b>Total</b>		<b>4.254</b>		<b>2</b>	2 sites
Most suitable area (4)					
Moderately suitable area (3)		2.636		1	
Marginally suitable area (2)		1.618		1	
<b>Total</b>		<b>4.254</b>		<b>2</b>	

## 5. Limitations and recommendations

### 5.1. Limitations for degraded and barren area mapping

- i. The degraded and barren sites having more than 46% existing vegetation cover and more than 60% slope gradient are excluded in the mapping.
- ii. The biophysical parameters used for the categorization of the sites are visually assessed and validated during the field-truthing.
- iii. The soil types are limited to those sites that are very dry, rocky and marshy areas (excluded).
- iv. The survey and mapping polygons less than 0.5 hectares are not included for cost effectiveness (economical reasons).

### 5.2. Way forward recommendations and resources

- i. To make the plantation programs more impactful and successful, the *focused area plantation program* should be encouraged based on the suitability criteria prescribed in this report.
- ii. The focused area plantation shall be initiated annually based on the degraded and barren area mapping report by selecting only few Divisions or PAs in a financial year.
- iii. The plantation sites may be proposed based on the suitability criteria (firstly focus on the most suitable site, then moderately suitable and so on) to make the plantations more successful and climate smart sustainable management.
- iv. An ecosystem service of the barren area should not be altered by artificial intervention and management (e.g. microclimate alteration by planting foreign or alien species).
- v. This report 'in particular' does not include other types of plantations (such as mining site, avenue and roadside, urban recreation, river,

and stream bank protection, heritage site, private forest) and accordingly, the DoFPS may consider accepting proposals depending on the importance, objectives, feasibility and availability of the budget and other external fund support.

- vi. The shapefiles for degraded and barren areas will be uploaded as plantation layers in the Spatial Decision Support System (SDSS) for future references and planning.

## **6. Conclusion**

The forest plantation is one of the priority programs which contributes towards maintaining 60% forest cover (constitutional and forest policy mandates). Since 1947, the plantation program has been initiated and in the 12<sup>th</sup> FYP, the target was set to 2000 hectares. Though the plantation target has been achieved but there are numerous challenges that hindered success of the plantation programs in the country (no plantation roadmap for proper planning, budget constraints, lack of quality seedlings and nurseries, choice of species, limited participation by the stakeholders, biotic interference, and plantation sites loss to developmental activities, etc).

To overcome challenges in success of the plantations, henceforth, the focused area plantation establishment should be implemented to have more impacts on the plantation programs (catchment/watershed, improvement in wildlife habitat and potentially important for payment for environment services etc.). The focused area plantation should be initiated based on 'packaged system' (with the secured budget for after care and maintenance for at least 4-5 years) to enable better success and bring the area under climate smart restoration. The area mapped for the degraded and barren area is about 0.69% of the country's total forest cover. With the current annual target plantation of 400 hectares, the total area mapped (7679.154 hectares) will suffice for about 19 years for taking up plantation programs in the country. To maintain principles of sustainability and conservation of forest resources, the second phase survey and mapping may be necessary in SRF land as continuity of road map guidelines.

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## Annexure

### Annex 1. List of forestry officials who involved desktop survey and mapping by of degraded and barren areas using OSM technology

SN	Name and Designation	Agency	Email_ID	Cell Number
1	Karma Dorji, Sr. FO	Bumthang	karmad@moaf.gov.bt	17798056
2	Nima Tshering, DCFO	Chukha	tsheringwater@gmail.com	17606471
3	Jambay Gyeltshen, Sr. FR1	Dagana	jgyeltshen@dagana.gov.bt	17652148
4	Sonam Drugyal, Sr. FR2	Mongar	sdrugyel@moaf.gov.bt	17700125
5	Kinley Dorji, FO	P/Gatsel	kinleydorji3@moaf.gov.bt	17642077
6	Tshewang Namgay, Sr. FR	P/Gatsel	tshegyel0@gmail.com	17849623
7	Sherab Jamtsho, FO	Paro	sherabjamtsho@moaf.gov.bt	17708210
8	Kuenzang Norbu, Sr. FR	S/Jongkhar	knorbu12xl@gmail.com	17285688
9	Dawa, Sr. FR	Samtse	kunpheldawa@gmail.com	17891436
10	Sangay Dorji, Sr. FR1	Sarpang	sangaydorjit@gmail.com	17636187
11	Sangay Dorji, Sr. FR	Thimphu	sangaydorji@moaf.gov.bt	17624115
12	Chorten, Sr. FO	Thimphu	chorteny100@gmail.com	17645252
13	Pema Tenzin, Sr. FR	Trashigang	plazichoksu406@gmail.com	17892159
14	K.N. Ghemirey, DCFO	Tsirang	ghimirey.kharananda@gmail.com	17645692

SN	Name and Designation	Agency	Email_ID	Cell Number
15	Tshering Penjor, Sr. FR1	Wangdue	tpenjore1972@gmail.com	17633014
16	Shivalal Sanayasi, Sr. FR1	Wangdue	foshiva76@gmail.com	17707543
17	Pema Dendup, Sr. FR2	Wangdue	fbopagli@gmail.com	17624624
18	Jangchuk Wangdi, FO	Zhemgang	jwangdi22@gmail.com	17662857
19	Sangay Tenzin, Sr. FR	JDNP	gasasangay2006@gmail.com	17965855
20	Choki Dorji, Sr. FR	JSWNP	dorjichoki123@gmail.com	17601485
21	Kezang Dawa, Sr. FR	WCNP	kdawa@lhuentse.gov.bt	17244344
22	Doley Tshering, Sr. FR	JKSNR	dorjilegpa@gmail.com	17671608
23	Dawa Tshering, Sr. FR	JKSNR	dtshering09@gmail.com	17681030
24	Dorji Wangdi, Sr. FR2	BWS	dorgwang03@gmail.com	17121411
25	Kencho Rigzin, FO	PWS	kenchorigzin@gmail.com	17604027
26	Kiran Rai, Sr. FR	JWS	kirankiran70@gmail.com	17532175
27	Tshering Dorji, FO	RMNP	tsheringdorji@moaf.gov.bt	17775540
28	Sangay Chophel, FR1	SWS	schophel0889@gmail.com	17754564
29	Pema Tshewang, Sr. FR2	PNP	pematshewang1980@gmail.com	17708586
30	Tshering	GBCL	tsheringgbcl@gmail.com	17693230

SN	Name and Designation	Agency	Email_ID	Cell Number
	Dorji, Sr. Manager			
31	Pema Wangmo, APM	GBCL	peewom506@gmail.com	17586746
32	Pasang Wangdi, APM	GBCL	shengap2020@gmai.com	17439556
33	T.B. Rai, Sr. FR1 (organizer)	SFED	tbdrrai@moaf.gov.bt	17292999

**Annex 2. List of forestry officials who involved survey and mapping for additional sites, field truthing and revalidation**

SN	Divisions/Parks	Name of staff	Designation
1	Bumthang	Karma Dorji	Sr.FR-II
2	Bumthang	Tashi	Sr.FR-II
3	BWS	Chonning Zangpo	FR-I
4	BWS	Dorji Wangdi	Sr.FR-II
5	BWS	Kuenzang Thinley	Sr.FR-I
6	BWS	Lungten Jamtsho	Sr. Fr
7	BWS	Sonam Choidup	FR-III
8	Dagana	Jambay Gyeltshen	Sr,RO
9	Dagana	Ran Bdr Rai	Sr.FR-III
10	Dagana	Ysehi Khandu	FR 2
11	Gedu	Pema Gyeltshen	Sr. FR1
12	JDNP	Chimi Namgyel	Sr. FR2
13	JDNP	Leki	Sr. FR
14	JDNP	Leki Wangdi	FR2
15	JDNP	Sherub Tenzin	FR1
16	JDNP	Tandin Dorji	Sr. FR2
17	JDNP	Wangchuk	P4
18	JDNP	Yonten Jamtsho	P4
19	JKSNR	Dawa Tshering	Sr.FR-III
20	JKSNR	Karma Nidup	FR-I
21	JKSNR	Ngawang Jamtsho	Sr.FR-III
22	JKSNR	Phuntsho	Sr. FR-III

<b>SN</b>	<b>Divisions/Parks</b>	<b>Name of staff</b>	<b>Designation</b>
23	JSWNP	Cheku	Sr. FR 3
24	JSWNP	Choki Dorji	Sr. FR 1
25	JSWNP	Phuntshok	Se. FR 1
26	JSWNP	Ratan Giri	Sr. FR
27	JSWNP	Rinchen Gyeltshen	Sr. FR 2
28	JSWNP	Tshering	FR 2
29	JSWNP	Yeshi Wangdi	Sr. FR 2
30	JWS	Kiran Rai	Sr.FR
31	JWS	Nidup Dorji	Sr. Forester
32	Mongar	Cheten Dorji	Sr.FR-II
33	Mongar	Dawa Norbu	FR-II
34	Mongar	Gyeltshen	FR-II
35	Mongar	Jigme Thinley	FO
36	Mongar	Jigme Wangchuk	Sr.FR-III
37	Mongar	Krishna Prasad Dhimal	FR-II
38	Mongar	Lhadarla	FR-II
39	Mongar	Ngawang Dorji	Sr.Fr
40	Mongar	Nima Gyeltshen	Sr.Fr
41	Mongar	Pema Dendup	Sr.FR-III
42	Mongar	Sonam Drugyal	Sr.FR-II
43	Mongar	Sonam Jamtsho	Sr.Fr
44	Mongar	Tshering Dendup	SR.FR-II
45	Mongar	Tshering Namgay	FR-II
46	Mongar	Tshering Namgyal	Sr.FR-II
47	Mongar	Tshering Namgyel	Sr.FR-II
48	Mongar	Yenten Phuntsho	FR-II
49	Paro	Choney Rangdel	Sr. FR
50	Paro	Kelzang	Sr. FR
51	Paro	Sangay	Sr. FR1
52	Paro	Sherab Jamtsho	FO
53	Paro	Tempa Gyeltshen	FR-I
54	Paro	Thinley Tshering	Sr. FO
55	Pema Gatsel	Dargay Wangchuk	RF-II
56	Pema Gatsel	Kinley Dorji	FO
57	Pema Gatsel	Sangay Dorji	Sr. Fr
58	Pema Gatsel	Sungrab Dorji	FR-I
59	Pema Gatsel	Tshering	Sr. Fr

<b>SN</b>	<b>Divisions/Parks</b>	<b>Name of staff</b>	<b>Designation</b>
60	Pema Gatsel	Ugyen Dorji	Sr. FR-III
61	PNP	Kezang Dukpa	Sr. FR-II
62	PNP	Pema Tshewang	Sr.FR-II
63	PWS	Kencho Rigzin and Chorten	FO
64	RMNP	Dawa Penjor	Asst. Fr
65	RMNP	Dew Bdr. Dahal	FR-II
66	RMNP	Duptho Ugyen	FR-I
67	RMNP	Pema Zangpo	Sr.FR-III
68	RMNP	Phub Namgay	Sr.Fr
69	RMNP	Rinchen Dorji	Sr.Fr
70	RMNP	Sangay Dorji	Sr.Fr
71	RMNP	Sonam Dorji	Sr.FR-III
72	RMNP	Sonam Phuntsho	Sr.Fr
73	RMNP	Tshering Dorji	Sr.FR-I
74	RMNP	Tshering Tashi	Sr.FR-II
75	RMNP	Yeshi Dorji	Sr. FR-I
76	Samdrup Jongkhar	Kuenzang Norbu	Sr.FR-I
77	Samdrup Jongkhar	Wangchuk	Sr.FR
78	Samdrup Jongkhar	Wangchuk Dukpa	Sr.FR-I
79	Samtse	Dawa	Sr.Fr.
80	Samtse	Mindu	Sr.Fr.
81	Samtse	Phurba Dukpa	Head, SFES
82	Samtse	Rin Dorji	Sr.FR-III
83	Samtse	Singye Lham	Sr. Fr
84	Sarpang	Sangay Dorji	Sr.FR-I
85	Sarpang	Tshering Dorji	FO
86	SWS	Pema Rinzin	Sr.FR-II
87	SWS	Sangay Chopel	FR-I
88	Thimphu	Chorten	Sr.FR-II
89	Thimphu	Juddha Bir Rai	SS1
90	Thimphu	Sangay Dorji	Sr.FR-III
91	Thimphu	Tshering Dorji	P4
92	Trashigang	Pema Tenzin	Sr.FR-I
93	Trashigang	Sonam Lhendup	FR-I
94	Trashigang	Sonam Wangmo	FO
95	Tsirang	K.N Ghimeray	Sr.FR

<b>SN</b>	<b>Divisions/Parks</b>	<b>Name of staff</b>	<b>Designation</b>
96	Tsirang	Sacha Dorji	Sr. FR 1
97	Tsirang	Shacha Dorji	Sr.FR-II
98	Wangdue	Dorji	Sr.FR-II
99	Wangdue	Pema Dendup	Sr.FR-II
100	Wangdue	Shivalal Sanayasi	Sr.FR-I
101	WCNP	Karma Yeshe	FR
102	WCNP	Kezang Dawa	Sr.FR
103	Zhemgang	Jangchuk Wangdi	FO
104	Zhemgang	Kezang Dorji	FR-II
105	Zhemgang	Kinzang Dorji	Sr.FR-III
106	Zhemgang	Pema Choten	Sr.Fr.
107	Zhemgang	Thukten Yonten	FR-II

