



དཔལ་ལྷན་འབྲུག་གཞུང་། སོ་ནམ་དང་ནགས་ཚལ་ལྷན་ཁག་།

ནགས་ཚལ་དང་གླིང་ཀ་ཞབས་ཏྲིག་ལས་ཁུངས།

Royal Government of Bhutan
Ministry of Agriculture and Forests
Department of Forests and Park Services
Thimphu: Bhutan



FOREWORD

The Department of Forests and Park Services, Ministry of Agriculture and Forests publish the information booklet every year for documenting the services rendered by Department in a calendar year and make information available for policy discourses. This publication is intended to make information available to different stakeholder including our own employees, academicians, researchers, general public, etc. in very succinct manner.



This Forestry Facts and Figures 2017 is compiled from Forestry Information Database and extensive validation with field offices and contain information on plans and programs implemented by Department, forest management regimes and summary of services tendered to various individuals, agencies and other stakeholders during the year 2017. We hope that the decision makers, researchers, academicians, conservationist, planners and many other stakeholders both within and outside the Department will make use of the information published in this booklet.

I would like to acknowledge the collective effort of all our field colleagues for continuously striving to fulfill important goals and mandates of the Department and implementing the plans and programs while reaching out our services to general public. In addition, I must also congratulate Forest Resources Management Division (FRMD) for their tireless effort in collecting, cleansing, sorting, analyzing and consolidating into this information book.

Phento Tshering
Director

INTRODUCTION

Forests consist of 71 % of the total geographical area of Bhutan (NFI, Vol. 1, 2016). The forests provide the Bhutanese community with food, fodder, shelter and other intangible services. The rich forests contribute significantly to the GDP of Bhutan through its contribution from the forestry, tourism and hydropower sectors. Every year, thousands of cubic meters of forest produce are allotted to people to meet their needs while at the same time, many compensatory afforestation and other measures are taken to ensure sustainable forest management.

The Facts and Figures 2017 recounts the services delivered by the Department in the year 2017. The administrative data are collected through the data managers in all the field offices, who submit it to the Department.

KEY FACTS

Table 1 Key Facts, 2017

Major Forest Type (National Forest Inventory Report Vol. I, 2016)		Protected Areas	
Subtropical Forest	6%	Protected Area Network (Km ²)	19750.57
Fir Forest	9%	Protected Area Network (%)	51.44%
Warm Broadleaved Forest	18%	Protected Area	42.70%
Blue Pine Forest	4%	Biological Corridors	8.60%
Chir Pine Forest	3%	Royal Botanical Park	0.10%
Cool Broadleaved Forest	26%	Protected Area (Nos.)	
Evergreen Oak Forest	1%	National Parks	5
Spruce Forest	1%	Wildlife Sanctuaries	4
Hemlock Forest	2%	Strict Nature Reserve	1
Fir Forest	9%	Biological Corridors	7
Juniper-Rhododendron Scrub	1%	Biodiversity (Nos.)	Recorded species
Forest Cover (NFI)		Vascular Plants	< 5600
Total Growing Stock (mil m ³)	1001	Ferns and their Allies	< 411
Forest cover	71%	Endemic plants	144
Institutions (Nos.)		Mammals	200
Functional Divisions (including UWICER)	6	Globally threatened Mammals	27
Territorial Divisions	14	Bird	721

Protected Areas	10	Globally threatened birds	18
Range Offices	71	Rhododendron species	46
Beat Offices	94	Orchids	469
Forest Check Posts	33	Fungus	350
Forest Management Units (FMU) office	20	Insect-Fungi	< 100
Social Forestry		Globally threatened Birds	47
Community Forest (CF)	733	Amphibians	41
Households involved in CF	30352	Reptiles	124
Community Forest Area	83215	Butterfly	586
Non-Wood Forest Produce (NWFP) groups	138	Moths	16
Households involved in NWFP groups	47210	Fishes	119
Total Number of wood-based Industries	138	Non-vascular plants	282

ORGANIZATIONAL STRUCTURE

The Department is headed by the Director and is assisted by five Functional Divisions (FD) and a research teaching institute at the central level, 14 Territorial Divisions (TD), 10 National Parks (NP) and Wildlife Sanctuaries (WS) (Figure 1) at the field level.

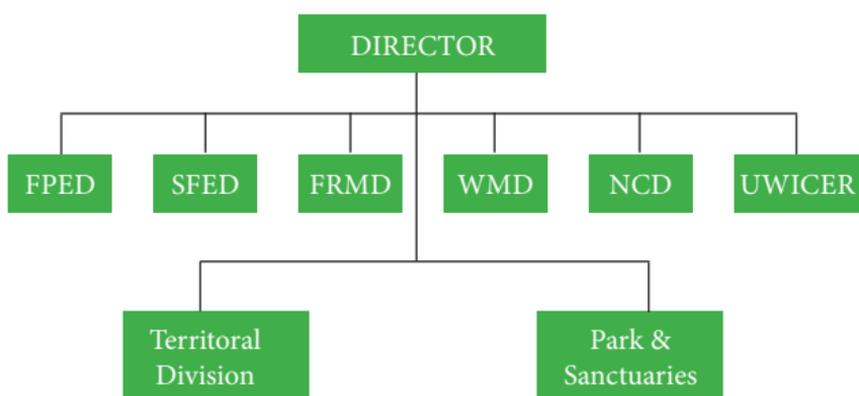


Figure 1 Organogram of the Department

The Functional Divisions; Forest Protection and Enforcement Division (FPED), Social Forestry and Extension Division (SFED), Forest Resources Management Division (FRMD), Watershed Management Division (WMD), Nature Conservation Division (NCD) and Ugyen Wangchuck Institute of Conservation and Environmental Research (UWICER) prepare programs in their relevant fields and provides technical backstopping to the field offices. The programs are implemented

by the field offices (Territorial Division and Protected Areas). These field offices are spread throughout the country (Table 2 and Table 3) and caters to the need of the people without compromising the sustainability of the forests.

Table 2 List of Range Offices and Gewogs covered (Division-wise)

	Name of TD	Dzongkhag	Range	Gewog
1	Bumthang	Bumthang	Chamkhar	Choekhor
			Chumey	Chumey
			Karshong FMU	Chumey
			Rodungla FMU	Tang
			Dawathang FMU	Choekhor
		Trongsa	Trongsa	Nubi
			Chendebji FMU	Tangsibji
2	Dagana	Dagana	Dagana	Tseza, part of Kana and Khebisa
			Dagapela	Tsendagang, Geserling, Goshi, Trashiding, Dorona & parts of Kana.
			Lhamoyzinkingha	Nichula
			Drujeygang	Drujeygang, Part of Khebisa, Laja, Tsangkha
3	Gedu	Chukha	Tsimasham	Bjabchho, Chapcha and Metabkha
			Gedu	Darla, Bongo, Geling, Dungna and Getana
			Phuentsholing	Sampheling, Phuntsholing & Logchina
4	Mongar	Mongar	Mongar	Mongar, Chaskhar, Thangrong, Narang, Balam, Chali & Tsakaling
			Gyelpozhing	Drepong, Jurmey, Kengkhar, Gongdue & Silambi
			Korilla FMU	Ngatshang, Parts of Chaskhar & Mongar
			Lingmethang FMU	Saling
		Lhuentse	Rongmangchu FMU	Parts of Tsenkhar and Minjey
			Lhuentse	Menjey, Menbi, Tsenkhar & Gangzur
5	Pemagatshel	Pemagatshel	Pemagatshel	Shumar, Nanong, Zobel & Khar
			Yurung	Chongshing, Chimung, Dungmaed & Yurung
			Nganglam	Norbugang, Dechheling & Choekhorling

6	Paro	Paro	Paro	Tsento, Lamgong, Dopshari, Hungrel, Lungnyi, Shaba, Dogar, Doteng and Naja
			Zonglela FMU	Shaba, Lungnyi, Lamgong, Wangchang
			Bitekha FMU	Naja
		Haa	Haa	Bji, Samar, Sombaykha, Eusu, Gakiling and Katsho
			Haa-East FMU	Samar, Eusu, Naja(Paro)
Selela FMU	Samar, Naja(Paro), Meta (Chukha), Dungna (Chukha)			
		Longchu FMU	Samar	
7	Samtse	Samtse	Samtse Range	Phuntshopelri, Samtse and Tading
			Dophuchen Range	Dumtse, Denchukha and Dophuchen
			Norbugang Range	Norbugang, Ugyentse, Yoeseltse and Sangnagchoeling
			Tashicholing Range	Norgaygang, Tendruk, Pemaling, Tashicholing and Namgaycholing
8	Sarpang	Sarpang	Sarpang	Chhudzom, Shompangkha, Gakidling and Singye
			Gelephu	Samtenling, Sershong, Chuzangang, Gelephu and Jigmecholing
		Dagana	Lhamoyzingkha	Karmaling and Lhamoyzingkha
9	Samdrup Jongkhar	Samdrup Jongkhar	Samdrup Jongkhar	Dewathang, Gomdar, Wangphu, Orong
10	Thimphu	Thimphu	Thimphu Range	Chang, Kawang
			Khasadrachhu	Mewang, Gene
			Gidakom FMU	Mewang
			Chamgang FMU	Dagala
11	Trashigang	Trashigang	Wamrong	Lumang, Thrimshing, Kangpara and Khaling
			Trashigang	Kanglung, Samkhar, Yangyer, Bartsham & Udzorong
			Radhi	Radhi, Shongphu, Phongmey & Bidung
			Khaling Kharungla FMU	Parts of Lumang and Khaling
		Trashi Yangtse	Yangtse	Yangtse, Khamdong & Toedtsho
			Doksum	Ramjar, Jamkhar, Tongzhang & Yallang
		Dongdechu FMU	Parts of Yangtse	
12	Tsirang	Tsirang	Tsirang Range	Rangthangling, Kikorthang & Tsholingkhar

13	Wangdue	Wangdue	Wangdue	Athang, Daga, Gase-Tshowom, Nahi, Gase-Tshogom, Nyesho, Kazhi, Phangyul, Thedtsho, part of Bjena, and Rubesa,
			Nobding	Phobjikha, Gangtoe, Dangchu, Sephu, part of Bjena and Rubesa
			Khotokha FMU	Bjena and Rubesa
			Gogona FMU	Gangtoe
		Punakha	Punakha	Kabesa, Guma, Talo, Chubu, Toewang, Dzomi, Limbukha, Shengana
		Lobesa	Baap and Toep	
14	Zhemgang	Zhemgang	Zhemgang Range	Nangkor and Trong
			Nimshong	Bardo and Shingkar
			Panbang	Bjoka, Goshing and Ngangla
			Wangdigang FMU	Trong, Nangkor and Langthel

Table 3 Range and Gewog Covered (NP and WS)

Sl. No.	Park	Dzongkhag	Range	Gewog
1	Bumdeling WS (BWS)	Lhuentse	Khoma	Khoma
		Mongar	Serzhong	Sherimuhung
		Trashiyangtse	Dungzam	Bumdeling
2	Jomotsangkha WS (JWS)	Samdrup Jongkhar	Samdrupcholing	Phutshothang, Pemathang, Martshala and Samrang
		Samdrup Jongkhar	Jomotsangkha	Langchenphu, Serthi and Lauri
3	Jigme Singye Wangchuck National Park (JSWNP)	Zhemgang & Sarpang	Tingtibi	Trong & Parts of Jigmecholing
		Trongsa	Nabji	Khorphu
			Langthel	Langthel and Tangsibji
	Wangdue	Taksha	Athang	
4	Jigme Khesar Strict Nature Reserve (JKSNR)	Haa	Lolithang (Proposed)	Bjee
			Sombaykha (Proposed)	Sombaykha
5	Jigme Dorji National Park (JDNP)	Paro	Soe	Yaktsa & Yuetoey
		Thimphu	Lingzhi	Lingzhi & Naro
		Punakha	Ramina	Goenshari
		Gasa	Gasa	Khatoed & Khamaed
			Lunana	Lunana
Laya	Laya			

6	Phrumsengla National Park (PNP)	Bumthang	Western Park Range, Ura	Ura, Parts of Chumey
		Mongar	Central Park Range, Lingmethang	Tsamang and Saleng
		Lhuentse	Eastern Park Range, Phawan	Metsho, Jarrey
7	Phibsoo WS (PWS)	Dagana	Nichula	
		Sarpang	Phibsoo	
8	Royal Manas National Park (RMNP)	Sarpang	Umling	Umling, Chuzangang
		Zhemgang	Gomphu	
		Zhemgang	Manas	Panbang
9	Sakteng WS (SWS)	Trashigang	Sakteng	Sakteng
		Trashigang	Joenkhar	Sakteng
		Trashigang	Merak	Merak and Lauri (Samdrup Jongkhar)
10	Wangchuck Centennial National Park (WCNP)	Bumthang	Central Range	Choekor, Tang
		Wangdi, Trongsa	Western Range	Sephu, Kazhi, Dangchu, Nubi, Lunana
		Lhuentse	Eastern Range	Gangzor, Kurtoe, Khoma

FOREST COVER

The National Forest Inventory, Vol I, 2016 reports 71% forest cover (2,730,889 ha) out of the total geographical area (3,839,400 ha) of the country. The estimates are based on the forest definition as mentioned in the National Forest Policy 2011. Wangdue Phodrang Dzongkhag has the highest forest cover (292,824 ha) with Tsirang Dzongkhag having the least forest cover (48,857 ha). However, the forest cover percent vary accordingly to the size of the Dzongkhag (Table 4).

Table 4 Dzongkhag wise Forest cover Source: NFI Vol I, 2016

Sl. No.	Dzongkhag	Dzongkhag Area (ha)	Forest Area (ha)	Forest Cover (%)	MoE%	90% Confidence interval	
						Lower	Upper
1	Bumthang	269,091	144,842	54	13	47	60
2	Chukha	186,149	151,164	81	7	75	86
3	Dagana	170,608	141,861	83	7	77	88
4	Gasa	310,398	112,272	36	28	26	48
5	Haa	188,635	129,500	69	11	61	75
6	Lhuntse	283,091	213,792	76	12	66	83
7	Mongar	192,536	158,031	82	7	76	87
8	Paro	127,461	72,574	57	16	48	65
9	Pemagatshel	101,217	83,745	83	10	75	89

10	Punakha	109,878	79,316	72	14	62	80
11	Samdrup Jongkhar	185,881	133,622	72	9	65	77
12	Samtse	129,216	77,299	60	13	52	67
13	Sarpang	163,928	127,397	78	9	71	83
14	Thimphu	177,841	94,256	53	16	45	61
15	Trashigang	218,253	159,998	73	8	67	79
16	Trashiyangtse	143,496	99,860	70	14	60	78
17	Trongsa	179,607	142,571	79	10	72	85
18	Tsirang	63,163	48,857	77	13	68	85
19	Wangdue Phodrang	399,641	292,824	73	8	67	78
20	Zhemgang	239,308	198,036	83	6	78	87

SUSTAINABLE FOREST MANAGEMENT

The National Forest Policy 2011 mandates all forest to be managed sustainably under a management plan. Besides the Protected Area network, there are various systems under which the forests of Bhutan are currently managed (Figure 2).

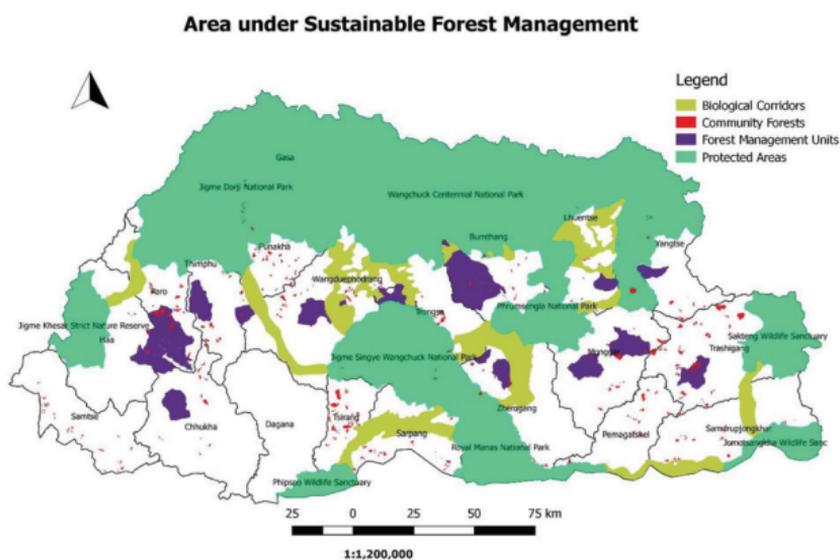


Figure 2 Area under Sustainable Forest Management

Protected Area

The Protected Area (PA) Network in Bhutan consists of the National Parks, Wildlife Sanctuaries, Strict Nature Reserve, Biological Corridors and the Royal Botanical Park. Encompassing about 51.44 % of the country area (Table 5 and Table 6), the Protected Areas play a very important role in the conservation vision of the Department.

Table 5 Protected Areas in Bhutan

Total Protected Area & Biological Corridors	Area (Km ²)	Percentage (%)
Total Protected Area	16,396.43	42.71
Total Area Biological Corridors	3,307.14	8.61
Royal Botanical Park	47.00	0.12
Total PAs & BCs	19,703.57	51.44

Table 6 Total area under Protected Area network

Name of Protected areas	Year of Estd	Area (Km ²)	Dzongkhags
A. National Parks			
1. Wangchuck Centennial National Park	2008 (gazetted)	4,914.00	Gasa, Wangdue, Bumthang, Trongsa & Lhuentse
2. Jigme Dorji National Park	1995	4,316.00	Punakha, Gasa, Thimphu & Paro
3. Jigme Singye Wangchuck National Park	1995	1,730.00	Trongsa, Wangdue, Sarpang, Tsirang & Zhemgang
4. Royal Manas National Park	1966	1,057.00	Sarpang & Zhemgang
5. Phrumsengla National Park	2000	905.05	Bumthang, Lhuentse, Mongar & Zhemgang
B. Wildlife Sanctuaries			
1. Bumdeling Wildlife Sanctuary	1998	1520.61	Trashiyangtse, Lhuentse & Mongar
2. Sakteng Wildlife Sanctuary	2003	740.6	Trashigang & SamdrupJongkhar
3. Phibsoo Wildlife Sanctuary		268.93	Sarpang & Dagana
4. Jomotsangkha Wildlife Sanctuary		334.73	SamdrupJongkhar
C. Strict Nature Reserve			
1. Jigme Khesar Strict Nature Reserve		609.51	Haa
Total Protected Areas		16,396.43	
1. Biological Corridors		3307.14	Haa, Paro, Thimphu, Punakha, Wangdue, Sarpang, Tsirang, Trongsa, Zhemgang, Bumthang, Mongar, Lhuentse, Trashigang & SamdrupJongkhar
E. Recreational Park			
1. Royal Botanical Park	2004	47	
Total		19,750.57	

Forest Management Units (FMU) and Local Forest Management Plan (LFMP)

Forest Management Unit (FMU) are established throughout the country to manage the forests scientifically. These are strictly prepared as per the prescription under the “Forest Management Code of Bhutan”, 2004. Further, to scientifically manage all State Reserve Forest (SRF) outside FMU, PA, CF and other management regimes, Local Forest Management Plan (LFMP) are prepared in Gewogs.

Currently, there are 20 FMU and 22 LFMP in operation (Table 7 and 8), which caters to the commercial and rural needs of the people.

Table 7 Area under FMUs (Dzongkhag-wise)

Sl. No.	Dzongkhag	Name of units	FMU area (ha)	AAC (m ³ /yr) ¹
1	Bumthang	Dawathang	17,541.66	12,186
2		Rudongla	14,686.58	14,999
3		Karshong	4,715.77	5,035
4	Chhukha	Metapchhu	10,761.85	4,131
5	Haa	Haa East	6,580.99	1,900
6		Lon Chhu	12,567.01	6,700
7		Sele La	9,157.00	11,886
8	Mongar	Korila	13,137.00	3,800
9		Lingmithang	10,571.74	9,000
10	Paro	Paro-Zonglela	16,155.81	9,366
11		Bitekha	7,260.10	4,500
12	Thimphu	Chamgang- Helela	4,692.85	1,800
13		Gidakom	13,100.00	5,670
14	Trashiyangtse	Dongdechu	4,856.00	5,215
15	Trongsa	Chendebji	8,123.93	1,100
16	Wangdue	Khotokha	9,407.48	9,400
17		Gogona	8,080.60	7,900
18	Zhemgang	Wangdigang	8,759.00	2,100
19	Lhuentse	Rongmanchu	6,401.00	4,577
20	Trashigang	Khaling Kharungla	7,265.40	2,708
TOTAL			193,821.77	121,265

Table 8 Area under LFMP

Sl. No.	Dzongkhag	Geog	Area (ha)	AAC (m ³ /yr)
1	Dagana	Laja	1,000.00	371
2		Khebesa	1,000.00	320

¹ AAC (Annual Allowable Cut) is the total maximum sustainable harvestable timber supply for each year of the plan period.

3	Haa	Bjee	1,732.00	723
4		Katsho	712	837
5		Esue	339	383
6		Sama	325	343
7	Mongar	Mongar	1,346.00	1,985
8		Thangrong	1,421.00	704
9		Sherimuhung	2,100.10	1,832
10	Paro	Shari	1,600.00	946
11		Dogar	1,263.00	591
12		Shaba	769	713
13	Punakha	Barp	2,300.00	1,442
14		Toeb	2,562.00	4,492
15	Trashigang	Samkhar	5,206.50	3,140
16	Tsirang	Khikhorthang	553.2	123
17	Wangdue	Phobjikha	3,250.40	8,247
18	Phodrang	Daga	21,043.90	29,403
19	Zhemgang	Nangkor	24,334.00	19,938
20		Shingkhar	2,956.00	1,416
21		Trong	3,386.00	1,095
22		Bardo	11,793.00	17,737
TOTAL			90,992.10	96,781

Community Forests

To encourage peoples' participation in promoting sustainable forest management, the first Community Forests (CF) was established and handed over to the people in 1997 (Dozam CF, Mongar). Since then, 733 CF (83,215 ha) involving 30,352 households has been established as of December 31, 2017.

In 2017, 56 CF was established in the country (Figure 3). Covering an area of about 7,023 ha, these CFs helps generate natural resources and income for around 2037 households (Figure 4).

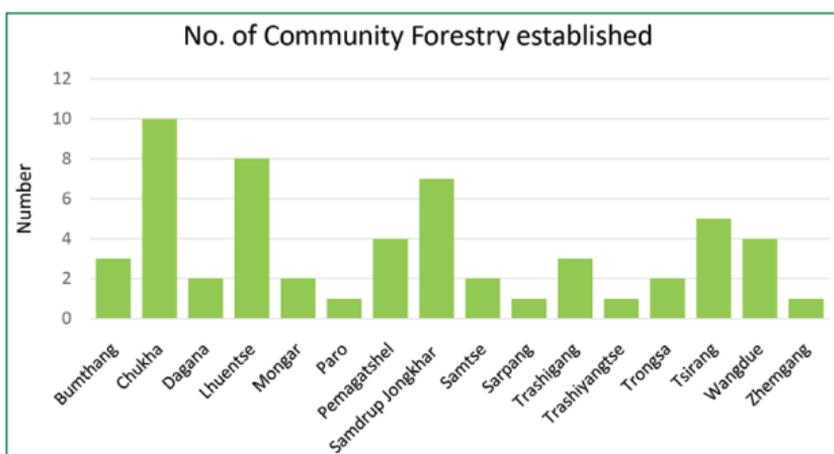


Figure 3 No of CF established in 2017 (Dzongkhag-wise)

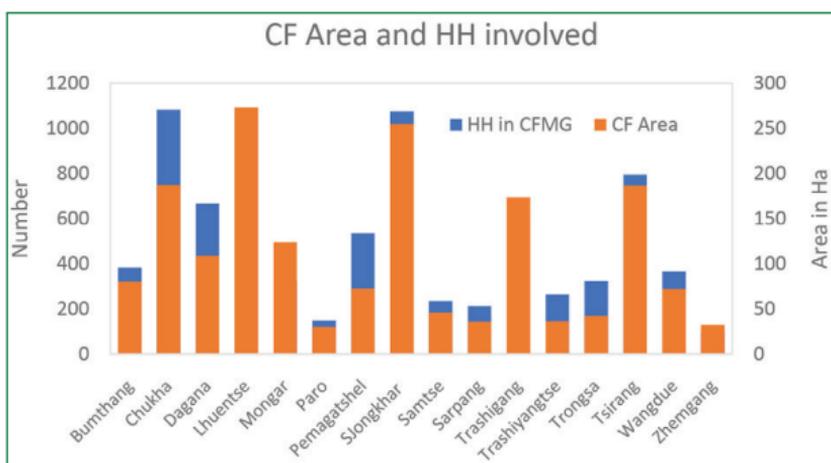


Figure 4 Dzongkhag-wise distribution of CF and HH involved

Non-Wood Forest Products

Non-Wood Forest Products (NWFP) groups are formed to sustainably manage the collection of NWFP in the country. This initiative also helps to alleviate the poverty and raise the livelihood of the rural people by generating income through the sale of the produce. The NWFP groups generated about Nu.11.78 million in 2015-2016 FY.

There are currently 138 NWFP groups involving 4721 households. 10 new NWFP groups were formed during the 2016-2017 FY (Table 9).

Table 9 NWFP groups established in 2017

Sl. No.	Dzongkhag	Gewog	Village	Name of NWFP Group	No. of HH	Species
1	Chhukha	Dungna	Mondokha, Choleykha	Mondokha Cane Management Group	12	<i>Plectocomia himalayana</i>
2	Chhukha	Dungna	Drukdingsa	Drukdingsa Cane Management Group	32	<i>Plectocomia himalayana</i>
3	Chhukha	Phuentsholing	Serina	Serina Broom Grass Management Group	36	<i>Thysanolaena Spp.</i>
4	Chhukha	Phuentsholing	Bosokha	Bosokha Broom Grass Management Group	17	<i>Thysanolaena Spp.</i>
5	Dagana	Karmaling	Homa	Homa Shingmen Tshogpa	51	<i>Dendrocalamus hamiltonii</i> , <i>Piper longum</i> , <i>Thysanolaena Spp.</i>

6	Dagana	Nichula	Gangtokha	Gangtokha NWFP Group	66	
7	Mongar	Ngatshang		Cheroap Desho Dulen Tshogpa	38	
8	Zhemgang	Bjoka	Bjoka	Kamati Pipla Management Group	20	
9	Zhemgang	Nangla	Ngalatrong	Ngalatrong NWFP Management Group	36	
10	Zhemgang	Nangla	Gagtrong	Gagtrong NWFP Management Group	35	

Integrated Watershed Management

In 2017, 5 numbers of management plans for degraded watersheds was developed (Kholongchhu, Chamkharchhu, Kurichhu, Nikkachhu and Themnangbi-Jaibab watershed under Kurichhu). In addition, the Department has assessed 120 watersheds within Kholongchhu, Kurichhu, Mangdechhu, Nikkachhu and Chamkharchhu sub-basins exceeding the set target.

Wetland Management

Realizing the rapid loss of wetlands ecosystem and given the dearth of information on wetlands, the Department lead in the conservation and wise use of wetlands in the country. Bhutan became the 161st member country to join the Ramsar Convention (the oldest environmental convention on wetlands) in September 2012. As of December 2017, a total of 12 number of wetlands has been assessed, and accordingly, two management plans have been developed (Bumdeling wetland Management plan incorporated in Kholongchhu sub-basin and Buli wetland management plan). In 2017, wetland inventory was done in the area in and around the Motithang Takin Preserve, Thimphu.

RESOURCE UTILIZATION

Timber supply

The Department has allotted around 244,233 m³ of timber in the year (Table 10). Majority of the timber allotted has been on the concessional rate to the rural people. This is in line with His Majesty's vision of providing resources to the people at an affordable price.

Table 10 Timber supplied at different royalty rate

Royalty type ²	Qty in m ³	Royalty Realized (Nu)
Commercial	80,250	5,016,353
Concessional	158,590	3,533,450
Free	5,393	0
TOTAL	244,233	8,549,802

Of the total 244,233 m³ of timber supplied, around 1842 m³ has been supplied for the construction/renovation of Dzongs, Lhakhangs and other religious structures (Table 11).

Table 11 Timber supplied (m3) for Dzongs, Lhakhangs and other religious purposes

Purpose	Quantity supplied in m ³		
	Commercial	Concessional	Total
Dzongs and Lhakhangs	1,648	194	1,842

This however, doesn't account for the timber supplied for the said purpose through NRDCL. NRDCL, through FMU and other ad hoc areas has supplied about 6152 m³ of timber for Dzongs and Lhakhangs.

Division and Parks

Timbers are supplied from the Division and Parks in different forms and at different royalty. 83% of the total timber allotment has been done by the Divisions while only 17 % allotment is done from the protected area (Figure 5). Timber harvesting from the protected area is done mainly to meet the demand of the people living within the PAs.

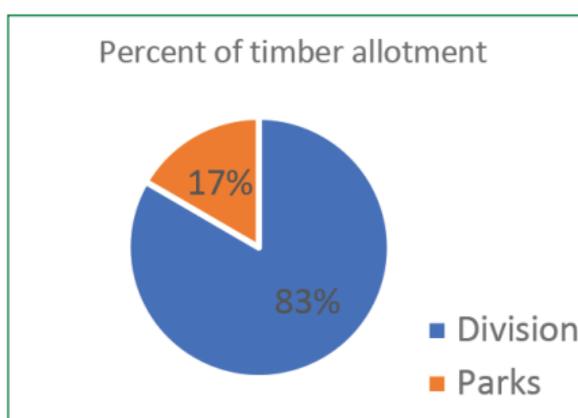


Figure 5 Percentage of timber allotment by Divisions and Parks

2 There are three types of royalty levied on forest produce; Commercial, Concessional and Free. Commercial royalty is levied on produce supplied for commercial purpose while concessional/rural royalty are levied on supply of forest produce in rural area as per Chapter IX of the FNCRR 2017. "Free" are those which are supplied free of royalty as per FNCRR 2017.

Timber supplied at various royalty rates from the Division and Park is being detailed in Figure 6. Maximum timber allotment is done from Bumthang division (Table 12) while minimum allotment is from PWS (Table 13).

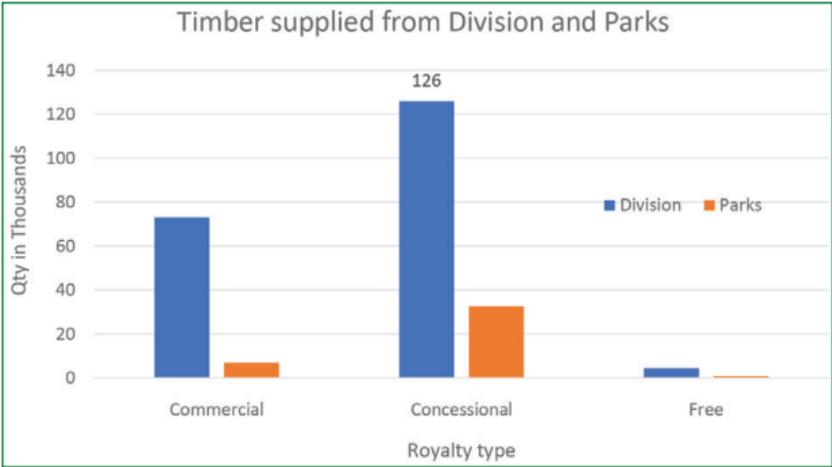


Figure 6 Timber supplied at different royalty rate

Table 12 Timber allotment from Territorial Division (m3)

Product type	Timber allotted in m ³ from different Dzongkhags													
	Bumthang	Dagana	Gedu	Mongar	Paro	Pemagatshel	Samdrup Jongkhar	Samtse	Sarpang	Thimphu	Trashigang	Tsirang	Wangdi	Zhemgang
Bakals	7131	143	4	27	1	4	7	3	3	21	616	8	92	
Cham	1918	1516	472	1449	1700	33	1	15	20	2010	523	0	2173	51
Dangchung	4	12		10	26	210		3		18			3	
Drashing	2561	3383	2528	1896	2782	1104	785	3659	651	3597	2880	7468	6223	1262
Firewood	9717	8575	14575	12258	1300	652	595	3830	792	5698	9600	3051	8545	2233
Logs	769	1013	42	1534	13180	32	138		3712	1153	197	153	1446	
LopsAndTops	346	14	558	723	544			360		264	372		1804	12
Mushroom billets				20	210			13		34	468		60	
Poles	4143	1587	1410	469	220	181	284	70	25	3008	418	11	466	609
Posts	2377	390	367	552	133	1	11	651	197	1035	1226	15	977	621
Sawn timber	1698	389		63	142	171	64		849	140	54	213	25	79
Tsim	468	293	3169	7	81			4		406	72	0	155	45
Woodchips										8			1990	79
TOTAL	31131	17316	23124	19007	20318	2389	1884	8609	6250	17393	16426	10919	23960	4991

Table 13 Timber allotment from Protected areas (m3)

Product type	Timber supplied in m ³								
	BWS	JDNP	JSWNP	JWS	PNP	PWS	RMNP	SWS	WCNP
Bakal	7				91			313	
Cham	238	836	378		1151		117		1337
Dangchung		48	7		76				31
Drashing	383	946	965	13	225	69	125	10616	270
Firewood	3387	3072	1174	648	2304	59	686	3142	1851
Hakaries				2					
Logs	520	45		94	244	19			20
Lops and Tops		12			40			2	8
Poles	65	57	18	3	213	21	3	427	47
Posts	76	262	180	13	995	56	103	789	454
Sawn timber	6	54	2	32	152	1		2	14
Shinglep					502				
Tsim	27	130	50		63			54	69
TOTAL	4709	5463	2774	805	6056	226	1033	15347	4101

From the total timber supplied by the Department, around 50,521 m³ of timber has been met from the Forest Management Units (FMU) (Figure 7).

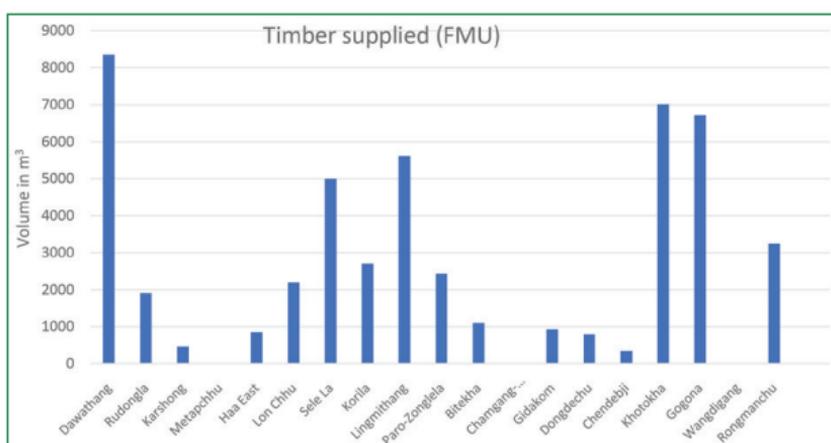


Figure 7 Timber volume achieved from FMUs

Dzongkhag-wise

Dzongkhag-wise distribution of timber supply and royalty realized can be compared in Figure 8, Figure 9 and Figure 10.

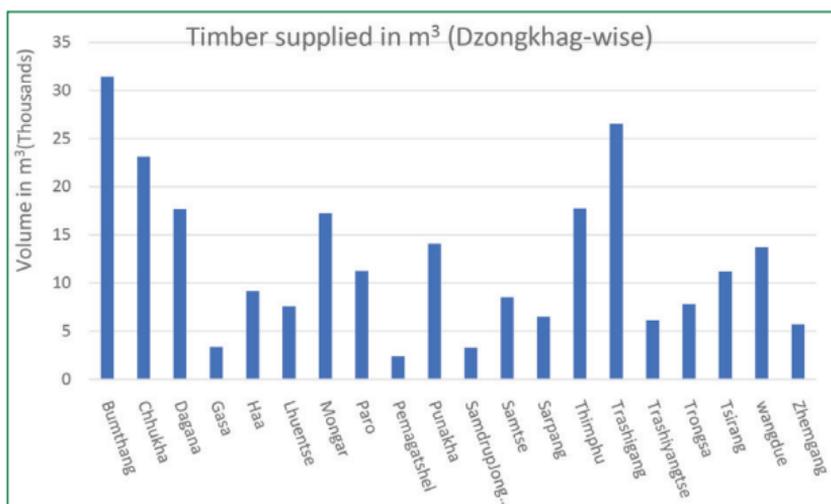


Figure 8 Timber supplied (Dzongkhag-wise)

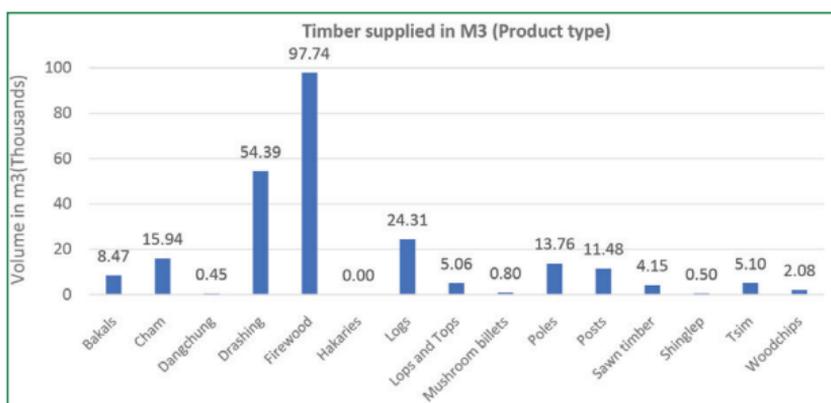


Figure 9 Timber supplied (by-product)

ROYALTY REALIZED

Around Nu. 8.5 million has been realized on supply of timber for both rural and commercial purposes (Table 10). Maximum royalty has been realized from Bumthang Dzongkhag (Nu. 1.7 million) followed by Trashigang and Mongar whereas minimum royalty has been realized from Gasa and Pemagatshel Dzongkhags (Nu. 0.16 million). Royalty realized for different forest produce in 2017 has been detailed in Figure 11.



Figure 10 Royalty realized for product supplied (Dzongkhag-wise)

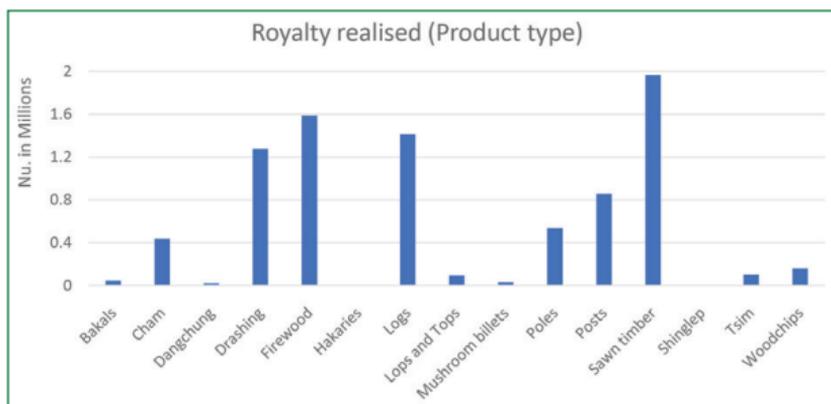


Figure 11 Royalty realised (Product type)

Non-Wood Forest Products

In addition to the timber produce, various NWFP are also supplied to the people from the state forests (Table 14). These are a major source of income for many rural people as well as other people who work with NWFPs.

Table 14 NWFP supply, 2017

Produce	Unit	Quantity	Royalty realised
Aconitum spp.	Truckload	1	20
	KG	150	3000
Bamboo	Bundle	1118	7830
	Truckload	727	2098
	No	170120	119288
	m ³	1	110
	Headload	215	208
	KG	150	300
Cane	Bundle	15	60
	Truckload	8	44
	No	9304	6796
	Headload	2281	9448
Charcoal	Truckload	1	40
	KG	600770	1429
Cordyceps	No	41	8200
	KG	241	2055372
Daphne	KG	4860	3010
<i>Hippophae rhamnoides</i>	KG	100	1200
Incense	Truckload	20	674
	KG	15747	50164
<i>Knema tenuinervia</i>	No	100	1000
Leaf litters	Truckload	33	1980
Leafmould	Truckload	997	61430
	M ³	16	200
Lemon grass oil	LTR	319	1595
Mushrooms	No	4300	4300
	KG	685	4520
Orchid	Bundle	40	1960
<i>Paris polyphylla</i>	KG	482	7288
Persia	KG	200	2010
<i>Picorrhiza spp.</i>	KG	100	1200
Pine needles	Truckload	54	1856
	Headload	458	994
<i>Piper spp</i>	KG	1955	36700
<i>Pouzolzia sanguinea</i>	KG	3397	6794
Resin	KG	3029	12116
Rhododendron	KG	865	1730

Rubia	KG	31761	515368
<i>Saccharum spp.</i>	Headload	148	15
Sand	Truckload	26877	1106764
	M ³	2463	15406
<i>Sapindus mukorossi</i>	Truckload	2	80
Soil	Truckload	2211	139030
	KG	2255	4600
Star Anise	KG	2770	5540
Stone Boulders	Truckload	85810	3554639
	M ³	2660	18564
<i>Swertia chirata</i>	KG	457	10968
<i>Terminalia spp</i>	Truckload	2	80
Wildlings	Truckload	16	640
	No	6389	7044
Wood burrs	No	420	4600
Others	Bundle	10	40
	Truckload	17	569
	No	2303	4685
	Headload	672	1998
	KG	560	3485
Grand Total			7,811,078

WOOD BASED INDUSTRIES

Sawmill is a major primary processing plant for converting logs into sawn timber in Bhutan and, different brands of sawmill technologies are currently being promoted in the country. The number of sawmills in Bhutan has increased significantly from 23 in 1979 to 49 in 1990 and 138 sawmills and/ or integrated sawmills in 2017 (Table 15).

Table 15 Inventory of Sawmill and Integrated Sawmills

Dzongkhag	Sawmill only	Integrated sawmill	Total
Bumthang	19	1	20
Chhukha	2	10	12
Dagana	0	0	0
Gasa	0	0	0
Haa	22	2	24
Lhuntse	1	0	1
Mongar	4	1	5
Paro	22	2	24
Pemagatshel	1	0	1
Punakha	0	0	0
Samdrupjongkhar	3	1	4

Samtse	3	0	3
Sarpang	5	1	6
Thimphu	11	7	18
Trashigang	4	0	4
Trashiyangtse	1	0	1
Trongsa	1	0	1
Tsirang	1	1	2
Wangdue-phodrang	7	3	10
Zhemgang	2	0	2
TOTAL	109	29	138

The Department has been advocating up-gradation of outdated sawmilling technologies since 2008, in line with the National Forest Policy 2011 and the Eleventh Five Year Plan of the Department.

CHALLENGES:

Forest fire

Forest fire poses a major threat to the sustainability of the forests and is one of the major drivers of deforestation and degradation in Bhutan. In 2017, 31 fire incidences were recorded burning an area of 5249 hectares.

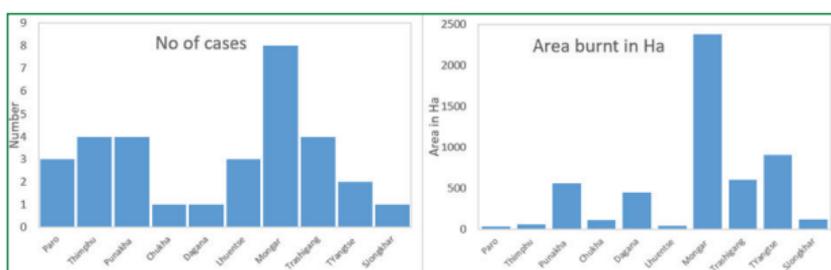


Figure 12 Fire incidences in 2017 (Dzongkhag-wise)

Mongar witnessed maximum number of fire incidences (8) covering an area of 2383 Ha. Though Dagana Dzongkhag had just one fire incidences, around 443 ha of area was burnt causing huge damage to the environment (Figure 12).

Forestry Clearance for land allotment

Forestry clearance (FC) has been issued to allot 9444 ha of State Reserve Forest (SRF) for different purpose in the year 2017. Majority of the land allotment is for the construction of road and transmission lines (Figure 13).

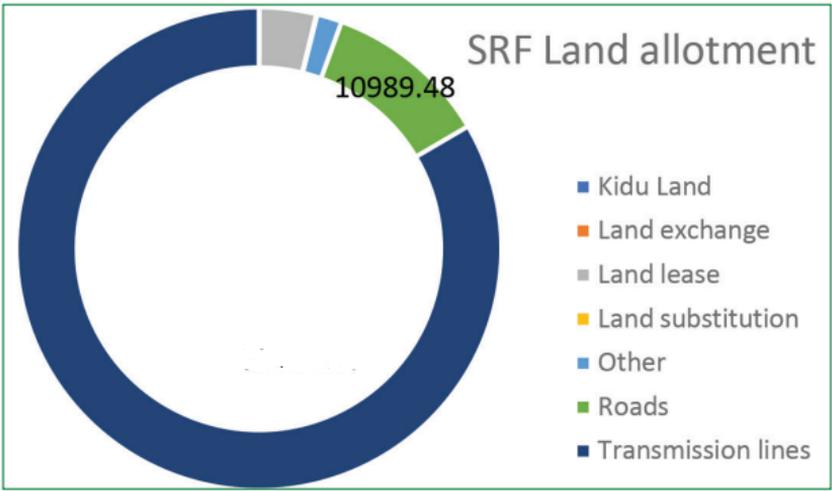


Figure 13 FC issued for different purpose

Maximum FC has been accorded in Paro Division while very less or no FC for land allotment was accorded in PWS and PNP (Table 16 and Table 17)

Table 16 FC issued for land allotted for different purpose in acre (Division wise)

Division	Area in acre									
	Kidu Land	Land exchange	Land lease	Land substitution	Roads	Transmission lines	Other	Total		
Bumthang	-	-	-	-	3.56	4.51	0.06	8.13		
Dagana	-	8.42	21.73	8.36	1045.70	0.06	1.17	1085.45		
Gedu	0.05	6.51	5.78	6.08	6.56	8.50	246.95	280.43		
Mongar	1.01	-	1.30	2.04	8548.25	0.98	76.16	8629.74		
Paro	0.93	-	10.75	1.63	29.43	3418.58	5.76	3467.08		
Pemagatshel	-	-	68.97	0.01	20.68	8.04	5.98	103.67		
SamdrupJongkhar	-	-	31.93	5.07	12.79	0.04	9.00	58.83		
Samtse	-	-	-	-	19.01	47.59	241.92	308.53		
Sarpang	-	-	13.93	9.10	1038.02	3160.77	1028.74	5250.56		
Thimphu	-	-	60.17	4.53	5.80	13.19	19.45	103.15		
Trashigang	-	-	12.84	-	35.33	22.58	1.98	72.74		
Tsirang	0.07	-	0.06	1.71	0.91	9.04	4.15	15.94		
Wangdue	1.81	13.00	23.37	10.74	170.98	41.42	17.46	278.78		
Zhemgang	-	-	3.71	3.02	19.68	27.78	2.89	57.09		
Total	3.87	27.94	254.54	52.29	10956.72	6763.08	1661.67	19720.11		

Table 17 FC issued for land allotted for different purpose in acre (Protected area)

Park	Area in acre							Total
	Land exchange	Land lease	Land substitution	Roads	Transmission lines	Other		
BWS				6.52	0.12	3.66		10.30
JDNP	0.06	0.33		2.30	1.99	1.24		5.93
JSWNP		0.41		0.30		0.34		1.05
JWS		3519.88	2.84	15.87	1.89	2.07		3542.55
PWS						0.40		0.40
RMNP		0.07	1.03	1.06	20.82	0.11		23.09
SWS				6.70	13.14	0.00		19.84
WCNP	0.04	7.10	0.25		6.71	0.80		14.91
Total	0.11	3527.79	4.12	32.76	44.68	8.63		3618.08

Human Resources

The DoFPS has 1439 technical staffs consisting of 1245 male and 194 female foresters at different position levels (PL). The Department has maximum staffs in S and SS level which corresponds to about 1260 foresters which are involved mainly in field implementation of the forestry activities (Figure 14).



Figure 14 Distribution of staff at different position levels(PL) in the Department

Shortage of manpower has been one of the main challenges faced by the Department. The Department, in upholding the constitutional mandate of maintaining at least 60 % forest cover for all times to come, has various role from conservation and protection of the forests, while also ensuring to meet the demand and need of the people. The 1439 foresters must sustainably manage the forests of the country, which by the ratio a forester is managing at least 27 Km² of the country area each. This has been a huge challenge especially in curbing illegal (forestry related) activities in the country.

Forest Offence

1159 offence cases were detected in 2017. Paro Dzongkhag detected the highest number of cases (161) followed by Thimphu (154) and Wangdue (149), while JKSNR saw the least number of cases (3) (Figure 15).

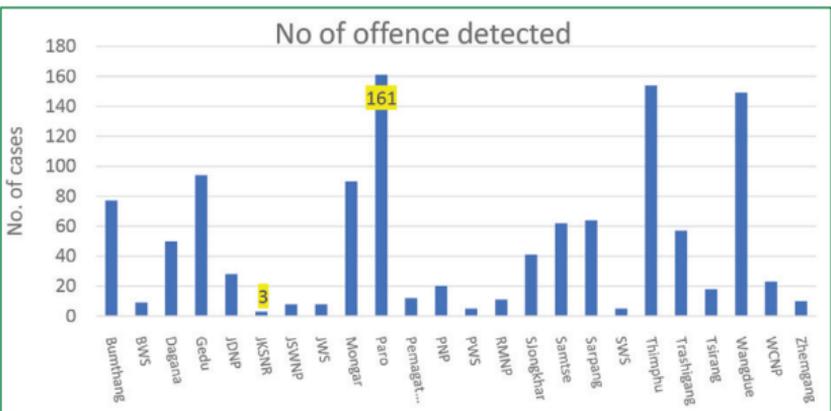


Figure 15 No. of offence cases detected

Timber-related cases involving misuse of rural timber and other surplus timber were the most common offence detected. Out of the 1159 cases detected, 1154 cases were solved incurring a fine of Nu. 27.89 million (Table 18) .

Table 18 Details of forest offence detected

Category	No. of cases	Fine imposed (Million Nu)	Detector rewarded ³ (Million Nu)
Firewood	22	0.12	0.03
Fishing	124	1.02	1.02
Forest fire	17	0.17	0.03
Land	46	0.79	0.17
NWFP	37	1.60	0.10
NWFP(Cordyceps)	11	0.49	0.08
Sand	72	0.68	0.11
Soil	2	0.19	0.09
Stone boulders	107	2.13	0.27
Timber	577	14.15	2.01
Wildlife	25	3.35	3.32
Other	114	3.21	0.51
Grand Total	1154	27.89	7.73

Fishing and wildlife poaching accounted for a total of 149 cases, resulting in a huge black market for wildlife. While various measures in both policy and implementation level been carried out by the Department, offence and illegal cases are still a major challenge for the Department and the nation as a whole.

WAY FORWARD

Plantation

Since the inception of the Department, thousands of hectares of plantation work have been carried out by the Department. In 2017, Green Bhutan Corporation Limited (GBCL) was established to promote clean and green Bhutan. The GBCL has been mandated to carry out plantation work besides landscaping, urban greening, consultancy and floriculture amongst others.

³ Any persons who informs or helps apprehend an offender is rewarded from the actual amount of fine imposed to the offender. The reward is 25 % for timber and other non-wood species, while 100 % reward is paid for any offence related to wildlife.

In 2017 alone, plantation work has been carried out in 702.92 ha of SRF land (Table 19) including 384.41 ha through GBCL. Plantation done in the TD and PAs by both the Department and GBCL is detailed in Table 20 and 21.

Table 19 Plantation done in 2017 (Dzongkhag-wise)

Sl. No	Dzongkhag	Plantation done by		Total Area
		Department	GBCL	
1	Trongsa	44.00	41.50	85.50
2	Dagana	13.00	60.00	73.00
3	Chhukha	0.00	24.00	24.00
4	Thimphu	35.00	0.00	35.00
5	Samtse	17.00	16.00	33.00
6	S/Jongkhar	12.00	16.00	28.00
7	Sarpang	4.61	0.00	4.61
8	Mongar	45.06	0.00	45.06
9	Lhuentse	0.00	10.11	10.11
10	Paro	8.21	5.00	13.21
11	Pemagatshel	18.00	0.00	18.00
12	Trashigang	49.53	45.00	94.53
13	Tsirang	11.00	65.00	76.00
14	Wangdue	0.00	74.50	74.50
15	Punakha	0.00	22.30	22.30
16	Trashigang	49.00	0.00	49.00
17	Bumthang	6.50	5.00	11.50
18	Gasa	1.00	0.00	1.00
19	Sarpang	1.00	0.00	1.00
20	Trashiyangtse	3.60	0.00	3.60
Grand Total		318.51	384.41	702.92

Table 20 Plantation carried by Divisions and GBCL (Area under Division)

Sl. No	Division	Plantation done by		Total Area
		Divisions	GBCL	
1	Bumthang	44.00	41.50	85.50
2	Dagana	13.00	60.00	73.00
3	Gedu	0.00	24.00	24.00
4	Thimphu	35.00	0.00	35.00
5	Samtse	17.00	16.00	33.00
6	S/Jongkhar	12.00	16.00	28.00

7	Sarpang	4.61	0.00	4.61
8	Mongar	45.06	10.11	55.17
10	Paro	8.21	5.00	13.21
11	Pemagatshel	18.00	0.00	18.00
12	Trashigang	49.53	45.00	94.53
13	Tsirang	11.00	65.00	76.00
14	Wangdue	0.00	96.80	96.80
Grand Total		257.41	379.41	636.82

Table 21 Plantation carried out by PAs and GBCL (Area under PAs)

Sl. No.	PA	Plantation done by		Total Area
		Parks	GBCL	
1	SWS	49.00	0.00	49.00
2	WCNP	6.50	5.00	11.50
3	JDNP	1.00	0.00	1.00
4	PWS	1.00	0.00	1.00
5	BWS	3.60	0.00	3.60
Grand Total		61.10	5.00	66.10

Gewog Environmental Conservation Committee (GECC)

Human-wildlife Conflict (HWC) is a huge challenge for the Department. The killing of wildlife for trade and, retaliation killing has been on the rise over the years. Various measures such as electric fencing, Intergrated Conservation and Development Programs (ICDP) has been taken by the Department. The community-based insurance scheme managed by the the Gewog Environmental Conservation Committee (GECC) is one of the measures instituted to mitigate HWC.

Started as a pilot program by the then, Wildlife Conservation Division in 2011, there are 48 GECCs established through funding support from different donor agencies like Royal Government of Bhutan (RGoB), World Wildlife Fund (WWF), United Nations Development Program (UNDP), Bhutan Trust Fund for Environmental Conservation (BT FEC), Mangdechhu Hydro Power Authority (MHPA), and HWC Endowment Fund (Annexure I). A total amount of Nu. 21.86 million is currently available with these 48 committees.

An addition of Nu.1 million has been secured to establish two more committees one in Samrang Gewog, Samdrup Jongkhar and Athang Gewog, Wangdue Phodrang.

Payment for Ecosystem Services Framework

Payment for Environment Services (PES) initiative started in Bhutan with a feasibility study in 2009. In 2010, WMD was able to establish the first PES site in the country at Mongar between Yakpagang Community Forest Management Group (CFMG) and Mongar municipality. However, the first contractual period which was signed for three years expired in December 2014, and it was further reviewed and revised for another five-year term till 2019 with revised fee structure in 2015. Another PES scheme on water source conservation was established 2015 at Pasakha under Chhukha Dzongkhag between Burkhey watershed community and the five industrial companies based in Pasakha. The third PES site on water source conservation was established at Namay Nichu under Paro Dzongkhag between CFMG members and the water users (Four hoteliers and water user association). WMD has developed and distributed the PES framework and field guide to all the relevant stakeholders including Dzongkhag for promotion and upscaling of PES program in the country.

PES assessment was carried out in Tsirang Dzongkhag in 2017 to see the feasibility and to further establish the scheme.

Annexure I: Details of GECC formed

Gewog	Dzongkhag	Seed money in million Nu.	Year	Funding
Bjena GECC	Wangdue Phodrang	0.3	2011	HWCM Endowment fund
Nubi GECC	Trongsa	0.60	2011	HWCM Endowment fund (0.3 m) and IDA World Bank Project (Nu.0.2 M in 2016)
Dangchu GECC	Wangdue Phodrang	0.3	2011	HWCM Endowment fund
Tsamang Crop Insurance Scheme	Mongar	0.5	2011	HWCM Endowment fund (0.3 m) and IDA World Bank Project (Nu.0.2 M in 2016)
Chimung GECC	Pemagatshel	0.3	2011	HWCM Endowment fund
Brume-Chedungkar Chiwog Conservation Committee		0.2	2016	IDA World Bank Project
Dhur Chiwog Livestock Insurance Scheme	Bumthang	0.5	2011	WWF Co-management Project (Nu.0.3 M) and IDA World Bank Project (Nu.0.2 M in 2016)
Tareything Crop Insurance Scheme	Sarpang	0.3	2011	WWF Project (Nu.0.1 M) and IDA World Bank Project (Nu.0.2 M in 2016)
Norbugang Crop Insurance Scheme	Sarpang	0.3	2011	WWF Project (Nu.0.1 M) and IDA World Bank Project (Nu.0.2 M in 2016)
Nasphel - Zangling chiwog, Livestock Insurance Scheme	Bumthang	0.48	2011	WWF -Co-management Project (Nu.0.28 M) and IDA World Bank Project (Nu.0.2 M in 2016)

Thangbi- Kharsa GECC	Bumthang	0.12	2011	WWF -Co-management Project
Tashicholing Community Elephant Conservation Committee	Samtse	0.5	2012	HWCM Endowment fund (0.3 m) and IDA World Bank Project (Nu.0.2 M in 2016)
Lhamozingkha Gewog, Crop Insurance Scheme	Dagana	0.5	2012	HWCM Endowment fund (0.3 m) and IDA World Bank Project (Nu.0.2 M in 2016)
Langchenphu Gewog, Crop Insurance Scheme	Samdrup Jongkhar	0.3	2012	
Nabji -Korphu Gewog, Livestock Insurance Scheme	Trongsa	0.5	2012	HWCM Endowment fund (0.3 m) and IDA World Bank Project (Nu.0.2 M in 2016)
Phangkhar Livestock Insurance Scheme		0.2	2012	WWF Project
Khatoe Livestock Insurance Scheme	Gasa	0.5	2013	WWF Project (Nu.0.3 M) and IDA World Bank Project (Nu.0.2 M in 2016)
Khamoe Livestock Insurance Scheme	Gasa	0.5	2013	WWF Project (Nu.0.3 M) and IDA World Bank Project (Nu.0.2 M in 2016)
Ura Crop Insurance Scheme	Bumthang	0.5	2013	RGoB
Naro Livestock Insurance Scheme	Thimphu	0.5	2014	WWF Project
Jarey Crop Insurance Scheme	Lhuentse	0.5	2014	RGoB
Metsho Crop Insurance Scheme	Lhuentse	0.5	2014	RGoB
Lingzhi GECC	Thimphu	0.5	2015	HANAS Project
Nangkhor Livestock Insurance Scheme	Zhemgang	0.5	2015	HWCM Endowment fund

Bardo Livestock Insurance Scheme	Zhemgang	0.5	2015	HWCM Endowment fund
Shingkar Livestock Insurance Scheme	Zhemgang	0.5	2015	HWCM Endowment fund
Tangsibji GECC	Trongsa	0.5	2015	MHPA
Langthel GECC	Trongsa	0.5	2015	MHPA
Lunnana GECC	Gasa	0.5	2015	HANAS Project (Nu. 0.2 m) and IDA World Bank Project (Nu.0.2 M in 2016)
Sephu GECC	Wangdue Phodrang	0.5	2015	WWF Project
Kalapani Elephant Conservation Committee, Phuntshopelri	Samtse	0.5	2016	IDA World Bank Project
Drakten GECC	Trongsa	0.5	2016	MHPA
Dekiling GECC	Sarpang	0.5	2016	IDA World Bank Project
Shompangkha GECC	Sarpang	0.5	2016	IDA World Bank Project
Singay GECC	Sarpang	0.5	2016	IDA World Bank Project
Samtenling GECC	Sarpang	0.5	2016	IDA World Bank Project
Goshing GECC	Zhemgang	0.5	2016	IDA World Bank Project
Ngala GECC	Zhemgang	0.5	2016	IDA World Bank Project
Bjoka GECC	Zhemgang	0.5	2016	IDA World Bank Project
Tsaling GECC	Mongar	0.5	2016	IDA World Bank Project

Lungo Chiwog, Laya GECC	Gasa	0.5	2016	IDA World Bank Project
Yaksa chiwog, Tsento GECC	Paro	0.5	2016	IDA World Bank Project
Soe GECC	Paro	0.5	2016	IDA World Bank Project
Goenshari GECC	Punakha	0.5	2016	IDA World Bank Project
Chumey GECC	Bumthang	0.5	2016	IDA World Bank Project
Trong GECC	Zhemgang	0.5	2016	MHPA
Kurtoe GECC	Trashiyangtse	0.46	2016	HANAS Project
Nichula GECC	Dagana	0.5	2016	WWF TraMCA Project (Nu. 0.3 M) & IDA World Bank Project (Nu.0.2 M).