



# Bhutan State of Environment at Glance 2017

## Contents

Land Environment.....	3
Pressure: .....	3
State .....	6
AIR.....	9
Pressure .....	9
State .....	10
Response .....	11
Biodiversity .....	12
State .....	13
Response .....	13
Water .....	14
Pressure .....	14
State .....	14
Response: .....	15

## Land Environment

### Land Environment

Pressure	State	Response
Forest land converted to other land types	Major Forest type	Areas under Forest Management Units
Timber allotment	Protected Areas	Number of Community Forest established
Waste Generation	Protected Areas (Numbers)	Waste Recovery center
Number of tourist visit		
Yak and Cattle population		

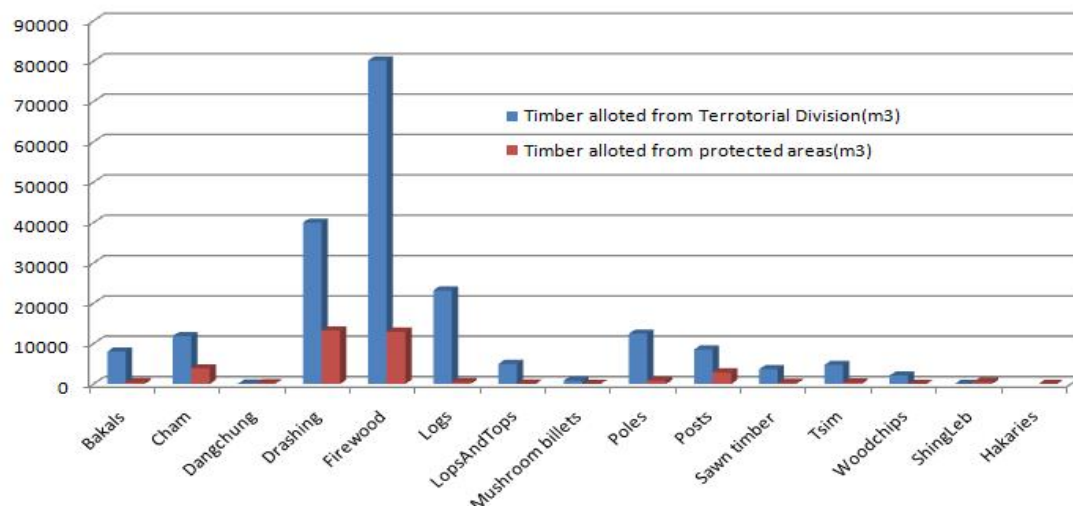
### Pressure:

- Forest Land converted to other type of land in 2015 as per National Forest Inventory Report 2016.

Forest land converted to	Area estimates (ha)
Cropland	124.99
Grassland	312.47
Settlement	312.47
Other land	187.48
<b>TOTAL</b>	<b>937.41</b>

Source: National Forest Inventory Report:2016; FRMD, DOFPS, MoAF

## - Timber allotment

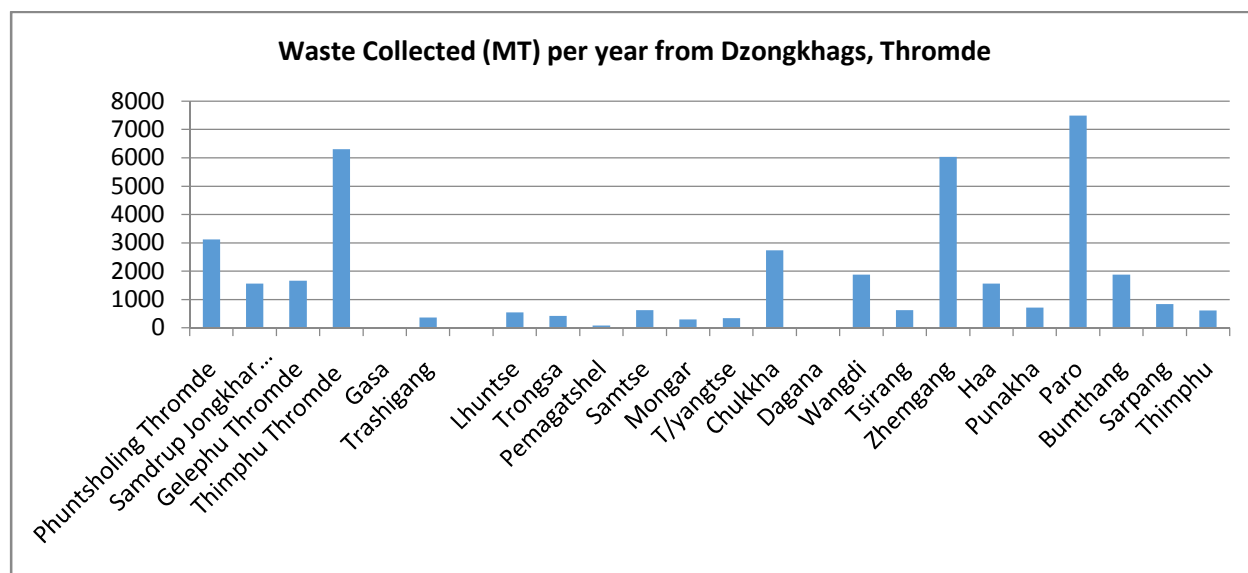


Timber allotment (Year 2017)

Source: National Forest Inventory Report: 2016; FRMD, DOPS, MoAF

## - Waste Generations

Per capita waste generation in 2015, Thimphu Thromde is 174g/capita/day which is equivalent to 0.063 tonnes/capita/year.



Source Waste and Climate Change Baseline Inventory report, 2018, National Environment Commission Secretariat

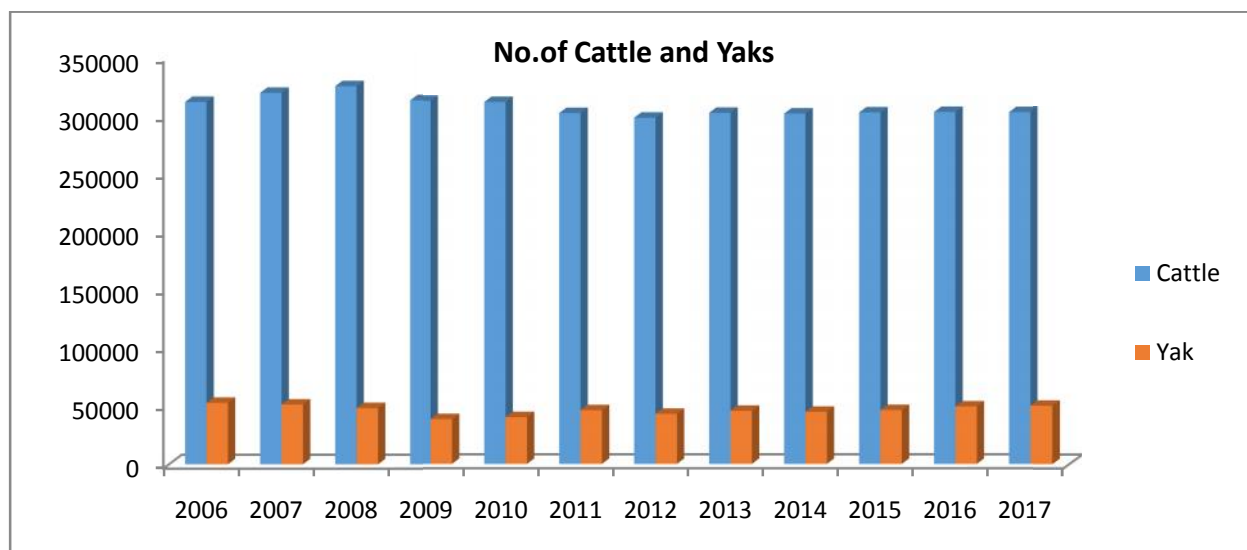
### - Tourism(Number of tourist arrivals) trends**



Trend of Tourism arrival over years,

Source: Bhutan Tourism Monitor, 2017, Tourism Council of Bhutan

### - Cattle and Yak Population(Nos)**



Source: Department of Livestock, MoAF, 2018

## State

Forest Cover of 1270889 Ha 71% out of total geographical area(389400 ha) out of country.

### Major Forest type

Sub tropical Forest-6%	Evergreen Oak Forest -1%
Fir Forest- 9%	Spurce Forest -1%
Warm Broad Leaved Forest-18%	Hemlock Forest -2%
Blue Pine Forest-4%	Fir Forest -9%
Chir Pine Forest -3%	Juniper-Rhododendron scrub -1%
Cool Broadleaved Forest-26%	

Source: National Forest Inventory Report:2016; FRMD, DOPS, MoAF

### Protected Areas

Protected Area network (Km<sup>2</sup>)- 19750.57  
 Protected Area Network (%)-51.44%  
 Protected Area -42.70%  
 Biological Corridors -8.60%  
 Royal Botanical Park- 0.10%

Source: National Forest Inventory  
 Report:2016; FRMD, DOPS, MoAF

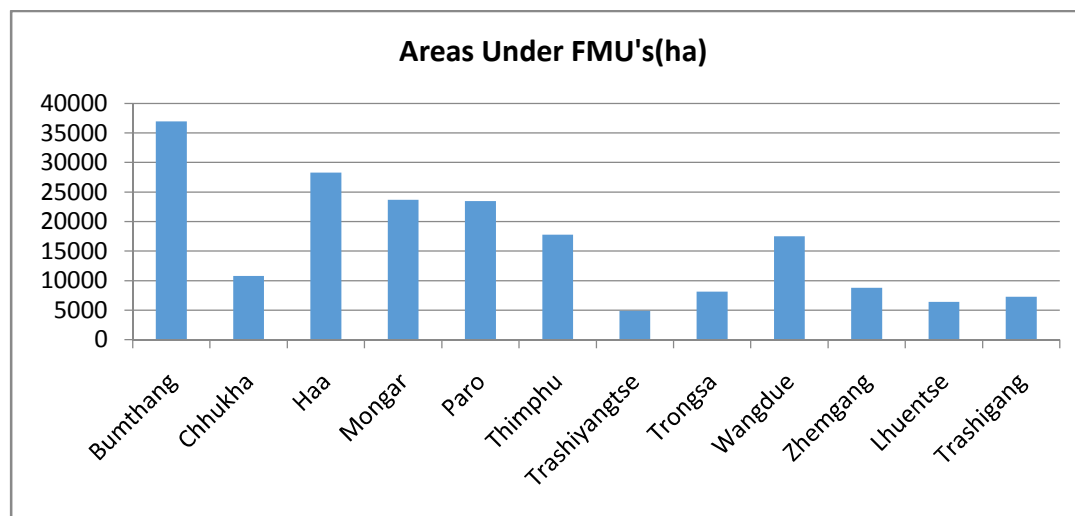
### Protected Areas (Numbers)

National Parks -5  
 Wild Life Sanctuaries – 4  
 Strict Nature Reserve – 1  
 Biological Corridors -7

Source: National Forest Inventory  
 Report:2016; FRMD, DOPS,

## Response

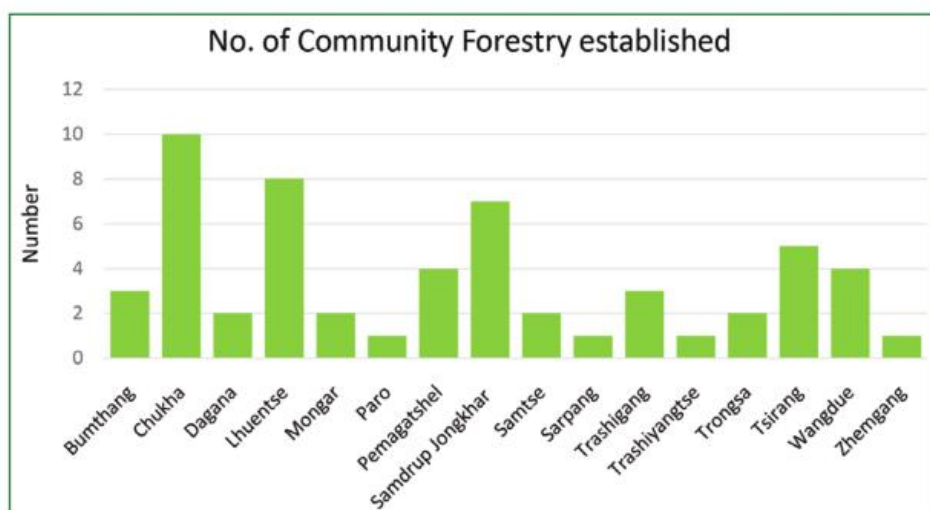
- Areas under Forest Management Units**



Areas under Forest Managements Units Dzongkhag (Year 2017)

Source: National Forest Inventory Report: 2016; FRMD, DOPS, MoAF

- Number of Community Forest established**

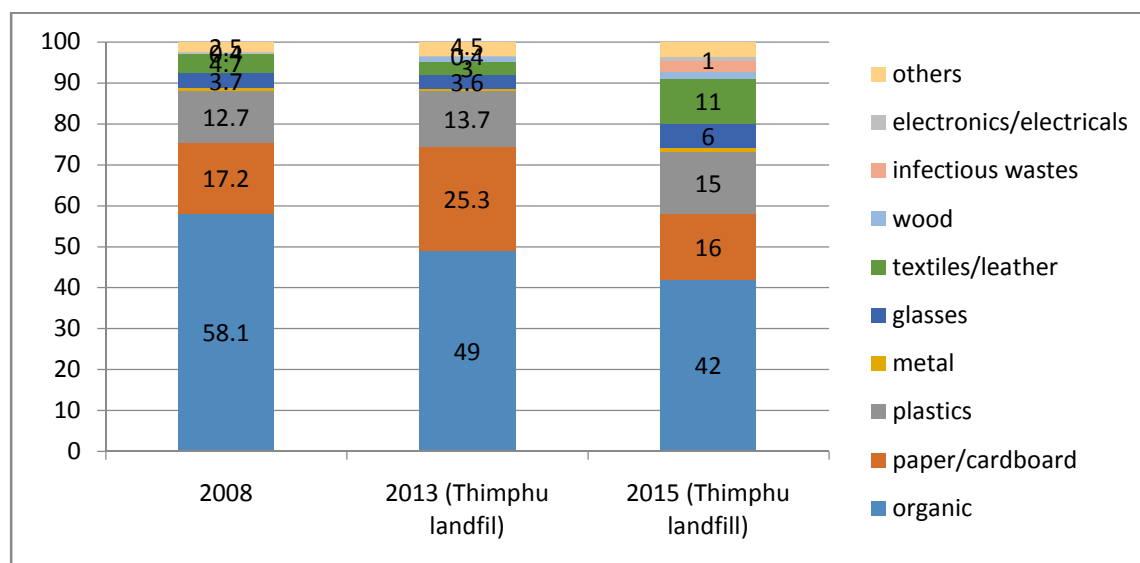


Number of Community Forest established

Source: National Forest Inventory Report: 2016; FRMD, DOPS, MoAF

- Waste Recovery Centers opens at Thimphu:** Coinciding with the environment day, Her Majesty The Gyalsuen inaugurated the waste recovery centre (transfer station) at Ngabiphu, Thimphu . Her Majesty also launched the behaviour change strategy and Thimphu thromde signage guideline 2017 during the inauguration. 15 percent of waste which cannot be recovered along with the 25 tonnes of organic waste to Memelakha landfill as per Thimphu Thromde.

- Waste Composition(%) from 2008-2015**



Source: MOWHS (2008), Thimphu Thromde (2013 & 2015)

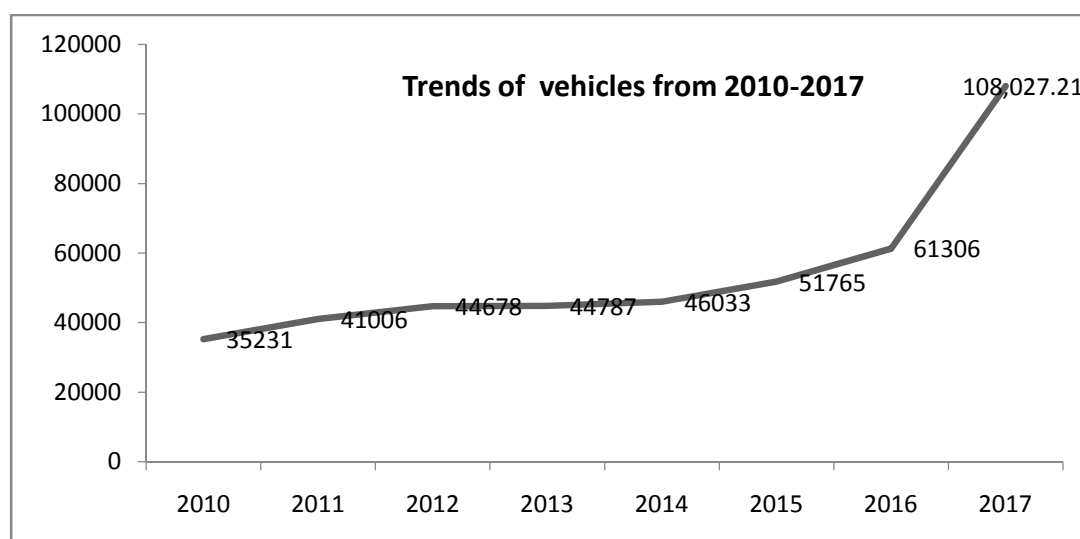


## AIR

Pressure	State	Response
Increase trend of Number of vehicles	Ambient Air Quality in Thimphu	Reforestation/Plantation Dzongkhag wise(Hectares)
Forest Fire Incidences	Fossil fuel Consumption	

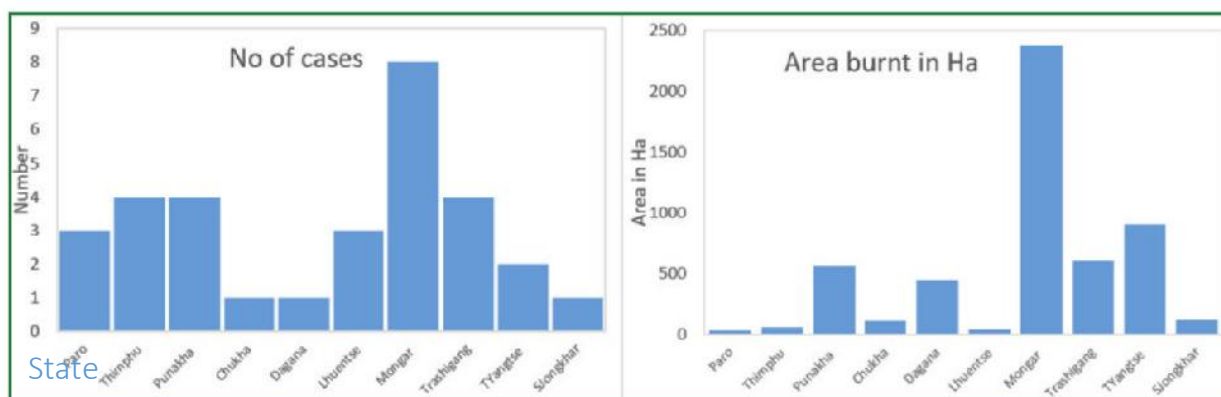
## Pressure

- **Increase Vehicle Emission/Number of Vehicles**



Source: RSTA , MoIC

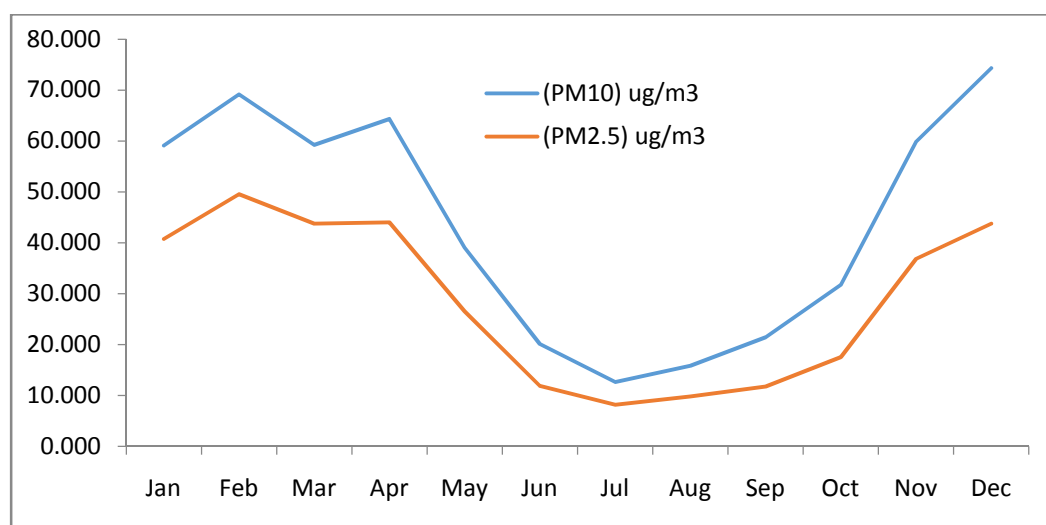
- **Forest Fire Incidences**



Forest Fire Incidences by Dzongkhag (Year 2017)

Source: National Forest Inventory Report: 2016; FRMD, DOPS, MoAF

- **Ambient Air Quality in Thimphu (Annual Average PM10 & PM2.5 concentration), 2017**



Source: Climate Change Division, NEC 2018

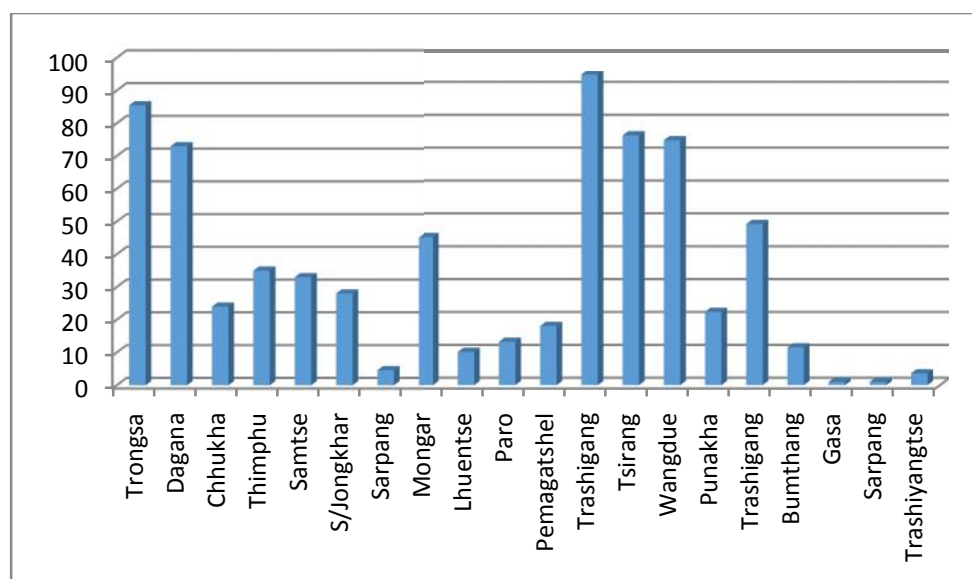
### • Fossil Fuel consumption

Fuel Type	Unit	2010	2011	2012	2013	2014	2015	2016	2017
Diesel	KL	85,620.00	103,610.90	121,832.00	122,424.80	117,273.80	122,091.40	127,539.00	140,640.50
HSD	KL	326.00	268.00	197.00	88.00	61.00	64.00	56.00	32.00
LDO	KL	39.00	36.00	45.00	40.00	40.00	40.00	-	-
Xtramile	KL	6.00	-	-	-	-	-	-	-
<b>Total Diesel</b>		<b>85,991.00</b>	<b>103,914.90</b>	<b>122,074.00</b>	<b>122,552.80</b>	<b>117,374.80</b>	<b>122,195.40</b>	<b>127,595.00</b>	<b>140,672.50</b>
Petrol	KL	23,422.50	26,761.10	29,094.00	30,195.20	31,289.20	33,880.60	35,960.00	38,960.50
Speed Petrol	KL	284.00	275.00	132.00	55.00	30.00	20.00	206.00	48.00
Xtra Premium	KL	39.00	-	-	-	-	-	-	-
Octane 91	KL	-	-	-	-	-	-	-	-
<b>Total Petrol</b>		<b>23,745.50</b>	<b>27,036.10</b>	<b>29,226.00</b>	<b>30,250.20</b>	<b>31,319.20</b>	<b>33,900.60</b>	<b>36,166.00</b>	<b>39,008.50</b>
Lubes	KL	587.93	708.74	574.68	574.51	555.50	625.39	499.67	363.49
Furnace Oil	KL	2,757.00	564.00	12.00	-	-	556.63	621.85	899.30
SKO (Industrial)	KL	240.00	120.00	-	12.00	21.00	12.00	36.00	12.00
SKO (Quota)	KL	5,540.00	5,607.00	5,547.00	4,978.00	5,673.00	4,599.00	4,755.00	4,226.00
<b>Total Kerosene</b>		<b>5,780.00</b>	<b>5,727.00</b>	<b>5,547.00</b>	<b>4,990.00</b>	<b>5,694.00</b>	<b>4,611.00</b>	<b>4,791.00</b>	<b>4,238.00</b>
ATF	KL	1,332.00	1,455.00	2,070.00	3,168.00	3,546.00	3,330.00	3,303.00	3,982.00
LPG	MT	6,834.16	7,410.87	7,469.24	6,777.98	7,029.93	7,302.60	7,593.23	8,046.82

Source: Bhutan Trade Statistics, 2018

### Response

#### • Reforestation/Plantation Dzongkhag wise(Hectares)



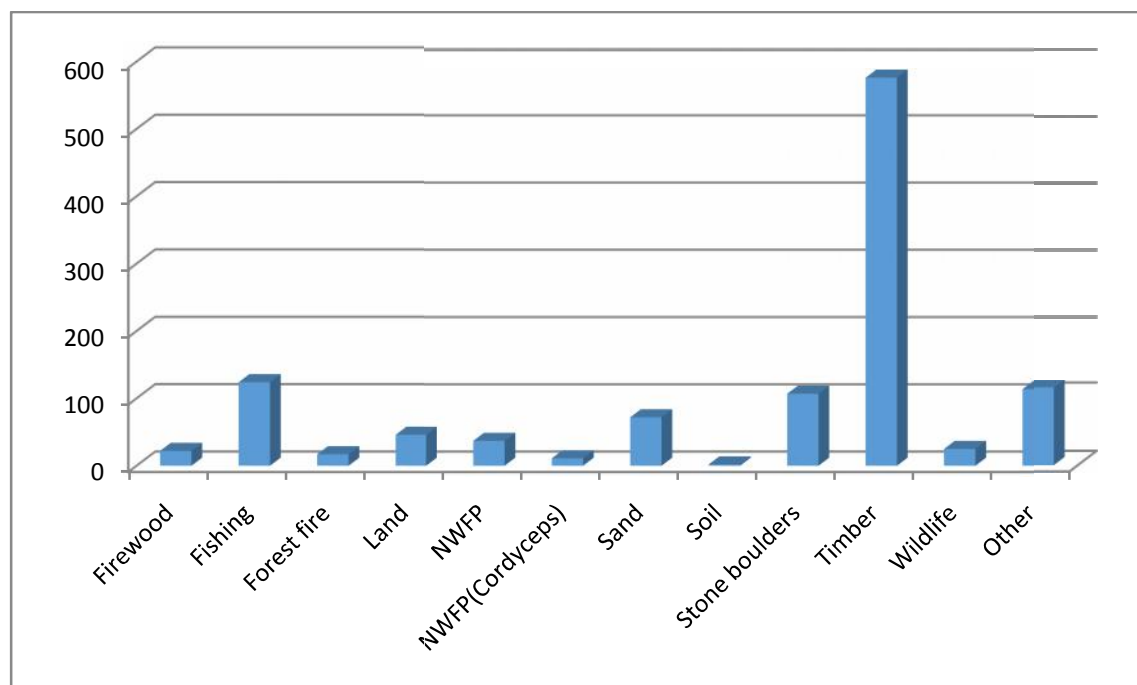
Source: Forest Facts and Figures 2017, MoAF

## Biodiversity

Pressure	State	Response
Number of fuel wood and timber extractions(Forest Offences)	Record Number of Species	Geog Environment Conservation Committee(GECC)
		Payment for Environment Service(PES) initiative

### Pressure

- Number of fuel wood and timber extractions(Forest Offences)



Source: Forest Facts and Figures 2017, MoAF

## State

Biodiversity (nos.)	recorded species	Biodiversity (nos.)	recorded species
Vascular Plants	< 5600	Fungus	350
Ferns and their Allies	< 411	Insect-Fungi	< 100
Endemic plants	144	Globally threatened Birds	47
Mammals	200	Amphibians	41
Globally threatened Mammals	27	Reptiles	124
Bird	721	Butterfly	586
Globally threatened birds	18	Moths	16
Rhododendron species	46	Fishes	119
Orchids	469	Non-vascular plants	282

Source: [Source: Forest Facts and Figures 2017. MoAF](#)

## Response

- **Geog Environment Conservation Committee(GECC):**Due to huge challenge for the Human-wildlife Conflict. Various Measures such as Electric fencing, Integrated Conservation and Development programs(ICDP) has been taken. Community-based insurance scheme is managed by Geog Environment Conservation Committee to mitigate Human-Wildlife Conflict. 31665 acres which represent about 7.3% of total registered land is covered by electric fencing
- **Payment for Environment Service(PES) initiative (Water Shed Management Division, DoPFS.**

## Water

Pressure	State	Response
Increased Water Demand	Total annual water availability	Drinking Water standard 2016
Water Pollution by Pesticide Use	Average flow	

### Pressure

- **Increased Water Demand Projections for different types(in MCM/yr) for 2015 & 2030**

Sl.No	Demand Type	2015	2030
1	Drinking Water	36.09	77.68
2	Industry and Others	74.39	218.35
3	Irrigation	666.9	911.8

Source: NECS 2016

- **Water Pollution by Pesticide Use in Country**

The total quantity of fertilizer distributed in 2017 is 2883.3 MT with (Urea-1273.7 MT, SSP-207.3 MT, Suphala- 1385.7 MT, MoP-14.6 MT, Bone meal- 1.10 MT)

Source: Statistics on agriculture and horticulture inputs supplied during Jan-Dec 2017.

### State

- **Total annual water availability is 70576.02 m3**
- **Average flow 2238 m3/s in 2015.**

Management Basin	Area (km <sup>2</sup> )	River Basins	Area (km <sup>2</sup> )	Annual flow (MCM)
Amochhu	3252	Jaldakha	942	9,375.07
		Amochhu	2310	
Wangchhu	4596	Wangchhu	4596	5,209.06
Punatsangchhu	11582	Punatsangchhu	9645	19,129.79
		Aiechhu	1937	6,989.14
Mangdechhu	7380	Mangdechhu	7380	11,797.24
Drangmechhu	11584	Drangmechhu	8457	13,569.14
		Nyera amachhu	2348	4,506.57
		Jomori	642	
		Merak - Sakteng	137	
Total	38394	Total	38394	70,576.01
		Population		746,773
		Per Capita Water Available		94,508.04 m <sup>3</sup> /Annum
		Flow		2,238.0 m <sup>3</sup> /s

Source: NECS 2016

Response:

- Bhutan Drinking Water Quality Standard 2016 Developed