



BHUTAN RNR STATISTICS 2021



**Policy and Planning Division
Ministry of Agriculture and Forest
Royal Government of Bhutan**

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FOREWORD

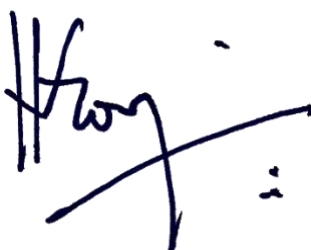
The Ministry of Agriculture and Forests is pleased to bring out the Bhutan RNR Statistics 2021. It is a comprehensive and systematic compendium of the relevant statistics in the domain of Renewable Natural Resources (RNR).

The BRNRS21 is expected to serve as the major source of information for planners, policymakers, researchers, and academicians. The statistics presented are compiled based on the information gathered through the statistical surveys and censuses as well as from the administrative data maintained by different agencies and departments under the Ministry of Agriculture and Forest (MoAF).

The statistics are thoroughly harmonized and validated by the Policy and Planning Division and also by the RNR-Technical Working Group (RNR-TWG). As statistics are compiled from various sources, each statistical table mentions the source so that data contributors are duly acknowledged and secondary users may contact the source for any further information.

I would like to extend my appreciation to the Agriculture Statistics Division (NSB) and all departments/agencies including the dzongkhag RNR sectors for their contribution and for successfully bringing out this publication. To improve the quality of the statistical issues, we would like to request comments and suggestions from the users of this publication.

This publication will be the official source of information on the RNR sector and the electronic version of the publication will be made available at www.moaf.gov.bt.



Karma Tshering
Policy and Planning Division
Ministry of Agriculture and Forests

ACRONYMS

AED	Agriculture Engineering Division
ASD	Agriculture Statistics Division
AEZ	Agro-Ecological Zones
AFS	Annual Financial Statement
AFO	Annual Forestry Statistics
BAFRA	Bhutan Agriculture and Food Regulatory Authority
BAIL	Bhutan Agro Industries Limited
BTS	Bhutan Trade Statistics
CF	Community Forests
CFM	Centenary Farmers Market
CFMG	Community Forest Management Groups
DAMC	Department of Agricultural Marketing and Cooperatives
DoA	Department of Agriculture
DoC	Day-old Chick
DoFPS	Department of Forests and Park Services
DoL	Department of Livestock
DPA	Department of Public Accounts
DRC	Department of Revenue and Customs
FCBL	Food Corporation of Bhutan Limited
FMCL	Farm Machinery Corporation Limited
FMU	Forest Management Unit
GDP	Gross Domestic Product
LUPP	Land Use Planning Project
LCMP	Land Cover Mapping Project 2010
LULC	Land Use and Land Cover 2016

LFS	Labour Force Survey
MoAF	Ministry of Agriculture and Forests
MoF	Ministry of Finance
MoLHR	Ministry of Labour and Human Resources
MoDa	Mobile Operational Data Acquisition
NCHM	National Centre for Hydrology and Meteorology
NLCS	National Land Commission Secretariat
NPPC	National Plant Protection Centre
NRDCL	Natural Resources Development Corporation Limited
NRPC	National Research Poultry Centre
NSB	National Statistics Bureau
NSC	National Seed Centre
NWFP	Non-Wood Forest Products
PHCB	Population Housing and Census of Bhutan 2017
RNR	Renewable Natural Resources
PPD	Policy and Planning Division
SYB	Statistical Yearbook of Bhutan
WBI	Wood-Based Industry

Contents

Page

TABLE 1.1.1 HARVESTED AREA UNDER CEREALS (2017-2021)	2
TABLE 1.1.2 CEREAL CROP PRODUCTION (2017-2021)	2
TABLE 1.2.1 HARVESTED AREA UNDER OILSEEDS (2017-2021)	3
TABLE 1.2.2 OIL SEED PRODUCTION (2017-2021)	3
TABLE 1.3.1 HARVESTED AREA UNDER ROOTS AND TUBERS (2017-2021)	4
TABLE 1.3.2 ROOTS AND TUBERS PRODUCTION (2017-2021)	4
TABLE 1.4.1 HARVESTED AREA UNDER PULSES (2017-2021)	5
TABLE 1.4.2 PULSES PRODUCTION (2017-2021)	5
TABLE 1.5.1 HARVESTED AREA UNDER SPICES (2017-2021)	5
TABLE 1.5.2 SPICES PRODUCTION (2017-2021)	5
TABLE 1.6.1 HARVESTED AREA UNDER VEGETABLES (2017-2021)	6
TABLE 1.7 FRUIT CROPS PRODUCTION (2017-2021)	8
TABLE 1.8 LIVE ANIMAL POPULATION (2017-2021)	9
TABLE 1.9 MILKING ANIMAL POPULATION (2017-2021)	10
TABLE 1.10 PRODUCTION OF MILK AND DAIRY PRODUCTION (2017-2021)	10
TABLE 1.11 MEAT PRODUCTION (2017-2021)	11
TABLE 1.12 HONEY AND WOOL PRODUCTION (2017-2021)	13
CHAPTER 2: TRADE	14
TABLE 2.1 EXPORT OF MAJOR FOOD ITEM FROM INDIA AND COTI (2017-2021)	2
TABLE 2.2 IMPORT OF MAJOR FOOD ITEMS FROM INDIA AND COTI (2017-2021)	3
TABLE 2.3 AGRICULTURE COMMODITIES AUCTIONED THROUGH FCBL (2017-2021)	9
CHAPTER 3: LAND USE AND LABOUR POPULATION IN AGRICULTURE	10
TABLE 3.1 POPULATION OF BHUTAN (2017-2021)	11
TABLE 3.2 LABOUR FORCE EMPLOYED IN AGRICULTURE (2017-2021)	11
TABLE 3.3 LABOUR FORCE EMPLOYED IN AGRICULTURE FARMING BY AGE GROUP	12
TABLE 3.4 LAND COVER BY MAJOR CATEGORIES IN 2010 AND 2016	13
TABLE 3.5 DZONGKHAG-WISE GEOGRAPHICAL AREA BY LAND COVER TYPES	14
TABLE 3.6 DZONGKHAG WISE AREA LAND UNDER DIFFERENT AGRICULTURAL LANDUSE IN 2010 AND 2016	15
TABLE 3.7 DZONGKHAG-WISE CASES UNDER LAND LEASED PROGRAM	16
TABLE 3.8 DZONGKHAG-WISE NUMBER OF CASES AND AREA RECOMMENDED BY DoA TO NLCS FOR LAND CONVERSION	17
TABLE 3.9 DZONGKHAG-WISE NUMBER OF CASES AND AREA NOT RECOMMENDED BY DoA TO NLCS FOR LAND CONVERSION	18
CHAPTER 4: MACHINERY	19
TABLE 4.1 IMPORT OF FARM MACHINERIES FROM INDIA	20
TABLE 4.2 IMPORT OF FARM MACHINERIES FROM OTHER COUNTRIES	21
TABLE 4.3 GOVERNMENT OWNED FARM MACHINERY BY DZONGKHAG AS OF 2021	22
TABLE 4.4 PRIVATE OWNED FARM MACHINERY BY DZONGKHAG AS OF 2021	23

CHAPTER 5: AGRICULTURAL INPUT SUPPLY	24
TABLE 5.1 IMPORT OF PLANT PROTECTION CHEMICALS FROM INDIA	25
TABLE 5.2 IMPORT OF PLANT PROTECTION CHEMICALS FROM OTHER COUNTRIES	25
TABLE 5.3.1 PLANT PROTECTION CHEMICALS DISTRIBUTED BY NPPC	26
TABLE 5.3.2 PLANT PROTECTION CHEMICALS DISTRIBUTED BY NPPC	27
TABLE 5.3.3 IMPORT OF FERTILIZER (2017-2021)	28
TABLE 5.3.4 FERTILIZER DISTRIBUTED BY NSC (2017-2018).....	29
TABLE 5.3.5 FERTILIZER DISTRIBUTED BY NSC (2018-2019).....	30
TABLE 5.3.7 FERTILIZER DISTRIBUTED BY NSC (2020-2021).....	32
TABLE 5.4.1 VEGETABLE SEED & SEEDLINGS DISTRIBUTED BY NSC (2018-2021)	33
TABLE 5.4.2 TEMPERATE SEED & SEEDLING DISTRIBUTED BY NSC	35
TABLE 5.4.3 SUBTROPICAL SEED & SEEDLING DISTRIBUTED BY NSC	35
TABLE 5.4.4. CEREALS SEED & SEEDLING DISTRIBUTED BY NSC.....	36
TABLE 5.5 DOC (DAY OLD CHICK) DISTRIBUTED BY NRPC	37
TABLE 5.6 BIOGAS PLANTS ACHIEVEMENT BY DZONGKHAG.....	38
TABLE 5.7 GREENHOUSE DISTRIBUTION TO DZONGKHAGS	39
CHAPTER 6: INFRASTRUCTURE.....	40
TABLE 6.1 AGRICULTURE CENTRES UNDER DoA AS OF DEC. 2021.....	41
TABLE 6.2 FORESTRY OFFICES/CENTRES UNDER DoFPS AS OF DEC. 2021.....	41
TABLE 6.3 LIVETSOCK CENTRES UNDER DoL AS OF DEC. 2021.....	42
TABLE 6.4.1 IRRIGATION INFRASTRUCTURE (2018-2019)	43
TABLE 6.4.2 IRRIGATION INFRASTRUCTURE (2019-2020)	44
TABLE 6.4.3 IRRIGATION NEW CONSTRUCTION (2020-2021)	45
TABLE 6.4.4 IRRIGATION MAINTENANCE (2020-2021).....	46
TABLE 6.5.1 ELECTRIC FENCING LENGTH AND LAND AREA COVERED.....	47
TABLE 6.5.2 ELECTRIC FENCING LENGTH AND LAND AREA COVERED (2019-2020)	48
TABLE 6.5.3 NEW ELECTRIC FENCING LENGTH AND LAND AREA COVERED (2020-2021)	49
TABLE 6.5.4 ELECTRIC FENCING MAINTENANCE LENGTH AND LAND AREA COVERED (2020-2021) ...	49
TABLE 6.6 NEW FARM ROAD CONSTRUCTION AND MAINTENANCE (2020-2021)	50
CHAPTER 7: PRICE.....	51
TABLE 7.2 AVERAGE RETAIL PRICE OF VEGETABLES AT CFM, THIMPHU	52
TABLE 7.3 AVERAGE RETAIL PRICE OF FRUITS AT CFM, THIMPHU	53
TABLE 7.4 AVERAGE RETAIL PRICE OF LIVESTOCK PRODUCTS AT CFM, THIMPHU	53
TABLE 7.5 AVERAGE RETAIL PRICE OF CEREALS AND PULSES AT CFM, THIMPHU	53
TABLE 7.6 PRICE OF CEREAL SEEDS AND OILSEED SEEDS	54
TABLE 7.7 PRICE OF TEMPERATE FRUIT SEEDLINGS.....	54
TABLE 7.8 PRICE OF VEGETABLE SEEDS.....	55
TABLE 7.9 PRICE OF SUB-TROPICAL FRUIT SEEDLINGS	56
TABLE 7.10 PRICE OF FERTILIZERS.....	56
CHAPTER 8: FORESTRY	57

TABLE 8.1 PROTECTED AREAS AND COVERAGE	58
TABLE 8.2 DZONGKHAG-WISE AREA UNDER FOREST MANAGEMENT UNIT (FMU)	59
TABLE 8.3.1 NWFPS SUPPLIED AND REVENUE GENERATED BY DoFPS	60
TABLE 8.3.2 NWFPS SUPPLIED AND REVENUE GENERATED BY DoFPS (2019)	61
TABLE 8.3.4 NWFPS SUPPLIED AND REVENUE GENERATED BY DoFPS (2020)	62
TABLE 8.3.5 NWFPS (SURFACE COLLECTION) SUPPLIED AND REVENUE GENERATED BY DoFPS (2020)	63
TABLE 8.3.5 NWFPS SUPPLIED AND REVENUE GENERATED BY DoFPS (2021)	64
TABLE 8.4.1 FIREWOOD ALLOTTED BY DIVISIONAL FOREST OFFICES AND PARK OFFICES	66
TABLE 8.4.2 FIREWOOD ALLOTTED BY DIVISIONAL FOREST OFFICES AND PARK OFFICES	67
TABLE 8.5.1 TIMBER ALLOTTED BY DIVISIONAL FOREST OFFICES AND PARK OFFICES	68
TABLE 8.5.2 TIMBER ALLOTTED BY DIVISIONAL FOREST OFFICES AND PARK OFFICES	69
TABLE 8.6 NUMBER OF WOOD-BASED INDUSTRIES IN THE COUNTRY.....	71
TABLE 8.7 DZONGKHAG-WISE FOREST FIRE CASES AND AREA BURNT.....	72
TABLE 8.8 DZONGKHAG-WISE COMMUNITY FOREST FIRE AREA AND NUMBER.....	74
TABLE 8.9.1 PLANTATION CREATION AND MAINTENANCES BY DIVISIONAL FOREST OFFICES AND PARK OFFICES.....	76
TABLE 8.9.2 PLANTATION CREATION AND MAINTENANCES BY FOREST MANAGEMENT UNITS.....	77
CHAPTER 9: METEOROLOGY STATISTICS	78
TABLE 9.1 STATION-WISE ANNUAL RAINFALL (MM) DURING 2021	79
TABLE 9.2 METEOROLOGY INFORMATION OF BHUR STATION DURING 2021	80
TABLE 9.3 METEOROLOGY INFORMATION OF CHAMKHAR STATION DURING 2021	80
TABLE 9.4 METEOROLOGY INFORMATION OF DAGANA STATION DURING 2021	81
TABLE 9.5 METEOROLOGY INFORMATION OF DAMPHU STATION DURING 2021	81
TABLE 9.6 METEOROLOGY INFORMATION OF DEOTHANG STATION DURING 2021	82
TABLE 9.7 METEOROLOGY INFORMATION OF GASA STATION DURING 2021	82
TABLE 9.8 METEOROLOGY INFORMATION OF HAA STATION DURING 2021.....	83
TABLE 9.9 METEOROLOGY INFORMATION OF KANGLUNG STATION DURING 2021	83
TABLE 9.10 METEOROLOGY INFORMATION OF MONGGAR STATION DURING 2021	84
TABLE 9.11 METEOROLOGY INFORMATION OF PARO STATION DURING 2021	84
TABLE 9.12 METEOROLOGY INFORMATION OF PEMA GATSHEL STATION DURING 2021.....	85
TABLE 9.13 METEOROLOGY INFORMATION OF PHUENTSHOLING STATION DURING 2021	85
TABLE 9.14 METEOROLOGY INFORMATION OF PUNAKHA STATION DURING 2021	86
TABLE 9.15 METEOROLOGY INFORMATION OF SIMTOKHA STATION DURING 2021.....	86
TABLE 9.16 METEOROLOGY INFORMATION OF SIPSU STATION DURING 202.....	87
TABLE 9.17 METEOROLOGY INFORMATION OF TRASHI YANGTSE STATION DURING 2021	87
TABLE 9.18 METEOROLOGY INFORMATION OF TRONGSA STATION DURING 2021	88
TABLE 9.19 METEOROLOGY INFORMATION OF WANGDUE STATION DURING 2021	88
TABLE 9.20 METEOROLOGY INFORMATION OF ZHEMGANG STATION DURING 2021.....	89

List of figures

FIGURE 1: TREND OF PRODUCTION AND HARVESTED AREA OF MAJOR CEREAL CROPS (2017-2021)	3
FIGURE 2: TREND OF DOMESTIC POTATO PRODUCTION AND AREA HARVESTED	4
FIGURE 3: TREND OF MAJOR SPICES PRODUCTION (2017-2021)	6
FIGURE 4: TREND OF MAJOR FRUIT CROPS PRODUCTION (2017-2021)	9
FIGURE 5: TREND OF DAIRY PRODUCT PRODUCTION (2017-2021)	11
FIGURE 6: TREND OF DOMESTIC MEAT PRODUCTION IN A COUNTRY (2017-2021)	12
FIGURE 7: TREND OF DOMESTIC OTHER DAIRY ITEMS PRODUCTION (2017-2021)	13
FIGURE 8: TREND OF PLANT PROTECTION CHEMICAL DISTRIBUTION (2017-2021)	28
FIGURE 9: TREND OF DoC SUPPLIED FROM NATIONAL RESEARCH POULTRY CENTRE (2017-2021)	37
FIGURE 10: TREND OF BIOGAS DISTRIBUTION DURING (2018-2021)	38
FIGURE 11: DZONGKHAG-WISE NEW IRRIGATION CHANNEL CONSTRUCTION (2020-2021)	46
FIGURE 12: DZONGKHAG-WISE ELECTRIC FENCE INSTALLATION DURING THE FINANCIAL YEAR 2020-2021	48
FIGURE 13: TIMBER ALLOTMENT ON CONCESSIONAL AND COMMERCIAL IN M3	70
FIGURE 14: REVENUE GENERATE BY CONCESSIONAL AND COMMERCIAL ROYALTY REALIZED IN MILLION NGULTRUMS	70
FIGURE 15: TREND OF NUMBER OF CASES DETECTED AND TOTAL AREA BURNT (2017-2021)	73
FIGURE 16: TREND OF COMMUNITY FORESTRY ESTABLISHMENT (2017-2021)	75
FIGURE 17: ANNUAL MONTHLY RAINFALL, 2021	78

CHAPTER 1: PRODUCTION

This chapter presents summary statistics on the harvested area of primary crops, production of crops & dairy products along with the livestock population at the national level. The crop and livestock statistics are based on the agriculture and livestock statistics 2021 conducted by the Agriculture Statistics Division (ASD) under National Statistics Bureau (NSB).

Agriculture farming had remained one of the mainstays of the Bhutanese population depending on agriculture for livelihood. Bhutanese Agriculture Sector has come a long way since the introduction of modern agriculture techniques in first Five Year Plan, gradually transitioning to commercial production from that of subsistence systems.

With an average farm size of 2.22 acres (PHCB, 2017), most farmers practice subsistence to semi-subsistence integrated farming systems. Despite its small size, Bhutan's agroecology is diverse with large variations in altitude and micro climatic conditions.

The livestock-keeping households are enumerated on a complete basis, the statistics given are actual totals and not based on estimates. Another important difference from the crop statistics is that the livestock statistical figures include live animal numbers and production from the government farms as well and hence reflect a complete picture of livestock population and production within the country.

Table 1.1.1 HARVESTED AREA UNDER CEREALS (2017-2021)

(Value in Acres)

Crops	2017*	2018**	2019*	2020*	2021
Amaranthus	40	61	64	-	-
Barley	3,421	1,715	1,957	1,764	1,605
Buckwheat	5,817	4,647	5,116	4,949	3,782
Millet	3,623	2,760	2,686	2,690	2,273
Maize	66,042	36,836	32,485	27,945	20,289
Paddy	52,368	37,268	30,298	31,328	24,055
Quinoa	73	114	308	223	89
Wheat	5,259	2,819	2,481	2,457	2,286

Source: *Annual Agriculture Statistics & **RNR Census 2019, MoAF. Agriculture Statistics 2021, NSB

Table 1.1.2 CEREAL CROP PRODUCTION (2017-2021)

(Value in MT)

Crops	2017*	2018**	2019*	2020*	2021
Amaranthus	3	20	19	-	-
Barley	2,005	929	1,026	1,123	857
Buckwheat	3,480	1,991	2,350	2,701	1855
Maize	94,052	55,259	46,235	40,965	30939
Millet	1,739	1,071	1,241	1,613	1122
Paddy	86,385	63,890	49,930	54,088	40508
Quinoa	9	21	83	102	37
Wheat	3,883	1,445	1,319	1,623	1169

Source: *Annual Agriculture Statistics & **RNR Census 2019, MoAF. Agriculture Statistics 2021, NSB

The major cereal crops grown in the country are paddy and maize. Other cereals include wheat, barley, buckwheat, Millet, Amaranthus, and Quinoa. The domestic paddy harvested area decreased by 23% and production by 25% in 2021 as compared to that of 2020. The Maize harvested area decreased by 27% and production by 25% in 2021. Likewise, there is slight fluctuation in all other crops like vegetables, roots & tuber and fruits etc....

In general, the main reason for crop reduction are: -

1. Due to natural calamities (heavy rainfall during the harvest seasons, hailstorm, frost & wind)
2. Direct and indirect crop damaged by pests (Insects, birds & rodents)
3. Due to heavy pruning and die back of the fruit tree
4. New variety less yield
5. lack of fertilizers and irrigation

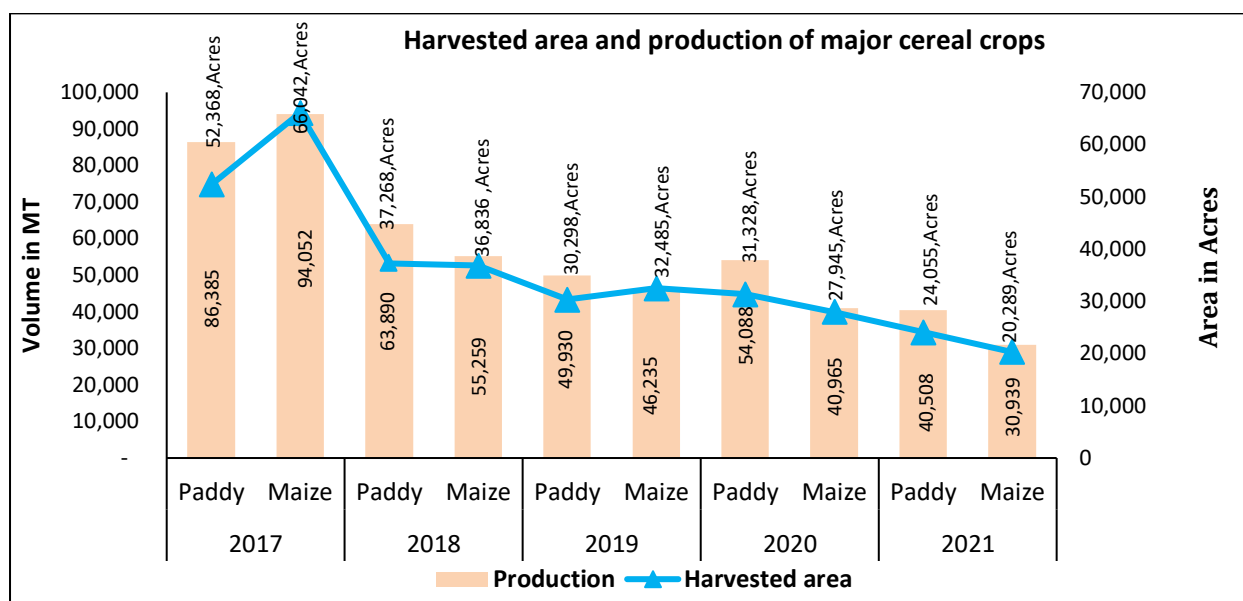


Figure 1: Trend of production and harvested area of major cereal crops (2017-2021)

Table 1.2.1 HARVESTED AREA UNDER OILSEEDS (2017-2021)

(Value in Acres)

Crops	2017*	2018**	2019*	2020*	2021
Groundnut	436	267	378	274	157
Mustard	2,697	1,103	1,664	1,746	1,159
Pyrilla	249	-	-	177	113
Sesame	-	-	4	-	-
Soya bean	867	377	621	540	266
Sunflower	23	8	32	11	7

Source: *Annual Agriculture Statistics & **RNR Census 2019, MoAF. Agriculture Statistics 2021, NSB

Table 1.2.2 OIL SEED PRODUCTION (2017-2021)

(Value in MT)

Crops	2017*	2018**	2019*	2020*	2021
Groundnut	246	197	230	313	48
Mustard	969	244	394	538	331
Pyrilla	108	-	-	61	26
Sesame	-	-	0.57	-	-
Soya bean	204	107	171	234	90
Sunflower	3	2	8	8	3

Source: *Agriculture Statistics & **RNR Census 2019, MoAF. Agriculture Statistics 2021, NSB

Table 1.3.1 HARVESTED AREA UNDER ROOTS AND TUBERS (2017-2021)

(Value in Acres)

Crops	2017*	2018**	2019*	2020*	2021
Colocacia /Taro	-	140	127	164	-
Ground apple	-	-	61	121	73
Potato	12,824	11,131	10,342	9,964	8244
Sweet potato	203	63	62	66	52
Tapioca/Cassava	320	389	329	319	213

Source: *Agriculture Statistics & **RNR Census 2019, MoAF. Agriculture Statistics 2021, NSB

Table 1.3.2 ROOTS AND TUBERS PRODUCTION (2017-2021)

(Value in MT)

Crops	2017*	2018**	2019*	2020*	2021
Ground apple	-	-	211	236	146
Colocacia /Taro	-	91	210	244	147
Potato	57,223	44,278	43,560	45,500	38573
Sweet potato	80	32	48	67	53
Tapioca/Cassava	306	448	484	608	389

Source: *Agriculture Statistics & **RNR Census 2019, MoAF. Agriculture Statistics 2021, NSB

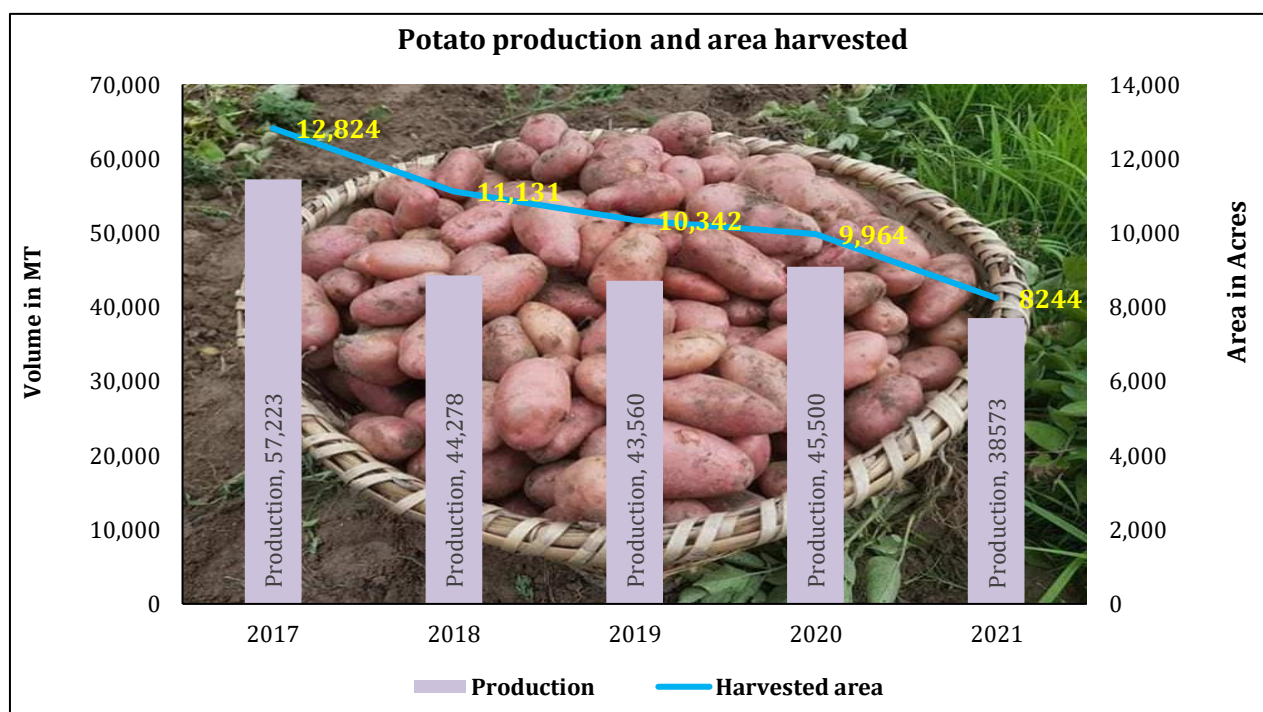


Figure 2: Trend of domestic potato production and area harvested

Table 1.4.1 HARVESTED AREA UNDER PULSES (2017-2021)

(Value in Acres)

Crops	2017*	2018**	2019*	2020*	2021
Cowpea	-	-	66	-	
Chickpea	-	-	31	-	
Beans dry	-	-	929	875	723
Lentil	-	617	297	342	39
Mung bean	922	-	1,307	1084	1032
Rajma bean	2,236	-	1,590	1594	681

Source: *Agriculture Statistics & **RNR Census 2019, MoAF. Agriculture Statistics 2021, NSB

Table 1.4.2 PULSES PRODUCTION (2017-2021)

(Value in MT)

Crops	2017*	2018**	2019*	2020*	2021
Beans dry	-	-	407	485	320
Chick pea	-	-	22	-	-
Cow pea	-	-	64	-	-
Lentil	-	138	55	91	15
Mung bean	298	-	464	382	381
Rajma bean	932	-	666	850	363

Source: *Agriculture Statistics & **RNR Census 2019, MoAF. Agriculture Statistics 2021, NSB

Table 1.5.1 HARVESTED AREA UNDER SPICES (2017-2021)

(Value in Acres)

Crops	2017*	2018**	2019*	2020*	2021
Cardamom	13,880	21,395	15,615	13,696	11,599
Garlic	1,411	874	770	570	255
Ginger	3,809	2,156	2,386	3,721	3,080
Turmeric	-	-	70	156	177

Source: *Agriculture Statistics & **RNR Census 2019, MoAF. Agriculture Statistics 2021, NSB

Table 1.5.2 SPICES PRODUCTION (2017-2021)

(Value in MT)

Crops	2017*	2018**	2019*	2020*	2021
Ginger	7,859	4,260	6,209	8,890	7,154
Cardamom	2,245	1,542	1,413	2,175	1,609
Turmeric	-	-	92	187	203
Garlic	708	550	761	691	240

Source: *Agriculture Statistics & **RNR Census 2019, MoAF. Agriculture Statistics 2021, NSB

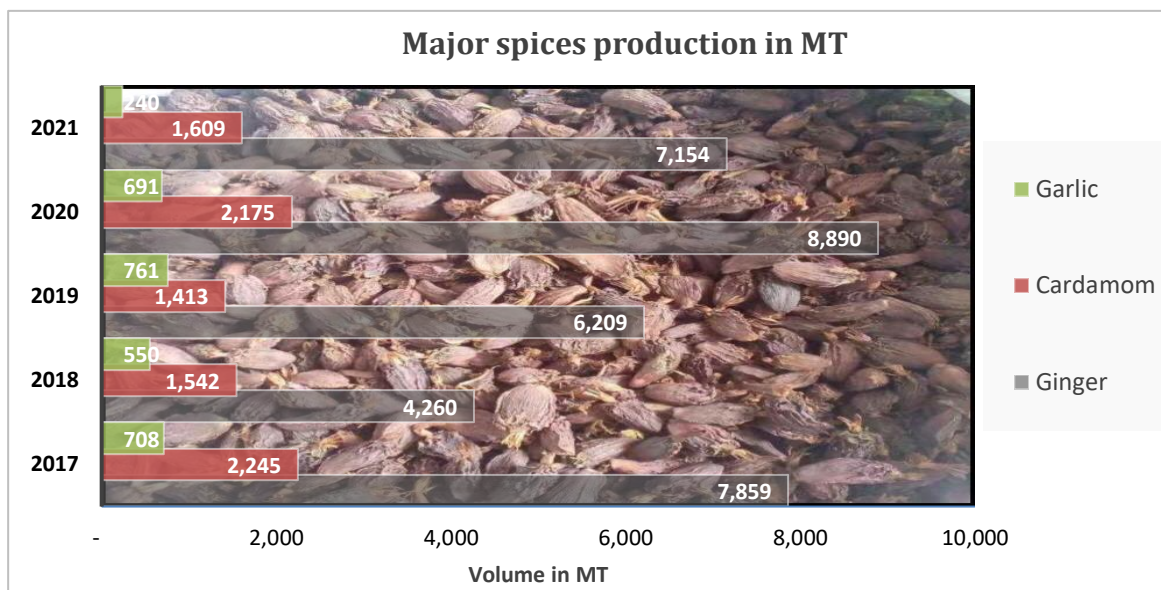


Figure 3: Trend of major spices production (2017-2021)

Table:1.6.1 HARVESTED AREA UNER VEGETABLES (2017-2021)

(Value in Acres)

Crops	2017*	2018**	2019*	2020*	2021
Asparagus	201	154	264	206	181
Beans	3,739	3,423	2,058	2,544	150
Bunching onion	-	-	243	307	247
Broccoli	1056	781	751	1,107	871
Cabbage	3,551	1,792	1,737	2,072	1,320
Cauliflower	1,604	1,001	851	1,198	947
Carrot	530	415	540	677	438
Chilli	7,571	4,031	3,524	3,765	3,439
Coriander	-	-	255	295	171
Cucumber	-	-	247	499	540
Dally chilli	-	-	194	-	-
Egg-plant	751	242	197	301	219
Lady Finger	45	79	15	-	-
Green leaves	3,429	1,780	1,262	-	-
Onion bulb	594	394	141	203	415
Peas	1,003	642	451	603	386
Pumpkin/squash/gourd	-	-	569	-	-
Radish	3,533	1,644	1,238	2,406	1,244
Tomato	320	329	148	246	229
Turnip	1,804	1,433	1,465	1,584	1,244

Source: *Agriculture Statistics & **RNR Census 2019, MoAF. Agriculture Statistics 2021, NSB

Table 1.6.2 VEGETABLES PRODUCTION (2017-2021)

(Value in MT)

Crops	2017*	2018**	2019*	2020*	2021
Asparagus	79	160	79	127	178
Beans	5,273	2,274	2,923	3,169	2,096
Bunching onion	-	-	179	268	227
Broccoli	1,371	846	864	1,727	1,156
Cabbage	10,562	4,036	6,069	7,830	3,763
Cauliflower	3,575	1,191	1,446	2,448	1,648
Carrot	787	782	1,374	1,787	874
Chilli	13,606	7,133	7,673	9,333	5,864
Coriander	-	-	120	301	136
Cucumber	1,948	1,541	2,691	1,970	1,194
Cultivated Mushroom	122	34	44		-
Dally Chili	-	-	169	-	-
Egg-plant	643	245	300	429	303
Green leaves	4,153	2,049	2,040	3,531	255
Lady Finger	26	9	23	-	
Onion bulb	489	305	155	216	419
Peas	859	567	685	749	482
Pumpkin/squash/gourds	3,171	3,870	6,043	7,918	5,695
Radish	6,307	3,649	4,721	5,234	3,162
Tomato	383	261	233	359	289
Tree tomato	404	-	359	441	484
Turnip	13,051	9,097	9,293	10,385	3,162

Source: *Annual Agriculture Statistics & **RNR Census 2019. *Agriculture Statistics 2021, NSB*

Table 1.7 FRUIT CROPS PRODUCTION (2017-2021)

(Value in MT)

Fruits	2017*	2018**	2019*	2020*	2021
Apple	8,039	3,684	4,321	4,056	2,324
Apricot	-	-	15	36	41
Areca nut	9,342	11,681	16,107	17,446	21,377
Avacado	-	-	61	112	73
Banana	3,113	2,762	3,754	3,150	3,174
Coffee	-	-	8	-	-
Date plum	-	-	19	-	-
Dragon fruits	-	-	0.23	0.36	1
Guava	1,084	895	1,369	1,062	824
Hazelnut	-	-	3	6	14
Jackfruit	528	566	469	285	366
Kiwi	-	-	20	28	51
Lemon & Lime	-	-	126	115	139
Litchi	313	303	385	329	391
Mandarin	28,017	26,527	27,529	25,661	15,966
Mango	530	850	666	819	531
Papaya	278	161	216	206	164
Passion fruit	94	-	-	74	51
Peach	1,124	1,135	1,246	1,061	633
Pear	1,510	1,372	1,584	1,107	859
Persimmon	152	207	235	207	97
Pine apple	72	279	149	162	128
Plum	482	532	585	439	257
Pomegranate	74	59	79	80	63
Sugarcane	-	101	396	-	-
Walnut	239	223	256	219	179
Watermelon	-	-	66	53	156

Source: *Agriculture Statistics & **RNR Census 2019, MoAF. Agriculture Statistics 2021, NSB

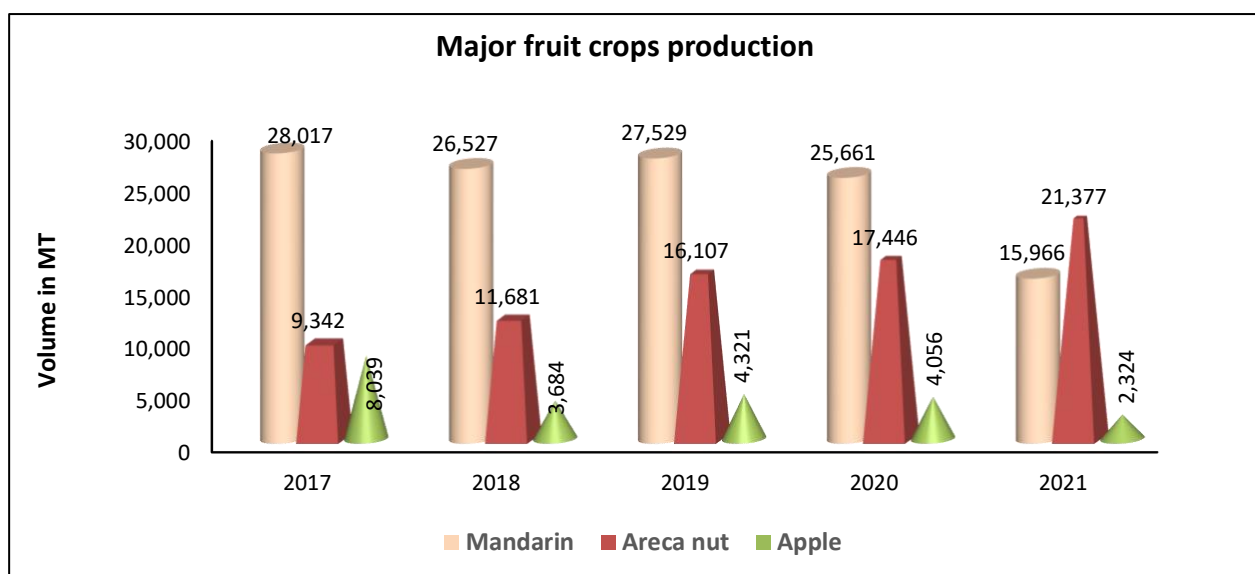


Figure 4: Trend of major fruit crops production (2017-2021)

Table 1.8 LIVE ANIMAL POPULATION (2017-2021)

(Value in Headcount)

Animal Types	2017*	2018*	2019*	2020*	2021**
Buffalo	550	531	477	398	385
Cattle	303,250	298,916	302,589	281,015	295,444
Equine	18,211	16,820	16,792	14,649	12,418
Goats	42,689	43,839	47,735	44,119	59,577
Mithun	502	418	453	390	347
Pigs	18,815	21,200	20,070	17,577	22,954
Poultry	1,118,178	1,099,493	1,299,810	1,383,714	1,384,449
Sheep	10,444	10,786	11,466	10,793	10,694
Yaks	41,528	41,463	41,918	40,897	38,642
Zo-zom	8,806	9,581	9,904	10,680	11,161

Source: *Annual Livestock Statistics, DoL, MoAF and **Livestock Statistics 2021, NSB

Table 1.9 MILKING ANIMAL POPULATION (2017-2021)

(Value in Head count)

Breed types	2017*	2018*	2019*	2020*	2021**
Jersey Pure breed	1,491	1,377	1,562	1,606	1,944
Jersey Cross breed	28,877	31,744	34,525	34,383	29,884
Brown Swiss pure breed	36	2	5	39	105
Brown Swiss cross breed	1,230	1,030	1,240	1,183	1,334
Holsten-Friesian breed	273	392	456	380	330
Jatsha-Jatsam	10,020	10,058	9,729	8,053	6,317
Yangku-Yangkum	6,922	6,911	6,960	6,099	4,183
Doeb-Doebum	2,176	2,235	1,781	1,776	1,207
Doethra-Doethram	2,582	2,624	2,508	2,434	1,978
Nublang-Thrabum	20,002	19,314	19,338	16,776	14,543
Jaba	327	380	446	544	650
Buffallo	135	111	126	103	107
Yaks	10,521	10,401	11,000	10,285	8,621
Zo-zoms	3,386	3,818	3,658	3,680	3,265

Source: *Annual Livestock Statistics, DoL, MoAF and **Livestock Statistics 2021, NSB

Table 1.10 PRODUCTION OF MILK AND DAIRY PRODUCTION (2017-2021)

(Value in MT)

Products	2017*	2018*	2019*	2020*	2021**
Milk	50,251	52,816	57,547	58,197	54,654
Cheese	4,298	3,953	4,091	4,219	3,154
Butter	2,053	1,948	2,126	2,097	1,930
Chugo	147	175	182	179	198

Source: *Annual Livestock Statistics, DoL, MoAF and **Livestock Statistics 2021, NSB

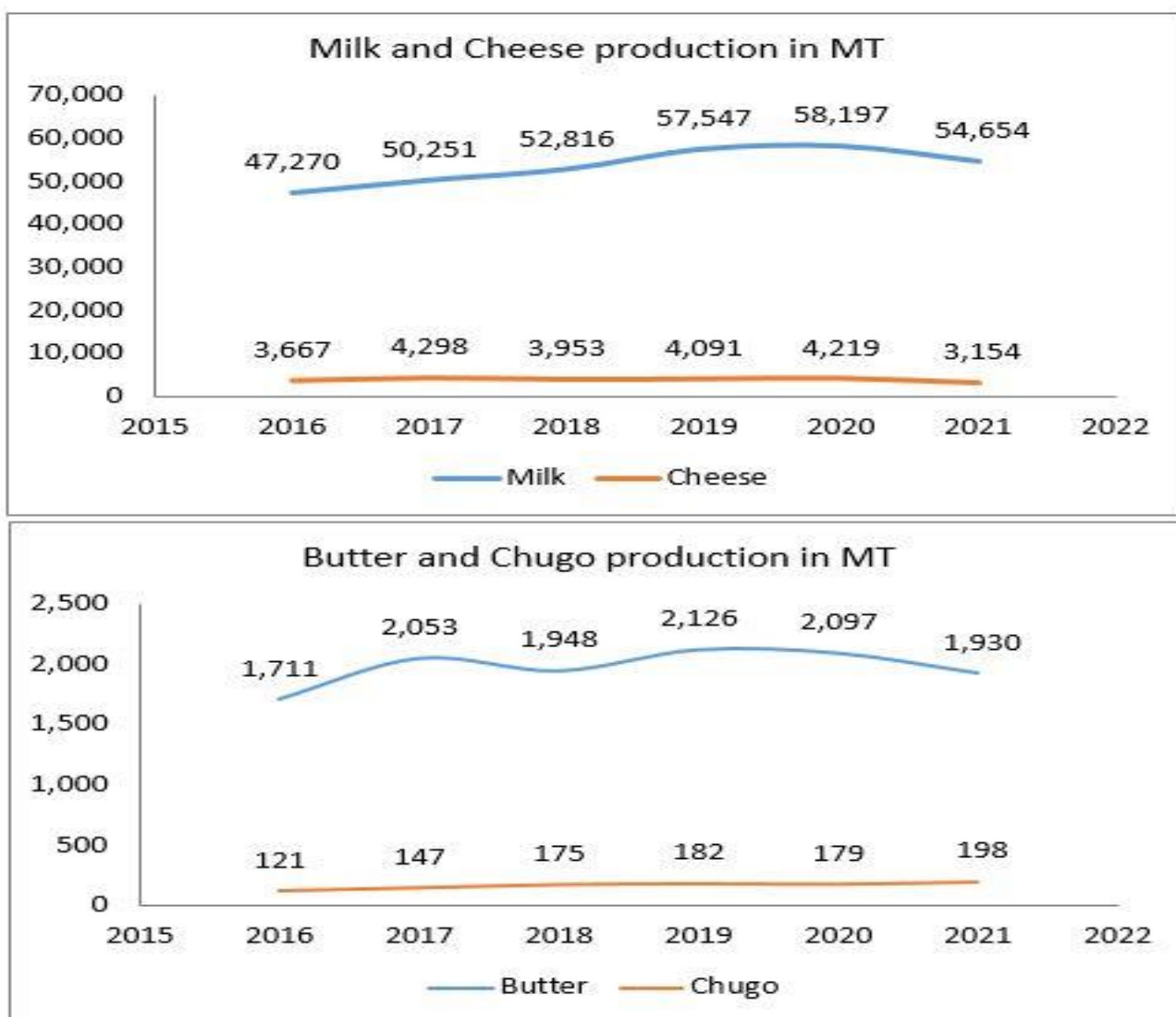


Figure 5: Trend of dairy product production (2017-2021)

Table 1.11 MEAT PRODUCTION (2017-2021)

(Value in MT)

Products	2017*	2018*	2019*	2020*	2021**
Beef	501	410	488	697	1,016
Chevon	195	257	281	296	162
Chicken	1,349	1,687	1,926	1,835	1,866
Fish	223	200	209	182	193
Pork	928	972	1,113	879	700
Yak Meat	134	191	119	107	161

Source: *Annual Livestock Statistics, DoL, MoAF and **Livestock Statistics 2021, NSB

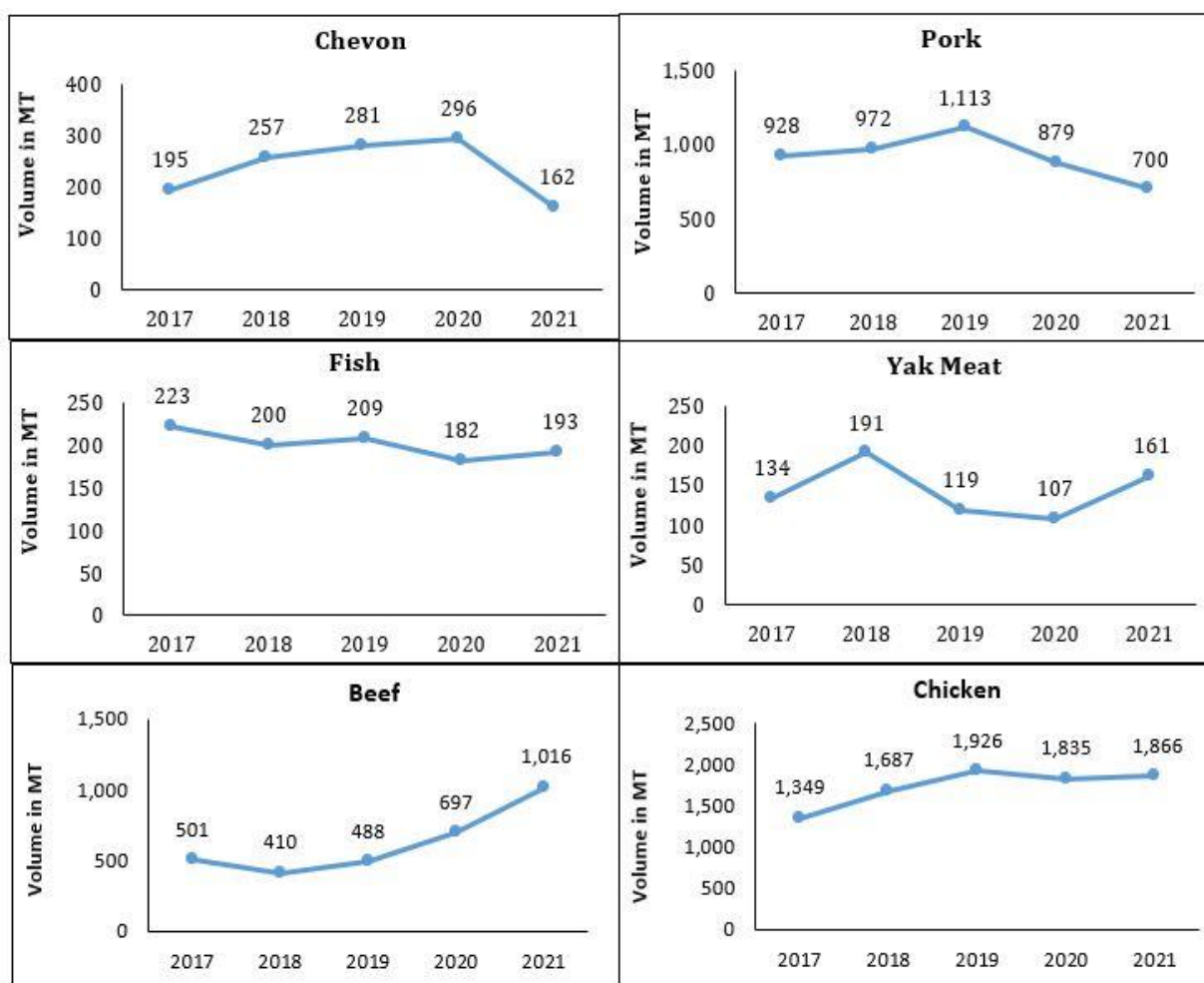


Figure 6: Trend of domestic meat production in a country (2017-2021)

Table 1.12 HONEY AND WOOL PRODUCTION (2017-2021)

(Value in MT)

Years	2017*	2018*	2019*	2020*	2021**
Honey	48.30	62.00	65.89	44.18	43.19
Eggs ('000 nos.) *	116,707	125,180	135,678	172,482	133,301
Wool	7.80	8.60	25.29	5.65	5.77

Source: *Annual Livestock Statistics, DoL,MoAF and **Livestock Statistics 2021, NSB

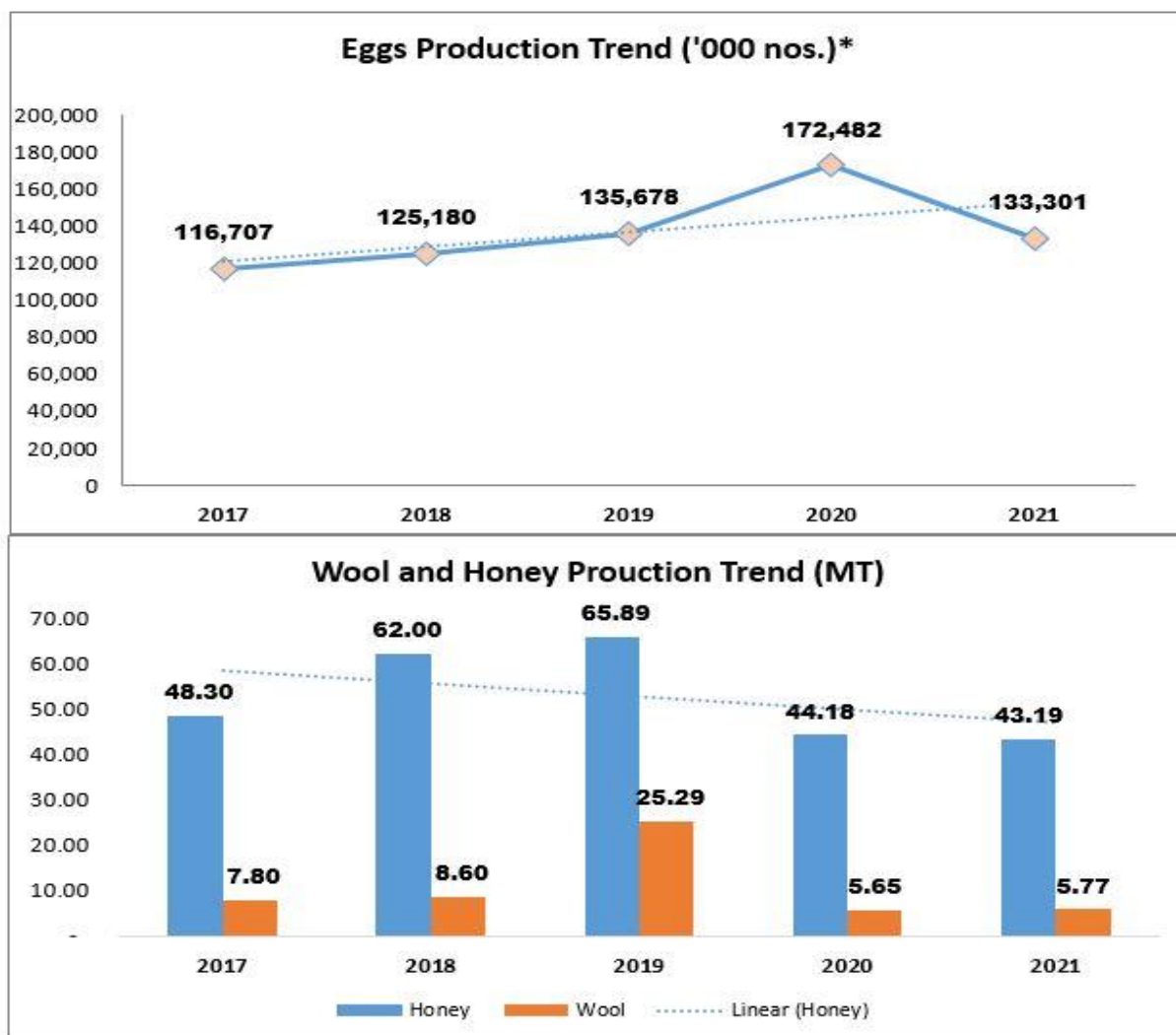


Figure 7: Trend of domestic other dairy items production (2017-2021)

CHAPTER 2: TRADE

This chapter presents the statistical tables on year-wise import and export of RNR commodities from 2017 to 2021, as per the Bhutan Trade Statistics compiled by the Department of Revenue and Customs (DRC), Ministry of Finance. The import of types of farm machinery, fertilizers and plant protection chemicals are presented separately.

The data on trade is useful for calculating trade balance, food balance sheet, food security, and many other indicators. It can also yield useful information with regard to trends in people's consumption patterns, the country's production capacity, and pointers for policymakers in relation to investment in agriculture and related industries.



Table 2.1 EXPORT OF MAJOR FOOD ITEM FROM INDIA AND COTI (2017-2021)

(Volume in MT., unless specified and value in Million Nu)

Commodity	2017		2018		2019		2020		2021	
	Volume (MT)	Value (Million Nu.)	Volume (MT)	Value (Million Nu.)	Volume (MT)	Value (Million Nu.)	Volume (MT)	Value (Million Nu.)	Volume (MT)	Value (Million Nu.)
Rice in the husk	-	-	2.40	0.04	0.80	0.02	-	-	-	-
Red Rice	3.40	0.43	-	-	5.18	0.75	-	-	0.11	0.01
Semi-milled rice	-	-	-	-	20.56	0.70	-	-	-	-
Wheat & Meslin flour	510.72	10.25	858.48	19.51	1,519.06	35.86	228.98	5..63	-	-
Soya bean seed	40.84	1.23	7.40	0.31	9.00	0.28	6.40	0.13	-	-
Mustard seed	3.07	0.10	3.00	0.09	3.20	0.09	-	-	5.25	0.26
Oranges	16,141.16	478.37	11,086.85	354.84	15,110.58	530.04	8,168.52	295.52	12,533.28	448.82
Apples	2,659.21	69.18	1,293.04	33.83	2,922.10	81.81	262.69	6.80	837.46	21.01
Cauliflower & broccoli	34.05	0.76	2.15	0.16	8.37	0.25	1.61	0.04	1.19	3.00
Cabbage lettuce	2,096.07	34.54	1,247.36	22.74	2,608.39	41.81	1,834.29	40.48	990.03	10.64
Carrots and turnips	695.99	18.85	386.44	11.24	957.19	28.34	984.73	27.49	1,080.06	17.54
Potato	24,045.32	458.70	24,983.40	511.06	26,074.35	521.05	20,137.15	534.36	27104.93	500.69
Peas	93.75	2.64	46.69	1.80	55.21	1.69	68.73	2.97	34.04	1.02
Beans	15.04	0.41	17.37	0.53	40.34	1.36	65.27	2.67	64.46	2.02
Asparagus	-	-	-	-	-	-	0.01	0.003	-	-
Chillies	18.39	0.55	20.52	0.66	10.96	2.78	3.18	0.19	14.59	0.48
Lentils	94.79	6.29	112.11	6.81	133.50	7.65	54.30	3.42	90.80	5.71
Betel nuts, in shell	5,714.40	105.89	6,510.54	120.86	5,194.28	115.42	6,239.60	134.74	6,038.61	176.50
Betel nuts, shelled	77.46	1.48	45.39	1.35	9.90	0.26	125.44	3.38	152.80	5.77
Betel leaves	-	-	3.35	0.19	3.75	0.11	5.80	0.13	2.00	0.04
Cardamom	2,031.31	1,330.22	1,698.03	929.41	2,451.08	1,227.62	1,970.68	1,011.56	3,428.63	1,712.25
Ginger	3,947.95	70.41	3,368.59	75.10	2,317.75	92.13	3,033.36	95.76	4,716.35	91.71
Chirata	-	-	0.03	0.001	2.26	0.06	-	-	-	-
Cordyceps	0.41	183.94	0.48	210.57	0.32	172.67	0.18	94.89	0.44	108.90
Poe	11.17	6.78	111.78	6.07	30.41	6.92	18.46	4.86	77.66	10.43
Matsutake	4.01	18.59	5.32	27.54	5.26	27.87	2.65	14.76	5.12	18.87
Rubia (Tsoe)	135.91	3.37	88.98	1.78	96.01	2.42	-	-	90.62	5.59

Source: Bhutan Trade Statistics

Table 2.2 IMPORT OF MAJOR FOOD ITEMS FROM INDIA AND COTI (2017-2021)

(Volume in MT and Value in Million Nu.)

Commodity	2017		2018		2019		2020		2021	
	Volume (MT)	Value (Million Nu.)	Volume (MT)	Value (Million Nu.)	Volume (MT)	Value (Million Nu.)	Volume (MT)	Value (Million Nu.)	Volume (MT)	Value (Million Nu.)
Meat										
Bovine meat	3,120.31	447.56	3,194.07	488.56	3,788.15	627.25	1,729.93	317.45	1,728.27	369.10
Swine meat	1,869.84	276.75	1,755.00	274.64	1,684.01	285.95	756.24	136.30	2,001.46	451.62
Chevon	34.17	10.98	30.93	13.68	29.82	12.80	2.47	1.36	0.58	0.67
Chicken	1,584.46	205.09	1,575.11	200.11	1,631.95	211.26	1,647.72	222.27	2,275.18	342.61
Offal of bovine/swine/chevon	89.91	9.32	88.73	9.45	115.15	13.53	21.07	2.60	1.00	0.11
Fish										
Fish fresh or frozen	1,316.15	180.31	827.82	119.02	710.67	106.94	1,092.96	171.34	1,389.11	218.51
Fish fillets, fresh,chilled	9.95	1.03	3.93	2.13	2.31	1.78	15.56	3.12	28.26	4.21
Dry fish	189.62	25.68	336.25	55.02	383.57	61.76	766.58	127.67	937.39	226.03
Seafood										
Crutaceans	18.09	2.70	1.03	1.47	4.18	3.42	28.23	7.65	21.02	5.87
Molluscs	0.26	0.29	0.23	0.40	0.23	0.32	0.02	0.02	-	-
Dairy product										
Fresh milk	127.49	4.18	62.37	3.05	16.35	1.07	44.37	2.31	13.89	0.77
Tetra pack	1,523.41	85.30	1,226.81	69.57	3,042.24	157.18	3,005.78	164.95	3,903.17	215.46
Condensed milk	16.23	0.83	7.40	0.56	1.36	0.13	56.83	3.06	615.21	33.19
Milk powder	1,574.74	445.44	783.79	176.15	696.88	167.64	743.45	258.01	829.00	247.60
Yogurt	5.59	0.39	20.08	1.23	11.55	0.84	7.06	(2.82)	4.35	0.45
Butter, fresh	0.79	0.28	0.25	0.10	2.12	0.84	3.81	1.53	0.03	0.10
Butter,processed	206.50	67.88	661.57	61.91	170.14	58.41	161.68	58.98	211.48	78.29
Cheese, fresh	4.87	1.03	1.60	0.28	0.47	0.18	12.87	1.92	11.41	1.89
Cheese,processed	1,298.80	510.10	1,159.19	477.79	1,139.28	449.42	1,111.69	476.91	1,128.65	518.98
Natural honey	39.04	8.07	64.72	11.30	42.29	9.72	41.93	10.31	52.18	12.62

Fresh vegetables										
Potatoes seed	44.23	0.43	7.38	0.57	17.44	0.21	17.82	0.78	-	-
Potatoes others	5,237.70	50.69	4,690.27	62.76	4,892.58	59.56	4,550.96	97.71	6,831.46	132.57
Tomatoes	2,978.46	70.14	2,636.85	46.73	2,590.79	62.28	3,017.68	99.99	4,296.63	150.19
Onion & shallots	3,748.34	83.78	3,558.75	74.20	3,308.13	83.14	4,087.42	137.12	6,069.67	226.59
Garlic	61.36	4.29	49.06	2.57	47.88	3.32	104.86	12.32	368.55	53.01
Leeks & others	3.42	0.06	4.40	0.09	3.19	0.08	0.90	0.05	2.91	0.16
Cauliflower & broccoli	13.54	0.23	19.26	0.32	36.58	0.68	55.87	0.90	38.25	1.34
Cabbage lettuce	1,662.90	15.07	1,328.81	10.78	1,367.93	13.11	1,206.11	11.72	229.29	4.65
Carrots and turnips	266.42	3.84	255.89	3.07	313.42	4.69	286.76	5.45	81.52	2.79
Cucumber & gherkins	492.05	8.26	385.70	6.47	409.97	8.36	311.31	5.09	642.69	17.69
Peas	139.39	4.90	86.64	25.81	120.42	4.07	171.33	7.25	377.97	20.00
Beans	0.68	0.02	1.30	0.02	-	-	0.21	0.002	0.77	0.05
Other leguminous vegetable	1,595.25	37.46	1,091.15	24.56	1,341.45	30.92	560.85	13.55	1,245.77	59.56
Egg-plants)	713.19	11.75	491.43	8.89	586.88	11.93	467.53	11.48	712.87	19.68
Mushroom	129.00	8.80	178.93	12.71	79.69	6.11	72.04	6.03	548.68	75.82
Capsicum	0.08	0.03	0.12	0.04	0.12	0.01	-	-	0.02	0.01
Chilli	333.90	9.28	28.94	0.64	7.57	0.19	-	-	0.74	0.13
Spinach	4.76	0.11	1.68	0.04	2.52	0.04	0.79	0.02	1.67	0.09
Pumpkin/squash/gourd	147.04	1.62	213.20	3.17	217.26	3.52	261.81	4.73	366.19	12.72
Others	1,838.52	35.91	2,035.46	36.96	749.97	16.60	912.28	26.28	845.06	38.71
Dried vegetable										
Onion	28.47	0.73	29.24	0.53	46.11	1.18	2.36	0.08	65.55	2.22
Dry mushroom	12.24	1.47	10.92	1.68	21.22	2.45	14.29	2.16	53.90	6.56
Mixture of vegetable	1.10	118.49	0.79	0.09	2.82	1.43	6.72	0.84	2.57	0.33
Pea	208.37	10.64	51.81	2.41	38.78	1.87	51.06	3.48	102.30	6.22
Chickpea	186.01	14.27	234.12	10.41	170.06	9.38	279.37	18.90	481.17	30.46
Beans	0.22	0.08	0.08	0.03	0.25	0.04	0.28	0.04	1.26	0.10
Cow pea	0.81	0.02	0.19	0.001	-	-	-	-	-	-
Lentils	2,141.28	119.68	2,116.82	113.66	2,141.29	127.97	2,383.63	161.58	3,008.42	234.72
Fresh fruits										

Plantains	123.78	2.56	70.58	1.56	182.79	4.10	74.58	1.98	121.48	5.06
Bananas	472.46	10.15	578.42	12.11	673.24	12.57	588.70	14.07	986.78	42.80
Dates	0.57	0.13	6.43	0.32	6.92	0.42	18.58	1.34	4.33	0.90
Pineapple	519.11	7.20	276.90	4.98	276.87	5.18	106.67	3.18	164.29	6.38
Avacado	1.13	0.32	0.10	0.20	0.08	0.13	0.15	0.08	9.24	1.85
Guavas	2.26	0.08	2.17	0.14	2.27	0.08	13.19	0.30	19.88	2.00
Mangoes	619.19	24.68	434.81	15.13	442.30	20.06	806.23	49.88	1,116.83	93.00
Orange	86.84	5.34	86.06	5.26	112.07	6.37	103.67	7.83	103.82	12.53
Lemon	89.21	3.78	114.50	15.15	156.89	5.40	114.40	6.96	420.91	27.73
Grapes	26.91	2.21	13.53	1.20	20.07	1.42	44.00	3.86	278.96	39.02
Watermelons	813.92	17.90	742.33	15.71	706.03	15.17	628.03	14.17	2.34	72.16
Papayas	79.68	2.30	78.27	2.40	84.17	2.64	42.67	1.71	82.17	4.52
Apples	185.58	19.28	73.58	7.02	165.73	14.12	265.12	33.71	629.69	104.42
Pears	41.14	3.26	5.86	0.45	9.43	0.77	13.77	1.51	122.86	20.08
Apricot	0.03	0.001	0.07	0.02	8.83	0.46	0.09	0.02	-	-
Kiwi	1.10	0.04	0.01	0.001	0.07	0.01	0.29	0.04	15.90	3.03
Others	525.04	21.60	485.23	21.35	159.78	9.13	117.57	8.34	677.81	71.68
Dried fruits										
Grapes	1.00	0.17	0.94	0.18	4.00	0.32	6.31	1.48	6.23	1.52
Apricot	0.01	0.01	0.17	0.16	0.15	0.03	0.11	0.09	0.41	0.12
Prunes	0.01	0.01	0.32	0.05	-	-	0.09	0.04	0.05	0.03
Apples	0.04	0.01	-	-	1.27	0.08	-	-	0.10	0.02
Other fruits	17.66	0.65	11.18	1.44	33.48	2.30	8.63	1.07	23.12	5.09
Mix nuts & fruits	19.17	4.42	15.23	2.38	14.58	2.18	8.06	1.92	7.86	2.90
Green tea										
Green tea (not fermented)	3.07	1.94	10.02	2.55	15.48	4.42	39.50	13.50	88.11	29.47
Other green tea	40.26	10.86	44.32	9.87	50.56	10.84	65.92	13.78	31.38	8.81
Black tea(fermented)	346.00	76.81	347.08	78.40	296.06	61.47	430.39	101.72	425.47	118.08
Other	26.68	29.50	11.54	5.67	25.69	1.53	21.40	3.03	42.76	4.94
Spices										
Chilli dry	542.99	38.25	323.36	29.62	250.43	27.22	663.37	100.32	858.12	135.62

Chilli crush	33.47	5.19	49.19	6.22	0.04	0.01	53.54	11.40	45.81	12.39
Cinnamon	0.82	0.08	0.11	0.05	0.25	0.08	0.67	0.21	1.04	0.59
Clove not crush or ground	1.57	1.02	0.25	0.05	0.25	0.16	1.08	0.50	1.36	0.87
Clove crush	0.01	0.01	0.82	0.59	1.70	0.89	1.79	1.02	1.71	1.23
Cardamoms	0.49	0.39	0.49	0.38	0.42	0.62	1.38	2.57	6.74	3.29
Turmeric	16.28	2.94	11.83	1.88	11.16	1.94	23.11	4.02	33.36	7.25
Ginger	1.14	3.34	0.97	0.42	3.16	0.18	3.38	0.29	1.96	0.14
Mixtures	1.08	0.30	8.01	1.07	2.95	2.39	30.08	3.72	32.77	8.47
Other spices	112.14	23.40	74.28	14.83	79.08	13.79	148.97	22.42	127.38	30.36
Cereals seed										
Wheat seed	-	-	-	-	24.98	0.54	55.05	1.10	72.02	1.34
Wheat other	3,365.70	62.99	3,042.16	56.69	4,808.54	99.59	2,569.01	57.09	896.20	19.77
Meslin seed	18.52	0.33	4.00	0.08	4.14	84.00	-	-	12.45	0.27
Meslin other	45.39	2.86	24.43	0.48	55.51	1.55	660.43	14.23	1,045.78	22.80
Rye	1.77	0.06	2.47	0.13	4.31	0.20	5.86	0.26	0.07	0.004
Barley	0.02	0.003	0.01	0.002	0.06	0.01	-	-	1.05	0.03
Oats seed	0.04	0.004	0.05	0.003	-	-	0.06	0.01	-	-
Oats other	0.60	0.06	0.13	0.03	0.13	0.01	0.96	0.11	0.58	0.02
Maize (corn) seed	14.45	0.45	45.17	2.74	74.98	4.74	185.54	12.10	129.74	5.08
Maize others	24,076.30	343.90	21,718.78	302.84	15,855.68	327.11	18,617.94	279.24	26,315.19	472.58
Buckwheat	10.40	0.25	1.17	0.04	12.10	0.29	24.38	0.40	7.94	0.16
Buckwheat seed	0.76	0.01	6.96	0.10	2.03	0.04	3.15	0.08	4.32	0.12
Buckwheat other	114.94	2.84	112.43	2.32	107.96	2.41	95.25	2.41	120.76	2.68
Other cereals	3.92	3.92	39.57	0.77	17.11	0.43	32.59	0.99	73.35	1.52
Rice										
Rice in the husk	538.96	8.84	76.75	0.95	115.04	1.00	93.24	1.85	8.00	0.34
Husked (brown) rice	34.84	0.78	13.74	0.40	1.02	0.05	3.34	0.03	0.04	0.01
Red rice (yeechum)	2.25	0.03	8.28	0.30	0.30	0.01	-	-	-	-
Semi-milled rice	62,069.45	1,677.41	60,267.80	1,689.09	61,030.58	1,664.61	77,564.68	2,382.46	68,371.48	2,181.19
Broken Rice	15,804.08	292.69	11,144.33	193.26	23,443.06	490.63	12,820.82	254.93	25,353.17	436.56
Flour										

Wheat & Meslin flour	7,420.14	185.70	7,139.72	187.12	7,019.57	202.77	9,062.42	281.88	8,944.11	276.97
Maize(corn)flour	642.81	10.31	343.90	5.33	127.62	3.33	295.56	6.46	420.12	9.75
Maize (other)	125.73	3.97	158.72	4.10	226.43	6.45	95.67	3.65	172.83	5.95
Oil Seeds										
Soya bean seed	0.72	0.08	-	-	0.01	0.001	0.83	0.05	0.62	0.08
Soya bean other	-	-	0.37	0.09	0.33	0.05	1.39	0.11	3.72	0.43
Ground nut seed	0.56	0.09	0.28	0.05	0.24	0.04	15.54	1.66	14.64	1.68
Ground nut, in shell	9.06	1.08	6.57	0.69	4.41	0.55	1.82	0.23	7.74	0.95
Ground nut,shelled	17.97	2.10	19.75	2.51	18.23	2.48	17.84	2.27	22.05	3.04
Linseed	0.00	0.0001	0.02	0.01	0.01	0.01	0.24	0.02	0.68	0.08
Sunflower seed	0.32	0.05	0.06	0.06	0.42	0.06	0.17	0.03	0.58	0.09
Sesamum seed	0.02	0.02	0.13	0.02	0.08	0.02	2.94	0.53	3.75	0.65
Mustard seed	8.73	0.60	2.06	0.13	12.75	0.91	6.62	0.37	11.09	0.91
Betel Nuts and leaves										
Betel leaves(total)	667.21	58.76	615.16	48.36	675.47	49.98	671.12	101.59	1,783.56	491.11
Betel nuts,in shell	12.48	0.64	14.45	1.47	2.15	0.22	79.97	9.78	250.23	33.55
Betel nuts, shelled	15.24	2.28	191.85	18.38	186.55	14.29	205.16	34.21	749.81	171.54
Oil										
Soya bean oil	10,684.52	778.01	9,778.27	811.82	10,078.76	852.86	10,534.84	968.05	11,640.68	1,629.74
Ground nut oil	-	-	1.49	0.16	4.14	0.07	0.12	0.02	1.66	0.20
Olive oil	12.24	2.68	35.89	5.93	26.58	4.34	37.78	5.85	36.86	6.21
Sunflower oil	146.36	12.97	168.98	12.43	85.90	8.60	0.02	0.002	206.12	29.95
Palm oil	0.38	0.04	56.49	4.12	1.43	0.10	-	-	2.55	0.35
Refined bleached deodorised palm oil	-	-	3.23	0.26	6.78	0.53	6.00	0.53	31.63	3.16
Refined bleached deodorised palmolein	1.12	0.23	2,900.12	144.17	2,084.84	94.19	69.08	6.05	48.62	5.77
Other palm oil	1.55	0.11	1.48	0.14	28.57	1.60	28.26	2.17	7.81	1.00
Colza/mustard oil	50.37	3.80	68.41	6.89	47.89	4.75	-	-	193.69	30.14
Safflower/cotton-seed oil	1.46	73.79	0.18	0.01	0.22	0.12	0.12	0.004	5.17	0.96
Coconut oil	1.63	0.29	2.72	0.52	2.23	0.37	5.14	1.00	9.77	2.48

Babassu oil	0.01	0.003	0.31	0.15	0.95	0.17	0.17	0.03	0.71	0.19
Rape oil	0.72	60.72	636.27	55.72	631.26	57.14	459.96	45.42	274.77	38.39
Oil Crude										
Olive (crude)	1.35	0.98	3.08	0.55	5.34	1.64	15.05	1.09	5.42	1.50
Sunflower (Crude)	-	-	-	-	0.59	0.13	0.04	0.004	4.96	0.74
Soya bean (crude)	1.46	0.12	2.57	0.17	0.84	0.07	1.84	0.12	4.06	1.94
Rape crude	1.28	0.10	0.38	0.04	-	-	0.01	0.001	0.26	0.04
Colza/mustard crude	4.30	0.37	33.82	3.37	17.93	1.73	6.83	0.86	28.06	4.51
Palm (crude)	-	-	-	-	2,134.94	100.93	0.11	0.01	0.27	0.04
Sugar										
Beet sugar	1.50	0.06	67.57	2.30	101.77	3.45	100.53	3.81	14.22	1.11
Other sugar cane	10,832.92	449.13	9,841.37	353.37	9,738.92	363.72	8,959.45	340.11	9,713.09	367.13
Salt										
Common salt (iodised)	5,621.68	32.49	6,979.19	39.99	6,945.27	42.03	6,830.22	49.45	7,222.81	57.07
Common salt (non-iodised)	905.38	3.91	191.98	1.18	73.48	0.37	296.27	1.92	246.09	2.49

Source: Bhutan Trade Statistic, DRC

Table 2.3 AGRICULTURE COMMODITIES AUCTIONED THROUGH FCBL (2017-2021)

(Volume in MT and Value in Million Nu.)

Commodity	2017		2018		2019		2020		2021	
	Volume (MT)	Value (Million Nu.)	Volume (MT)	Value (Million Nu.)	Volume (MT)	Value (Million Nu.)	Volume (MT)	Value (Million Nu.)	Volume (MT)	Value (Million Nu.)
Potatoes	25,687.38	356.54	31,537.30	649.30	30,277.08	709.81	2,753.01	760.41	5,668.55	110.32
Apple	28.26	0.66	12.38	2.80	32.03	8.62	-	-	-	-
Vegetables	4,104.04	115.86	3,463.10	93.76	5,091.66	162.87	3,160.92	583.39	934.37	16.66
Pulses	7.67	0.44	8.54	0.44	5.67	0.30	-	-	0.80	0.02
Spices	587.41	9.35	250.29	8.10	167.85	9.86	289.60	76.85	3,179.13	57.57
Mandarin	667.38	15.28	391.28	7.28	201.45	6.25	42.91	9.97	-	-
Areca nut	485.13	9.96	131.06	2.47	483.46	9.17	546.77	122.29	1,046.26	36.46
Pear	0.59	0.01	-	-	-	-	-	-	-	-
Plum	0.61	0.02	0.95	0.02	0.63	0.02	-	-	0.87	0.01
Peach	1.35	0.03	0.31	0.01	0.65	0.01	-	-	-	-
Apricot	-	-	-	-	-	-	-	-	-	-
Total	31,569.82	508.14	35,795.21	764.18	36,260.48	906.91	6,793.21	1,552.91	10,829.97	221.03

Source: Food Cooperation of Bhutan Limited, Phuentsholing

CHAPTER 3: LAND USE AND LABOUR POPULATION IN AGRICULTURE

The primary source of data on agriculture farm labour is the labour force survey, which is conducted by the National Statistics Bureau (NSB) annually, and captures the total farm labour on both the male and female in agriculture sector.

Land is one of the most important elements in agriculture and hence statistics on land and its use is of special interest to the users. Although the figures may be outdated by now, nonetheless owing to lack of any recent land cover mapping efforts, we present in this chapter the figures from LCMP, 2010 and National Forest Inventory (NFI), 2016. Additional statistics on government land leasing and private individuals' land conversion, mainly from wetland to dryland category, are also presented.

Therefore, in this chapter it includes the statistics on agricultural land area and farming labour involved by the both genders.



Table 3.1 POPULATION OF BHUTAN (2017-2021)

Description	2017**	2018***	2019***	2020***	2021***
Total population	727,145	734,374	741,672	748,931	756,129
Male	380,453	383,909	387,402	390,877	394,323
Female	346,692	350,465	354,270	358,054	361,806

Source: *LFS, MoLHR** PHCB, &***PPB 2017-2047, NSB

Table 3.2 LABOUR FORCE EMPLOYED IN AGRICULTURE (2017-2021)

Description	2017**	2018***	2019***	2020***	2021***
Working age population	537,728	496,550	481,821	488,336	489,732
Economically active population	340,236	310,856	319,758	331,222	338,376
Economically inactive population	197,492	185,694	162,063	157,114	151,356
Economically active male population	208,053	169,328	235,466	169,586	164,789
Economically active female population	132,183	141,528	246,354	161,636	173,586
Economically active population <i>employed</i> in agriculture	145,691	162,239	159,032	157,015	158,511
Economically active male population <i>employed</i> in agriculture	49,826	76,502	67,680	67,710	65,465
Economically active female population <i>employed</i> in agriculture	86,395	85,737	87,808	89,305	93,046

Source: *LFS, MoLHR, *** LFS, NSB

Table 3.3 LABOUR FORCE EMPLOYED IN AGRICULTURE FARMING BY AGE GROUP

Years Age group	2018***			2019***			2020***			2021***		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
15-19	1,337	1,011	2,349	1,337	1,011	2,348	1,345	1,443	2,788	775	751	1,526
20-24	4,835	5,145	9,981	4,835	5,147	9,982	3,567	5,206	8,773	3652	4491	8,143
25-29	7,476	8,549	16,025	7,476	8,549	16,025	5,919	8,577	14,496	5665	6905	12,570
30-34	7,385	9,384	16,768	7,385	9,384	16,769	6,132	10,438	16,570	5926	10157	16,083
35-39	7,341	10,823	18,164	7,341	10,823	18,164	7,169	11,263	18,432	6479	10004	16,483
40-44	7,286	9,784	17,069	7,286	9,784	17,070	6,886	9,888	16,774	6320	10797	17,117
45-49	7,733	10,097	17,830	7,733	10,097	17,830	6,585	10,210	16,795	6909	11757	18,666
50-54	7,588	9,770	17,358	7,588	9,770	17,358	6,646	10,066	16,712	7012	9705	16,717
55-59	7,798	7,612	15,410	7,798	7,612	15,410	7,370	8,816	16,186	6664	8090	14,754
60-64	7,648	7,262	14,910	7,648	7,262	14,910	7,427	6,971	14,398	7427	7425	14,852
65+	9,778	6,297	16,075	9,778	6,297	16,075	9,192	6,877	16,069	11253	8670	19,923
Total	76,502	85,737	162,239	76,205	85,736	161,941	68,238	89,755	157,993	68,082	88,752	156,834

Source: * LFS, MoLHR&** PHCB 2017 ***LFS 2021 NSB

Table 3.4 LAND COVER BY MAJOR CATEGORIES IN 2010 AND 2016

Land Cover class	Sub-Class	LCMP 2010			LULC 2016		
		Total Area (Ha)	Area (%)	Total Area (%)	Total Area (Ha)	Area (%)	Total Area (%)
Forests	Fir Forest	183,208.26	4.77	70.46	230,983.99	6.02	70.77
	Mixed Conifer Forest	613,963.92	15.99		519,585.68	13.53	
	Blue Pine Forest	80,023.99	2.08		101,155.06	2.64	
	Chir Pine Forest	107,666.51	2.80		101,537.45	2.64	
	Broadleaf Forest	1,688,956.50	43.99		1,763,899.50	45.94	
	Broadleaf & Conifer Forest	31,472.06	0.82				
Alpine Scrub	Alpine Scrubs				130,097.72	3.39	3.39
Shrubs	Shrubs	400,526.40	10.43	10.43	374,032.56	9.74	9.74
Meadows	Meadows	157,568.51	4.10	4.1	96,273.61	2.51	2.51
Cultivated Agricultural	Chhuzhing	31,361.23	0.82	2.93	31,891.87	0.83	2.76
	Kamzhing	69,670.79	1.81		68,260.64	1.78	
	Apple Orchard	2,041.47	0.05		5,529.92	0.14	
	Citrus Orchard	5,086.42	0.13				
	Areca nut Plantation	984.92	0.03				
	Cardamom Plantation	3,397.95	0.09				
	Others	13.43	-				
Built up areas	Built up Areas	6,150.87	0.16	0.16	7,457.03	0.19	0.19
Non-Built-up areas	Non-Built-up Areas	330.10	0.01	0.01	595.89	0.02	0.02
Snow Cover	Snow Cover	285,479.22	7.44	7.44	205,343.63	5.35	5.35
Bare Areas	Rock Outcrops	99,659.29	2.60	3.2	119,754.16	3.12	3.12
	Scree	23,287.71	0.61		39,701.39	1.03	
	Bare Soils	26.87	-				
Water Bodies	Lakes	4,753.42	0.12	0.72	6,252.58	0.16	0.65
	Reservoirs	130.70	-				
	Rivers	22,684.66	0.59		18,923.20	0.49	
Marshy Areas	Marshy Areas	319.47	0.01	0.01			
Degraded Areas	Landslides	7,032.54	0.18		3,730.22	0.10	0.10
	Gullies	6.66	-	0.54			
	Ravines	-	-				
	Moraines	13,596.24	0.35		14,393.94	0.37	
	Total	3,839,400.00	100.00	100	3,839,400.00	100.00	100

Source: LCMP & LULC, MoAF

Table 3.5 DZONGKHAG-WISE GEOGRAPHICAL AREA BY LAND COVER TYPES

(Value in Hectares)

Dzongkhag	Land Cover Types										
	Forests	Cultivated Agriculture	Shrubs	Meadows	Built up	Non-Built up	Moraines	Rocky Outcrops	Land-slides	Snow & Glacier	Water Bodies
Bumthang	139,411	3,399	58,927	10,096	481	-	2,033	23,779	4	29,118	1,844
Chhukha	166,099	7,892	6,414	2,625	894	45	-	462	343	-	1,375
Dagana	152,086	7,397	6,038	2,252	108	7	-	850	291	-	1,581
Gasa	60,842	458	94,883	10,985	44	-	9,402	62,701	64	68,734	2,284
Haa	125,768	1,718	34,424	9,481	275	3	-	15,883	19	391	673
Lhuentse	183,360	3,769	37,947	3,246	170	9	966	4,935	104	47,426	1,161
Monggar	175,879	6,530	7,810	736	316	8	-	2	364	-	893
Paro	66,238	5,462	34,347	12,704	655	37	-	5,599	-	1,897	523
Pema Gatshel	91,925	3,665	4,221	8	210	48	-	219	275	-	647
Punakha	91,887	4,704	9,250	483	298	4	-	250	6	2,189	809
Samdrup Jongkhar	168,645	5,497	8,798	479	191	35	-	174	363	-	1,698
Samtse	105,150	14,803	5,619	245	300	160	-	201	615	3	2,121
Sarpang	146,852	8,030	5,094	15	456	10	-	63	441	-	2,967
Thimphu	71,212	1,693	53,153	18,329	1,390	86	755	20,988	-	9,767	469
Trashigang	172,795	9,812	26,720	7,087	600	-	-	77	235	199	729
Trashigang Yangtse	100,379	3,492	20,883	823	103	-	-	464	32	16,460	860
Trongsa	153,780	2,556	16,300	4,463	399	8	-	556	118	1,002	426
Tsirang	55,265	5,705	1,390	60	70	2	-	216	24	-	432
Wandue Phodrang	264,060	5,826	64,131	12,066	512	133	1,239	21,756	53	27,876	1,988
Zhemgang	225,429	3,449	7,639	78	127	1	-	294	357	273	1,660
Total	2,717,061	105,855	503,987	96,262	7,598	595	14,394	159,467	3,705	205,336	25,140

Source: LULC, DoFPS

Table 3.6 DZONGKHAG WISE AREA LAND UNDER DIFFERENT AGRICULTURAL LANDUSE IN 2010 AND 2016

(Value in Hectares)

Dzongkhag	LCMP 2010			LULC 2016		
	Chuzhing	Kamzhing	Orchard	Chuzhing	Kamzhing	Orchards
Bumthang	24.70	2,883.90	11.50	68.60	3,330.70	-
Chhukha	1,586.70	5,735.80	1,918.00	1,882.90	5,682.20	327.10
Dagana	1,493.70	4,588.30	1,455.30	2,028.40	4,798.90	569.20
Gasa	143.60	386.30	-	148.40	309.90	-
Haa	88.50	2,068.50	624.60	181.40	1,486.80	49.60
Lhuentse	1,575.60	4,328.50	1.00	1,733.50	2,032.70	2.30
Monggar	436.40	5,300.00	3.30	687.40	5,832.10	10.00
Paro	1,763.70	3,555.80	1,023.70	1,888.40	2,886.60	686.80
Pema Gatshel	82.60	4,837.10	335.10	18.30	2,787.20	859.90
Punakha	5,073.00	261.90	16.70	4,304.00	390.90	8.90
Samdrup Jonkhar	1,147.60	6,731.30	249.10	1,121.00	4,212.40	163.20
Samtse	5,680.50	8,149.70	3,533.40	4,312.30	10,079.80	410.50
Sarpang	1,942.70	3,351.60	923.60	3,062.30	3,906.40	1,061.10
Thimphu	458.20	913.80	902.10	484.90	466.40	741.70
Trashigang	1,439.50	4,982.30	-	1,658.60	8,149.20	4.10
Trashigang Yangtse	946.60	2,112.40	-	1,049.60	2,442.60	-
Trongsa	1,082.00	1,205.00	-	1,231.80	1,321.70	2.20
Tsirang	1,527.20	2,867.50	314.40	2,080.70	3,320.40	303.50
Wandue Phodrang	4,013.70	1,930.00	0.10	3,113.10	2,713.20	-
Zhemgang	639.60	3,251.00	211.30	789.20	2,300.20	359.30
Total	31,146.10	69,440.60	11,523.40	31,844.90	68,450.50	5,559.60

Table 3.7 DZONGKHAG-WISE CASES UNDER LAND LEASED PROGRAM

Dzongkhag	2019-2020		2020-2021	
	No. of Cases	Area(acre)	No. of Cases	Area(acre)
Bumthang	3	2.489	4	0.92
Chukha	26	120.775	12	33.20
Dagana	5	31.4	0	0.00
Gasa	2	0.34	3	5.34
Haa	2	0.21	5	2.76
Lhuntse	2	0.196	2	0.20
Monggar	4	1.51	7	65.05
Punakha	9	13.221	4	3.67
Paro	37	25.465	9	1.98
Pema Gatshel	2	7.403	1	3.75
Samtse	41	578.587	31	43.09
Samdrup Jongkhar	14	55.056	21	71.36
Sarpang	15	20.15	30	55.85
Tsirang	3	2.231	6	16.73
Trongsa	9	1.284	0	0.00
Trashigang	7	0.833	7	1.42
Trashy Yangtse	3	1.86	0	0.00
Thimphu	24	7.46	12	39.36
Wangdue Phodrang	29	79.394	12	87.22
Zhemgang	1	0.5	2	0.44
Total	238	950.364	168	432.33

Source: National Land Commission (NLC)

Table 3.8 DZONGKHAG-WISE NUMBER OF CASES AND AREA RECOMMENDED BY DoA TO NLCS FOR LAND CONVERSION

Dzongkhag	2017		2018		2019		2020		2021	
	No. of Cases	Area (acre)	No. of Cases	Area (acre)	No. of Cases	Area (acre)	No. of Cases	Area (acre)	No. of Cases	Area (acre)
Chukha	-	-	1	1.36	2	0.63	2	0.93	-	-
Dagana	12	7.64	-	-	7	3.91	-	-	6	3.43
Gasa	-	-	-	-	-	-	-	-	-	-
Lhuntse	-	-	-	-	1	0.40	-	-	-	-
Mongar	1	0.13	-	-	-	-	-	-	-	-
Pemagatshel	2	2.34	-	-	-	-	-	-	-	-
Paro	2	0.48	26	6.63	51	17.09	18	3.94	31	10.66
Punakha	9	4.42	26	35.82	15	8.41	-	-	27	12.89
Samtse	-	-	3	5.59	13	12.23	10	7.78	-	-
Samdrupjongkhar	-	-	-	-	-	-	-	-	-	-
Sarpang	-	-	-	-	10	4.98	-	-	-	-
Thimphu	2	0.35	14	2.95	15	5.26	9	2.23	19	3.94
Trashigang	3	1.69	-	-	-	-	-	-	-	-
Trashiyangtse	5	3.39	-	-	23	5.22	-	-	-	-
Tsirang	1	1.04	-	-	-	-	-	-	3	1.75
Trongsa	1	0.50	-	-	5	1.77	-	-	2	1.10
Wangdue	4	1.10	3	4.86	8	6.78	-	-	9	4.80
Zhemgang	-	-	-	-	56	17.51	-	-	-	-
Total	42	23.07	73	57.21	206	84.18	39	14.88	97	38.58

Source: DoA, MoAF

Table 3.9 DZONGKHAG-WISE NUMBER OF CASES AND AREA NOT RECOMMENDED BY DoA TO NLCS FOR LAND CONVERSION

Dzongkhag	2017	2018		2019		2020		2021		
	Nos	Acres	Nos	Acres	Nos	Acres	Nos	Acres	Nos	Acres
Bumthang	-	-	-	-	-	-	-	-	4	0.92
Chhukha	-	-	-	-	4	4.92	-	-	12	33.20
Dagana	23	29.16	-	-	10	8.84	-	-	-	-
Gasa	-	-	-	-	-	-	-	-	3	5.34
Lhuntse	-	-	-	-	-	-	-	-	2	0.20
Monggar	-	-	-	-	-	-	-	-	7	65.05
Paro	1	0.30	28	7.27	22	8.89	13	3.8	9	1.98
Pema Gatshel	-	-	-	-	-	-	-	-	1	3.75
Punakha	10	7.90	18	12.65	20	14.16	-	-	4	3.67
Samtse	-	-	1	2.42	5	7.41	4	6.97	31	43.09
Samdrup Jongkhar	-	-	-	-	-	-	-	-	21	71.36
Sarpang	-	-	-	-	11	18.86	-	-	30	55.85
Thimphu	-	-	6	1.99	12	3.72	3	1.85	12	39.36
Trashigang	-	-	-	-	-	-	-	-	7	1.42
Trashi Yangtse	-	-	-	-	-	-	-	-	-	-
Tsirang	8	8.75	-	-	-	-	-	-	6	16.73
Trongsa	1	0.64	-	-	-	-	-	-	-	-
Wangdue Phodrang	20	25.67	3	2.20	14	8.57	-	-	12	87.22
Total	63	72.42	56	26.53	98	75.34	20	12.62	161	429.13

Source: DoA, MoAF

CHAPTER 4: MACHINERY

Mechanization of Bhutanese farming has been given importance since the 1980s and continues to this day. With the trend in young and able-bodied people seemingly leaving the rural farms in search of jobs in towns, the farms in the countryside face labour shortages and wages have steadily increased, driving the whole production prices up. Farm mechanization is therefore seen as one area that requires major focus.

The major importer of farm machinery has been Agriculture Machinery Centre (AMC) under the MoAF. However, in recent years, a number of private bodies have also entered the scene and play an important role in mechanizing Bhutanese farms. Further, the government in a

drive to speed up farm mechanization process has created

Farm Machinery Corporation

Limited (FMCL), a state-owned

enterprise. The job of importing, distributing, hiring

and providing maintenance services which has until recently been carried out by AMC will now be looked after by FMCL.



This chapter presents the statistics on number of different farm machineries imported, owned by government agencies and also owned by private individuals for farming purposes in a households.

Table 4.1 IMPORT OF FARM MACHINERIES FROM INDIA

(Volume in No. and Value in Million Nu.)

Types of machinery	2017		2018		2019		2020		2021	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value
Ploughs	958	5.48	215	3.77	1,024	3.13	3571	6.19	5708	7.82
Power tiller	340	14.87	152	11.01	338	14.16	1238	5.39	231	8.12
Straw /fodder Balers	-	-	-	-	-	-	45	1.29	35	0.08
Combine harvester-threshers	574	1.12	-	-	21	0.21	29	0.17	-	-
Threshing machines	-	-	72	0.28	70	0.28	95	1.02	191	1.59
Root or tuber harvesting machines	-	-	-	-	-	-	15	0.30	142	1.37
Milking machines	146	1.16	356	3.65	629	1.36	922	2.18	1777	4.38
Pedestrian controlled tractors (single axle tractor)	9	6.28	5	2.61	4	2.97	6	4.55	1	0.8

Source: Bhutan Trade Statistics, DRC, MoF compiled by PPD, MoAF

Table 4.2 IMPORT OF FARM MACHINERIES FROM OTHER COUNTRIES

(Volume in No. and Value in Million Nu.)

Type of machinery	Importing country	2017		2018		2019		2020		2021	
		Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value
Ploughs	China	351	6.58	450	10.01	100	3.53	470	17.19	838	23.47
	Japan	596	22.82	144	5.18	-	-	-	-	200	22.58
	Singapore	64	0.42	191	1.17	352	1.90	355	2.26	540	3.33
	Thailand	10	0.03	-	-	120	0.03	-	-	-	-
Power tiller	Vietnam	234	36.13	180	31.64	218	39.12	358	53.53	426	65.12
	Indonesia	-	-	20	7.16	2	0.49	20	7.44	-	-
	Japan	96	12.98	260	24.62	-	-	192	12.07	150	36.54
	China	65	8.50	-	-	2	0.03	-	-	262	29.54
	Thailand	401	80.27	-	-	2	0.44	-	-	-	-
	Singapore	446	11.78	169	9.48	219	9.08	140	11.50	135	11.84
Manure spreaders and fertilizer distributors	Singapore	-	-	-	-	180	4.00	-	-	-	-
Combine harvester - threshers	Japan	-	-	-	-	3	5.34	1	0.71	40	36.05
	China	-	-	-	-	-	-	8	0.54	5	0.10
Threshing machines	China	228	2.83	500	10.10	4	0.29	324	8.16	346	11.52
	Singapore	-	-	-	-	-	-	100	1.05	-	-
	Japan	-	-	-	-	-	-	5	3.01	-	-
Root or tuber harvesting machines	China	20	0.72	-	-	-	-	-	-	5	0.02
	Vietnam	270	6.20	-	-	-	-	-	-	-	-
Milking machine	China	-	-	-	-	-	-	-	-	5	0.08
Rice huller and husking machine	singapore	-	-	-	-	-	-	200	1.01	270	3.24
	Japan	-	-	-	-	-	-	-	-	8	1.00
	China	-	-	-	-	-	-	526	4.52	671	5.30
Flour-mill	singapore	-	-	-	-	-	-	50	0.46	870	6.15
	China	-	-	-	-	-	-	104	1.65	77	0.70

Source: Bhutan Trade Statistics, DRC, MoF compiled by PPD, MoAF

Table 4.3 GOVERNMENT OWNED FARM MACHINERY BY DZONGKHAG AS OF 2021

(Volume in Number, unless specified)

Dzongkhag	Power tiller	Mini power tiller	Tractor	Mini tractor	Power sprayer	Power reaper	Milling machine	Manual thresher	Power thresher	Combine thresher	Cornflake machine	Maize Sheller	Drier	Cardamom Drier
Bumthang	1	0	0	1	0	0	2	0	8	0	0	0	30	0
Chhukha	17	10	1	0	3	0	48	29	2	0	8	2	1	9
Dagana	1	10	0	0	5	0	11	0	0	0	11	1	0	22
Gasa	6	0	0	0	4	0	10	0	0	0	0	0	0	0
Haa	21	3	0	0	65	0	10	0	0	0	0	0	2	5
Lhuntse	25	4	0	0	4	0	12	3	1	5	12	10	54	0
Monggar	42	15	0	0	44	0	20	0	0	0	30	9	37	0
Paro	1	0	0	0	2	2	0	19	0	0	0	0	39	0
Pema Gatshel	46	12	0	0	2	0	75	7	1	0	16	31	16	1
Punakha	23	0	0	0	0	0	53	65	0	0	0	0	7	0
Samdrup Jongkhar	2	1	0	0	0	0	4	0	0	0	0	0	0	0
Samtse	25	1	0	0	10	0	11	1	0	0	4	0	0	0
Sarpang	2	4	0	0	0	1	3	0	9	0	2	0	12	1
Thimphu	8	1	0	0	0	0	1	0	0	0	0	0	1	0
Trashigang	31	37	1	1	1	2	19	28	0	0	14	2	98	0
Trongsa	13	8	1	1	7	0	1	0	0	0	0	0	5	0
Tsirang	13	18	0	0	5	0	8	0	0	0	2	28	10	4
Wangdue Phodrang	15	0	0	0	6	1	4	5	0	0	0	0	14	0
Zhemgang	19	1	0	0	4	0	23	0	0	0	13	0	4	7
Grand Total	339	142	3	3	165	6	324	157	21	5	130	90	338	49

Source: Moda system,, MoAF

Table 4.4 PRIVATE OWNED FARM MACHINERY BY DZONGKHAG AS OF 2021

(Volume in Number, unless specified)

Dzongkhag	Power tiller	Mini power tiller	Tractor	Mini tractor	Power sprayer	Power reaper	Milling machine	Manual thresher	Power thresher	Combine thresher	Cornflake machine	Maize Sheller	Drier	Cardamom Drier
Bumthang	73	2	54	1	6	0	22	0	0	0	0	0	2	0
Chhukha	21	190	1	0	9	4	42	5	0	0	0	0	0	7
Dagana	33	55	1	0	13	6	88	26	9	0	1	11	2	12
Gasa	54	5	0	0	19	0	24	104	1	0	0	0	3	0
Haa	42	11	0	0	16	0	10	6	4	3	0	0	0	0
Lhuntse	61	105	0	0	0	0	518	2	1	0	22	4	27	0
Monggar	186	66	4	0	1	0	860	15	1	0	207	39	9	0
Paro	377	124	3	1	123	65	171	435	48	2	8	0	30	0
Pema Gatshel	25	7	1	0	0	0	109	0	1	2	9	0	2	1
Punakha	736	5	1	0	1	0	919	693	6	0	0	0	15	0
Samdrup Jongkhar	2	0	0	0	0	0	30	0	0	0	0	0	0	0
Samtse	41	21	3	1	0	0	55	1	0	0	0	0	0	0
Sarpang	74	132	30	3	4	2	165	26	4	1	4	57	2	3
Thimphu	117	86	0	1	65	0	51	8	28	0	0	0	41	0
Trashigang	24	210	2	1	1	1	478	2	0	0	6	33	1	0
Trashigang	52	155	0	2	0	0	277	2	1	0	20	19	21	0
Trongsa	378	35	7	0	58	0	440	2	0	0	23	0	356	4
Tsirang	35	332	0	0	11	1	182	1	0	1	4	13	13	2
Wangdue Phodrang	636	10	98	0	385	15	459	615	1	0	0	1	12	0
Zhemgang	61	9	0	0	0	0	114	0	0	0	13	0	21	0
Grand Total	3028	1560	205	10	712	94	5014	1943	105	9	317	177	557	29

Source: MoA system, MoAF

CHAPTER 5: AGRICULTURAL INPUT SUPPLY

Since the inception of the 1st FYP, the ministry has been providing the agriculture inputs such as agrochemicals, seed & seedlings, and green house to all the farming communities in the country to promote the national food sufficiency and security.

The demand of seeds and seedlings were mostly produced in the farms of National Seed Centre and the deficit were produced by the Registered Seed Growers who were the collaborators of NSC. The farmers often depend on agrochemicals (pesticides and fertilizers) to combat pests and diseases, boost productivity, and improve crop quality.

Bhutan may not become totally organic, at least in the near future, but certainly the country is aware of the harmful effects of agrochemical pesticides and therefore strict measures are put in place to control the import and use. No private players are allowed to import agrochemicals due to fear that all kinds of dangerous and/or inferior quality



chemicals may be imported. Only National Plant Protection Centre (NPPC), an agency under Department of Agriculture, MoAF, is mandated to oversee the import and its distribution. From the statistics over the years, one will notice a gradual increase in

the quantity of agrochemicals imported and distributed.

This chapter first presents the statistics on import quantity and value of agrochemical imported from 2017 to 2021 based on the data maintained by Bhutan Trade Statistics. It gives an idea of the trend in agrochemical usage. Then we present data on agrochemical distribution by National Seed Centre and National Plant Protection Centre. One difference between the two sources is that BTS data is by calendar year basis (Jan – Dec) while NPPC&NSC data is by financial year basis (Jul – Jun).

Table 5.1 IMPORT OF PLANT PROTECTION CHEMICALS FROM INDIA

(Volume in MT. and Value in Million Nu.)

Commodity	2017		2018		2019		2020		2021	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value
Insecticides	53.09	18.91	78.97	23.64	69.12	24.96	82.51	34.63	114.03	44.97
Fungicides	1.98	0.66	-	-	5.94	2.97	5.57	1.15	2.95	1.2
Herbicides	0.08	0.48	-	-	536.50	32.09	568.68	25.98	5.01	1.75
Disinfectants	69.93	6.89	83.67	11.59	82.47	12.66	197.54	38.17	188.42	26.42
Others	438.80	16.97	179.78	6.94	23.79	7.24	31.19	5.97	496.00	23.71

Source: Bhutan Trade Statistics, DRC, MoAF compiled by PPD

Table 5.2 IMPORT OF PLANT PROTECTION CHEMICALS FROM OTHER COUNTRIES

(Volume in MT. and Value in Million Nu.)

Commodity	2017		2018		2019		2020		2021	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value
Insecticides	0.88	0.65	0.43	0.24	0.88	1.24	0.67	5.16	1.64	0.31
Fungicides	5.04	1.43	-	-	-	-	-	-	-	-
Herbicides	0.02	0.03	-	-	-	-	-	-	-	-
Disinfectants	-	-	0.01	0.11	0.02	0.11	6.28	2.11	10.91	4.69
Others	0.06	0.04	0.43	0.11	0.30	0.38	0.22	0.06	1.29	0.09

source: Bhutan Trade Statistics, DRC, MoAF compiled by PPD

Table 5.3.1 PLANT PROTECTION CHEMICALS DISTRIBUTED BY NPPC

(Volume in Kg/L, unless Specified)

Products	2017-2018					2018-2019				
	Insecticides	Fungicides	Herbicides	Rodencides	Non-toxic	Insecticides	Fungicides	Herbicide	Rodencides (gm)	Non-toxic
Bumthang	40.80	217.75	409.25	0.37	0.00	31.60	218.50	414.75	0.09	28.60
Chhukha	92.80	146.50	10543.50	0.00	5.50	72.50	1.00	16742.25	0.12	3.50
Dagana	23.00	1.25	5014.25	0.10	10.00	72.80	0.00	5287.50	15.30	51.25
Gasa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Haa	202.70	191.45	5311.50	2.67	26.25	152.70	93.25	74.50	0.82	20.00
Lhuntse	30.00	3.50	14025.00	2.00	0.00	26.40	1.25	23132.75	0.53	0.00
Monggar	170.00	0.75	7230.00	1.00	100.00	339.00	200.50	11941.00	0.50	230.00
Paro	1972.60	1018.85	161986.75	0.50	4297.40	1598.20	879.30	163130.50	0.67	3934.40
Pema Gatshel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Punakha	195.20	18.50	90009.50	0.28	0.00	339.20	25.55	70098.00	2.67	105.00
Samdrup Jongkhar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1000.00	0.00	0.00
Samtse	0.00	0.00	7300.00	0.10	2.00	0.00	0.00	5000.00	0.00	5.00
Sarpang	147.50	66.20	10235.00	0.00	117.50	76.70	30.45	9103.00	1.80	72.25
Thimphu	30.50	21.60	27010.00	0.10	0.00	1321.00	44.60	20036.00	11.75	0.20
Trashhi Yangtse	41.50	112.45	46000.00	1.00	0.00	40.00	104.05	62100.00	0.05	0.00
Trashigang	1849.30	1010.00	36029.00	0.61	3402.75	1509.60	703.50	30434.00	2.01	1205.70
Trongsa	51.00	40.00	16182.00	0.00	0.00	0.00	2.75	17165.00	0.05	0.00
Tsirang	61.30	32.40	11171.50	1.18	0.00	42.60	1.00	10871.00	12.37	20.00
Wangdue Phodrang	250.60	2083.40	41590.75	4.53	430.75	410.70	3741.95	57989.25	9.02	424.15
Zhemgang	0.00	0.30	0.00	0.00	0.10	2.00		0.00	0.00	0.50

Source: NPPC/DOA,MoAF

Table 5.3.2 PLANT PROTECTION CHEMICALS DISTRIBUTED BY NPPC

(Volume in Kg/L ,unless Specified)

Products	2019-2020					2020-2021		
	Insecticides	Fungicides	Herbicides	Rodencides (gm)	Non-toxic	Insecticides	Fungicides	Non-toxic
Bumthang	45.50	4.20	179.00	0.00	20.00	72.90	333.20	408.10
Chhukha	127.00	0.00	8582.50	0.00	13.50	402.20	147.25	664.15
Dagana	112.10	0.50	5012.00	3.31	62.00	329.30	65.25	554.95
Gasa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Haa	108.90	0.00	10107.75	0.00	81.00	114.00	80.75	211.15
Lhuntse	0.00	0.00	14520.00	0.00	0.00	70.70	12.50	88.70
Monggar	342.50	0.00	10093.00	0.00	0.00	781.80	142.50	1489.30
Paro	949.00	20.10	132028.50	0.00	2729.05	1793.90	1139.40	3689.00
Pema Gatshel	0.50	0.00	0.00	0.00	0.00	78.10	35.75	123.85
Punakha	250.80	6.80	75014.25	0.26	27.50	312.90	201.65	586.15
Samdrup Jongkhar	0.00	0.00	1000.00	0.00	0.00	2.00	4.00	6.00
Samtse	7.80	0.00	4502.00	0.00	30.50	12.00	2.50	19.50
Sarpang	34.00	0.00	20010.00	0.00	23.80	251.50	212.50	620.00
Thimphu	70.00	0.00	18000.00	0.00	0.00	1841.70	696.25	3894.75
Trashhi Yangtse	90.00	50.00	30934.50	0.00	38.10	269.00	193.00	476.50
Trashigang	589.60	0.50	35273.25	0.47	2967.95	502.10	304.40	1029.00
Trongsa	12.80	0.00	20033.00	0.00	0.60	66.00	0.75	80.75
Tsirang	12.00	5.00	20512.50	0.30	30.00	55.00	32.25	110.25
Wangdue Phodrang	318.40	9.60	52418.25	0.40	33.90	1039.10	5194.45	6872.65
Zhemgang	11.00	1.00	0.00	0.00	0.00	123.30	26.00	152.00

Source: NPPC/DOA,MoAF

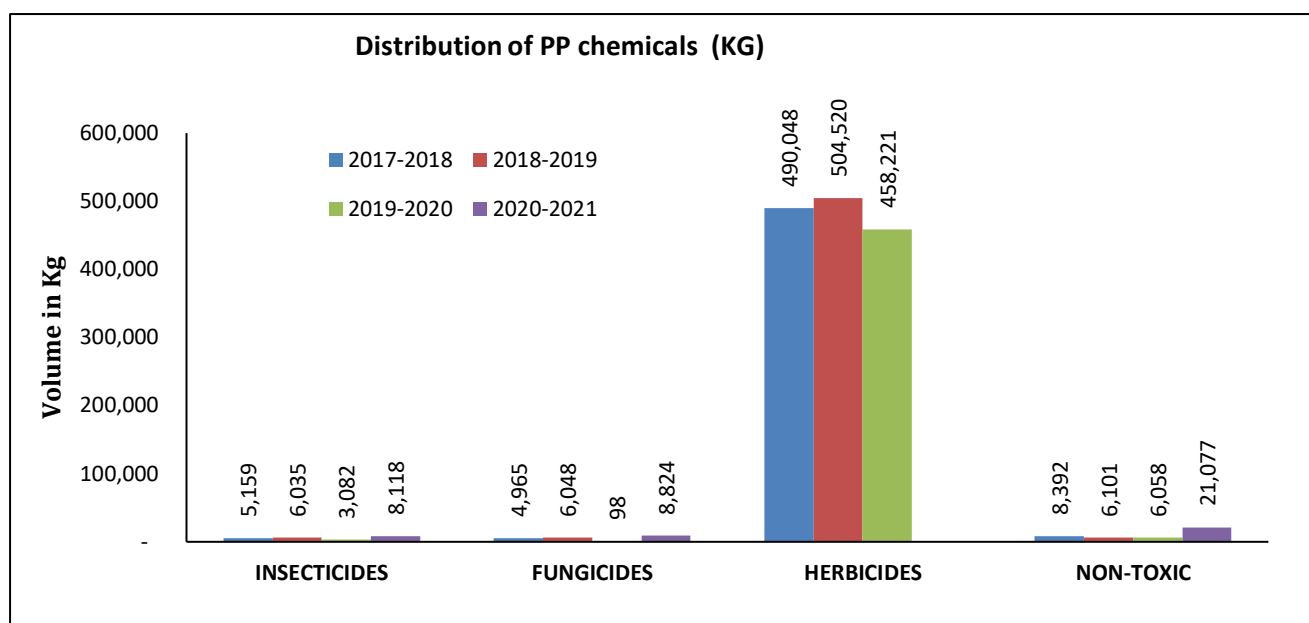


Figure 8: Trend of plant protection chemical distribution (2017-2021)

Table 5.3.3 IMPORT OF FERTILIZER (2017-2021)

(Volume in MT and Value in Million Nu.)

Commodity	2017		2018		2019		2020		2021	
	Vol.	Val.	Vol.	Val.	Vol.	Val.	Vol.	Val.	Vol.	Val.
Urea	1,196.06	17.69	2,110.03	35.49	1,517.93	25.19	1849.46	30.99	74.63	5.24
Ammonium sulphate	3.5	0.03	-	-	0.01	-	30.15	0.51	0.04	0.03
Ammonium nitrate	7.51	0.29	-	-	0.02	-	0.01	0.003	-	-
Sodium nitrate	2,885.75	82.31	-	-	0.01	-	-	-	-	-
Superphosphate	0.45	0.55	-	-	-	-	-	-	-	-
Potassium chloride	0.01	0.04	0.91	0.08	0.44	0.08	0.3	0.04	1.99	0.16
Potassium sulphate	3.45	0.09	0.02	0.01	0.01	0.0	0.004	0.003	0.01	0.006
Mixture of nitrogen, phosphorus & potassium	2.25	0.04	-	-	0.57	0.06	160	5.18	579.25	13.07

Source: Bhutan Trade Statistics, DRC, MoAF compiled by PPD

Table 5.3.4 FERTILIZER DISTRIBUTED BY NSC (2017-2018)

(Volume in MT)

Dzongkhag	Suphala	Urea	Single super phosphate	Muriate potash	Bone meal	Borax	Calcium Ammonium Nitrate (CAN)
Bumthang	33.55	89.50	-	-	-	-	-
Chhukha	176.96	37.40	4.80	-	-	-	0.45
Dagana	1.25	0.75	-	-	-	-	-
Gasa	-	-	-	-	-	-	-
Haa	16.00	8.50	-	-	-	-	-
Lhuentse	5.30	6.50	-	-	-	-	-
Monggar	49.50	111.05	-	-	-	-	-
Paro	128.65	150.80	82.00	1.20	-	-	0.10
Pema Gatshel	2.00	-	-	-	-	-	-
Punakha	90.65	130.89	10.00	0.05	-	-	-
Samtse	2.90	3.60	-	-	-	-	-
Sarpang	6.65	15.50	1.60	0.10	0.15	-	-
Samdrup Jongkhar	-	-	-	-	-	-	-
Thimphu	140.65	55.20	53.95	9.75	0.75	0.15	0.15
Trashigang	73.30	445.20	28.85	0.15	-	-	-
Tashi Yangtse	49.55	89.50	-	-	-	-	-
Trongsa	9.00	6.85	-	-	-	-	-
Tsirang	4.00	12.00	-	2.78	-	-	-
Wangdue Phodrang	588.35	105.00	26.05	0.60	-	-	-
Zhemgang	-	-	-	-	-	-	-
Total	1,378.26	1,268.24	207.25	14.63	0.90	0.15	0.70

Source: NSC, DoA, MoAF

Table 5.3.5 FERTILIZER DISTRIBUTED BY NSC (2018-2019)

(Volume in MT)

Dzongkhag	Suphala	Urea	Single super phosphate	Muriate potash	Bone meal	Diammonium phosphate (DAP)	Borax	Calcium Ammonium Nitrate (CAN)
Bumthang	49.94	146.49	298.4	-	0.25	-	-	-
Chhukha	66.57	106.02	-	-	-	1.15	0.02	0.25
Dagana	11.19	7.85	-	-	-	-	-	-
Gasa	-	-	-	-	-	-	-	-
Haa	15.65	12.52	-	-	0.2	-	-	-
Lhuentse	0.1	110.38	0.2	-	-	-	-	-
Monggar	44.84	149.07	0.25	-	-	-	-	-
Paro	109.55	86.21	32.55	1.75	-	-	0.19	-
Pema Gatshel	0.04	0.08	-	-	-	-	-	-
Punakha	106.23	123.61	9.35	-	-	-	-	-
Samtse	1.79	3.99	-	-	-	0.2	-	0.25
Sarpang	4.2	15.84	2.75	0.2	-	-	-	-
Samdrup Jongkhar	-	-	-	-	-	-	-	-
Thimphu	113.67	78.78	40.35	1.8	0.15	0.2	0.19	-
Trashigang	107.15	170.44	21.6	-	-	-	-	-
Trashhi Yangtse	36.15	143.17	-	-	-	-	-	-
Trongsa	12	11.95	-	-	-	-	-	-
Tsirang	9.32	17.57	-	-	0.85	-	-	-
Wangdue	507.1	90.14	145.2	0.8	0.75	-	-	-
Zhemgang	-	-	-	-	-	-	-	-
Total	1195.49	1274	550.65	4.55	2.2	1.55	0.41	0.5

Source: NSC, DoA, MoAF

Table 5.3.6 FERTILIZER DISTRIBUTED BY NSC (2019-2020)

(Volume in MT)

Dzongkhag	Suphala	Urea	Single super phosphate	Muriate potash	Diammonium phosphate (DAP)	Borax
Bumthang	41.40	143.36	280.00	-	-	-
Chhukha	175.45	117.36	-	-	-	-
Dagana	18.50	9.77	-	-	-	-
Gasa	-	-	-	-	-	-
Haa	-	19.98	-	-	-	-
Lhuentse	11.00	62.91	0.25	-	-	-
Monggar	58.95	58.86	4.20	-	-	-
Paro	174.25	126.45	3.50	-	-	0.21
Pema Gatshel	8.75	1.31	-	-	-	-
Punakha	96.25	134.85	14.00	-	-	-
Samtse	-	-	-	-	-	-
Sarpang	4.95	7.65	1.00	-	-	-
Samdrup Jongkhar	3.50	16.02	0.70	-	0.40	-
Thimphu	46.50	143.82	-	-	-	-
Trashigang	179.35	99.72	59.65	1.50	-	0.25
Tashi Yangtse	271.85	372.56	57.20	-	-	-
Trongsa	17.85	10.89	-	-	-	-
Tsirang	5.60	9.86	-	-	-	-
Wangdue Phodrang	652.35	113.09	170.60	-	-	-
Zhemgang	-	-	-	-	-	-
Total	1766.50	1448.43	591.10	1.50	0.40	0.46

Source: NSC, DoA, MoAF

Table 5.3.7 FERTILIZER DISTRIBUTED BY NSC (2020-2021)

(Volume in MT, unless specified)

Dzongkhag	Suphala	Urea	Single super phosphate	Muriate potash	Borax	Diammonium phosphate (DAP)
Bumthang	52.94	199.44	351.45	0.35	0	0
Chukha	254.30	118.95	5.10	0.05	0	0.90
Dagana	13.20	6.84	0	0	0	0
Haa	21.00	17.55	2.50	0	0	0
Lhuentse	18.65	25.11	0.35	0	0	0
Mongar	53.05	34.34	14.20	0	0	0
Paro	298.55	147.02	7.70	1.60	0.15	0
Pema Gatsel	0	5.13	0	0	0	0
Punakha	97.44	151.16	17.95	0.00	0	0
Samtse	4.05	3.51	0	0	0	0
Sarpang	4.50	27.05	0.50	1	0	0
Thimphu	136.30	71.88	45.95	4.15	0.18	0
Trashigang	243.80	101.39	42.25	0	0	0
Trashy Yangtse	62.51	28.85	3.50	0	0	0
Trongsa	21.40	13.86	0	0	0	0
Tsirang	10.05	9.77	0.60	0	0	0
Wangdue	563.75	119.28	183.20	1.75	0	0
Total	1855.49	1081.10	675.25	8.40	0.33	0.90

Source: NSC,DOA,MoAF

Table 5.4.1 VEGETABLE SEED & SEEDLINGS DISTRIBUTED BY NSC (2018-2021)

(Volume in Kg, unless specified)

Commodity	2018-2019	2019-2020	2020-2021
Vegetable Seeds			
Bean Borlotto Climber	3,210.95	4783.85	5819.2
Bean Borlotto Dwarf	93.70	703	499.45
Beans Rajma	-	2603.5	2130.65
Bean Pole	81.05	602.45	242.25
Bean Top Crop	70.55	33.95	56.00
Beetroot DDR	148.61	283.7	135.94
Bitter Gourd	43.75	43.94	127.41
Bottle Gourd	35.31	17.71	60.00
Brinjal PP Long	68.34	96.07	315.20
Brocoli Centauro Hybrid	196.77	382.81	512.26
Brocoli Dessico	139.46	228.54	154.58
Bunching Onion No. 21	31.09	77.16	24.13
Cabbage Bondy Cross Hybrid	144.22	226.74	154.51
Cabbage Golden Acre	137.06	229.58	285.30
Cabbage Golden Cross Hybrid	158.73	311.58	344.73
Cabbage Green Coronet Hybrid	91.20	146.35	116.57
Carrot All Season Hybrid	64.30	155.4	202.77
Carrot New Kuroda	420.24	820.23	711.82
Cauliflower Khangma Early	134.43	187.74	119.79
Cauliflower Snow Mystique Hybrid	232.62	484.03	359.93
Cauliflower (Pragati 40)	-	-	34.06
Cauliflower white express 50	-	-	38.34
Chilli Hyb Pan 1498	2.00	-	-
Chili Hyb SHP4884	35.00	43.35	174.27
Chili Hyb SV2319HA	35.00	70.02	148.09
Chili IR-8	113.40	130.97	177.26
Chili Sha Ema	66.29	208.2	263.66
Chili Urka Bangla	-	0.25	-
Chinese Cabbage Kyoto	46.87	60.44	30.20
Coriander	70.05	140.2	178.61
Cucumber Frontier Hybrid	7.31	10.48	19.54
Cucumber Santon No. 1	33.18	46.65	52.60
Cucumber Shaba Genchu	12.10	19.26	1.24
Garlic	200.00	-	-
Japanese Green Mibuna	1.56	20	4.02
Japanese Green Taisai	7.68	-	-

Ladies Finger Kranti	28.52	124.96	171.23
Lettuce Great Lake	23.99	51.14	59.27
Mustard Green Him Beauty	88.74	228.71	62.05
Onion Bombay Red	147.93	171.79	136.65
Onion Pune Red Hybrid	260.08	362.37	1,219.80
Onion (red creole)	-	-	8.00
Onion white creole	-	-	3.77
Pea Arkel	181.80	318.2	1,262.20
Pea Mr. Big	117.00	121.85	33.90
Pea Usui	1,996.40	3879.4	974.50
Radish-35 days		25.5	18.32
Radish Minowase	137.32	338.06	273.34
Radish SPTN	262.95	335	514.68
Spinach All Green	4.90	52.15	81.19
Spinach Leaf Beet	29.62	0.03	38.23
Squash Zucchini	12.58	49.66	17.01
Tomato Cosmic	-	-	1.77
Tomato PS-61 Hybrid	12.76	41.83	107.96
Tomato Rattan	22.94	55.93	58.74
Tomato Roma	24.13	58.41	62.51
Turnip PTWG	21.58	41.53	44.99
Water Melon Sugar Baby	34.84	43.33	96.33
Organic commodities	-	-	
Beans borlotto-Indeterminate	-	-	30.00
Beans borlotto-Determinate	-	-	65.00
Royal quinoa seeds	-	-	145.00
Buck wheat	-	-	1600.00
Ginger-Local	-	25330	3400.00
Turmeric-Local	-	21200	2500.00
Potato Seeds			
Potato Chipsona	3,000.00		
Potato-Desiree	229,000.00	331381	247,686.00
Potato-desiree (G3)	-	-	3,900.00
Potato-Desiree (Oversize)	450.00	1000	
Potato-Desiree (Under Size)	1,600.00	5750	1,000.00
Potato-Kufri Joyti	-	-	-
Potato-Nasephey Kewa Kaap	1,000.00	1950	7,100.00
Potato-Yusimaap	-	33941	6,450.00
Potato-Khangma Kaap	-	7800	-

Source: NSC, DoA, MoAF

TABLE 5.4.2 TEMPERATE SEED & SEEDLING DISTRIBUTED BY NSC

(Volume in Kg, unless specified)

Category	2018-2019	2019-2020	2020-2021
Apple	8,613.00	22,523.00	9,576.00
Almond Kagzi	-	412.00	597.00
Apricot Shakapara	490.00	766.00	1,453.00
Cherry Seneca	204.00	291.00	116.00
Chestnut Jewphu-1	44.00	315.00	417.00
Peach	1,151.00	2,340.00	3,218.00
Pear	2,550.00	6,541.00	9,692.00
Persimmon	1,546.00	2,135.00	830.00
Plum	785.00	117.003	1,451.00
Prune	14.00		-
Walnut Kagzi	1,895.00	658.00	1,000.00
Assorted seedlings			
Cardamomn Barlangay	46,751.00	30,005.00	0.00
Asparagus	84,880.00	665,400.00	146,995.00
Strawberry Seedling	1,508.00	2,035.00	3,435.00

Source: NSC,DoA,MoAF

TABLE 5.4.3 SUBTROPICAL SEED & SEEDLING DISTRIBUTED BY NSC

(Volume in Number, unless specified)

Commodity	2018-2019	2019-2020	2020-2021
Areca nut Bhur S-1	4,921	5,539	7,444
Avocado Hass	6,771	6,196	9260
Citrus Seedlings	12,350	10,241	35,928
Banana G-Naine	6,539	3,747	9,500
Dragon Fruit Gewaringpa-1	652	5,171	5,817
Guava Bebsew Shakha	1,531	577	598
Jack Fruit Bhur S-1	31	145	7
Litchi	8,845	4,678	2,042
Mango Grafted	16,196	6,473	6,780
Papaya Bhur S-1	115	1,119	1,699
Passion Fruit	2	820	400
Pine Apple	120,845	56,000	7,860
Pomegranate Bedana	1,752	1,265	1,012

Source: NSC,DoA,MoAF

Table 5.4.4. CEREALS SEED & SEEDLING DISTRIBUTED BY NSC

(Volume in Kg, unless specified)

Commodity	2018-2019	2019-2020	2020-2021
Maize			
Maize Chaskharpa	9,350.00	8,520.00	7,950.00
Maize Hybrid	10,304.00		40,068.00
Maize Shaphangma	3,265.35	1,970.00	680.00
Maize Yangtsepa	56,872.50	46,310.00	52,890.00
Maize Rejects	1,890.00		
Maize P3377/P3302		14,003.00	
Paddy			
Paddy Bajo Maap 1	80.00	810.00	
Paddy Bajo Maap-2	2,225.00	5,070.00	1,700.00
Paddy Bajo kaap 1		720.00	
Paddy Bajo kaap 2		500.00	1,000.00
Paddy Bhur Kamja-1	22,333.00	28,415.00	19,700.00
Paddy Bhur Kamja-2	447.00		
Paddy IR-20913	-	370.00	200.00
Paddy IR-64	500.00	1,830.00	1,700.00
Paddy Khangma Maap	13,700.00	17,120.00	16,420.00
Paddy No.11	2,150.00	1,260.00	2,240.00
Paddy Yusi Ray Maap	7,420.00	3,560.00	2,560.00
Paddy Reject	397.00		
Wheat			
Wheat Bajosokha Kaa	1,140.00	60.00	68.90
Wheat Bumthang Kaa-60	-	260.00	
Wheat Gumasokha Kaa	16,720.00	25,203.00	26,900.00
Gulum			272.00
Others cereal			
Quinoa	212.00		
Millet		510.00	
Buckwheat		1,045.00	
Oil Seeds & Pulses			
Mustard M-27	6,451.30	8,237.50	8,730.00
Soya Bean Khangma Lebi-1	2,635.00	1,870.00	455.00
Yusi Peka 1	149.00		
Yusi Peka 2	1.00	7,179.00	975.00
Lentil (WBL-58)			4,770.00

Source: NSC, DoA, MoAF

Table 5.5 DOC (DAY OLD CHICK) DISTRIBUTED BY NRPC

(Volume in Number, unless specified)

Dzongkhag	2018-2019	2019-2020	2020-2021	2021-2022
Bumthang	-	-	-	-
Chhukha	-	-	-	-
Dagana	500	3830	2420	10915
Gasa	-	-	2265	2500
Haa	-	-	1000	-
Lhuntse	-	-	-	-
Monggar	-	-	-	-
Paro	-	-	-	-
Pema Gatshel	-	-	-	-
Punakha	15300	13300	8710	14225
Samdrup Jongkhar	3000	9450	0	0
Samtse	15450	7100	4505	0
Sarpang	153199	118175	37591	105802
Thimphu	2500	-	-	-
Trashigang	-	-	-	-
Trongsa	700	-	3745	10863
Tsirang	56145	26075	27534	56048
Wangdue Phodrang	2900	2450	5600	19245
Zhemgang	2200	2175	2000	9990
BLDCL	-	-	1500	1500

Source: DoL, MoAF

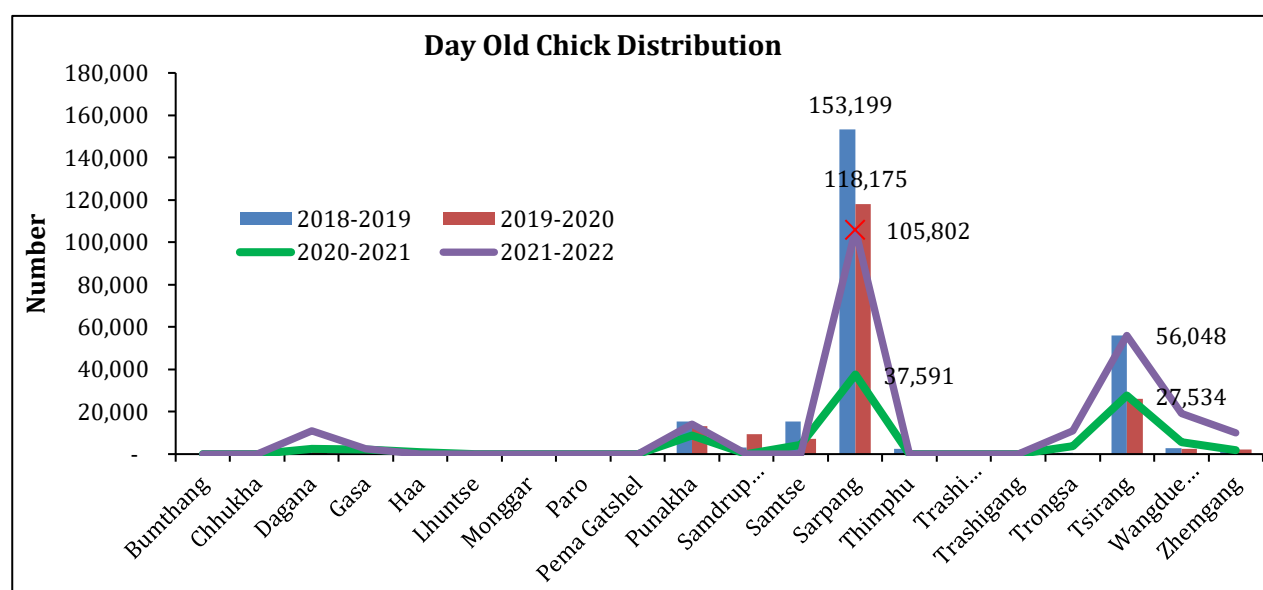


Figure 9: Trend of DoC supplied from National Research Poultry Centre (2017-2021)

Table 5.6 BIOGAS PLANTS ACHIEVEMENT BY DZONGKHAG

(Volume in Number, unless specified)

Dzongkhag	2018-2019	2019-2020	2020-2021
Bumthang	10	19	0
Chhukha	0	128	64
Dagana	40	62	34
Gasa	5	0	4
Haa	0	9	0
Lhuntse	6	9	7
Monggar	83	124	76
Paro	17	2	0
Pema Gatshel	2	33	30
Punakha	8	11	9
Samdrup Jongkhar	61	133	23
Samtse	79	152	70
Sarpang	4	105	97
Thimphu	10	10	10
Trashhi Yangtse	0	51	146
Trashigang	19	32	76
Trongsa	18	12	23
Tsirang	7	89	48
Wangdue Phodrang	25	39	24
Zhemgang	20	22	12
Medium scale plant	0	0	1

Source: DoL, MoAF

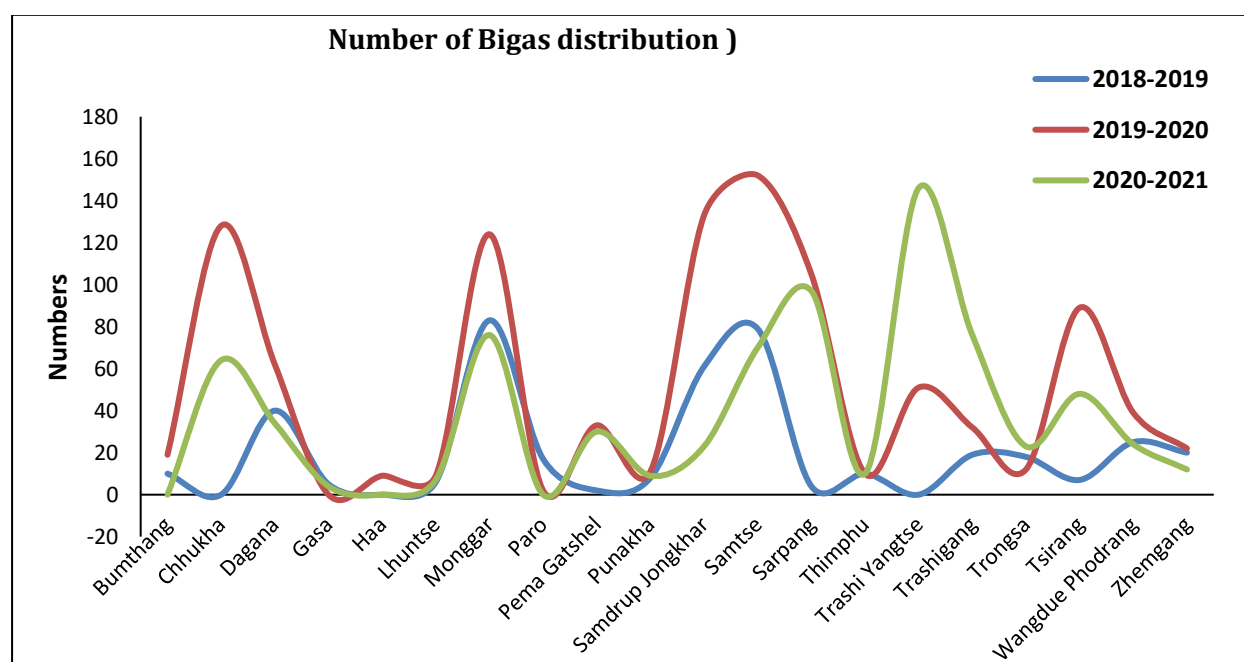


Figure 10: Trend of biogas distribution during (2018-2021)

Table 5.7 GREENHOUSE DISTRIBUTION TO DZONGKHAGS

Dzongkhag	2019-2020		2020-2021		2021-2022	
	Fabricated plastic	Low-Cost plastic	Fabricated plastic	Low-Cost plastic	Fabricated plastic	Low-Cost plastic
Bumthang	0	0	0	0	11	112
Chhukha	77	6	103	28	13	0
Dagana	82	23	181	28	18	1
Gasa	0	161	7	85	0	48
Haa	8	2	63	75	0	18
Lhuntse	42	0	113	0	41	0
Monggar	37	5	43	3	27	0
Paro	45	3	153	5	3	0
Pema_Gatshel	49	19	58	12	8	1
Punakha	40	71	53	25	1	0
Samdrup Jongkhar	50		100		68	
Sarpang	72	1	240	191	14	2
Samtse	8	61	45	121	1	23
Thimphu	12	33	84	62		
Trashigang	29	154	132		19	
Trashy_Yangtse	42	23	57	61	65	1
Trongsa	96	95	83	51		
Tsirang	49	124	162	52	106	30
Zhemgang	29	4	6		1	
Wangue	13	166	56	770	15	9
Total	780	951	1739	1569	411	245

CHAPTER 6: INFRASTRUCTURE

This chapter presents statistics on the state of various production infrastructures such as offices, irrigation canals, farm roads, and electric fencing across the country. These kinds of hardware inputs are crucial in keeping rural farms up and running, combating rural-urban migration and ensuring food self-sufficiency or food security.

The construction of irrigation canals and farm roads is often executed by both central bodies in Thimphu (e.g. by the engineering division of DoA) and the Dzongkhags themselves through funding from various sources, hence compilation of statistics accurately and timely on these infrastructures is quite challenging.

Electric fencing, which has become quite popular as a means to keep wild animals off crops is another input that is executed by several bodies such as NPPC under DoA, various functionaries under DoFPS, various projects, and even NGOs. Private individuals are also known to put electric fencing around their fields. Nonetheless, we present here reliable and updated figures to the best extent possible.

Table 6.1 AGRICULTURE CENTRES UNDER DoA AS OF DEC. 2021

Offices/Center	Number
RNR center	198
Agriculture Extension Centre	15
National Mushroom Centre	1
Agriculture Research and Development Centre	3
Agriculture Research and Development Sub-Centre	5
Soil & Plant Analytical Laboratory	1
Research and Development Centre Organic Agriculture	1
National Plant Protection Centre	1
Farm Machinery Cooperation Limited (FMCL) (SOE)	1
National Seed Centre	1
Regional Seed Centre	4
Seed Production Farms	4
Fertilizer Store	1
Agriculture Machinery Centre	1
Regional Agriculture Machinery Centre	3
National Post Harvest Centre	1
Regional Post Harvest Centre	4

Source: DoA, MoAF

Table 6.2 FORESTRY OFFICES/CENTRES UNDER DoFPS AS OF DEC. 2021

Offices/Center	Number
Functional Division Offices	7
Territorial Division Offices	14
Range Offices (Territorial Division)	42
Beat Office (Territorial Division)	75
Forest check Posts (Territorial Division)	38
Outpost (Territorial Division)	1
Protected areas (Parks & Sanctuaries)	10
Range Offices (Parks & Sanctuaries)	33
Beat Office (Parks & Sanctuaries)	10
Forest check Posts (Parks & Sanctuaries)	6
Outpost (Parks & Sanctuaries)	13
Forest Management unit	21
Biological Corridors	8

Source: DoFPS, MoAF

Table 6.3 LIVETSOCK CENTRES UNDER DoL AS OF DEC. 2021

Offices/Centre	Number
Livestock Extension Centre's (LEC)	15
National Livestock Research and Development Centre	7
National Center for Animal Health	1
Dzongkhag Veterinary Hospitals	20
Regional Livestock Development Centre	4
National Veterinary Hospital	1
City Veterinary Hospital	1
Satellite Veterinary Hospitals	4
Government Livestock Farms (for breeding/production)	16
Vaccine Production Centre	1
Liquid Nitrogen	2
Semen Processing Centre	1
National Highland Program	1
Livestock Central Store	1

Source: DoL, MoAF

Table 6.4.1 IRRIGATION INFRASTRUCTURE (2018-2019)

Dzongkhag	No of Schemes	Functionality Status (No.)			Water Availability Perception			
		Functional	Semi-Functional	Non-functional	Abundant	Adequate	Inadequate	Critical
Bumthang	25	25	0	0	7	11	7	0
Chhukha	36	34	0	2	20	12	4	0
Dagana	95	81	3	11	22	34	38	0
Gasa	3	3	0	0	1	2	0	0
Haa	12	11	0	1	1	3	7	0
Lhuentse	46	43	0	3	15	18	13	0
Monggar	33	33	0	0	11	12	10	0
Paro	56	54	0	2	17	22	13	4
Pema Gatshel	9	4	0	5	2	2	5	0
Punakha	93	89	0	4	10	65	13	1
Samdrup Jongkhar	42	41	0	1	19	15	8	0
Samtse	31	28	0	3	11	13	9	0
Sarpang	97	78	2	17	34	41	22	0
Thimphu	29	28	1	0	14	10	3	1
Trashigang	43	32	2	9	8	14	12	9
Trashigang Yangtse	47	39	3	4	15	22	7	1
Trongsa	45	37	1	7	6	29	9	1
Tsirang	84	73	2	8	23	45	12	2
Wangdue Phodrang	99	89	5	5	17	61	17	4
Zhemgang	42	33	0	9	11	21	1	9
	967	855	19	91	264	452	210	32

Source: DoA, MoAF

Table 6.4.2 IRRIGATION INFRASTRUCTURE (2019-2020)

Dzongkhag	No of Schemes	Functionality Status (No.)			Water Availability Perception			
		Functional	Semi-Functional	Non-functional	Abundant	Adequate	Inadequate	Critical
Bumthang	25	25	0	0	7	11	7	0
Chhukha	45	41	0	4	18	18	9	0
Dagana	97	89	3	5	22	37	38	0
Gasa	3	3	0	0	1	2	0	0
Haa	24	24	0	0	1	13	7	3
Lhuentse	52	52	0	3	14	24	14	0
Monggar	34	33	0	1	11	10	13	0
Paro	56	55	0	2	17	19	16	4
Pema Gatshel	10	7	0	3	2	3	5	0
Punakha	94	91	0	3	20	60	13	1
Samdrup Jongkhar	42	40	0	2	18	15	9	0
Samtse	37	34	0	3	11	17	9	0
Sarpang	109	90	2	17	33	54	22	0
Thimphu	29	28	1	0	14	10	3	1
Trashigang	47	38	1	8	8	16	14	9
Trashi Yangtse	47	42	0	5	14	25	7	1
Trongsa	50	43	1	6	6	34	9	1
Tsirang	84	75	2	7	23	44	14	3
Wangdue Phodrang	99	88	5	6	17	60	17	5
Zhemgang	42	33	0	9	10	14	5	13
	1026	931	15	84	267	486	231	41

Source: DoA, MoAF

Table 6.4.3 IRRIGATION NEW CONSTRUCTION (2020-2021)

Dzongkhag	Beneficiary household (No)	Wetland Command area (acre)	Dryland command area (acre)	Length in km
Bumthang	-	-	-	-
Chhukha	75	59.20	43.60	4.60
Dagana	153	260.40	606.90	7.00
Gasa	7	5.00	4.00	4.00
Haa	-	-	-	-
Lhuntse	12	9.31	-	1.00
Monggar	116	59.51	-	6.20
Paro	545	508.77	283.00	25.60
Pema Gatshel	-	-	-	-
Punakha	438	1351.00	121.00	54.20
Samdrup Jongkhar	185	400.00	-	14.30
Samtse	163	219.00	132.00	3.63
Sarpang	624	1687.43	675.00	27.05
Thimphu	242	180.99	115.00	19.08
Trashigang	70	31.50	-	1.47
Trashigang	118	43.00	140.00	4.50
Trongsa	174	223.18	-	10.00
Tsirang	35	96.00	-	8.60
Wangdue Phodrang	556	1942.29	131.04	63.95
Zhemgang	-	-	-	-
Grand Total	3513	7076.58	2251.54	255.17

Source: MoDa system

Table 6.4.4 IRRIGATION MAINTENANCE (2020-2021)

Dzongkhag	Beneficiary household (Nos.)	Wetland Command area (acre)	Dryland command area (acre)	Length in km
Bumthang				
Chhukha	75	87.50	20.00	2.40
Dagana	-	-	-	-
Gasa	-	-	-	-
Haa	-	-	-	-
Lhuntse	-	-	-	-
Monggar	168	71.00	52.80	14.90
Paro	-	-	-	-
Pema Gatshel	-	-	-	-
Punakha	49	130.00	3.00	8.57
Samdrup Jongkhar	114	98.52	115.00	14.50
Samtse	160	207.00	123.50	11.50
Sarpang	-	-	-	-
Thimphu	-	-	-	-
Trashhi Yangtse	404	385.20	777.00	9.00
Trashigang	149	36.40	315.00	3.50
Trongsa	-	-	-	-
Tsirang	186	98.86	272.78	4.10
Wangdue Phodrang	85	152.36	240.88	0.39
Zhemgang	159	20.00	159.00	11.50
Grand Total	1549	1286.84	2078.96	80.36

Source: MoDa system

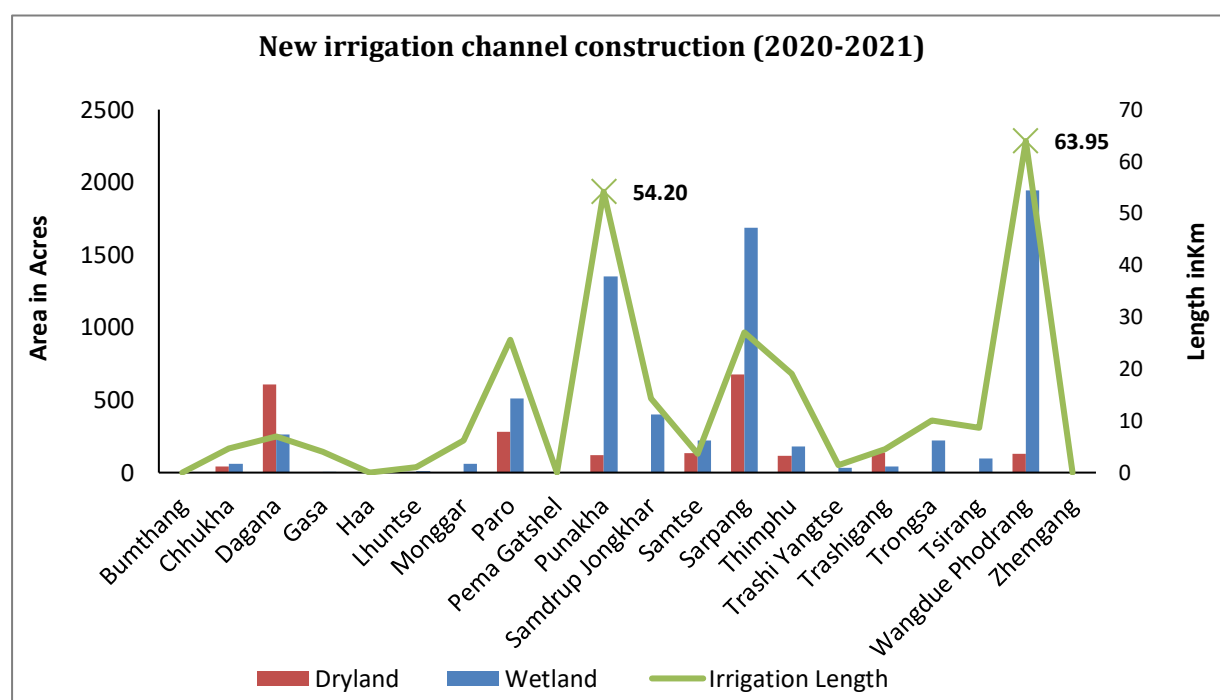


Figure 11: Dzongkhag-wise new irrigation channel construction (2020-2021)

Table 6.5.1 ELECTRIC FENCING LENGTH AND LAND AREA COVERED

Dzongkhag	FY2017-2018				FY2018-2019			
	Fence length (km)	Beneficiaries (No)	Dryland (acre)	Wetland (acre)	Fence length (km)	Beneficiaries (No)	Dryland (acre)	Wetland (acre)
Bumthang	30.65	150	221.00	-	104.11	486	578.59	23.90
Chukha	12.64	98	146.00	36.00	8.34	62	79.13	-
Dagana	19.70	121	175.33	176.08	21.00	5	8.22	-
Gasa	7.30	23	122.00	7.00	18.70	38	33.95	5.35
Haa	20.26	177	261.98	-	33.76	158	282.60	-
Lhuentse	73.70	113	234.90	13.40	-	-	-	-
Monggar	76.74	374	204.20	18.00	-	-	-	-
Paro	35.50	110	30.00	130.00	54.50	296	-	-
Pema Gatshel	5.00	24	73.00	-	19.00	40	75.83	-
Punakha	53.45	100	13.26	55.24	65.20	219	31.33	318.26
Samdrup Jongkhar	49.00	60	60.00	22.00	50.00	0	-	-
Samtse	18.00	-	-	-	9.85	85	-	105.70
Sarpang	50.88	272	2,244.93	732.42	11.00	127	134.00	171.00
Thimphu	-	-	-	-	-	-	-	-
Trashigang	50.72	352	544.33	163.00	16.01	50	175.90	2.25
Trashigang Yangtse	103.06	356	221.25	422.00	-	-	-	-
Trongsa	156.37	638	533.04	961.55	39.90	212	68.12	38.45
Tsirang	48.45	194	-	440.65	38.30	156	271.07	169.74
Wangdue Phodrang	34.66	116	205.33	50.97	195.73	507	63.20	795.25
Zhemgang	43.88	218	315.00	241.00	20.91	103	-	265.01
Total	889.95	3496	5,605.56	3,469.31	706.31	2544	1,801.94	1,894.91

Source: NPPC, DoA, MoAF

Table 6.5.2 ELECTRIC FENCING LENGTH AND LAND AREA COVERED (2019-2020)

Dzongkhag	Fence length (km)	Beneficiaries (No)	Dryland (acre)	Wetland (acre)
Bumthang	157.22	794	797.3	79
Chukha	1	22	30	-
Dagana	2.5	7	13.5	1.5
Gasa	10.4	28	19.2	32.85
Haa	25	82	141.16	-
Lhuentse	-	-	-	-
Monggar	230.15	939	1098	105.5
Paro	97.238	648	1090.91	516.54
Pema Gatshel	21.5	138	124.6	0
Punakha	84.45	288	112.673	603.213
Samdrup Jongkhar	61.29	245	122	331.25
Samtse	3.5	32	69.6	7.1
Sarpang	37.98	104	175.1	32.5
Thimphu	29	98	132.63	62.09
Trashigang	122.744	528	768.32	193.2
Trashhi Yangtse	101.6	-	-	-
Trongsa	58.68	279	312.18	64.23
Tsirang	54.27	343	471.09	327.26
Wangdue Phodrang	173.871	708	367.618	1214.069
Zhemgang	20	78	35	47
Total	1292.393	5361	5880.881	3617.302

Source: NPPC, DoA, MoAF

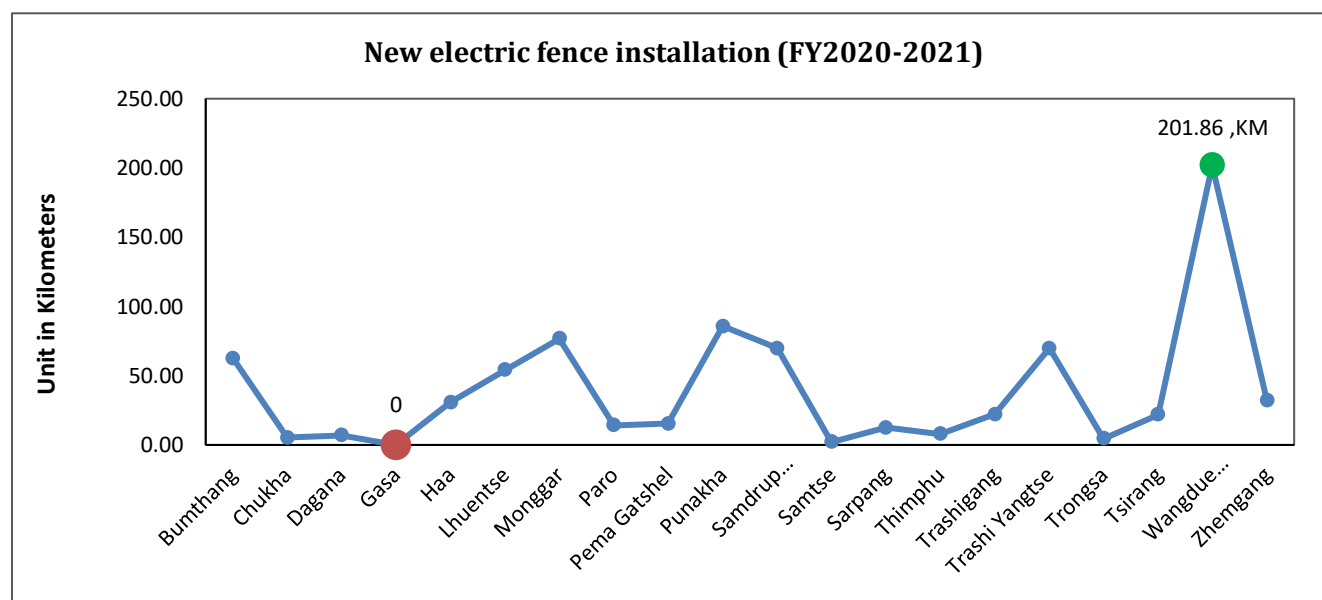


Figure 12: Dzongkhag-wise electric fence installation during the financial year 2020-2021

Table 6.5.3 NEW ELECTRIC FENCING LENGTH AND LAND AREA COVERED (2020-2021)

Dzongkhag	Fence length (km)	Beneficiaries (No)	Dryland (acre)	Wetland (acre)
Bumthang	62.65	308	331.81	-
Chukha	5.20	13	21.87	0.92
Dagana	6.95	68	41.30	16.44
Gasa	-	-	-	-
Haa	30.75	54	65.24	15.50
Lhuentse	54.06	220	131.46	106.36
Monggar	76.71	191	220.22	54.50
Paro	14.10	327	210.00	307.00
Pema Gatshel	15.25	84	165.70	-
Punakha	85.58	218	77.54	388.67
Samdrup Jongkhar	69.80	170	296.50	10.00
Samtse	2.10	30	50.00	-
Sarpang	12.43	235	390.50	106.00
Thimphu	7.89	18	22.80	-
Trashigang	22.00	158	274.48	230.56
Trashi Yangtse	69.73	287	181.92	27.25
Trongsa	4.61	16	23.76	1.25
Tsirang	21.80	47	110.95	32.30
Wangdue Phodrang	201.86	1292	1361.05	208.06
Zhemgang	32.00	109	61.50	2.50
Total	795.46	3845	4038.60	1507.31

Source: MoDa system

Table 6.5.4 ELECTRIC FENCING MAINTENANCE LENGTH AND LAND AREA COVERED (2020-2021)

Dzongkhag	length in km	Beneficiary (No)	Dryland command area (acre)	Wetland Command area (acre)
Bumthang	60.00	333	215.62	138.00
Chhukha	5.00	24	145.52	16.48
Dagana	19.35	67	62.40	60.00
Haa	8.65	68	203.74	
Lhuntse	2.60	15	2.50	10.00
Monggar	3.90	7	32.81	0
Paro	17.80	294	183.50	380.73
Pema_Gatshel	9.17	21	37.39	0
Punakha	75.02	326	144.71	815.28
Samdrup_Jongkhar	9.20	63	55.00	158.00
Trongsa	17.64	52	44.95	41.63
Tsirang	18.80	229	615.79	388.73
Wangdue_Phodrang	112.60	359	32.00	619.30
Zhemgang	3.50	13	21.30	0
Total	363.23	1871	1797.23	2628.15

Source: MoDa system

Table 6.6 NEW FARM ROAD CONSTRUCTION AND MAINTENANCE (2020-2021)

Dzongkhag	New Farm Road Construction			Farm Road Maintenance	
	Beneficiary (No)	Target length (KM)	Achieved length (KM)	Beneficiary (No)	length (KM)
Bumthang	0	0	0	0	0
Chhukha	137	23.50	18.00	215	24.20
Dagana	262	29.80	26.40	178	21.40
Gasa	0	0	0	0	0
Haa	180	5.28	5.28	492	109.15
Lhuntse	117	19.60	17.60	25	12.00
Monggar	275	24.27	12.59	454	68.61
Paro	124	15.30	15.30	595	50.45
Pema Gatshel	249	35.56	19.20	395	57.76
Punakha	48	14.00	10.00	639	103.60
Samdrup Jongkhar	234	69.50	12.90	378	49.38
Samtse	443	37.74	37.74	1780	108.60
Sarpang	197	24.94	24.94	1268	46.27
Thimphu	10	0.90	0.90	102	7.50
Trashi Yangtse	752	39.65	37.85	73	5.08
Trashigang	754	25.50	12.80	819	100.80
Trongsa	217	25.67	20.67	344	65.00
Tsirang	509	55.33	50.43	623	38.38
Wangdue Phodrang	188	19.91	17.32	1112	109.71
Zhemgang	449	99.06	85.70	0	0
Grand Total	5145	565.50	425.61	9492	977.89

Source: MoDa system

CHAPTER 7: PRICE

Price received by farmers for their produce is an important indicator and therefore this chapter is devoted to price statistics. Price received by farmers means the farm-gate price. The annual agriculture sample survey collects price of products sold by farmers and is a good source. However, for livestock products like milk, meat, eggs and so on, farm gate price data are not available as the annual livestock census does not collect this indicator. Another source of price received by farmers is the auction price of commodities available from FCBL. Auction price is however not farm-gate price as farmers have to bear transportation cost from the villages to the border towns.



Prices for locally produced commodities sold at the Farmers' Centennial Market in Thimphu, collected regularly by DAMC, are also presented to give an idea of the retail prices, which are often several times higher than the prices received by farmers. Price of the imported commodities is also presented and gives further insight into the differential prices occurring.

This chapter also presents price of the various inputs such as seeds, seedling and fertilizers supplied by National Seed Centre. The price charged by NSC are at subsidized rate.

Table 7.1 AVERAGE RETAIL PRICE OF SECONDARY PRODUCTS AND PULSES AT CFM, THIMPHU

(Value in Nu. per KG)

Products	2017	2018	2019	2020	2021
White Rice (local)	80	89	95	-	95
Beaten/Flatten Maize	250	244	325	-	350
Beaten/Flatten Rice	200	199	150	-	25
Buckwheat flour (Sweet/Bitter)	150	157	175	127.62	183
Maize (Grinded/Kharang)	86	88	90	-	93
Red Rice (Local)	73	74	83	-	90
Wheat Flour (Roasted/Kapchi)	56	58	70	52.87	70.81
Zaw (Roasted rice)	96	105	135	-	120
Rajma Beans (Dried)	147	173	180	-	180

Source: AMIS,DAMC ,MoAF

Table 7.2 AVERAGE RETAIL PRICE OF VEGETABLES AT CFM, THIMPHU

(Value in Nu. per KG, unless specified)

Vegetables	2017	2018	2019	2020	2021
Asparagus	146	238	220	123	268
Bamboo shoot	100	125	130	130	130
Bean (Flat Type)	139	122	125	130	151
Bean (Round Type)	136	122	125	130	151
Bean (Long Type)	-	-	125	130	151
Bitter Gourd	98	85	90	95	89
Brinjal	76	56	70	70	73
Broccoli	90	91	85	87	96
Cabbage	45	40	50	41	44
Carrot	77	81	90	72	77
Cauliflower	149	138	120	128	132
Chilli dry (Big)	159	198	725	224	222
Chilli dry (Small)	206	252	190	320	335
Coriander	30	30	35	35	30
Cucumber	83	72	80	77	85
Garlic	225	185	215	292	259
Ginger	122	121	160	174	94
Mushroom (Oyster)	-	118	305	-	256
Mushroom (shitaake)	748	674	430	-	450
Onion	67	54	83	74	58
Peas	104	100	145	150	116
Potato	38	36	50	45	43
Pumpkin	46	43	63	46	45
Radish	40	39	45	35	42
Spinach (saag)	64	67	40	60	40
Squash	57	43	65	65	60
Tomato	90	72	90	88	85
Turnip	49	93	40	36	40

Source: AMIS,DAMC ,MoAF

Table 7.3 AVERAGE RETAIL PRICE OF FRUITS AT CFM, THIMPHU

(Value in Nu. per KG, unless specified)

Fruits	2017	2018	2019	2020	2021
Apple	130	211	150	167	198
Avocado	352	333	375	446	515
Banana(dozen)	82	77	80	53	111
Cucumber	83	72	80	-	85
Guava	88	84	140	-	110
Lemon	150	162	145	-	-
Mango	138	142	205	169	219
Orange	124	171	170	98	156
Papaya	86	97	150	-	120
Passion Fruit	100	235	200	-	-
Pear	137	178	175	-	170
Pineapple (pcs)	61	66	75	-	75

Source: AMIS,DAMC ,MoAF

Table 7.4 AVERAGE RETAIL PRICE OF LIVESTOCK PRODUCTS AT CFM, THIMPHU

(Value in Nu. per KG)

Products	2017	2018	2019	2020	2021
Butter (kg)	404	408	440	477	515
Cheese (kg)	368	462	510	517	515
Honey (litre)	-	3492	1000	-	-
Eggs (dozen)	112	122	128	149	159

Source: AMIS,DAMC ,MoAF

Table 7.5 AVERAGE RETAIL PRICE OF CEREALS AND PULSES AT CFM, THIMPHU

(Value in Nu. per KG)

Cereals	Unit	2017	2018	2019	2020	2021
Maize (Y/pa, S/phangma, C/karpa)	5 kg/bag	30	-	30	56.8	30
Maize (P3377)	2 kg/pkt	290	290	267	-	267
Maize (P344)	2 kg /pkt	290	290	-	-	-
Paddy (BRK-1 & 2, BK-1 & 2)	20 kg/bag	35	35	40	75	40
Paddy (Bajo Maap-	20 kg/bag	50	-	50	-	50
Paddy (Bajo kaap-1&2 & IR-64)	20 kg/bag	40	-	45	-	45
Paddy (No.K/Map, YRK-1 & 2 and Yrm)	20 kg/bag	60	68	71	-	71
Wheat (Sonalika, Baj&Agreem)	20 kg/bag	35	38	38	-	-
Dhaincha	20 kg/bag	60	-	61	-	61
Mustard (M-27)	5 kg /Bag	90	90	90	-	90
Soya bean (Lebi -1)	10 kg/bag	85	-	86	-	86

Source: AMIS,DAMC ,MoAF

Table 7.6 PRICE OF CEREAL SEEDS AND OILSEED SEEDS

(Value in Nu. per unit specified)

Cereals	Unit	2017	2018	2019	2020	2021
Maize (Y/pa, S/phangma, C/karpa)	5 kg/bag	30	-	30	56.8	30
Maize (P3377)	2 kg/pkt	290	290	267	-	267
Maize (P344)	2 kg /pkt	290	290	-	-	-
Paddy (BRK-1 & 2, BK-1 & 2)	20 kg/bag	35	35	40	75	40
Paddy (Bajo Maap-	20 kg/bag	50	-	50	-	50
Paddy (Bajo kaap-1&2 & IR-64)	20 kg/bag	40	-	45	-	45
Paddy (No.K/Map, YRK-1 & 2 and Yrm)	20 kg/bag	60	68	71	-	71
Wheat (Sonalika, Baj&Agreem)	20 kg/bag	35	38	38	-	-
Dhaincha	20 kg/bag	60	-	61	-	61
Mustard (M-27)	5 kg /Bag	90	90	90	-	90
Soya bean (Lebi -1)	10 kg/bag	85	-	86	-	86

*Source: NSC,DoA,MoAF***Table 7.7 PRICE OF TEMPERATE FRUIT SEEDLINGS**

(Value in Nu. per unit specified)

Temperate fruit seedlings	Unit	2017	2018	2019	2020	2021
Almond (Kagzi)	Seedling	90	90	100	100	100
Apple (All Varieties)	Seedling	80	80	90	90	90
Apricot (Shakharpara)	Seedling	90	90	100	100	100
Asparagus seedlings (MW)	Seedling	4	4	4	4	4
Cherry (Seneka/Jabouny)	Seedling	80	90	95	90	90
Chestnut (Jeuphu-1)	Seedling	50	50	60	60	60
Peach (N-wase/S-Hakuto)	Seedling	90	90	100	100	100
Pear (Hosui/Kosui/Chujoro/William)	Seedling	75	75	96	96	96
Persimmon (Fuyu/Jiro)	Seedling	110	110	125	125	125
Plum (Santarosa/Stamley)	Seedling	90	90	100	100	100
Straw berry (Chandler)	Seedling	7	7	9	9	9
Walnut (Grafted - Kagzi)	Seedling	185	185	205	205	205

Source: NSC,DoA,MoAF

Table 7.8 PRICE OF VEGETABLE SEEDS

(Value in Nu. per unit specified)

Vegetable Seeds	Unit	2017	2018	2019	2020	2021
Beans (Top crop/borlotto)	50 gm/pkt	10	11	13	24	18
Beetroot (DDR)	10 gm/pkt	10	13	15	28	15
Bitter Gourd (Hybrid)	10 gm/pkt	25	-	32	50	32
Bottle Gourd (Hybrid)	10 gm/pkt	25	-	32	50	32
Brinjal (PP Long)	10 gm/pkt	15	-	15	100	15
Broccoli (Centauro)	10 gm/pkt	310	-	226	300	255
Broccoli (Dessico - OP)	10 gm/pkt	10	10	13	-	13
Bunching Onion (No-21)	10 gm/pkt	25	25	25	50	25
Cabbage (Hybrid)	10 gm/pkt	205	-	149	200	-
Cabbage (Golden Acre	10 gm/pkt	40	29	32	250	-
Carrot (ASC - Hybrid)	10 gm/pkt	115	86	95	120	-
Carrot (N. Kuroda)	10 gm/pkt	20	20	22	850	22
Cauliflower (Hybrid)	10 gm/pkt	255	172	177	198	-
Cauliflower (K.early/K.late)	10 gm/pkt	15	17	19	-	-
Chilli-IR-8 (Indian)	10 gm/pkt	10	10	13	13	13
Chilli (Sha ema))	10 gm/pkt	10	-	20	20	20
Chinese Cabbage	10 gm/pkt	10	10	13	13	13
Coriander (Local)	10 gm/pkt	15	15	15	15	15
Cucumber (Frontier)	10 gm/pkt	100	100	100	100	100
Cucumber (S. Genchu)	10 gm/pkt	15	17	23	23	23
Cucumber (santon No 1)	10 gm/pkt	25	28	29	29	29
Garlic (Local)	10 gm/pkt	195	-	195	-	195
Ginger (Local)	10 gm/pkt	100	-	100	-	-
Japanese Green (Mibu-)	10 gm/pkt	10	10	15	15	15
Japanese Green (Taisai)	10 gm/pkt	10	10	15	15	15
Ladies Finger (PS)	10 gm/pkt	15	17	18	18	18
Lettuce (Great Lake)	5 gm/pkt	20	25	29	29	29
Sag (Him Beauty)	10 gm/pkt	10	14	15	15	-
Onion (OP/ B-Red)	10 gm/pkt	20	20	22	22	22
Onion (Pune Red)	10 gm/pkt	25	25	25	25	25
Peas (Mr. Rig). Hybrid	50 gm/pkt	10	11	13	13	13
Peas (Usui/Arkel)	50 gm/pkt	10	11	13	13	13
Beans (Pole bean white)	50 gm/pkt	10	11	-	-	18
Pumpkin (T-Kabuta)	10 gm/pkt	10	13	15	15	15
Radish (Ivory white)	10 gm/pkt	10	10	11	-	-
Radish (Minowase)	10 gm/pkt	10	10	13	13	13
Radish (Toki-shi)	10 gm/pkt	15	19	20	11	20
Spi-ch All (Green/Beet)	10 gm/pkt	10	10	13	20	13
Squaush (Zucchini)	10 gm/pkt	10	14	15	13	15
Tomato (PS-61)	5 gm/pkt	110	121	122	122	122
Tomato (Ratan/Roma)	5 gm/pkt	15	17	18	18	18
Turnip (PTWG)	10 gm/pkt	10	13	13	13	13
Water melon (Sugar Baby)	10 gm/pkt	15	18	22	22	22
Water melon (Hybrid)	10 gm/pkt	330	330	-	-	-
Potato Red (Desiree)	50 kg/bag	27	-	27	27	-
Potato White varieties	150 kg/bag	25	-	26	26	-

Source: NSC, DoA, MoAF

Table 7.9 PRICE OF SUB-TROPICAL FRUIT SEEDLINGS

(Value in Nu. per unit specified)

Subtropical fruit seedlings	Unit	2017	2018	2019	2020	2021
Areca nut (Bhur S-1)	Seedling	40	40	55	205	55
Avocado (Hasa/Pink caton)	Seedling	135	135	150	55	-
Ba-- (Chinichampa/Jahaji)	Seedling	40	40	50	150	50
Cardamom (Seedling multiplied)	Suckers	9	9	10	232	10
Cardamom (through seeds)	Seedling	13	-	-	10	-
Mandarin Orange (grafted)	Seedling	90	-	-	50	-
Mandarin Orange (seedlings)	Seedling	35	35	50	45	-
Gauva (L-49)	Seedling	45	45	45	21	45
Jack fruit (Bhur S-1)	Seedling	15	15	21	75	21
Litchi (E-Beda-/Shahi)	Seedling	60	60	75	85	75
Mango graft (Langra/DS/AP/CH)	Seedling	75	75	85	23	85
Papaya	Seedling	15	15	23	20	23
Passion fruit (Local)	Seedling	15	15	20	25	20
Pine apple (Sugar baby)	Seedling	35	35	25	50	25
Pomegranate (Bedana)	Seedling	30	30	50	50	50

Source: NSC, DoA, MoAF

Table 7.10 PRICE OF FERTILIZERS

(Value in Nu. per unit specified)

Fertilizers	Unit	2017	2018	2019	2020	2021
Urea (46 % N)	50 Kg pack	938	983	885	885	885
Urea (46% N)	10 Kg pack	220	218	218	218	218
Suphala (NPK 15:15:15)	50 Kg pack	1870	1876	1876	1876	1876
Suphala (NPK 15:15:15)	20 Kg pack	780	775	775	775	775
Suphala (NPK 15:15:15)	10 Kg pack	400	396	-	-	-
Suphala (NPK 15:15:15)	5 Kg pack	205	204	-	-	-
SSP (16% P2O)	50 Kg pack	985	977	977	977	977
Bone Meal	50 Kg pack	2840	2065	2065	2065	2065
MOP (60% K2O)	50 Kg pack	2145	2132	2132	2132	2132
Borax (20% Boron minimum)	5 Kg pack	945	938	938	938	938
DAP (18%N 46%P2O)	50 Kg pack	2405	-	-	-	2405
CAN	50 Kg pack	1335	-	-	-	-

Source: NSC, DoA, MoAF

CHAPTER 8: FORESTRY

Although users of the RNR sector data are used to seeing forestry statistics just adjacent to crop and livestock, here we present forestry statistics very much separately, almost at the end of this document. The statistics presented are non-wood forest products quantity extracted from the forests for use by the people and royalty charged; extraction of timber, stones, leaf litter, sand and so on. The data are compiled from the administrative records maintained by the various Territorial Forest Divisions, National Park offices and also the state-owned Natural Resources Development Corporation Ltd (NRDCL). The latter extracts timber from the Forest Management Units and sells to the saw-mills from where clients finally buy. It also extracts and sells sand and boulders from the designated river banks and sites.



One of the biggest threats to the forest wealth of the country is the forest fires which are mostly caused by humans either through negligence or deliberate means. Forests destroyed by fires are truly a loss as no one benefits financially and is also a major contributor to global warming. At least forest products lost as a result of illegal felling benefits someone. Statistics on forest fire incidences and acreage lost are presented.

Table 8.1 PROTECTED AREAS AND COVERAGE

Protected Area Network	Notification year	Establishment year	Dzongkhag	Area (km sq)
Bumdeling Wildlife Sanctuary (BWS)	1993	1998	Lhuentse	1534.24
Jigme Dorji National Park (JDNP)	1993	1995	Gasa	4374.06
Jigme Khesar Strict Nature Reserve (JKSNR)	1993	2010	Haa	784.22
Jigme Singye Wangchuck National Park (JSWNP)	1993	1995	Sarpang	1730.06
Jomotsangkha Wildlife Sanctuary (JWS)	1993	1993	Samdrup Jongkhar	362.49
Phrumsengla National Park (PNP)	1993	2000	Bumthang	906.65
Phipsoo Wildlife Sanctuary (PWS)	1974	1993	Sarpang	286.83
Royal Manas National Park (RMNP)	1993	1996	Pema Gatshe	1057.40
Sakteng Wildlife Sanctuary (SWS)	1993	2003	Trashigang	742.46
Wangchuck Centennial National Park (WCNP)	2008	2008	Bumthang	4914.65
Royal Botanical Park (RBP)	2004		Punakha	91.20
JDNP-JKSNR Biological Corridor (BC1)	1999	2007	Haa	255.55
RBP-JSWNP Biological Corridor (BC 2)	1999	2007	Wangdue Phodrang	291.76
JSWNP-PWS-RMNP Biological Corridor (BC 3)	1999	2007	Sarpang	407.70
JSWNP-PNP-RMNP Biological Corridor (BC 4)	1999	2007	Trongsa	594.65
JWS-RMNP Biological Corridor (BC 5)	1999	2007	Pema Gatshel	205.84
JWS-SWS Biological Corridor (BC 6)	1999	2007	Samdrup Jongkhar	232.77
BWS-PNP-WCNP Biological Corridor (BC 7)	1999	2007	Lhuentse	419.66
JSWNP-WCNP Biological Corridor (BC 8)	1999	2007	Trongsa	558.60

Source: DoFPS, MoAF

Table 8.2 DZONGKHAG-WISE AREA UNDER FOREST MANAGEMENT UNIT (FMU)

Forest Management Unit	Dzongkhag	Establishment year	Plan Period	Total FMU area (Ha)	Forested area (Ha)	Annual Allowable Cut (AAC) - m ³		
						Commercial	Rural	Total
Dawathang	Bumthang	2000	2021-2030	15173.80	13,308.61	6,900.00	4,000.00	10900.00
Rudongla		2002	2013-2023	14686.58	12368.91	12000.00	2999.00	14999.00
Karshong		1994	2020-2029	6008.54	5579.39	6200.00	1500.00	7700.00
Metapchhu	Chukha	2007	2018 -2027	10676.53	10099.00	4400.00	630.00	5030.00
Haa East	Haa	1987	2016-2026	6580.99	5690.50	-	500.00	500.00
Lon Chhu		2010	2020 -2029	12664.49	8846.00	5300.00	1000.00	6300.00
Sele La		1997	2021-2030	9155.72	8497.65	6790.00	2440.00	9230.00
Korila	Mongar	1993	2016-2026	13137.00	6922.00	1100.00	2700.00	3800.00
Lingmithang		1997	2019-2029	10490.00	10125.00	8900.00	500.00	9400.00
Paro-Zonglela	Paro	1992	2012-2021	16155.81	12880.68	6366.00	3000.00	9366.00
Bitekha		2006	2016-2026	7260.10	6199.00	3600.00	900.00	4500.00
Chamgang- Helela	Thimphu	1993	2017-2027	4508.78	4320.87	-	1800.00	1800.00
Gidakom		1977	2012-2022	13100.00	9105.00	3670.00	2000.00	5670.00
Dongdechhu	Trashigang	2001	2014-2024	4856.00	3172.00	3965.00	1249.83	5214.83
Chendebji	Trongsa	1996	2018-2027	7852.98	6912.12	4700.00	2000.00	6700.00
Khotokha	Wangdue	1984	2022-2029	9033.87	8428.63	7500.00	1900.00	9400.00
Gogona		2005	2015-2025	8080.60	4490.00	5161.00	1167.00	6328.00
Wangdigang	Zhemgang	1992	2017-2026	8759.00	7511.25	-	2100.00	2100.00
Rongmanchu	Lhuntse	2007	2018-2027	6403.13	5713.00	2700.00	500.00	3200.00
Khaling Kharungla	Trashigang	1996	2020-2029	7110.30	5553.68	900.00	400.00	1300.00
Khengzore	Pema Gatshel	2019	2019-2028	4096.35	4069.15	3700.00	400.00	4100.00
				195790.57	159792.44	93852.00	33685.83	127537.83

Source : DoFPS, MoAF

Table 8.3.1 NWFPS SUPPLIED AND REVENUE GENERATED BY DoFPS

Product Types	Unit	2017		2018	
		Volume	Royalty realized (Nu.)	Volume	Royalty realized (Nu.)
Clay soil/Top soil	Kg	2255	4600	600	NA
	m ³	17688	139030	32952	NA
Cane/Cane shoot	Bundle	15	60	1559	NA
	Headloads	2281	9448	-	NA
	Nos	9304	6796	-	NA
	m ³	64	44	-	NA
Charcoal	Kg	600770	1429	1000	NA
<i>Daphne bholua</i>	Kg	4860	3010	7095	NA
Incense (Leaves/wood)	Headloads	-	-	-	NA
	Kg	15747	50164	-	NA
	m ³	156	674	-	NA
Large/Small Bamboo	Bundle	1118	7830	-	NA
	Headloads	215	208	-	NA
	Nos	170120	119288	-	NA
	m ³	5817	2208	-	NA
Leaf mould	m ³	74807	11858	-	NA
Lemon grass oil	Ltr	319	1595	288	NA
Mushrooms	Kg	685	4520	5975	NA
	Nos	4300	4300	7390	NA
<i>Ophiocordyceps sinensis</i> (Whole part)	Kg	41	8200	277	NA
	Nos	241	2055372	-	NA
<i>Picorrhiza</i> (Putashing)	Kg	100	1200	100	NA
<i>Piper longum</i> (Pipla Fruits)	Kg	-	-	110	NA
<i>Rubiaceae</i>	Kg	31761	515368	18910	NA
<i>Paris polyphylla</i> (Satuva)	Kg	482	7288	572	NA
Shilajit (dragzhuen)	Kg	-	-	11	NA
Swertiachirayita (Plan)	Kg	457	10968	133	NA
<i>Terminalia</i> spp (Fruit)	m ³	16	80	100	NA
Wildlings (seeds/Seedlings)	Kg	3024	6488	-	NA
	Nos	30416	5984	4614	NA
	m ³	96	552	-	NA
<i>Zanthoxylum</i> (Fruit)	Kg	1955	36700	225	NA
Wood burrs	Nos	420	4600	-	NA
Thatch	Bundle	148	15	-	NA
Resin	Kg	3029	12116	14147	NA
Pine needles	Bundle	458	994	-	NA
	m ³	432	1856	-	NA
Star arise	-	2770	5540	-	NA

Source: DoFPS, MoAF

Table 8.3.2 NWFPS SUPPLIED AND REVENUE GENERATED BY DoFPS (2019)

Product Type	Unit	Quantity	Royalty Realized (Nu.)
Banana Leaves	Bundle	100	400
	Number	120	650
Calamus sp.	Number	120	120
	Bundle	782	2,942
	Truckload	3	1,240
Charcoal	Kilogram	7,300	1,476
Soil	Truckload	1,223	100,695
	Kilogram	1,700	3,400
Cymbidium sp.(Olatshy)	Bundle	6	240
Daphne sp.(Bark)	Kilogram	5,885	5,531
Hippophae rhamnoides(Tarbu)	Kilogram	1,100	4,400
Edgeworthia sp.(Bark)	Kilogram	1,000	600
Diplazium spp. (Fern top)	Truckload	2	140
Bamboo	Number	125,963	114,804
	Truckload	1,573	14,670
Lemon grass	Litre	560	2,800
Mushroom	Number	7,250	7,250
	Kilogram	52,875	106,950
Knema sp.	Kilogram	100	500
Nardostachys jatamansi (Pangpoe)	Kilogram	64,275	128,550
Ophiocordyceps sinensis (Cordyceps)	Kilogram	1,342	1,269,240
Paris polyphylla	Kilogram	535	8,215
Rhododendron sp.	Kilogram	3,081	6,241
Rubia cordifolia	Kilogram	24,524	377,504
River bed materials	Truckload	92,221	3,679,040
Pouzolzia sp.	Kilogram	8,962	17,924
Phyllanthus emblica	Kilogram	3	15
Picrorhiza sp.	Kilogram	10	120
Quartzite	Truckload	6	240
Resin	Kilogram	6,464	25,856
Piper longum (Pipla)	Kilogram	600	12,000
Pine needles	Truckload	38	1,397
	Bundle	72	76

Source: DoFPS, MoAF

Table 8.3.4 NWFPS SUPPLIED AND REVENUE GENERATED BY DoFPS (2020)

Product Type	Unit	Quantity	Royalty Realized (Nu.)
<i>Calamus spp</i>	Bundle	197.00	788.00
	Truckload	5.00	4000.00
Cane shoot	Bundle	435.00	3342.00
	Truckload	22.00	1680.00
<i>Ajanía nubigena</i> (Khamkar (Bum))	Kilogram	31.00	62.00
Bamboo shoots	Number	100.00	100.00
Banana Leave	Bundle	22.00	110.00
Charcoal	Kilogram	54290.00	10858.00
<i>Daphne spp</i> (Bark) (Deykap (Dz))	Kilogram	4260.00	2588.00
<i>Exidia recisa</i> (Sew-shamong (Dz))	Kilogram	150.00	900.00
Fern top	Kilogram	6520.00	6620.00
<i>Hippophae rhamnoides</i> (Taray tsang (Dz))	Kilogram	500.00	2000.00
<i>Hyparrhenia hirta</i> (Thatch grass)	Bundle	10.00	806.00
<i>Juniperus spp.</i>	Truckload	559.70	6384.00
<i>Knema spp.</i> (Duruka (Kheng))	Kilogram	50.00	5650.00
Large bamboo	Number	47215.00	88270.00
Leaf moulds	Truckload	604.50	33290.00
Leaves of BP/Fir	Headload	343.00	966.00
Leaves of juniper (Incense)	Headload	725.50	2522.00
Lemon grass oil	Litre	5.00	25.00
<i>Nardostachys jatamansi</i> (Pangpoe (Dz))	Kilogram	43514.00	87028.00
<i>Ophiocordyceps sinensis</i> (Yartsey Genbub (Dz))	Kilogram	2013.06	2614353.60
<i>Oroxylum indicum</i> (Flower) (Namkaling (Dz))	Kilogram	50.00	100.00
<i>Phyllanthus emblica</i> (Amla (Dz))	Kilogram	100.00	500.00
<i>Picrorhiza spp</i> (Putashing (Dz))	Kilogram	866.00	10392.00
Pine needle	Headload	364.50	1417.00
<i>Piper spp</i> (Pipla (Lho))	Kilogram	332.00	2818.00
<i>Pouzolzia spp</i> (Yongziba (Sh))	Kilogram	5231.00	7662.00
Resin	Kilogram	2927.00	11708.00
<i>Rhododendron spp</i> (Etho metho (Dz))	Kilogram	4306.50	8163.00
<i>Rubia cordifolia</i> (Tshoed (Dz))	Kilogram	10548.00	168768.00
<i>Shilajit</i> (Bjaju (Dz))	Kilogram	35.00	280.00
Small bamboo	Number	69682.00	39354.48
<i>Thysanolaena latifolia</i> (Tsakusha (Dz))	Bundle	462.00	1444.00
<i>Yushania maling</i> (Hikchu (Dzo))	Number	100.00	8.00
<i>Zanthoxylum armatum</i> (Zhungthey (Dz))	Kilogram	2400.00	9600.00
Others	Kilogram	13.00	36.00
	Truckload	1.00	40.00
	Number	30.00	180.00

Source:DoFPS,MoAF

Table 8.3.5 NWFPS (Surface collection) SUPPLIED AND REVENUE GENERATED BY DoFPS (2020)

Product Name	Unit	Quantity	Royalty realized (Nu.)
Clay soil	Truckload	199	7950
Color soil	Kilogram	24826	54600
Boulders	m ³	801389	4001850
	Tractor	2	632
	Truckload	22499	906861
Stone	Truckload	28775	1193650
	m ³	16034	80260
Stone dust	m ³	391	1420
	Truckload	157	6240
Sand	Truckload	33936	1498675
	m ³	107415	535500
River bed material	m ³	337891	1689455
	Truckload	95572	3763280
Gravel	Truckload	7869	342247
	m ³	120205	598240

Table 8.3.5 NWFPS SUPPLIED AND REVENUE GENERATED BY DoFPS (2021)

Product Name	Unit	Quantity	Royalty (Nu.)
<i>Astilbe rivularis (Thonsergugay)</i>	Kilogram	4500.00	9000.00
<i>Bulbophyllum umbellatum</i>	Number	20.00	1040.00
<i>Cymbidium</i> spp (Olatshey)	Bundle	140.00	5960.00
<i>Daphne</i> spp (Bark)	Kilogram	6950.00	4170.00
	Truckload	2.00	1200.00
<i>Ficus</i> spp.	Bundle	20.00	80.00
<i>Hippophae rhamnoides</i> (Tarbu)	Kilogram	300.00	1200.00
<i>Knema tenuinevia</i>	Kilogram	700.00	3500.00
<i>Lycopodium clavatum</i> (Zalagadang)	Truckload	2.00	120.00
Mushroom	Kilogram	27.00	540.00
<i>Nardostachys jatamansi</i> (Pangpoe)	Kilogram	14850.00	29700.00
<i>Neomicrocalamus andropogonifolius</i> (Ringshoo)	Bundle	118.00	11.80
<i>Ophiocordyceps sinensis</i> (Cordyceps)	Kilogram	36507.29	14968007.76
<i>Picrorhiza</i> spp	Kilogram	200.00	1300.00
<i>Piper longum</i> (Pipla)	Kilogram	320.00	6800.00
<i>Piper pedicellatum</i>	Kilogram	20.00	400.00
<i>Plumeria rubra</i>	Kilogram	1.00	16.00
<i>Pouzolzia sanguinea</i>	Kilogram	673.00	1346.00
<i>Pouzolzia</i> spp.	Kilogram	13779.00	24758.00
<i>Rhodiola</i> spp.	Truckload	1.00	10.00
<i>Rhododendron anthopogon</i>	Kilogram	280.00	560.00
<i>Rhododendron setosum</i>	Kilogram	143.00	292.00
<i>Rhododendron</i> spp	Kilogram	8667.00	17334.00
	Truckload	12.00	450.00
<i>Rubia cordifolia</i>	Kilogram	44145.00	572880.00
Charcoal	Kilogram	40300.00	8060.00
	Truckload	464.00	23200.00
Saw dust	M3	16.00	80.00
shilajit	Kilogram	100.00	800.00
<i>Terminalia chebula</i>	Kilogram	80.00	400.00
<i>Thysanolaena latifolia</i> (Broom grass)	Bundle	1408.00	4224.00
Wild yam	Kilogram	9.00	135.00
<i>Zanthoxylum armatum</i>	Kilogram	672.00	288.00
Leaves of BP/Fir	Bundle	10.00	40.00
	Truckload	2.00	66.00
Leaves of juniper (Incense)	Kilogram	6.00	12.00
	Truckload	17	680
Pine needle	Truckload	11.50	406.00
<i>Yushania mailing</i>	Bundle	5.00	40.00
	Number	770.00	126.00

<i>Calamus spp</i>	Number	100.00	200.00
	Truckload	2.00	200.00
Small bamboo	Bundle	160.00	1280.00
	Number	50928.00	33807.48
	Truckload	100.00	100.00
Large bamboo	Bundle	10.00	80.00
	Number	65828.00	108776.00
	Truckload	103.00	230.00
<i>Plectocomia himalayana(Patsa)</i>	Bundle	70.00	280.00
Cane shoot	Bundle	386.00	1568.00
	Number	71.00	184.00
	Truckload	801.00	300.00
Leaf moulds	Truckload	467.00	27110.00
Leave litters	Bundle	50.00	5.00
	Truckload	8.00	300.00
Banana Leave	Number	150.00	730.00

Source: DoFPS, MoAF

Table 8.4.1 FIREWOOD ALLOTTED BY DIVISIONAL FOREST OFFICES AND PARK OFFICES

Division/Park Office	Commercial (2018)		Concessional (2018)		Concessional (2019)		Commercial (2019)	
	Standing Volume (M3)	Firewood (M3)	Standing Volume (M3)	Firewood (M3)	Volume (m3)	Royalty Realized (Nu.)	Volume (m3)	Royalty Realized (Nu.)
Bumthang	3,366	421	11,354	1,199	2,057	22,937	1,695	23,257
Dagana	130	184	1,929	2,980	4,064	98,050	951	21,734
Gedu	427	1,747	769	816	1,265	28,615	3,084	68,399
Monggar	532	938	5,504	4,305	4,578	104,492	2,625	75,286
Paro	2,174	1,452	5,754	749	1,470	18,784	146	10,570
Pema Gatshel	67	94	1,324	351	225	5,940	157	3,960
Samdrup Jongkhar	2	332	609	-	-	-	630	14,201
Samtse	52	-	4,311	6,608	4,954	128,276	53	3,460
Sarpang	1,301	523	1,428	1,274	3,020	68,567	323	7,565
Thimphu	73	790	5,526	3,551	790	9,302	419	6,036
Trashigang	611	45	4,780	3,685	6,488	149,485	1,446	46,490
Tsirang	21	-	1,586	-	956	22,571	224	5,040
Wangdue Phordang	867	1,470	9,957	2,001	1,404	25,503	741	18,481
Zhemgang	283	913	1,367	24	23	9,680	125	10,201
Bumdeling Wildlife Sanctuary	250	25	1,629	222	2,505	56,522	117	2,636
Jigme Dorji National Park	2,033	1,841	2,379	969	754	10,640	3,483	74,406
Jigme Khesar Strict Nature Reserve	-	-	-	-	57	1,040	-	-
Jigme Singye Wangchuck National Park	238	16	530	458	360	8,100	-	-
Jomotsangkha Wildlife Sanctuary	2	-	3,726	191	148	3,715	480	10,789
Phibsoo Wildlife Sanctuary	783	-	33	40	120	2,700	-	-
Phrumsengla National Park	1,327	571	2,210	3,044	1,633	1,829,363	563	12,720
Royal Manas National Park	19	-	550	139	178	4,050	-	-
Sakteng Wildlife Sanctuary	630	532	3,349	1,554	2,692	60,833	349	7,853
Wangchuck Centennial National Park	20	-	1,694	1,313	703	10,597	-	-

Source: DoFPS, MoAF

Table 8.4.2 FIREWOOD ALLOTTED BY DIVISIONAL FOREST OFFICES AND PARK OFFICES

Division/Park Office	Concessional (2020)		Commercial (2020)		Concessional (2021)		Commercial (2021)	
	Volume (m3)	Royalty Realized (Nu.)	Volume (m3)	Royalty Realized (Nu.)	Volume (m3)	Royalty Realized (Nu.)	Volume (m3)	Royalty Realized (Nu.)
Bumthang	790	13562	710	19455	1937	23580	2781	32648
Dagana	2516	55767	922	20925	2378	52298	1480	31659
Gedu	806	18472	2976	63158	664	15000	7225	156600
Monggar	6031	151602	2484	59335	1397	35450	1295	27011
Paro	789	9203	72	1511	1648	22798	152	7060
Pema Gatshel	664	15950	748	16749	305	7380	152	4374
Samdrup Jongkhar	320	7200	1000	23038	76	1710	932	25756
Samtse	6025	149112	4.57	541	2455	70840	1233	29520
Sarpang	1445	32807	4.00	90	35	3183	180	4050
Thimphu	442	4666	619	9034	483	6716	474	19676
Trashigang	5748	136208	439	9898	1567	33940	1139	25780
Tsirang	937	24619	290	6525	187	4635	48	-
Wangdue Phordang	4037	86565	15	591	956	10774	350	9212
Zhemgang	116	6838	52	9441	126	5418	55	3988
Bumdeling Wildlife Sanctuary	2834	66023	96	10575	1724	40653	302	12692
Jigme Dorji National Park	2307	29818	2320	46699	1088	20273	1477	33128
Jigme Khesar Strict Nature Reserve	9.06	1230	-	-	1.36	880	0.03	180
Jigme Singye Wangchuck National Park	48	1080	16	160	205	4660	48	1081
Jomotsangkha Wildlife Sanctuary	880	19800	92	2070	256	30470	1280	28800
Phibsoo Wildlife Sanctuary	-	-	68	1537	131	4824	-	-
Phrumsengla National Park	3248	56510	440	7990	522	9330	1094	24000
Royal Manas National Park	153	3600	-	-	-	-	215	4848
Sakteng Wildlife Sanctuary	2054	48051	317	7290	661	14895	486	10845
Wangchuck Centennial National Park	1000	10000	-	-	-	-	-	-

Source: DoFPS, MoAF

Table 8.5.1 TIMBER ALLOTTED BY DIVISIONAL FOREST OFFICES AND PARK OFFICES

Division/Park Office	Concessional (2019)		Commercial (2019)		Concessional (2020)		Commercial (2020)	
	Volume (m3)	Royalty Realized (Nu.)	Volume (m3)	Royalty Realized (Nu.)	Volume (m3)	Royalty Realized (Nu.)	Volume (m3)	Royalty Realized (Nu.)
Bumthang	19,006.12	324,752.70	13,356.29	1,987,804.58	8004.50	149593.39	3974.78	792732.44
Dagana	10,196.69	223,603.28	1,667.18	150,799.00	3606.51	108232.51	1323.46	86886.54
Gedu	4,263.28	105,313.53	3,627.70	116,944.87	2038.38	43813.28	3755.90	269734.30
Monggar	8,193.41	238,113.92	3,382.04	227,634.73	11681.43	366786.60	3557.56	300688.26
Paro	7,265.81	133,464.92	4,668.83	1,248,597.67	1371.64	24382.51	3148.13	468633.13
Pema Gatshel	310.98	7,616.71	217.14	10,493.98	1366.17	31478.46	1549.64	63874.49
Samdrup Jongkhar	1,874.20	52,943.51	721.30	33,534.68	575.90	14524.94	1311.74	45945.55
Samtse	9,435.88	240,397.46	336.07	79,261.38	9506.89	230909.70	684.99	107239.78
Sarpang	3,880.87	111,524.53	1,848.02	325,926.83	1683.06	45518.73	2062.26	407525.51
Thimphu	6,264.62	121,033.87	1,972.18	250,782.48	2667.76	52919.99	3524.24	715646.00
Trashigang	13,186.49	414,871.47	2,327.82	172,705.60	13555.42	403056.99	638.97	36597.60
Tsirang	2,939.56	51,610.84	229.33	5,754.00	1277.78	32760.93	358.09	30354.70
Wangdue Phodrang	20,717.18	470,465.60	8,969.70	1,781,588.86	14413.67	398629.20	5084.42	1053852.51
Zhemgang	3,009.29	58,190.18	659.22	167,855.55	5666.36	121784.00	484.70	100992.41
Bumdeling Wildlife Sanctuary	5,388.17	130,132.95	528.07	87,298.83	3654.49	127157.02	464.29	136562.91
Jigme Dorji National Park	7,751.20	131,253.81	8,467.01	1,586,650.34	11184.94	297094.35	6926.77	1130092.28
Jigme Khesar Strict Nature Reserve	5,393.61	94,319.39	-	-	17.00	2333.60	198.14	47730.90
Jigme Singye Wangchuck National Park	931.32	31,666.03	-	-	242.11	6349.69	139.76	50537.46
Jomotsangkha Wildlife Sanctuary	1,878.42	55,208.92	577.43	20,849.77	1361.56	50499.32	365.79	45042.26
Phibsoo Wildlife Sanctuary	313.11	5,640.00	46.39	32,739.69	30.15	3400.00	915.98	360876.20
Phrumsengla National Park	6,073.01	1,920,894.36	1,486.70	173,643.29	4884.96	114307.78	850.60	77720.12
Royal Manas National Park	584.19	14,519.70	144.01	26,705.16	702.39	19053.42	10.00	4008.00
Sakteng Wildlife Sanctuary	-	-	-	-	3850.41	104863.60	572.31	53542.61
Wangchuck Centennial National Park	-	-	-	-	4496.69	65500.00	-	-

Source: DoFPS, MoAF

Table 8.5.2 TIMBER ALLOTTED BY DIVISIONAL FOREST OFFICES AND PARK OFFICES

Division/Park Office	Concessional (2021)		Commercial (2021)	
	Volume (m3)	Royalty Realized (Nu.)	Volume (m3)	Royalty Realized (Nu.)
Bumthang	2496.92	90214.44	6724.38	1,934,363.12
Dagana	586.53	15,544.49	567.15	113,042.83
Gedu	1054.90	15057.24	1014.24	152,204.70
Monggar	11942.12	41,935.54	3566.65	655,372.09
Paro	12252.70	185,502.11	2442.27	936,550.59
Pema Gatshel	89.74	2,360.05	2026.29	44,827.95
Samdrup Jongkhar	50.60	2,304.91	825.88	353,876.48
Samtse	435.61	8,995.96	1105.79	196,892.43
Sarpang	50.19	2,315.41	175.62	39,369.44
Thimphu	2362.05	18,360.05	1496.81	358,686.84
Trashigang	1160.39	43,240.77	121.83	16,837.08
Tsirang	3.74	1,084.00	35.56	5,251.88
Wangdue Phodrang	578.45	39,295.84	2976.34	533,681.35
Zhemgang	392.26	6,194.43	299.76	50,672.30
Bumdeling Wildlife Sanctuary	1809.76	52,703.11	273.25	121,438.58
Jigme Dorji National Park	1367.54	26,845.30	9203.50	2,311,686.95
Jigme Khesar Strict Nature Reserve	185.70	2,860.00	175.88	19,042.04
Jigme Singye Wangchuck National Park	293.49	10844.7	87.39	26,032.27
Jomotsangkha Wildlife Sanctuary	12.79	140.00	304.86	79,723.53
Phibsoo Wildlife Sanctuary	72.64	3,240.00	-	-
Phrumsengla National Park	314.35	18,029.00	769.44	137,166.68
Royal Manas National Park	119.61	1,400.00	332.32	85,910.76
Sakteng Wildlife Sanctuary	643.31	25,894.09	109.32	29,592.71
Wangchuck Centennial National Park	118.59	720.00	-	-

Source: DoFPS, MoAF

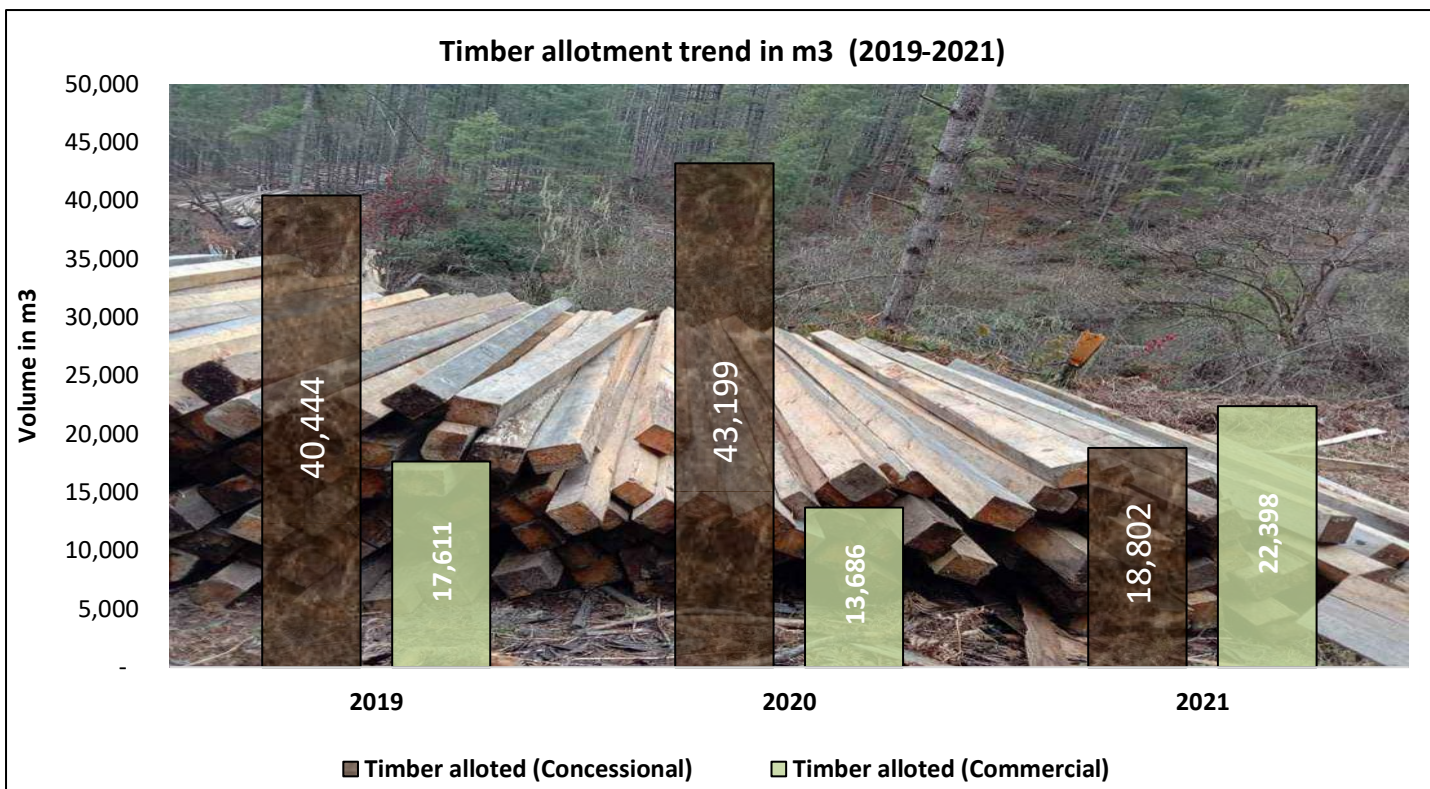


Figure 13: Timber allotment on concessional and commercial in m3

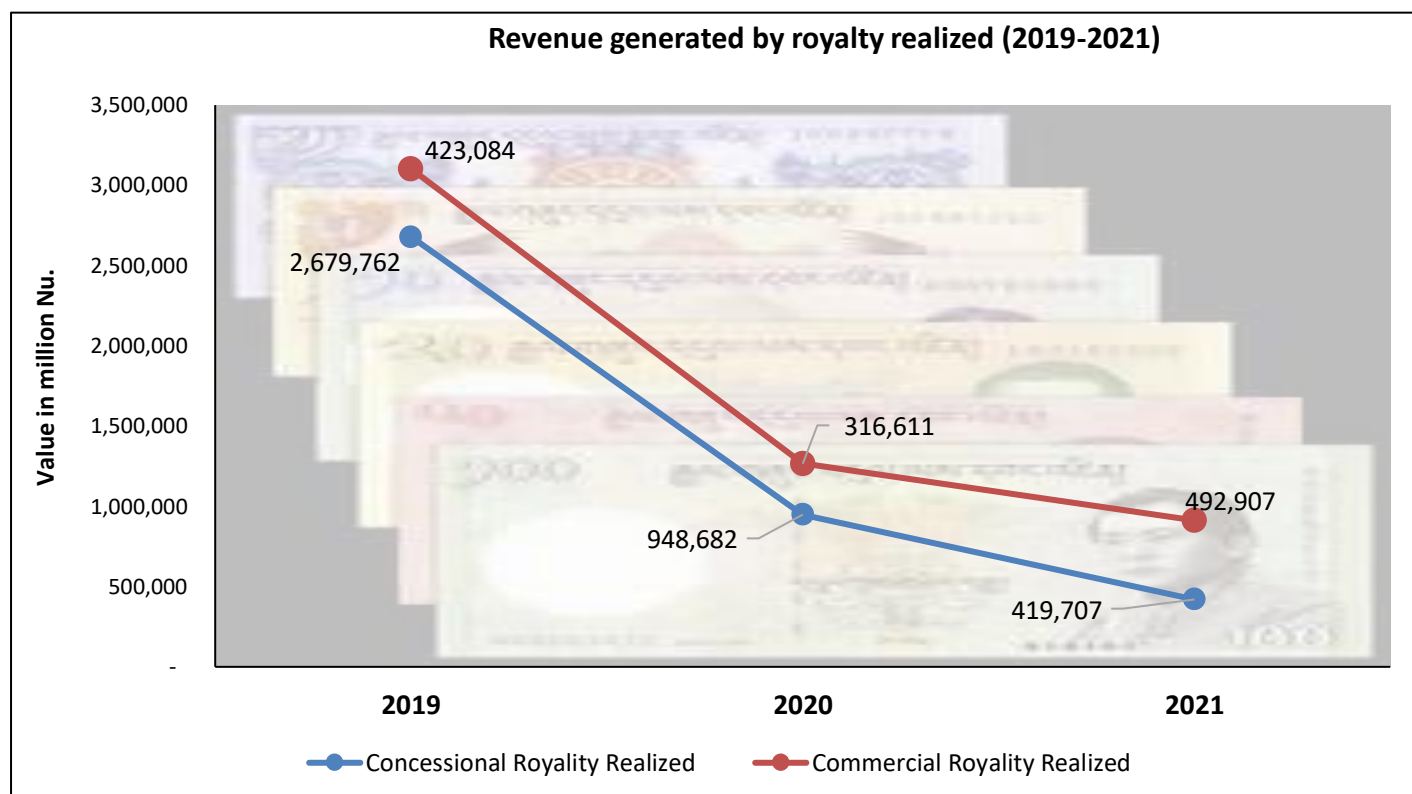


Figure 14: Revenue generate by concessional and commercial royalty realized in million ngultrums

Table 8.6 NUMBER OF WOOD-BASED INDUSTRIES IN THE COUNTRY

Dzongkhag	Briquette manufacturing unit	Charcoal production unit	Handicraft	Incense production unit	Paper manufacturing unit	Particle board factory	Plywood factory	Stationary sawmill & plywood factory	Stationary sawmill & furniture unit	Stationary sawmill & joinery unit	Stationary sawmill	Mobile sawmill	Integrated WBI	Furniture unit	Furniture unit & joinery Unit	Joinery unit
Bumthang	-	-	4	4	-	-	-	-	-	-	15	10	-	33	-	-
Chhukha	-	-	1	6	-	1	1	-	4	2	2	-	1	16	1	1
Dagana	-	-	-	-	-	-	-	-	-	-	3	-	-	10	-	-
Gasa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Haa	-	-	-	-	-	-	-	-	-	-	23	-	-	8	-	-
Lhuentse	-	-	1	3	1	-	-	-	-	-	-	1	-	9	-	-
Mongar	-	1	3	5	-	-	-	-	-	-	-	7	-	41	-	1
Paro	-	-	1	2	-	-	-	-	-	-	32	-	-	72	-	-
Pemagatshel	-	-	-	-	-	-	-	-	-	-	1	-	-	9	-	-
Punakha	-	-	-	-	-	-	-	-	-	-	1	2	-	9	-	-
Samdrupjongkhar	-	-	-	1	-	-	-	-	-	-	6	1	-	23	-	-
Samtse	-	-	-	-	-	-	-	-	-	-	5	-	-	7	-	-
Sarpang	-	-	1	1	-	-	-	1	-	-	6	-	1	20	-	-
Thimphu	2	-	1	3	-	-	-	-	1	2	10	1	3	8	1	3
Trashigang	-	-	7	3	-	-	-	-	-	-	2	-	-	16	-	-
Trashiyangtse	-	-	61	-	-	-	-	-	-	-	-	-	-	12	-	-
Trongsa	-	-	2	-	-	-	-	-	-	-	4	-	-	7	-	-
Tsirang	1	-	2	-	-	-	-	-	-	-	1	-	-	7	-	-
Wangdue	-	-	2	3	-	-	-	-	-	-	6	-	-	8	-	-
Zhemgang	-	-	1	-	-	-	-	-	-	-	2	-	-	12	-	-
Total	3	1	87	31	1	1	1	1	5	4	119	22	5	327	2	5

Source: DoFPS, MoAF

Table 8.7 DZONGKHAG-WISE FOREST FIRE CASES AND AREA BURNT

Dzongkhag	2017		2018		2019		2020		2021	
	No. of cases	Area burnt (Acres)	No. of cases	Area burnt (Acres)	No. of cases	Area burnt (Acres)	No. of cases	Area burnt (Acres)	No. of cases	Area burnt (Acres)
Bumthang	-	-	3	7	2	3	1	1	3	13
Chhukha	1	105	-	-	-	-	-	-	1	2
Dagana	1	443	1	12	-	-	-	-	-	-
Gasa	-	-	1	514	-	-	-	-	-	-
Haa	-	-	-	-	1	-	-	-	1	0
Lhuntse	3	42	2	1,240	1	26	1	62	2	653
Monggar	8	2,383	6	2,963	5	1,549	1	1298	7	5384
Paro	3	34	6	12	0	0	1	3	2	1
Punakha	4	562	-	-	5	128	8	1304	6	1642
Pema Gatshel	-	-	3	17	-	-	-	-	-	-
Samdrup Jongkhar	1	121	-	-	-	-	4	386	2	655
Sarpang	-	-	-	-	3	11	-	-	-	-
Samtse	-	-	-	-	2	32	-	-	-	-
Thimphu	4	57	4	109	2	707	1	2	5	233
Trashigang	4	597	3	734	8	981	1	243	3	149
Trashigang Yangtse	2	904	-	-	-	-	1	1	-	-
Tsirang	-	-	-	-	1	1	-	-	-	-
Trongsa	-	-	-	-	1	1	-	-	-	-
Wangdue Phodrang	-	-	14	2,466	8	68	7	2598	9	1712
Zhemgang	-	-	-	-	1	16	-	-	4	211
Total	31	5,249	43	8,075	40	3,525	26	5899	45	10655

Source: DoFPS, MoAF

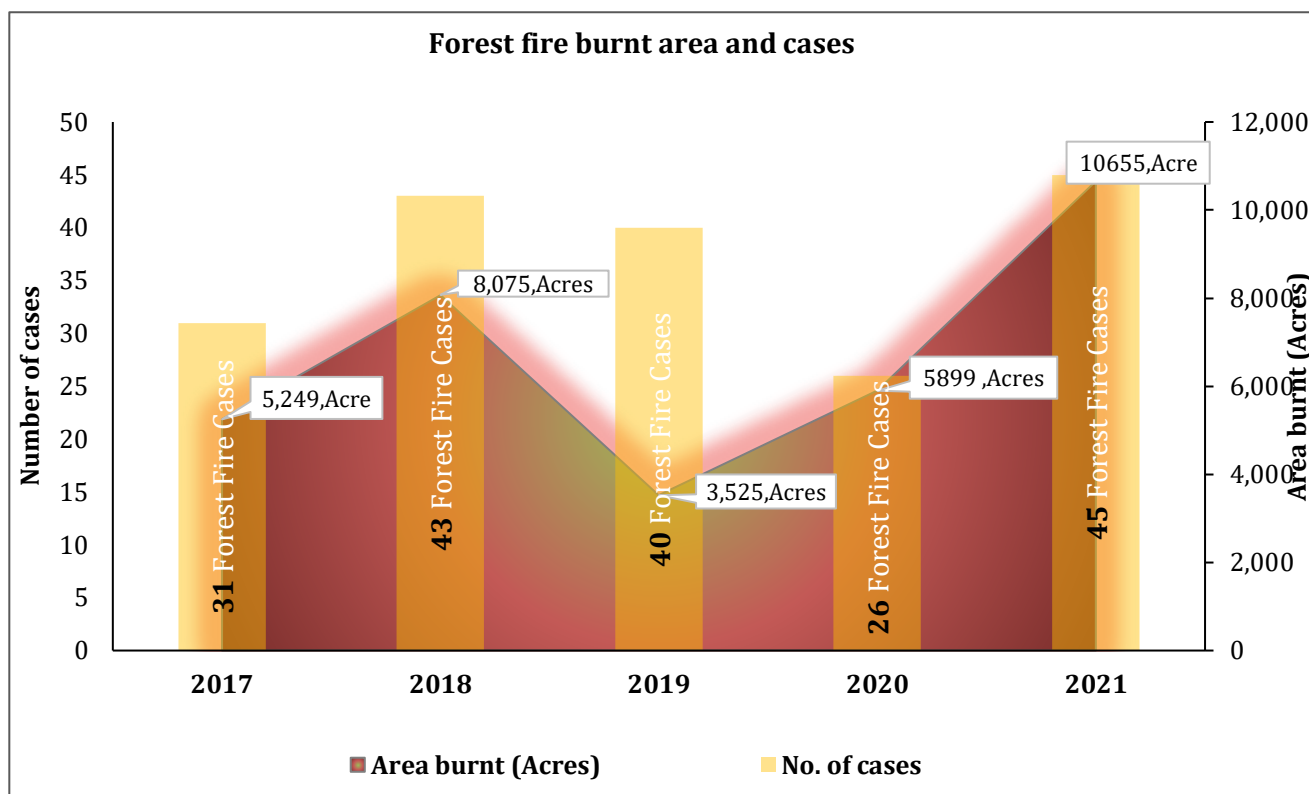


Figure 15: Trend of number of cases detected and total area burnt (2017-2021)

Table 8.8 DZONGKHAG-WISE COMMUNITY FOREST FIRE AREA AND NUMBER

Dzongkhag	2017		2018		2019		2020		2021	
	Nos. of CFs	Area (ha)	Nos. of CFs	Area (ha)	Nos. of CFs	Area (ha)	Nos. of CFs	Area (ha)	Nos. of CFs	Area (ha)
Bumthang	33	3,400	33	3,400	35	3,723	37	3,824	39	3,897
Chhukha	56	3,970	60	4,255	61	4,303	62	4,540	62	4,540
Dagana	27	2,278	27	2,278	28	2,423	31	2,892	34	3,355
Gasa	7	452	7	452	7	452	7	556	7	556
Haa	18	1,697	18	1,697	19	1,840	19	1,840	19	1,840
Lhuntse	31	2,745	37	3,391	37	3,475	37	3,577	37	3,577
Monggar	32	7,594	34	9,390	34	9,390	36	10,793	38	11,879
Paro	27	4,388	29	4,628	30	4,843	30	4,843	30	4,843
Pema Gatshel	39	3,623	40	3,826	43	4,482	57	5,616	58	5,773
Punakha	47	4,014	56	5,105	56	5,105	44	4,520	45	4,551
Samdrup Jongkhar	48	6,295	50	6,660	50	6,722	50	7,142	50	7,142
Samtse	32	3,307	33	3,430	34	4,053	63	6,824	64	6,919
Sarpang	52	4,740	57	5,358	62	6,607	35	4,540	36	4,612
Thimphu	21	2,750	21	2,857	22	2,912	22	3,039	22	3,039
Trashigang	53	9,923	54	10,458	54	10,458	54	11,178	54	11,178
Trashi Yangtse	30	3,517	32	4,273	33	4,538	36	4,820	39	5,111
Trongsa	43	6,512	48	7,767	49	9,241	30	3,580	30	3,580
Tsirang	29	3,064	30	3,176	30	3,569	50	9,500	51	9,697
Wangdue Phodrang	82	6,147	85	6,906	89	6,999	89	7,010	89	7,010
Zhemgang	26	2,800	26	2,856	31	4,010	33	4,467	35	4,768
Total	733	83,215	777	92,165	804	99,146	822	105,099	839	107,866

Source: DoFPS, MoAF

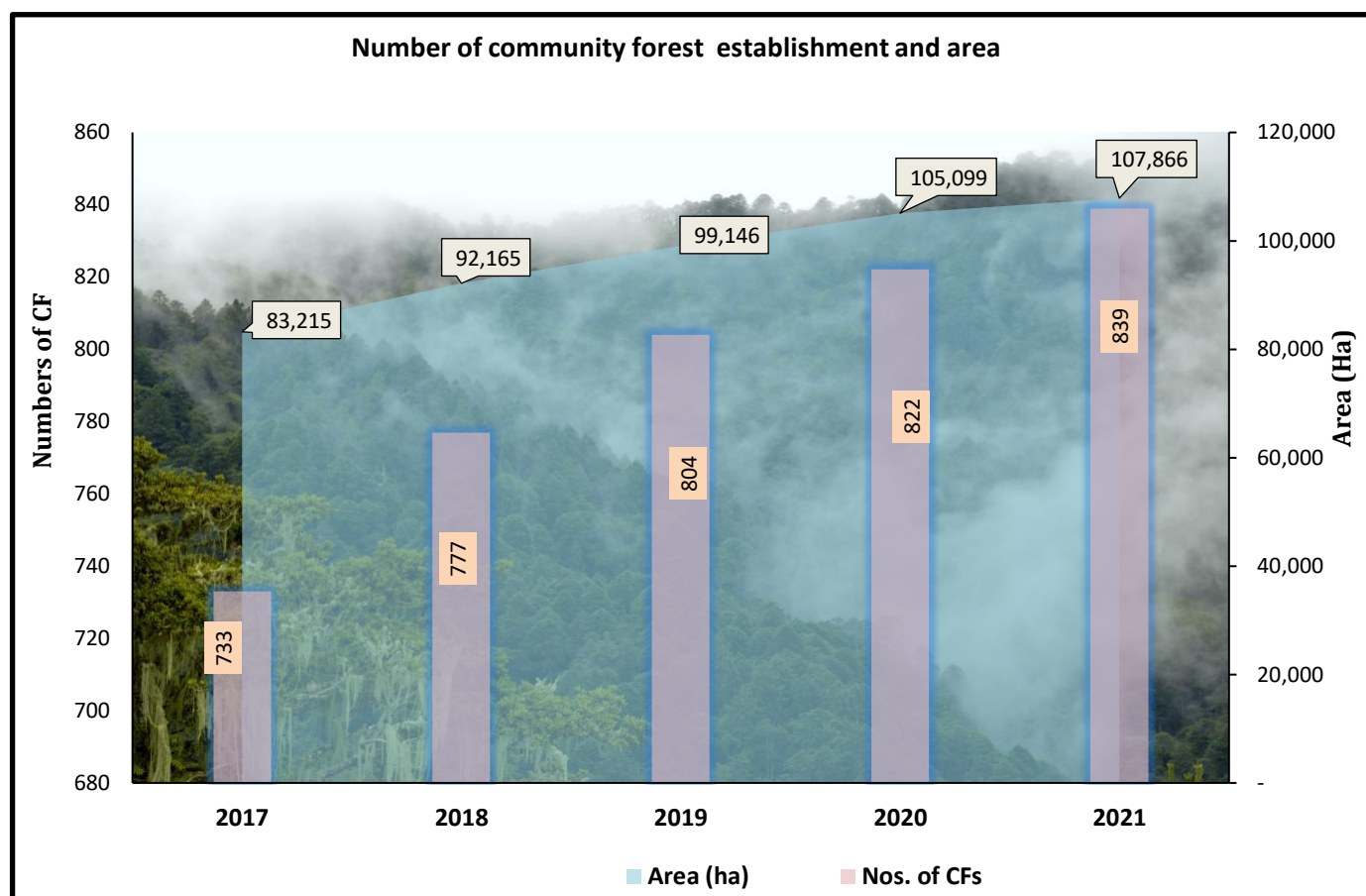


Figure 16: Trend of community forestry establishment (2017-2021)

**Table 8.9.1 PLANTATION CREATION AND MAINTENANCES BY DIVISIONAL
FOREST OFFICES AND PARK OFFICES**

Division /Park Offices	2020	2021
	Plantation Area (Ha)	Plantation Area (Ha) (Ha)
Bumthang	5.00	-
Dagana	14.00	6.58
Gedu	22.00	-
Monggar	30.04	0.57
Pema Gatshel	12.11	-
Samdrup Jongkhar	5.00	-
Samtse	1.50	-
Sarpang	2.00	1.00
Thimphu	3.00	-
Trashigang	4.02	-
Tsirang	29.00	-
Wangdue Phordang	43.11	4.11
Zhemgang	23.40	-
Bumdeling Wildlife Sanctuary	5.00	-
Jigme Dorji National Park	5.00	-
Jigme Khesar Strict Nature Reserve	6.00	-
Jigme Singey Wangchuck National Park	6.00	-
Jomotsangkha Wildlife Sanctuary	2.00	-
Phibsoo Wildlife Sanctuary	3.00	-
Phrumsengla National Park	5.08	-
Sakteng Wildlife Sanctuary	5.00	-
Total	231.26	12.26

Source: DoFPS, MoAF

**Table 8.9.2 PLANTATION CREATION AND MAINTENANCES BY FOREST
MANAGEMENT UNITS**

Forest Management Units	Plantation Creation planned (Ha)	Achievement (Ha)	Plantation Maintenance planned (Ha)	Achievement (Ha)
Chendebji	-	-	-	4.00
Lonchu	5.80	5.80	7.11	7.11
Korilla	1.78	1.78	37.38	25.36
Selela	1.57	1.57	19.34	19.34
Zonglela	5.50	5.50	37.20	37.20
Lingmithang	6.27	6.27	42.50	42.50
Karshong	-	-	-	-
Dongdechu	4.60	5.40	18.52	10.82
Khaling Kharungla	8.63	8.63	24.03	24.03
Betekha	-	-	10.92	10.92
Chamgang	-	-	1.00	-
Rongmanchu	-	-	59.22	59.22
Haa East	34.08	21.22	61.97	27.71
Gidakom	5.00	5.00	18.54	18.07
Gogona	5.00	5.32	5.37	5.37
Khotokha	-	-	-	-
Dawathang	-	-	5.00	5.00
Rhodungla	-	-	-	-
Total	78.23	66.49	348.10	296.65

Source: DoFPS, MoAF

CHAPTER 9: METEOROLOGY STATISTICS

For agriculture, water is one of the most important natural resources. The main source of water is rainfall which keeps the rivers flowing, lakes filled, and mountains peaks snow-covered or directly supplies moisture to the crops.

This chapter presents data on total precipitation (in millimeters) at 20 weather stations which are set up and managed by National Centre for Hydrology and Meteorology across the country.

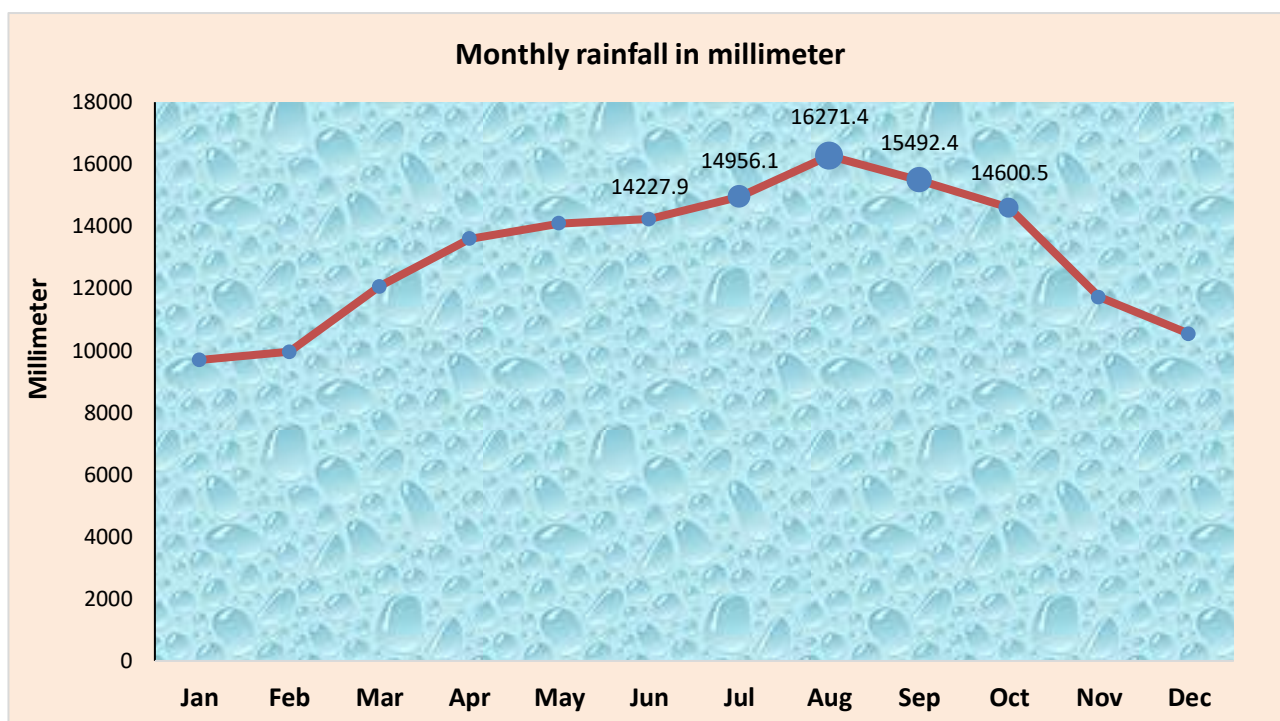


Figure 17: Annual monthly rainfall ,2021

Table 9.1 STATION-WISE ANNUAL RAINFALL (mm) DURING 2021

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Bhur	74.20	11.50	58.90	106.30	467.20	1016.40	847.00	1904.10	298.10	228.00	3.00	10.00
Chamkhar	395.00	416.50	503.50	564.00	592.50	685.50	684.50	675.00	654.50	618.00	463.50	394.00
Dagana	554.50	573.00	678.50	768.50	730.50	729.00	761.50	748.50	784.00	778.50	666.50	609.00
Damphu	456.00	427.50	559.00	618.00	673.50	683.50	738.50	727.00	735.50	679.00	611.50	582.00
Deothang	603.00	599.00	737.00	794.50	789.00	781.00	811.50	807.00	866.50	852.50	757.50	709.00
Gasa	307.00	306.50	350.50	427.00	476.50	575.00	572.00	562.50	599.50	570.00	379.50	333.00
Haa	345.00	293.50	373.50	450.00	468.00	578.00	594.10	584.50	576.00	511.00	388.50	319.00
Kanglung	465.00	521.00	618.50	711.00	693.00	724.50	735.00	738.00	769.00	729.50	577.00	533.00
Monggar	478.00	550.00	659.50	770.00	746.50	768.50	791.00	763.00	813.00	752.00	586.50	516.00
Paro	453.50	405.00	522.50	598.50	651.00	736.50	770.00	728.50	723.50	641.20	512.50	383.00
Pema Gatshel	473.90	513.00	656.50	758.00	740.50	754.50	786.50	764.50	838.00	808.50	679.00	594.00
Phuntsholing	739.00	767.50	915.00	953.50	929.00	0.00	0.00	595.00	936.50	935.50	848.50	814.00
Punakha	705.50	708.00	836.00	939.00	918.50	962.00	1008.00	967.50	996.50	956.00	793.50	743.00
Simtokha	400.50	422.00	529.00	597.50	654.50	740.00	768.50	763.00	744.50	688.50	565.00	463.00
Sispu	696.00	718.00	859.50	906.50	877.50	856.50	901.00	888.00	941.00	931.00	823.00	777.00
Tangmachu	622.00	673.50	752.50	841.00	876.00	583.50	984.50	954.50	979.00	881.50	699.00	649.00
Trashig Yangtse	500.00	556.50	630.00	718.00	722.50	804.00	822.50	784.50	825.00	773.50	601.50	522.00
Trongsa	418.80	446.80	521.00	605.50	592.50	671.50	716.50	701.30	760.80	716.30	535.70	479.00
Wangdue	595.50	612.00	730.00	826.00	833.00	876.00	913.50	880.50	896.50	859.00	693.50	646.00
Zhemgang	412.50	437.50	567.00	645.00	662.00	702.00	750.00	734.50	755.00	691.00	531.50	455.00
Total	9694.90	9958.30	12057.90	13597.80	14093.70	14227.90	14956.10	16271.40	15492.40	14600.50	11716.20	10532.00

Source: National Centre for Hydrology and Meteorology (NCHM)

Table 9.2 METEOROLOGY INFORMATION OF BHUR STATION DURING 2021

Month	Total Rainfall (mm)	Average of Temperature max. (°c)	Average of Temperature min. (°c)	Average of RH (%)	Average of Sunshine (Hours)
Jan	74.20	22.10	14.23	77.35	5.7
Feb	11.50	25.59	16.20	65.43	7.1
Mar	58.90	27.26	20.29	71.94	5.0
Apr	106.30	29.26	22.62	69.07	6.5
May	467.20	28.74	22.68	86.00	3.0
Jun	1016.40	29.47	23.83	93.77	1.4
Jul	847.00	29.27	24.69	92.55	1.9
Aug	1904.10	28.21	23.98	95.74	1.2
Sep	298.10	32.58	24.33	82.17	5.4
Oct	228.00	30.03	23.26	80.00	5.2
Nov	3.00	27.42	20.33	67.00	7.8
Dec	10.10	25.29	16.81	67.68	7.7
Total	5024.80	27.93	21.12	79.21	4.8

Source: National Centre for Hydrology and Meteorology (NCHM)

Table 9.3 METEOROLOGY INFORMATION OF CHAMKHAR STATION DURING 2021

Month	Total Rainfall (mm)	Average of Temperature max. (°c)	Average of Temperature min. (°c)	Average of RH (%)	Average of Evap Amount (mm)	Average of Sunshine (Hours)
Jan	0.40	12.74	-0.50	73.29	2.07	5.7
Feb	0.40	14.88	-0.61	73.46	2.68	5.6
Mar	42.70	16.24	4.29	74.39	2.69	5.1
Apr	36.20	18.80	4.45	66.13	3.24	5.7
May	90.20	19.11	10.27	71.00	3.15	3.7
Jun	56.10	22.85	13.95	67.00	4.34	5.6
Jul	188.60	22.08	15.03	78.61	2.86	3.0
Aug	96.20	21.77	14.45	79.00	2.85	3.4
Sep	74.70	21.82	12.02	71.93	3.36	4.7
Oct	73.70	19.94	9.34	73.97	2.94	5.2
Nov	0.30	15.45	3.65	76.03	2.57	6.2
Dec	11.20	12.71	-1.05	76.68	1.88	4.4
Total	670.70	18.21	7.16	73.49	2.88	4.8

Source: National Centre for Hydrology and Meteorology (NCHM)

Table 9.4 METEOROLOGY INFORMATION OF DAGANA STATION DURING 2021

Month	Total Rainfall (mm)	Average of Temperature max. (°c)	Average of Temperature min. (°c)	Average of RH (%)	Average of Evap Amount (mm)	Average of Sunshine (Hours)
Jan	1.80	17.89	7.02	57.35	1.83	5.6
Feb	5.50	20.46	8.50	47.43	2.51	6.2
Mar	10.10	21.89	11.31	57.77	2.92	5.0
Apr	18.80	25.62	13.07	48.57	4.06	7.4
May	147.50	23.56	16.29	80.03	2.62	2.8
Jun	240.30	24.30	18.70	89.57	2.27	3.1
Jul	127.00	24.56	19.32	88.90	2.10	2.3
Aug	217.80	24.15	19.10	93.00	1.76	1.7
Sep	83.30	26.13	17.72	77.40	2.86	5.1
Oct	14.50	25.11	15.63	73.29	2.37	5.3
Nov	0.00	22.22	10.28	56.03	2.37	6.9
Dec	17.40	19.66	7.19	51.74	1.95	6.7
Total	884.00	22.97	13.71	68.60	2.46	4.8

Source: National Centre for Hydrology and Meteorology (NCHM)

Table 9.5 METEOROLOGY INFORMATION OF DAMPHU STATION DURING 2021

Month	Total Rainfall (mm)	Average of Temperature max. (°c)	Average of Temperature min. (°c)	Average of RH (%)	Average of Evap Amount (mm)	Average of Sunshine (Hours)
Jan	4.20	14.71	6.85	84.23	1.86	5.5
Feb	1.60	15.27	7.27	78.61	2.46	6.6
Mar	24.80	18.03	10.55	79.68	2.74	5.6
Apr	11.40	20.60	12.05	71.73	3.10	7.8
May	96.40	21.73	15.65	85.58	2.64	5.4
Jun	313.10	22.78	18.38	91.33	2.04	3.6
Jul	227.20	23.82	19.35	90.84	1.99	3.5
Aug	352.20	23.45	19.37	94.06	1.73	3.1
Sep	116.40	24.52	18.03	86.00	2.31	6.7
Oct	153.20	22.63	16.20	87.30	2.74	6.1
Nov	1.00	20.38	9.97	85.37	3.80	8.5
Dec	0.00	18.79	7.56	81.06	0.00	7.4
Total	1301.50	20.58	13.47	84.70	2.28	5.8

Source: National Centre for Hydrology and Meteorology (NCHM)

Table 9.6 METEOROLOGY INFORMATION OF DEOTHANG STATION DURING 2021

Month	Total Rainfall (mm)	Average of Temperature max. (°c)	Average of Temperature min. (°c)	Average of RH (%)	Average of Evap Amount (mm)	Average of Sunshine (Hours)
Jan	51.00	19.45	10.77	70.84	2.20	4.9
Feb	32.20	21.39	12.46	53.18	2.56	6.5
Mar	49.10	23.77	15.58	61.06	2.69	5.9
Apr	25.10	26.48	17.50	63.47	4.04	7.0
May	429.20	25.45	19.31	85.32	2.31	2.8
Jun	880.20	26.03	20.92	93.43	1.53	2.0
Jul	339.20	26.18	21.29	92.10	1.64	1.8
Aug	667.90	26.03	21.31	94.35	1.41	1.5
Sep	189.40	28.88	21.00	79.23	3.60	5.0
Oct	119.20	27.50	19.03	73.68	2.51	4.8
Nov	0.20	25.25	14.47	57.83	2.79	7.0
Dec	0.80	22.89	12.42	56.26	2.10	6.3
Total	2783.50	24.95	17.20	73.56	2.45	4.6

Source: National Centre for Hydrology and Meteorology (NCHM)

Table 9.7 METEOROLOGY INFORMATION OF GASA STATION DURING 2021

Month	Total Rainfall (mm)	Average of Temperature max. (°c)	Average of Temperature min. (°c)	Average of RH (%)	Average of Evap Amount (mm)	Average of Sunshine (Hours)
Jan	30.50	9.90	-1.90	57.58	0.85	4.6
Feb	23.30	10.95	-1.34	56.86	0.57	4.0
Mar	125.40	11.31	1.40	58.87	0.31	2.9
Apr	135.10	14.23	2.62	51.93	0.87	4.5
May	346.10	15.37	7.02	77.26	0.84	2.1
Jun	314.60	19.17	10.60	79.17	0.65	2.5
Jul	472.70	18.45	11.77	83.87	0.21	1.6
Aug	470.90	18.15	11.50	86.90	0.13	1.5
Sep	289.20	19.98	9.52	73.80	0.72	5.2
Oct	182.20	18.39	7.13	71.35	0.94	4.4
Nov	35.30	12.65	1.83	69.53	0.42	3.6
Dec	30.10	10.76	-1.27	53.52	0.58	4.9
Total	2455.40	14.96	4.94	68.48	0.59	3.5

Source: National Centre for Hydrology and Meteorology (NCHM)

Table 9.8 METEOROLOGY INFORMATION OF HAA STATION DURING 2021

Month	Total Rainfall (mm)	Average of Temperature max. (°c)	Average of Temperature min. (°c)	Average of RH (%)	Average of Evap Amount (mm)	Average of Sunshine (Hours)
Jan	0.40	11.13	-3.74	58.55		5.7
Feb	3.40	10.48	-3.07	52.32		4.2
Mar	39.60	12.05	0.50	56.48	2.20	3.7
Apr	54.80	15.00	1.38	55.80	2.06	3.5
May	98.20	15.10	8.47	67.97	1.37	1.1
Jun	101.60	19.27	12.97	91.87	1.35	2.1
Jul	183.10	19.16	15.24	79.32	1.07	1.1
Aug	153.30	18.85	14.26	76.45	1.10	0.9
Sep	141.70	19.20	11.62	70.40	1.41	3.2
Oct	179.70	16.48	6.63	69.84	1.29	3.8
Nov	0.00	12.95	-0.57	58.63	1.55	5.5
Dec	24.60	10.31	-5.05	54.39	0.24	4.8
Total	980.40	15.02	4.94	66.08	1.36	3.3

Source: National Centre for Hydrology and Meteorology (NCHM)

Table 9.9 METEOROLOGY INFORMATION OF KANGLUNG STATION DURING 2021

Month	Total Rainfall (mm)	Average of Temperature max. (°c)	Average of Temperature min. (°c)	Average of RH (%)	Average of Evap Amount(mm)	Average of Sunshine (Hours)
Jan	2.80	15.00	3.85	76.19	1.09	3.2
Feb	7.60	18.61	5.09	68.25	1.31	5.6
Mar	63.50	20.62	8.10	73.84	1.66	5.2
Apr	55.00	23.70	9.93	62.60	1.83	6.1
May	132.60	22.35	12.66	84.58	1.60	3.4
Jun	95.20	24.15	15.47	88.53	1.61	3.6
Jul	190.60	23.71	15.94	90.58	1.47	2.6
Aug	248.20	23.81	16.39	90.87	1.30	2.6
Sep	56.80	25.63	15.25	86.53	1.53	5.5
Oct	178.00	23.53	12.95	80.35	1.42	4.8
Nov	5.40	19.23	7.27	77.93	1.25	4.3
Dec	19.60	17.19	4.50	78.16	1.05	3.8
Total	1055.30	21.47	10.65	79.98	1.43	4.2

Source: National Centre for Hydrology and Meteorology (NCHM)

Table 9.10 METEOROLOGY INFORMATION OF MONGGAR STATION DURING 2021

Month	Total Rainfall (mm)	Average of Temperature max. (°c)	Average of Temperature min. (°c)	Average of RH (%)	Average of Evap Amount (mm)	Average of Sunshine (Hours)
Jan	2.20	15.42	7.15	74.29	1.12	3.9
Feb	1.40	19.64	8.18	56.32	1.84	6.1
Mar	39.80	21.27	11.16	68.94	2.40	4.5
Apr	2125.90	25.67	12.98	59.53	3.46	6.6
May	136.60	24.08	15.87	79.23	2.10	2.9
Jun	75.20	25.62	18.50	82.37	2.11	3.1
Jul	252.00	25.52	18.69	85.77	2.24	2.3
Aug	104.00	24.61	18.81	86.19	1.97	2.0
Sep	28.60	27.10	18.03	78.70	2.74	6.0
Oct	151.60	24.26	15.55	74.10	1.81	5.6
Nov	6.40	19.55	10.12	68.07	1.35	6.7
Dec	18.80	16.65	7.23	67.68	1.08	5.9
Total	2942.50	22.45	13.55	73.59	2.02	4.6

Source: National Centre for Hydrology and Meteorology (NCHM)

Table 9.11 METEOROLOGY INFORMATION OF PARO STATION DURING 2021

Month	Total Rainfall (mm)	Average of Temperature max. (°c)	Average of Temperature min. (°c)	Average of RH (%)	Average of Evap Amount(mm)	Average of Sunshine (Hours)
Jan	0.00	14.63	0.24	68.65	0.96	7.2
Feb	0.20	14.46	-0.80	69.36	1.91	6.6
Mar	15.40	16.85	2.76	70.77	2.25	4.6
Apr	30.80	19.95	4.15	62.10	2.56	5.7
May	37.40	21.00	10.31	66.06	2.34	2.5
Jun	75.00	24.55	13.85	69.33	2.39	2.2
Jul	93.10	24.84	14.34	74.81	2.12	2.0
Aug	62.50	23.50	14.23	79.74	1.77	2.3
Sep	70.80	24.12	13.22	76.77	1.83	3.6
Oct	155.70	20.68	10.08	81.16	2.47	5.1
Nov	0.00	17.08	2.55	74.47	1.71	7.3
Dec	10.00	12.37	-0.56	72.65	1.29	6.0
Total	550.90	19.52	7.08	72.19	1.97	4.6

Source: National Centre for Hydrology and Meteorology (NCHM)

Table 9.12 METEOROLOGY INFORMATION OF PEMA GATSHEL STATION DURING 2021

Month	Total Rainfall (mm)	Average of Temperature max. (°c)	Average of Temperature min. (°c)	Average of RH (%)	Average of Evap Amount(mm)	Average of Sunshine (Hours)
Jan	26.40	15.29	6.24	80.29	1.13	4.5
Feb	37.00	18.32	6.86	73.29	1.77	7.8
Mar	62.60	21.18	10.16	81.58	2.15	4.9
Apr	18.20	25.27	12.15	72.43	3.10	6.5
May	232.40	23.89	15.71	82.87	2.09	3.0
Jun	238.70	25.15	18.52	86.57	1.90	2.2
Jul	146.90	25.37	19.15	87.68	1.87	1.9
Aug	502.70	24.66	19.13	90.61	1.68	1.4
Sep	38.60	27.93	18.05	86.03	2.33	5.3
Oct	186.40	26.08	15.44	85.39	2.00	5.5
Nov	0.60	22.63	9.12	80.20	1.56	6.4
Dec	6.60	19.18	6.95	83.42	1.17	5.4
Total	1497.10	22.92	13.16	82.62	1.89	4.5

Source: National Centre for Hydrology and Meteorology (NCHM)

Table 9.13 METEOROLOGY INFORMATION OF PHUENTSHOLING STATION DURING 2021

Month	Total Rainfall (mm)	Average of Temperature max. (°c)	Average of Temperature min. (°c)	Average of RH (%)	Average of Evap Amount(mm)	Average of Sunshine (Hours)
Jan	32.60	23.84	11.21	68.84	3.05	3.6
Feb	4.50	27.41	12.59	67.54	5.60	5.6
Mar	128.50	29.52	15.18	73.35	5.32	5.6
Apr	100.30	31.78	17.75	70.03	5.85	5.7
May	622.50	29.97	18.06	80.03	3.40	3.3
Jun	NA	NA	NA	NA	NA	NA
Jul	NA	NA	NA	NA	NA	NA
Aug	1375.80	21.25	19.87	84.21	2.03	2.1
Sep	365.30	31.22	20.73	76.57	4.59	4.5
Oct	572.80	30.18	19.58	79.10	5.18	5.1
Nov	14.00	28.28	14.43	55.07	4.48	5.2
Dec	6.40	26.27	12.56	55.35	5.45	5.7
Total	3222.70	28.02	16.07	70.54	4.59	4.7

Source: National Centre for Hydrology and Meteorology (NCHM)

Table 9.14 METEOROLOGY INFORMATION OF PUNAKHA STATION DURING 2021

Month	Total Rainfall (mm)	Average of Temperature max. (°c)	Average of Temperature min. (°c)	Average of RH (%)	Average of Evap Amount(mm)	Average of Sunshine (Hours)
Jan	3.50	22.76	8.79	72.06	2.31	4.5
Feb	4.60	25.29	9.43	63.18	2.76	5.2
Mar	30.00	26.97	13.77	65.19	3.28	4.1
Apr	9.00	31.30	15.05	49.73	4.88	6.2
May	121.20	29.63	19.58	71.42	3.88	3.1
Jun	90.90	32.07	24.03	69.77	4.01	4.3
Jul	168.00	32.52	22.94	74.23	4.74	3.8
Aug	115.00	31.21	22.77	78.71	5.08	3.1
Sep	84.40	33.22	21.62	74.07	4.88	5.6
Oct	158.20	30.84	18.90	71.23	5.02	4.9
Nov	0.40	26.45	13.27	68.83	2.28	5.1
Dec	13.40	23.92	8.76	74.39	1.45	5.6
Total	798.60	28.85	16.61	69.49	3.72	4.6

Source: National Centre for Hydrology and Meteorology (NCHM)

Table 9.15 METEOROLOGY INFORMATION OF SIMTOKHA STATION DURING 2021

Month	Total rainfall (mm)	Average of Temperature max. (°c)	Average of Temperature min. (°c)	Average of RH (%)	Average of Evap Amount(mm)	Average of Sunshine (Hours)
Jan	0.00	12.92	-1.45	54.61	1.23	6.8
Feb	1.80	15.07	-1.86	55.25	1.63	6.2
Mar	20.30	17.06	2.79	62.00	1.90	4.9
Apr	33.40	19.92	4.02	53.50	3.21	5.8
May	28.20	21.11	10.68	59.42	2.68	2.8
Jun	117.20	24.67	14.23	64.60	2.73	3.8
Jul	132.70	24.79	15.32	71.81	2.96	2.5
Aug	68.90	24.61	15.15	72.42	3.98	2.9
Sep	64.40	24.82	12.82	69.80	3.12	4.9
Oct	97.60	22.95	9.63	68.87	2.79	5.3
Nov	0.00	18.23	2.06	62.77	1.57	6.2
Dec	10.60	14.89	-2.68	55.58	0.76	3.7
Total	575.10	20.09	6.76	62.59	2.38	4.6

Source: National Centre for Hydrology and Meteorology (NCHM)

Table 9.16 METEOROLOGY INFORMATION OF SIPSU STATION DURING 202

Month	Total Rainfall (mm)	Average of Temperature max. (°c)	Average of Temperature min. (°c)	Average of RH (%)	Average of Evap Amount(mm)	Average of Sunshine (Hours)
Jan	65.80	22.45	11.79	64.19	2.34	4.6
Feb	11.80	25.64	13.73	53.79	2.60	5.0
Mar	82.40	27.73	17.16	63.03	2.12	2.4
Apr	133.40	30.22	19.30	57.17	2.77	5.2
May	649.80	28.31	19.79	78.97	2.63	2.8
Jun	1240.10	28.55	21.78	87.73	2.08	1.5
Jul	912.20	29.06	22.24	85.32	1.54	1.4
Aug	1533.80	28.65	21.95	89.97	1.90	1.4
Sep	876.60	31.37	21.95	78.17	2.57	4.5
Oct	453.40	30.03	20.47	74.61	2.59	5.1
Nov	28.80	27.43	15.75	60.33	3.03	7.1
Dec	3.20	25.06	13.37	58.26	3.01	6.5
Total	5991.30	27.88	18.30	71.10	2.43	3.9

Source: National Centre for Hydrology and Meteorology (NCHM)

Table 9.17 METEOROLOGY INFORMATION OF TRASHI YANGTSE STATION DURING 2021

Month	Total Rainfall (mm)	Average of Temperature max. (°c)	Average of Temperature min. (°c)	Average of RH (%)	Average of Evap Amount(mm)	Average of Sunshine (Hours)
Jan	16.20	16.13	2.35	74.52	1.09	4.5
Feb	8.40	19.88	2.45	67.04	1.81	4.8
Mar	91.10	20.32	6.45	72.19	1.39	3.6
Apr	79.90	23.93	7.37	69.17	2.40	4.7
May	160.60	23.31	12.81	79.13	1.61	2.1
Jun	128.70	26.80	16.40	80.13	2.16	3.9
Jul	204.30	26.53	16.97	85.42	1.52	1.9
Aug	192.30	25.31	19.32	86.13	1.54	2.0
Sep	139.80	27.50	16.82	78.97	1.94	4.5
Oct	94.60	24.95	12.79	78.84	1.81	4.5
Nov	9.00	20.05	6.27	75.67	1.71	5.3
Dec	21.00	16.85	1.94	74.48	1.32	4.7
Total	1145.90	22.63	10.21	76.90	1.68	3.8

Source: National Centre for Hydrology and Meteorology (NCHM)

Table 9.18 METEOROLOGY INFORMATION OF TRONGSA STATION DURING 2021

Month	Total Rainfall (mm)	Average of Temperature max. (°C)	Average of Temperature min. (°C)	Average of RH (%)	Average of Evap Amount (mm)	Average of Sunshine (Hrs)
Jan	0	13.5	2.9	81.5	1.1	5.1
Feb	9.4	16.0	3.4	73.2	1.8	6.0
Mar	99.4	16.8	6.4	82.3	1.7	5.2
Apr	48.4	20.2	7.3	66.6	2.1	6.7
May	138.2	19.8	12.3	76.8	1.7	2.6
Jun	219.7	22.4	15.2	84.0	1.6	2.5
Jul	281.5	23.1	16.1	88.0	1.7	1.6
Aug	197.3	22.6	16.1	88.4	1.6	1.5
Sep	80.1	25.4	14.1	83.6	1.9	5.0
Oct	122.5	23.1	11.5	80.9	1.8	5.2
Nov	5.8	17.9	6.1	67.8	1.6	6.2
Dec	23.3	15.5	1.9	67.0	1.1	0.3
Total	1225.6	19.7	9.5	78.4	1.6	4.0

Source: National Centre for Hydrology and Meteorology (NCHM)

Table 9.19 METEOROLOGY INFORMATION OF WANGDUE STATION DURING 2021

Month	Total Rainfall (mm)	Average of Temperature max. (°C)	Average of Temperature min. (°C)	Average of RH (%)	Average of Evap Amount (mm)	Average of Sunshine (Hours)
Jan	3	19.21	8.61	83.06	2.48	4.7
Feb	9.5	21.86	8.68	80.79	3.31	4.8
Mar	53.2	23.55	13.11	81.19	3.85	3.9
Apr	11.9	27.53	14.20	66.07	4.56	5.9
May	105.6	26.87	19.40	77.00	3.75	2.7
Jun	53.6	29.20	22.48	76.73	4.91	3.8
Jul	139	29.47	23.08	80.87	4.26	3.1
Aug	146.1	28.40	22.79	84.58	3.47	2.9
Sep	86.7	29.88	21.77	74.23	4.49	5.4
Oct	149.8	27.71	18.55	77.13	3.47	5.0
Nov	2	23.12	12.45	75.77	2.83	5.4
Dec	11.4	20.84	8.13	82.87	2.39	4.7
Total	771.8	25.65	16.15	78.39	3.65	4.3

Source: National Centre for Hydrology and Meteorology (NCHM)

**Table 9.20 METEOROLOGY INFORMATION OF ZHEMGANG STATION DURING
2021**

Month	Total Rainfall (mm)	Average of Temperature max. (°C)	Average of Temperature min. (°C)	Average of RH (%)	Average of Evap Amount(mm)	Average of Sunshine (Hours)
Jan	11.20	13.31	4.08	70.68	1.27	4.4
Feb	6.30	15.63	4.98	57.96	1.78	5.4
Mar	51.30	18.29	8.27	65.94	2.12	4.8
Apr	57.60	21.50	10.10	53.73	2.57	6.0
May	242.50	21.35	13.24	77.55	2.12	2.6
Jun	98.60	23.40	16.22	82.20	2.29	3.0
Jul	201.50	24.19	16.90	84.23	2.06	2.2
Aug	267.80	23.69	16.74	85.45	2.04	1.7
Sep	182.40	25.17	15.55	75.67	2.74	5.4
Oct	201.60	22.29	13.08	76.00	2.22	5.3
Nov	3.90	17.72	7.03	61.10	2.03	6.4
Dec	19.20	14.69	4.56	65.71	1.60	5.6
Total	1343.90	20.12	10.93	71.50	2.07	4.4

Source: National Centre for Hydrology and Meteorology (NCHM)





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