AGRICULTURE STATISTICS 2016

DEPARTMENT OF AGRICULTURE
MINISTRY OF AGRICULTURE & FORESTS
ROYAL GOVERNMENT OF BHUTAN
THIMPHU : BHUTAN

Contact Address:

Information Management Section
Department of Agriculture
Tel: +975 2 336462/322228; Fax: +975 2 336186/323562
Email: imsdoa@moaf.gov.bt, jamkins05@gmail.com

Published by: Department of Agriculture, MoAF, Thimphu
Date of Published: 12th sept, 2017

སོ་ནམ་ལས་ཁུངས། སོ་ནམ་ལྷན་ཐག། དཔལ་ལྡན་འབྲུག་གཞུང་།
DEPARTMENT OF AGRICULTURE
MINISTRY OF AGRICULTURE
ROYAL GOVERNMENT OF BHUTAN
Tashichhodzong: Thimphu

Foreword

The Department of Agriculture is pleased to publish the Annual Agriculture Statistics for the year 2016. As usual, it contains data on land use, crop area, yield, production, crop damages by wild animals and utilization of the crops cultivated in the country. There are two parts in this publication: Part I includes the data aggregated at the national level, while part II contains the data at the Dzongkhag level.

The agriculture sample survey data collection is conducted twice a year to collect the on time data seasonally. The 1st half yearly agriculture survey includes crops harvested from 1stJanuary to 30th June and 2nd half yearly from 1st July to 31st December. At the end of the year reports from half yearly surveys are merged and published as a regular annual agriculture statistics. The biannual survey was initiated to improve the quality of the data by collecting real time seasonal data and also to meet the data demands from the various users.

We hope that this publication will be useful for planners, policymakers, researchers, extension personals, academicians and those who are involved in the development of agriculture sector.

The Department of Agriculture would like to thank the Research and Development Centres in the Regions and the Agriculture sector of all the 20 Dzongkhags for their contributions.

(Kinlay Tshering)

Director

སོ་ནམ་ལས་ཁུངས། སོ་ནམ་སྐྱན་ཁག། དཔལ་ལྡན་འབྲུག་གཞུང་།
DEPARTMENT OF AGRICULTURE
MINISTRY OF AGRICULTURE
ROYAL GOVERNMENT OF BHUTAN
Tashichhodzong: Thimphu

Acknowledgements

The Department of Agriculture would like to acknowledge the support and cooperation of the Dzongkhag Agriculture Officers and Gewog Extension Officers of all the 20 Dzongkhags for their contribution and effort in collecting the data from the farming households. The support and facilitation of the Program Directors of Research and Development Centres for compilation and processing of data is also acknowledged. The overall coordination from the Information Management Section (IMS) of the Department is appreciated.

We would also like to acknowledge the support, cooperation and guidance from the National Statistics Bureau (NSB) and the United Nations Food & Agriculture Organization (UNFAO).

Contents

A. Methodology

1) Introduction

The annual agriculture sample survey was initiated in 2004. Since then, the annual publication endeavours to present comprehensive information on area, production and yield of principle crops viz: food-grains, oil seeds, pulses and spices, vegetables, fruit Crops, roots & tubers and other horticultural crops. The publication comprises of two parts, Part 1 at National level statistics which includes national level crop and fruit production data with other analysis like price and income, crop and fruit utilization, food security and coping mechanism data etc. Part 2 comprises of Dzongkhag level crop and fruit production statistics. From 2015 onwards the annual agriculture survey was bifurcated into a half yearly activity which consists of 1st half yearly agriculture survey from 1stJanuary to 30th June and 2nd half yearly from 1st July to 31st December. At the end of the year reports from half yearly surveys are merged and published as a regular annual agriculture statistics. The biannual survey was initiated to improve the quality of the data by collecting real time seasonal data and also to meet the recent emerging new data demands from the various users.

2) Objectives

The objectives of the survey are:

- The immediate objective is to generate data needed for preparation of the plans, programs and to assess the achievements.
- To establish reliable information on crop production and land use for planning and monitoring of agriculture development programmes.
- To collect information on indicators like annual crop production, yield and agricultural engaged area, fruit crop production and trees estimates etc...
- Prepare time series data of land use and agriculture production trend.

3) Sampling frame

The Household listing is done by the Gewog agriculture extension officers. The Gewog agriculture extension officer annually submits the updated Household listing to the Dzongkhag. Then, the Dzongkhag validates and submit complied HHs list to the Department.

For 2016 biannual agriculture sample survey the 2014 and 2013 household listings were used as a frame and only for few sub district / gewogs the house hold lists were updated as per the need.

Format for the annual agriculture sample survey HHs listing

Sl. No	Name of head of the HHs	Village	H.no	T. no	Land cultivated/ not cultivated	If Cultivated		Land left fallow		Land leased out		Land leased in	
						WLC	DLC	WLF	DLF	WLO	DLO	WLI	DLI
1	Pema	Benzibee	Ka-3-42	198	LC		11.37		4.63				
2	Jangchub	Benzibee	KA-3-39	106	LC		8.76		10.59				
3	Dolkar	Benzibee	KA-3-41	231	NC			3.7		1.5			
4	Sangay	Benzibee	KA-3-40	199	LC		14.87		7.93				

With the information collected using the above mentioned HHs listing format for the sample survey, the HHs which are engaged only in agriculture activities ie. LC HHs (Land cultivating HHs) were only included and NC HHs (Land not cultivating HHs/ empty HHs / Gungtongs) were excluded from the list in order to reduce the non response / empty questionnaires.
The agriculture land utilized area information collected with the above list was used as indicator/auxiliary information to come up with an appropriate sample size for the survey.

4) Questionnaire design

For the 2016 biannual survey two sets of questionnaires were designed as per the seasonality. A complete list on cropping pattern for crops was gathered from all the Districts. Then the annual survey questionnaire was deliberately split into two sets of questionnaire keeping in view the different cropping pattern and seasonality across the country. The new set of half yearly questionnaire were comprehensively discussed within the department and also with the Dzongkhag agriculture sector officials, field personnels before it was finalized.

5) Sample size

Given that geographical distribution of crops in Bhutan is based on the different ecological and climatic zones; it is not feasible to produce precise survey results for all crops in each geog/sub districts level. This is because agriculture has many indicators to be estimated like annual crop production, yield, and agriculture crop area and fruit trees estimates etc... Thus it was difficult to come up with a rigid sample size which could give precise unbiased efficient estimates. And also the farmers in Bhutan practice conventional mix farming system with small land holdings.

For 2016 biannual Survey the 2014 sample size formulae was adopted and improved using additional information gathered in previous survey, using the information collected on agriculture utilized areas of farming households at Gewog level as an indicator for sample size calculation.

The formulae given below were used for sample size calculation:

The initial sample size $n_0 = \left(\frac{Z*100* \text{ CV area}}{P} \right)^{\wedge} 2$

Here , n_0= *is the initial sample size*

Z= is the statistic that defines the level of confidence desired, at 95 Confidence Interval the value of z = 1.96

C.V= non percentage C.V (coefficient of variation) of the agriculture utilized area was taken for this survey.

Non percentage C.V= SD area / $\overline{x}$ area

P = the value of population proportion "p" or Margin of error is set at 15 ie. 0.15 at geog level.

The final sample size is given by,

Using Population correction factor we have:

$$n = \frac{n_0}{(1+ (n_0 / N))}$$

Were, N= Population size / total farming Households.

With the above described formulae, the sample size at gewog level was determined for all the 205 gewogs in 20 Dzongkhags for both the biannual surveys.

6) Sampling Design

The biannual agriculture surveys attempts to collect data on more than 60 indicators related to cereal crops, horticulture crops, oil seeds, spices, vegetables and others. A greater effort is also made using the same survey to generate statistics on crop utilization, farm gate price and income, loss in area and production due to crop damage by both the natural and non natural calamities and also coping mechanisms. The estimates are expected to be reliable with greater accuracy at Dzongkhag level and also to some extent at the Gewog level. **The existing survey design has good scope to provide reliable estimates at the District/ Dzongkhag level.**

A **stratified uni-stage sampling design** was adopted where the farming households within the Gewogs are selected using **circular systematic selection** approach. All the 20 Districts and 205 Gewogs/ sub Districts were completely enumerated.

7) Data Collection

The 1st biannual agriculture sample survey 2016 was conducted from 25th April 2016 to 31st July 2016. It includes the crops harvested in first harvest season, from 1st Jan 2016 to 30th June 2016.

Similarly, the 2nd biannual agriculture sample survey was conducted from 6th January 2017 to 7th April 2017. The crops harvested in second harvest season, from 1st July 2016 to 31st Dec 2016 was included. Both the biannual sample survey data were collected by the agriculture extension officials (EAs) posted in the gewogs (sub districts) under the supervision of Dzongkhag Agriculture Sector heads.

Twenty Assistant Dzongkhags agriculture officers (ADAOs) were briefed on the use of the questionnaire and methods of data collection, who in turn trained the field agriculture staff on the use of the questionnaire for data collection.

8) Data Entry and Processing

The database for 2016 survey is an improved version of the 2015 which was designed in CSPRO 6.2 version software. As per the policy of the department to decentralize data entry and processing at district level, the data Managers at district were already trained on use of CSPRO (Census and Survey Processing Software) for data cleaning and entry.

The data entry and processing was carried out at the Gewogs and Dzongkhags by the Dzongkhag Agriculture Sector Officials. As the survey is conducted twice a year to capture the seasonal harvest, the data entry and processing was carried out in August 2016 for 1st half yearly and March 2017 to 7th April 2017 for 2nd half yearly survey.

The raw field data was further cleaned & checked for outliers and inconsistencies by the regional and commodity coordinators at the regional ARDC office. The processed data was then submitted to IMS DoA head quarter for analysis and production of annual agriculture statistics. In the month of May 2017 the raw data were further cleaned, coded, validated and merged by the IMS officials for analysis.

9) Data Analysis and Estimation

The data analysis and report writing was done from June to August 2017 by the AEIMS officials under the Department of Agriculture. Data analysis was done in STATA 12 and SPSS version 20 analysis software.

Yield Estimation:

For the major cereal, horticulture and fruit crops the yield provided by the survey was always cross checked with the yield of the crop cuts carried out by the gewog agriculture extension officers.

Where ever the Department felt there are issues related to the yield provided by the sample survey the yield estimated from the crop cut were used for verification and further improvement.

Production= Estimated total area (from the sample survey) * Estimated yield (from the crop cuts)

The weight estimation procedure was used to represent the estimates of population from the sample survey. Therefore it is necessary to multiply the data by a sampling weight, or expansion factor. The basic weight for each sample household would be equal to the inverse of its probability of selection. The sample design for the agriculture survey 2016 was a self-weighting within stratum, meaning that all the sampled or the enumerated households within a geog will have the same weight.

Adjustment for non-response/ Non response Weight

In order to adjust for the loss of representativeness caused by non-responding households, the weight of the responding units ***(Wt_Eh)*** was increased by deploying the following formulae. It is the reciprocal/inverse of the percentage responding units from the sample.

$$\textit{Non response Weight / } W_{nr} = \frac{1}{Eh / Sh} \Rightarrow \boxed{\frac{Sh}{Eh}}$$

Where: ***Sh*** = *Sampled households in the geog*
Eh = *Enumerated households in the geog*

Design Weight / Weighting for probability of sample selection

The design weight or base weight is the inverse of probability of selection of the sample.
Based on the Circular systematic sampling design, the probability of selection for the sample households in a geog was calculated as follows:

$$\textit{Design weight/Base weight/ } W_d = K \Rightarrow \boxed{\frac{Nh}{Sh}}$$

Where: ***Nh*** = *Total households in the geog*
Sh = *Sampled households in the geog*

Therefore the final weight becomes / FW = $W_d \times W_{nr}$
(Or)
The Final WEIGHT = Design Weight × Non response Weight

Finally, the estimation for observed values in the Gewogs has been obtained by multiplying each sample data with the final weight (FW) calculated for each Gewog.

Therefore, the estimate of a *total value* (such as total production) is the product of the final weight, FW and the value, yi, for each responding unit, summed over all responding units:

$$\hat{Y} = \sum_{i=1}^{n} FW \times yi$$

B. Survey Coverage and Scope

From the new updated total rural farming households (area list frame gathered from geog extension centres) of 61,509, at least 19,339 (31 on an average) were selected for the enumeration in both the biannual surveys. For the first biannual survey which captures crop grown from 1st Jan to 30th June 2016, the coverage was 18,407 (95%) of the total sampled households of 19,339. The non response or the absentees for the 1st half yearly survey stood at 5 of the selected farming households for the survey. In the second biannual survey which captures crop grown from 1st July to 31st Dec 2016, the coverage was 18,286 (94%) of the total sampled farming households of 19,339. The non response or the absentees for the 2nd half yearly survey stood at 6.

PART 1

NATIONAL LEVEL STATISTICS

C. Summary Findings

Following are the estimated summary statistics based on the data collected from a sample of 19,399 Farming Households (twice a year). The weights are used to estimate population parameters from the sample data.

Coverage of Rural households by the survey 2016

Table A. Coverage of Rural Households by the Survey from 1st January to June 2016 (1st half yearly).

Dzongkhag	Total HHs (Sample frame) Nh	Sample HHs/Sh	Percent Sampled	Enumerated HHs (Eh)	Percentage Coverage
Bumthang	1,151	382	33	381	100
Chhukha	2,889	949	33	949	100
Dagana	4,206	1,312	31	1,312	100
Gasa	487	256	53	250	98
Haa	1,300	519	40	518	100
Lhuentse	2,332	771	33	742	96
Mongar	5,363	1,706	32	1,418	83
Paro	2,721	954	35	821	86
Pemagatshel	3,237	1,032	32	859	83
Punakha	3,506	1,046	30	1,037	99
Samdrup Jongkhar	3,844	1,078	28	945	88
Samtse	5,869	1,591	27	1,483	93
Sarpang	3,592	1,156	32	1,114	96
Thimphu	965	450	47	447	99
Trashigang	6,952	1,684	24	1,668	99
Trashiyangtse	2,554	810	32	810	100
Trongsa	1,705	514	30	510	99
Tsirang	2,882	1,095	38	1,095	100
Wangdue	3,961	1,374	35	1,334	97
Zhemgang	1,877	717	38	710	99
Bhutan	**61,393**	**19,396**	**32**	**18,403**	**95**

Table B. Coverage of Rural Households by the Survey from 1st July to December 2016 (2nd half yearly).

Dzongkhag	Total HHs (Sample Frame) Nh	Sample HHs/Sh	Percent Sampled	Enumerated HHs (Eh)	Percentage Coverage
Bumthang	1,151	382	33	381	100
Chhukha	2,889	949	33	942	99
Dagana	4,206	1,312	31	1,301	99
Gasa	487	256	53	256	100
Haa	1,300	519	40	510	98
Lhuentse	2,332	771	33	770	100
Mongar	5,363	1,706	32	1,420	83
Paro	2,721	954	35	920	96
Pemagatshel	3,237	1,032	32	952	92
Punakha	3,506	1,046	30	1,038	99
Samdrup Jongkhar	3,844	1,078	28	1,059	98
Samtse	5,869	1,591	27	1,585	100
Sarpang	3,592	1,156	32	1,112	96
Thimphu	965	450	47	446	99
Trashigang	6,952	1,684	24	1,672	99
Trashi yangtse	2,554	810	32	808	100
Trongsa	1,705	514	30	506	98
Tsirang	2,882	1,095	38	1,081	99
Wangdue	3,961	1,374	35	1,317	96
Zhemgang	1,877	717	38	707	99
Bhutan	**61,393**	**19,396**	**32**	**18,783**	**97**

1 Demographic Characteristics

Table 1.1: Farming Households Population in 2016

Dzongkhag	0-6 years		6-14 years		15-64 years		Above 64 years		Male	Female	Population
	Male	Female	Male	Female	Male	Female	Male	Female			
Bumthang	336	300	532	475	1,349	1,527	279	398	2,495	2,700	5,195
Chhukha	539	461	1,000	794	4,485	4,704	722	599	6,746	6,558	13,304
Dagana	549	524	1,106	839	5,492	5,801	644	578	7,791	7,742	15,534
Gasa	72	102	227	126	712	718	43	77	1,054	1,023	2,077
Haa	217	272	402	441	1,643	1,778	268	241	2,529	2,732	5,261
Lhuentse	560	362	647	881	2,865	3,242	805	712	4,877	5,197	10,074
Monggar	1,207	1,243	1,396	1,348	6,003	7,353	1,093	1,135	9,699	11,079	20,778
Paro	240	271	769	728	3,553	3,885	677	727	5,239	5,611	10,850
Pemagatshel	203	197	174	139	2,624	3,118	673	666	3,674	4,121	7,795
Punakha	569	568	1,489	1,353	3,937	4,739	702	794	6,696	7,454	4,150
Samdrup Jongkhar	440	328	695	593	4,252	4,477	495	446	5,882	5,843	11,725
Samtse	980	759	2,456	2,174	9,942	9,951	1,398	1,133	14,775	14,017	28,792
Sarpang	553	591	1,153	1,036	4,700	4,839	766	686	7,173	7,151	14,324
Thimphu	125	115	324	289	1,096	1,329	178	207	1,722	1,940	3,662
Trashigang	951	911	3,291	2,709	8,940	9,401	1,429	1,325	14,612	14,346	28,957
Trashiyangtse	521	435	798	740	2,755	3,072	389	406	4,463	4,653	9,116
Trongsa	263	235	583	436	2,108	2,426	238	316	3,191	3,413	6,604
Tsirang	455	372	1,089	965	4,446	4,317	804	610	6,795	6,264	13,059
Wangdue	914	741	1,412	1,391	5,007	5,946	682	956	8,015	9,033	17,048
Zhemgang	306	292	373	354	2,756	2,925	433	491	3,867	4,062	7,929
Bhutan	**10,000**	**9,079**	**19,915**	**17,809**	**78,664**	**85,549**	**12,716**	**12,502**	**121,295**	**124,939**	**246,234**

Table 1.2: Responding age, proportion of respondent's sex and relationship to the household head

Dzongkhag	Responding Age		Responding Sex in		Proportion of Respondents Relationship to the Household Head						
	Mean	Median	Male	Female	Self	Spouse	Father/Mother	Son/daughter	Grandpa/Grandma	In-law	Relatives
Bumthang	46	46	24	76	45	8	17	22	1	2	5
Chhukha	48	48	64	36	55	8	6	18	2	5	7
Dagana	46	45	61	40	64	8	7	9	0	4	8
Gasa	47	46	53	47	94	3	1	2	0	0	0
Ha	48	47	51	49	63	13	4	18	0	1	2
Lhuentse	52	53	36	64	54	8	25	9	3	2	0
Monggar	47	46	46	54	38	12	18	18	4	5	6
Paro	53	53	40	60	69	10	5	9	1	3	3
Pemagatshel	50	50	54	44	50	14	10	11	2	7	5
Punakha	51	49	31	69	60	7	11	12	4	2	4
Samdrup Jongkhar	49	50	72	28	65	8	1	16	1	4	6
Samtse	50	50	76	25	64	7	4	15	2	4	3
Sarpang	51	49	69	31	63	10	11	6	1	4	6
Thimphu	49	49	37	63	58	13	2	16	2	3	6
Trashigang	49	49	62	38	58	12	5	14	1	5	5
Trashiyangtse	47	46	45	54	44	17	13	13	1	7	5
Trongsa	47	47	33	67	52	13	4	18	2	3	9
Tsirang	49	49	67	33	57	12	8	15	1	5	3
Wangdue	46	45	40	60	55	11	7	13	1	7	5
Zhemgang	46	45	51	49	50	8	6	24	1	7	4
Bhutan	**49**	**48**	**54**	**46**	**57**	**10**	**8**	**14**	**2**	**4**	**5**

Figure 1: Bhutan's total population residing on farm by sex, 2016.

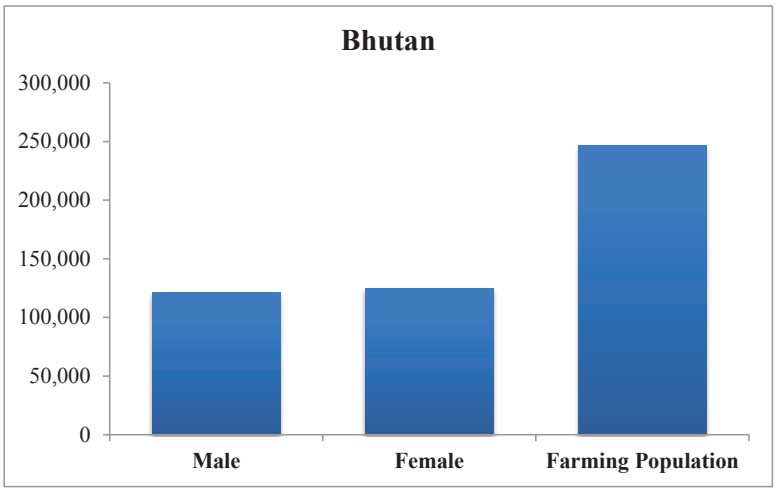
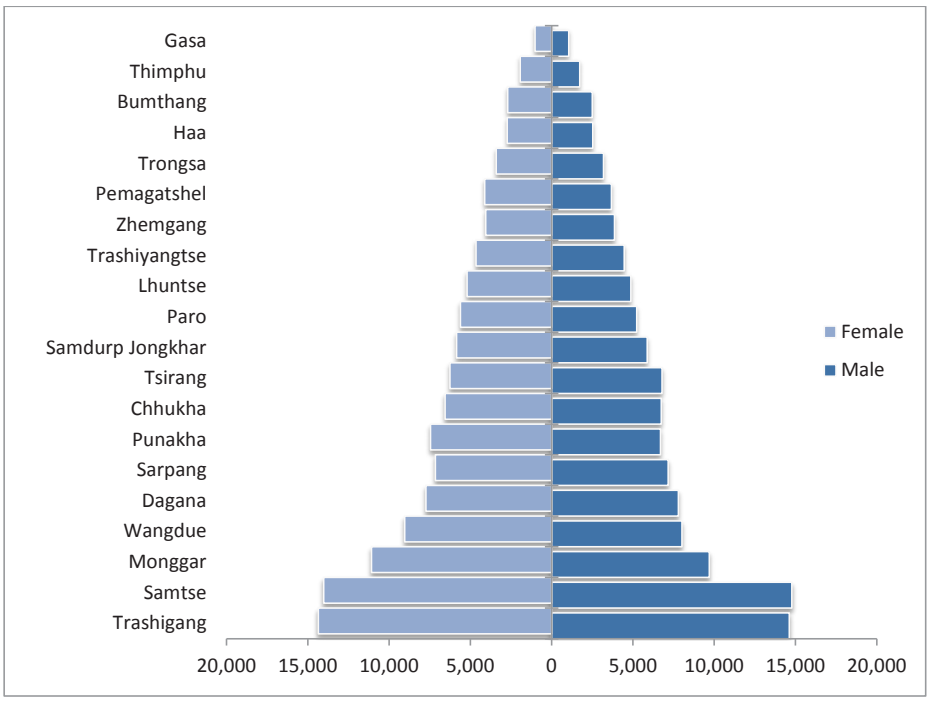


Figure 2: Dzongkhag wise Farming Population Pyramid by sex, 2016.



2 Land Utilization 2016

2.1 Dry land

Note: Operational land holdings= Kamzhing own land cultivated + Kamzhing fallow + Kamzhing leased in.

Since, only the farming households which are engaged in agriculture activities are included in the biannual sample survey 2016 excluding the Gungtong (empty HHs) and HHs having land but not engaged in agriculture activities, the Kamzhing/Dry land left fellow could be much higher than the estimated figure below.

In 2016 of the total estimated **129,036 acres** of operational Kamzhing land holdings **51,279 acres** were left fellow.

Dzongkhag	Dry land Own Cultivated (Acres)	Dry land left Fallow(Acres)	Dry land leased-Out(Acres)	Dry land leased-In(Acres)	Operational land holdings (Acres)
Bumthang	504	3,439	58	55	3,998
Chhukha	7,281	1,426	223	104	8,811
Dagana	8,446	1,816	358	107	10,368
Gasa	363	49			412
Haa	1,831	1,188		13	3,032
Lhuentse	1,874	2,673	89	38	4,585
Monggar	6,610	5,603	164	103	12,315
Paro	2,760	480	30	25	3,266
Pemagatshel	3,019	7,421	153	260	10,700
Punakha	1,093	435	34	21	1,550
Samdrup Jongkhar	5,027	4,735	125	96	9,859
Samtse	10,068	3,692	587	355	14,115
Sarpang	4,984	1,676	88	137	6,797
Thimphu	642	109	42	55	806
Trashigang	5,318	6,914	115	152	12,384
Trashi yangtse	1,669	2,144	61	166	3,980
Trongsa	2,027	2,636	107	82	4,746
Tsirang	5,439	831	139	90	6,360
Wangdue	3,229	928	170	318	4,476
Zhemgang	3,367	3,081	33	28	6,476
Bhutan	**75,550**	**51,279**	**2,575**	**2,206**	**129,036**

2.2 Wet Land

The wet land left fallow could be much higher than the one estimated below as the biannual survey excludes the gungtong (empty hhs), also households which are residing at their place but not engaged in any agriculture activities. Thus keeping their lands fallow during the survey period. The gungtongs and not engaged in agriculture activities are excluded to minimize the effect over the estimates due to the occurrence of non response by default.

The total wetland harvested area includes the wet land leased in by farming households.

Dzongkhag	Harvested Area (in Acres)	Wetland left fallow (in Acres)
Bumthang	155	
Chhukha	2,187	128
Dagana	3,950	469
Gasa	238	12
Haa	144	53
Lhuentse	1,840	378
Monggar	1,200	289
Paro	3,849	47
Pemagatshel	207	149
Punakha	7,489	336
Samdrup Jongkhar	2,320	85
Samtse	7,219	1,273
Sarpang	4,342	748
Thimphu	590	76
Trashigang	3,400	356
Trashi yangtse	2,359	289
Trongsa	1,470	306
Tsirang	3,639	380
Wangdue	5,141	684
Zhemgang	1,317	344
Bhutan	**53,055**	**6,402**

3 Crop Production

Table 3.1: Cereal, Oilseeds, Spices, Legumes & Pulses and Roots/Tubers.

Crop Type	Crop Name	Harvested Area (Acres)	Production (MT)	Yield (Kgs/acre)
Cereal	**Paddy**	53,055	85,090	1,604
	Maize	56,609	82,035	1,449
	Wheat	3,717	2,521	678
	Barley	2,451	1,702	694
	Buckwheat	6,897	3,705	537
	Millet	3,245	1,714	528
	Cereal Total	**125,974**	**176,766**	
Oil seeds	**Mustard**	2,395	892	370
	Groundnut	208	149	718
	Soya bean	544	254	466
	Sunflower	15	7	474
	Pyrilla/ Naam	41	12	282
	Oil Seeds Total	**3,203**	**1,314**	
Spices	**Cardamom**	11,086	2,736	247
	Ginger	4,773	10,871	2,278
	Spices Total	**15,859**	**13,607**	
Legumes & Pulses	**Rajma Bean**	1,565	994	635
	Mung Bean	952	482	506
	Legumes & Pulses Total	**2,517**	**1,475**	
Roots & Tubers	**Sweet Potato**	31	29	940
	Tapioca	278	415	1,490
	Roots & Tubers Total	**309**	**444**	

Foot note: *The above crop production estimates are exclusive of crop damages caused by the wild animals. The Crop damage by natural calamities and wild animals are covered in chapter 10 of this Publication. In the oil seeds section only mustard is used as oil for consumption.*

Table 3.2: Vegetable and Potato Production in 2016

Crop Name	Cultivated Area(acres)	Quantity Produced (MT)	Yield (Kg/Acre)
Asparagus	417	239	574
Chilli	5,538	9,907	1,789
Cabbage	2,738	6,685	2,442
Cauliflower	1,512	2,082	1,377
Carrot	607	1,276	2,103
Radish	2,871	6,490	2,261
Turnip	1,603	10,499	6,551
Beans	3,385	4,409	1,302
Peas	795	1,014	1,275
Tomato	347	455	1,310
Broccoli	725	1,004	1,385
Eggplant	408	585	1,433
Lady Finger	43	42	964
Green leaves	1,458	1,937	1,328
Onion Bulb	442	414	935
Garlic	1,409	1,176	835
Tree Tomato		275	
Cultivated Mushroom		82	
Dally Chilli		112	
Cucumber		1,194	
Pumpkin		3,671	
Squash		2,626	
Gourds		125	
Vegetable Total		**56,298**	
Potato	**14,638**	**58,820**	**4,018**

Foot note: *The above vegetable and potato production estimates are exclusive of crop damages caused by the wild animals. The Crop damage by natural calamities and wild animals are covered in chapter 10 of this Publication.*

4 Fruit Production

Commodities	Total Trees(No's)	Bearing Trees (No's)	Production (MT)	Yield (Kgs/bearing tree)
Apple	242,903	196,708	6,587	33
Mandarin	1,665,797	882,807	42,003	48
Areca nut	1,423,208	726,075	9,467	13
Mango	82,153	23,494	644	27
Pear	39,575	16,726	963	58
Peach	27,087	18,131	972	54
Plum	15,849	8,920	376	42
Walnut	24,072	7,984	181	21
Jackfruit	11,113	5,406	775	143
Guava	36,405	26,360	665	25
Papaya first half yearly	7,728	4,551	107	24
Papaya second half yearly	11,406	7,639	175	23
Pomegranate	8,740	4,270	83	19
Litchi	31,805	5,602	134	24
Persimmon	3,251	1,554	49	31
Banana	350,141	107,562	3,076	29
Date Plum(Gendum)	3,484	2,017	82	41
Sugarcane			345	
Passion Fruit			120	
Pine Apple			67	
BHUTAN			**66,872**	

Foot note: *The increase in total trees and bearing trees for Apple is due to inclusion of Apple trees in Thromde area for Thimphu Dzongkhag*

5 Crop Utilization for 2016

Table 5.1: Utilization of Cereals, Spices, Legumes & Pulses, Oil seeds, Cucurbits and Roots & Tuber.

Crop Type	Crop Name	Quantity Retained for Seed(MT)	Quantity for Brewing Alcohol (MT)	Quantity Sold(MT)	Mean Unit price (Nu/Kg)	Median Unit price (Nu/Kg)	Amount Earned (Million Nu)	Type of Market (%)	
Cereals	Paddy	1,206	556	662	55	59	34	99	0.8
	Maize	1,462	5,711	2,269	59	62	40	100	0.3
	Wheat	143	613	60	38	30	2	100	0.2
	Sweet Buckwheat	139	107	57	35	30	2	99	1.1
	Bitter Buckwheat	133	383	20	53	45	1	100	0
	Barley	82	253	33	42	40	1	99	0.2
	Finger Millet	41	302	25	41	25	1	100	0
	Foxtail Millet	12	42	0.3	32	29	0.01	100	0
Oil seeds	Mustard	29		55	47	33	2	97	3.1
	Sunflower	0.2		4	147	190	1	100	0
	Soya bean	16		23	53	45	1	100	0
	Groundnut	12		63	67	60	4	100	0
	Pyrilla	2		3	135	100	0.32	100	0
Pulses	Rajma Bean	67		393	62	50	22	82	18
	Mung Bean	16		119	101	95	11	94	5.7
Spices	Garlic	164		413	75	77	32	97	3.2
	Ginger	2,508		4,959	43	41	124	86	14.4
	Cardamom	-		771	789	760	558	80	20.2
Roots & Tubers	Sweet Potato	0.4		3	36	35	0.12	100	0
	Tapioca	6		37	25	20	1	99	0.6
Cucurbits	Cucumber	-		490	29	30	14	100	0.2
	Pumpkin	-		148	17	15	2	100	0.4
	Squash	-		65	15	10	1	95	4.8
	Gourd	-		45	38	40	2	100	0.2
Total Amount Earned							**856**		

Table 5.2: Utilization of Vegetables and Potato.

Commodities	Quantity Retained for Seed (MT)	Quantity Sold (MT)	Amount Earned (Million Nu)	Mean Unit Price (Nu/Kg)	Median Unit Price (Nu/Kg)	Type of Market ()	
						Domestic	Export
Asparagus		184	21	119	100	92.6	1.6
Chilli		4,328	298	66	57	99.0	1.0
Cabbage		3,388	75	26	23	97.9	2.1
Cauliflower		726	31	49	47	99.0	0.9
Carrot		1,013	38	39	43	91.9	3.3
Radish		1,733	29	19	18	99.0	1.0
Turnip		23	1	35	33	98.4	0.0
Beans		1,496	71	46	43	99.3	0.7
Peas		564	19	42	38	95.8	4.2
Tomato		191	7	42	40	97.3	0.4
Potato	9,090	37,762	797	24	24	83.4	16.5
Eggplant		145	5	37	37	99.6	0.4
Ladyfinger		17	0.4	31	27	95.7	0.7
Green leaves		1,040	25	27	27	99.3	0.3
Broccoli		470	24	61	53	99.4	0.6
Tree Tomato		62	2			100.0	0.0
Onion		166	7	49	50	99.1	0.4
Total		**53,308**	**1,449**				

6 Fruit Utilization for 2016

Commodities	Quantity Sold(MT)	Mean Unit Price (Nu/Kg)	Median Unit Price (Nu/Kg)	Amount Earned (Million Nu)	Type of Market (%)	
					Domestic	Export
Apple	6,160	50	40	215	87	13
Mandarin	36,721	34	20	432	73	27
Areca nut	7,141	21	20	143	80	20
Banana	875	26	20	19	97	3
Guava	142	34	30	5	100	0
Jackfruit	86	18	15	1.4	55	42
Litchi	66	31	30	2.1	91	9
Mango	142	43	45	4.6	98	2
Papaya	58	30	30	1.7	98	1
Passion fruit	16	44	45	0.6	99	0
Peach	256	42	40	9.4	99	1
Pear	147	51	50	4.5	99	0
Persimmon	9	42	45	0.4	80	7
Pine Apple	17	28	20	0.4	95	3
Plum	46	28	25	1.2	100	0
Pomegranate	32	49	50	1.4	94	6
Sugarcane	65	21	20	1.3	99	1
Walnut	32	212	250	3.1	100	0
Date Plum	60	34	30	1.6	100	0
Total Amount Earned				**848**		

The Agriculture Sector generated Nu. 3.15 Billion Revenue for the year 2016 from the sale of agricultural commodities (Domestic and Export). This doesn't include the produce used for self consumption.

7 HHs Cash Income

Table 7.1: Dzongkhag wise proportion of HHs having earned/ not earned cash income from non timber forest products (NTFP) and other off farm activities

Dzongkhag	Earned	Not Earned
Bumthang	63	37
Chhukha	29	71
Dagana	38	62
Gasa	71	29
Ha	54	46
Lhuentse	72	28
Monggar	51	49
Paro	36	64
Pemagatshel	60	40
Punakha	42	58
Samdrup Jongkhar	39	61
Samtse	29	71
Sarpang	41	59
Thimphu	58	42
Trashigang	48	52
Trashiyangtse	64	36
Trongsa	54	46
Tsirang	34	66
Wangdue	40	60
Zhemgang	42	58
Bhutan	**48**	**52**

Figure 3: Dzongkhag wise proportion of farming HHs having cash income from non-timber forest products (NTFP) and other activities.

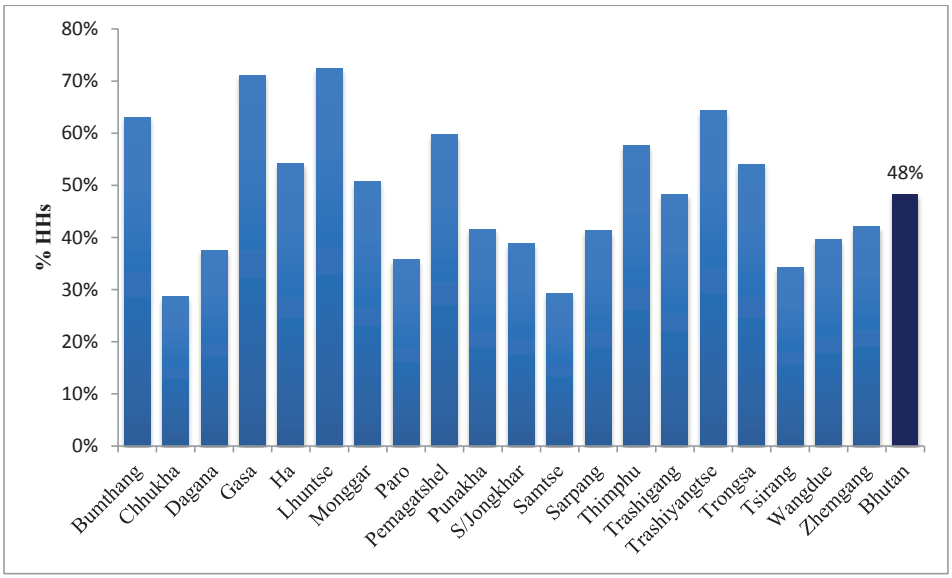


Figure 4: Rural household cash income from forest edible product and other activities in 2016 (in million Nu.).

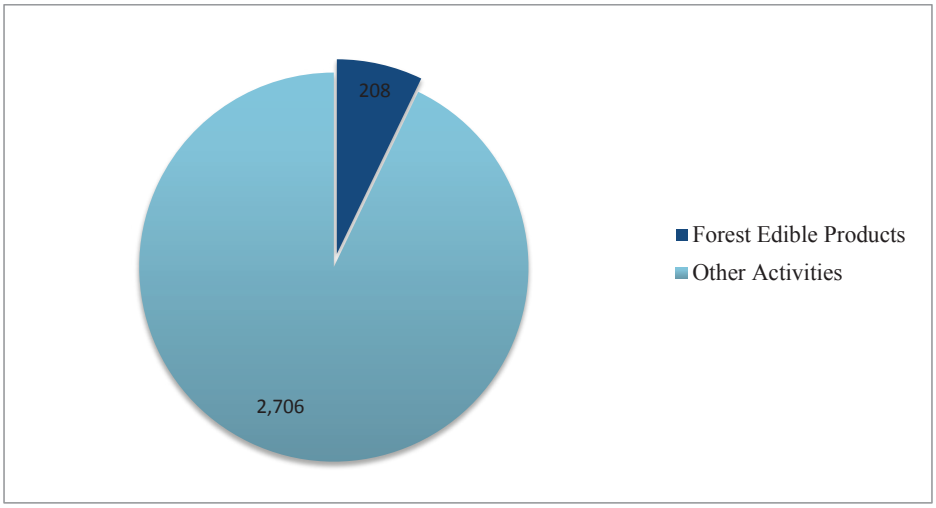


Table 7.2: Cash income from forest edible products and other activities in 2016

Forest Edible Products	Amount Earned (Million Nu)
Bamboo products (Bamboo shoot)	2
Cane Products (Cane shoot/Patsha)	2
Fern (*Nakay*)	6
Damru	1
Medicinal Aromatic Plants & herbs	39
Wild Mushrooms	21
Cordyceps	138
Total Amount Earned	**208**
Other Activities	**Amount Earned (Million Nu)**
Weaving(Weaving and sale of woven products)	116
Pottering (Carrying luggage and other loads)	69
Business/Contract works	1,961
Part time skilled labour (eg. Carpentry, Wood crafting, traditional painting)	480
On farm labour wages	80
Total Amount Earned	**2,706**

Table 7.3: Cash income from processed cereal products

Processed Cereals	Quantity sold (MT)	Unit Price (Nu/kg)		Amount Earned (Million Nu)	Type of Market (%)	
		Mean	Median		Domestic	Export
Rice	1,998	73	68	143	99	1
Zaw	282	90	100	24	100	0
***Zaw* Flour**	4	69	70	0.3	100	0
Tengma	351	125	100	52	98.5	1.5
Kharang	555	28	30	3	96.6	3.3
Roasted Maize	52	60	70	3	100	0
Wheat	18	54	50	0.9	100	0
Buckwheat	10	65	70	0.87	100	0
Local Alcoholic Beverage out of cereals	-			24	100	0
Maykhuu	479	45	50	6	100	0

8 Food Security 2016

Table 8.1: Proportion of farming households by self sufficiency of food (Agriculture crops) for 2016

Dzongkhag	Did you produce enough agriculture crops (food) for your households?		HHs with food (agriculture crops) shortage by months											
	Enough	Not Enough	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Bumthang	54	46	37	41	43	38	33	26	20	18	16	14	16	18
Chhukha	77	23	8	9	10	14	11	8	7	6	6	5	6	5
Dagana	52	48	19	18	23	22	23	24	21	18	15	14	14	11
Gasa	22	78	70	69	71	89	91	86	68	65	67	60	50	40
Haa	65	35	16	18	21	19	14	8	9	8	6	6	7	5
Lhuentse	92	8	2	2	3	4	6	8	8	6	4	3	3	3
Monggar	94	6	1	2	1	2	3	2	1	1	2	1	3	2
Paro	72	28	11	11	7	5	5	5	6	6	6	5	5	5
Pemagatshel	61	39	5	2	2	3	5	14	5	3	4	5	5	5
Punakha	77	23	2	2	2	3	3	3	10	11	10	9	5	3
Samdrup Jongkhar	64	36	6	6	13	22	26	18	18	14	13	8	6	6
Samtse	37	63	19	21	27	35	42	47	50	42	36	30	21	16
Sarpang	53	47	19	19	20	22	26	30	33	34	29	26	24	23
Thimphu	38	62	35	29	34	34	32	28	32	23	27	28	28	27
Trashigang	81	19	5	6	7	8	6	5	5	5	5	5	13	13
Trshi yangtse	71	29	4	8	10	12	13	12	17	18	16	8	6	5
Trongsa	64	36	7	8	11	17	24	26	24	19	16	12	7	6
Tsirang	45	55	15	16	18	28	34	38	39	33	26	19	14	13
Wangdue	64	36	14	15	28	29	20	19	18	18	18	16	13	12
Zhemgang	67	33	17	17	17	21	25	28	26	19	17	16	17	18
Bhutan	**66**	**34**	**11**	**11**	**14**	**16**	**17**	**18**	**18**	**16**	**14**	**12**	**11**	**10**

Figure 5: Estimated proportion of farming households facing food (agriculture crops) shortage in the year 2016

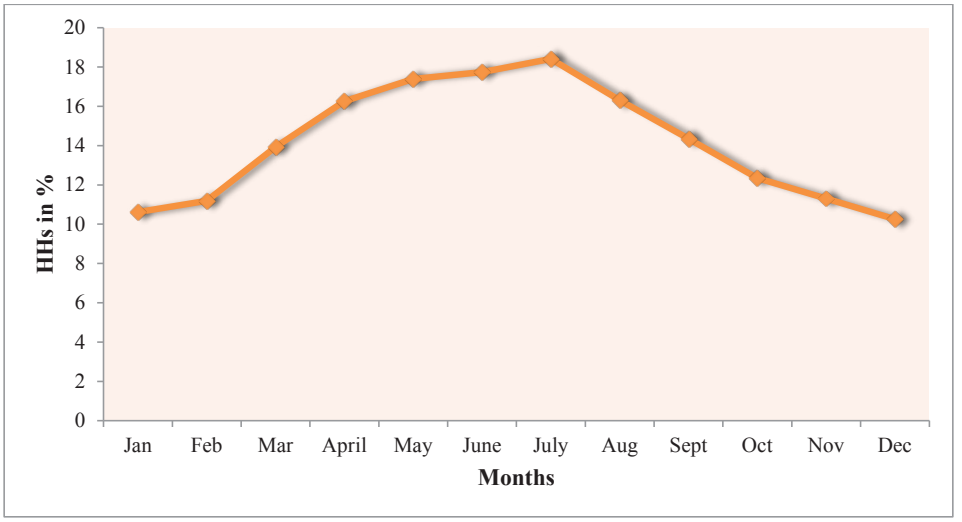
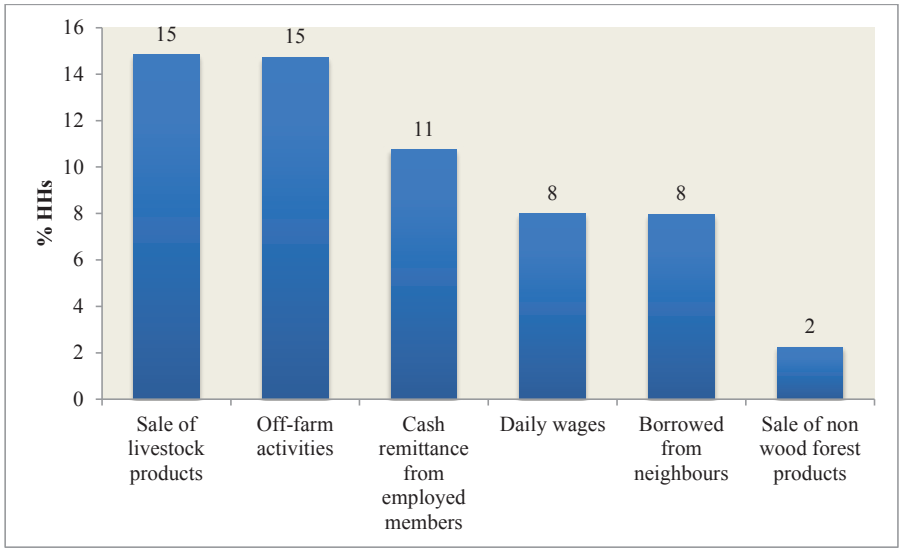


Table 8.2: Food Shortage coping mechanism in 2016

Coping Mechanism used	% HHs
Sale of livestock products	15
Off-farm activities	15
Cash remittance from employed members	11
Daily wages	8
Borrowed from neighbours	8
Sale of non wood forest products	2

Figure 6: Proportion of HHs using various coping mechanisms to address the food (agriculture crops) shortage in 2016.

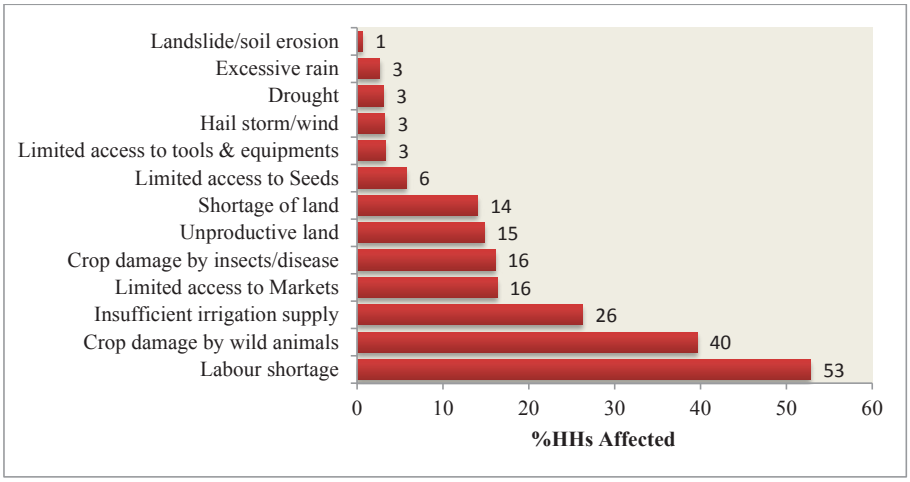


9 Farming Constraints Faced

Table 9: Proportion of HHs affected by the various farming constraints in the year 2016

Farming Constraints	% HHs affected by the various farming constraints
Labour shortage	53
Crop damage by wild animals	40
Insufficient irrigation supply	26
Limited access to Markets	16
Crop damage by insects/disease	16
Unproductive land	15
Shortage of land	14
Limited access to Seeds	6
Limited access to tools & equipments	3
Hail storm/wind	3
Drought	3
Excessive rain	3
Landslide/soil erosion	1

Figure 7: Percentage of farming HHs affected by the various constraints in the year 2016.



10 Crop damage by natural calamities and wild animals.

Table 10.1: Dzongkhag wise proportion of HHs affected by natural calamities resulting in low food production and low quality of produce

Dzongkhag	Experienced	Not Experienced
Bumthang	3	97
Chhukha	7	93
Dagana	15	85
Gasa	1	99
Ha	12	88
Lhuentse	10	90
Monggar	9	91
Paro	0	100
Pemagatshel	9	91
Punakha	9	91
Samdrup Jongkhar	6	94
Samtse	6	94
Sarpang	3	97
Thimphu	.4	99.6
Trashigang	9	91
Trashi yangtse	15	85
Trongsa	5	95
Tsirang	13	87
Wangdue	13	87
Zhemgang	1	99
Bhutan	**7**	**93**

*Note:

List of Calamities

1. Insufficient irrigation supply
2. Unproductive land
3. Crop damage by insects/diseases
4. Drought
5. Excessive rain
6. Hail storm/wind
7. Landslides / erosion

Figure 8: Proportion of HHs affected by various natural calamities resulting in low production and quality of crops.

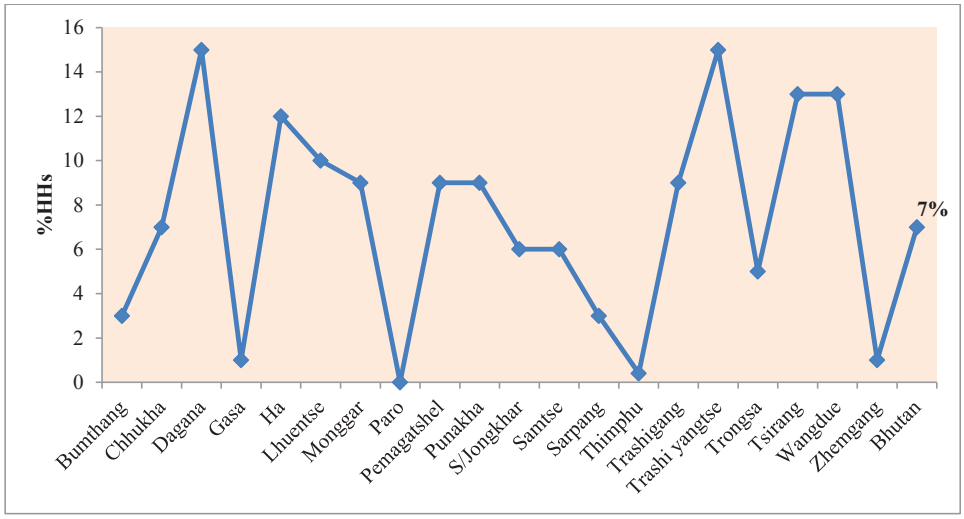


Table 10.2: Estimated Paddy area and quantity lost to the wild animals.

Dzongkhag	Area lost(Acres)	Quantity lost (MT)
Bumthang	1	1
Chhukha	22	11
Dagana	116	78
Gasa	6	7
Haa	19	14
Lhuentse	89	88
Monggar	13	7
Paro	56	99
Pemagatshel	1	1
Punakha	71	114
Samdrup Jongkhar	44	32
Samtse	194	207
Sarpang	136	130
Thimphu	0.13	5
Trashigang	51	63
Trashiyangtse	48	75
Trongsa	83	103
Tsirang	85	49
Wangdue	133	167
Zhemgang	115	104
Bhutan	**1,283**	**1,356**

Table 10.3: Estimated Maize area and quantity lost to the wild animals.

Dzongkhag	Area lost(Acres)	Quantity lost (MT)
Chhukha	110	61
Dagana	367	228
Ha	35	31
Lhuentse	188	213
Monggar	657	520
Pemagatshel	254	232
Punakha	31	19
Samdrup Jongkhar	388	495
Samtse	575	536
Sarpang	503	413
Trashigang	268	245
Trashi yangtse	106	135
Trongsa	116	206
Tsirang	448	236
Wangdue	22	39
Zhemgang	319	284
Bhutan	**4,390**	**3,892**

Table 10.4: Estimated Wheat area and quantity lost to the wild animals.

Dzongkhag	Area lost(Acres)	Quantity lost (MT)
Bumthang	8	7
Chhukha	11	3
Dagana	1	0.81
Gasa	0.2	0.08
Ha	1	0.12
Paro	9	7
Punakha	28	16
Samtse	6	5
Trongsa	37	19
Tsirang	1	0.59
Wangdue	62	47
Zhemgang	0.5	0.17
Bhutan	**165**	**105**

Table 10.5: Estimated Barley area and quantity lost to the wild animals.

Dzongkhag	Area lost(Acres)	Quantity lost (MT)
Bumthang	2	2
Chhukha	2	0.86
Dagana	4	1
Haa	0.3	0.15
Monggar	7	3
Punakha	3	2
Samdrup Jongkhar	0.3	0.15
Trashigang	0.5	0.25
Trongsa	14	6
Tsirang	0.1	0.06
Wangdue	8	5
Zhemgang	0.2	0.07
Bhutan	**41**	**20**

Table 10.6: Estimated Millet area and quantity lost to the wild animals.

Dzongkhag	Area lost(Acres)	Quantity lost (MT)
Chhukha	14	4.38
Dagana	6	1.40
Ha	18	8.09
Lhuentse	2	0.47
Pemagatshel	5	6.06
Samdrup Jongkhar	0	0.49
Samtse	44	17.61
Sarpang	118	11.86
Trashigang	150	0.32
Trashi yangtse	3	3.10
Trongsa	2	1.51
Tsirang	14	3.84
Wangdue	0.4	0.87
Bhutan	**374**	**60**

Table 10.7: Estimated Buckwheat area and quantity lost to the wild animals.

Dzongkhag	Area lost(Acres)	Quantity lost (MT)
Bumthang	11	9
Chhukha	21	11
Dagana	4	1
Haa	148	71
Monggar	9	7
Pemagatshel	6	3
Punakha	1	1
Samdrup Jongkhar	21	11
Samtse	8	3
Sarpang	5	1
Trashigang	48	2
Trashi yangtse	1	1
Trongsa	70	47
Tsirang	4	1
Wangdue	23	25
Zhemgang	10	5
Bhutan	**389**	**200**

Table 10.8: Estimated Vegetable area and quantity lost to the wild animals.

Dzongkhag	Area lost(Acres)	Quantity lost(MT)
Chhukha	17	10
Dagana	6	3
Gasa	1	0.2
Haa	18	7
Lhuentse	14	13
Monggar	76	29
Paro	9	21
Pemagatshel	6	6
Punakha	68	42
Samdrup Jongkhar	7	12
Samtse	43	56
Sarpang	5	5
Thimphu	1	0.8
Trashigang	11	10
Trashi yangtse	13	20
Trongsa	29	76
Tsirang	40	26
Wangdue	56	72
Zhemgang	1	0.3
Bhutan	**421**	**412**

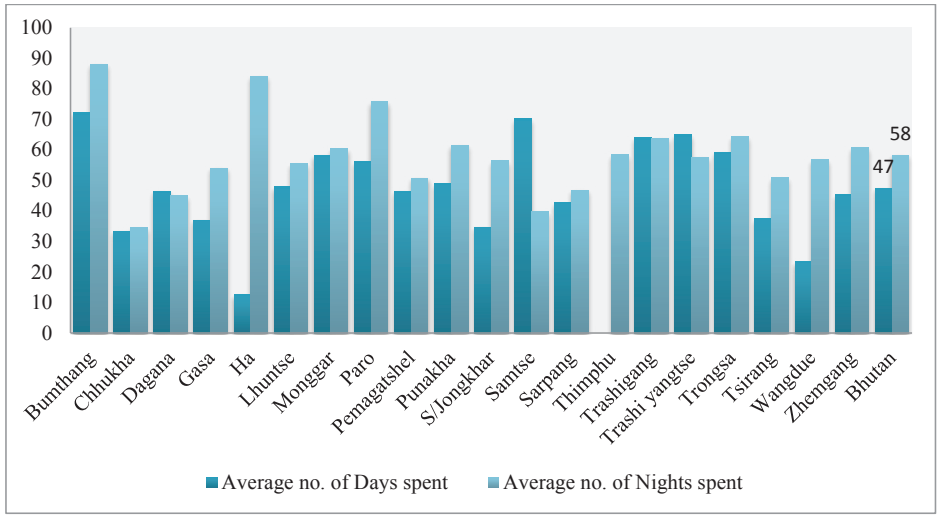
Table 10.9: Estimated Potato area and quantity lost to the wild animals.

Dzongkhag	Area Lost(Acres)	Quantity lost (MT)
Bumthang	12	75
Chhukha	84	52
Dagana	2	1
Gasa	2	5
Ha	36	111
Lhuentse	15	107
Monggar	78	66
Paro	66	245
Pemagatshel	5	5
Punakha	3	3
Samdrup Jongkhar	13	17
Samtse	3	5
Sarpang	3	2
Thimphu	1	15
Trashigang	110	117
Trashi yangtse	51	133
Trongsa	41	79
Tsirang	14	12
Wangdue	214	1,008
Bhutan	**753**	**2,056**

Dzongkhag wise estimated average number of days and nights spent in guarding crops from wild animal damages in 2016.

Dzongkhag	Guarding in Day	Guarding in Night
Bumthang	72	88
Chhukha	33	35
Dagana	47	45
Gasa	37	54
Ha	13	84
Lhuentse	48	56
Monggar	58	60
Paro	56	76
Pemagatshel	47	51
Punakha	49	62
Samdrup Jongkhar	35	57
Samtse	70	40
Sarpang	43	47
Thimphu		59
Trashigang	64	64
Trashi yangtse	65	58
Trongsa	59	64
Tsirang	37	51
Wangdue	23	57
Zhemgang	45	61
Bhutan	**47**	**58**

Figure 9: Dzongkhag wise estimated number of days and nights spent in guarding the crops from wild animal's damages.



11 Road Access in 2016

Note: The road access refers to the accessibility of farming households to any type of roads that are pliable to motor vehicles

Table 11: Proportion of rural households by walking distance to the nearest motor able road point.

Dzongkhag	Less than 1 hour	1 to 3 hours	4 to 6 hours	Above 6 hours
Bumthang	100	0	0	0
Chhukha	72	19	4	5
Dagana	62	30	7	1
Gasa	31	0	0	69
Haa	74	3	17	7
Lhuentse	67	12	19	2
Monggar	91	7	0	1
Paro	98	2	0	0
Pemagatshel	94	4	1	.7
Punakha	98	2	0	.1
Samdrup Jongkhar	64	19	12	5
Samtse	65	17	11	7
Sarpang	85	10	3	2
Thimphu	90	0	0	10
Trashigang	87	7	5	.5
Trashi yangtse	76	19	4	1
Trongsa	93	5	2	.2
Tsirang	86	12	2	.3
Wangdue	82	10	4	4
Zhemgang	63	27	7	3
Bhutan	**79**	**10**	**5**	**6**

PART 2

DZONGKHAG LEVEL STATISTICS

12 Cereal Crops

Table 12.1: Paddy harvested area (Acres), Production (MT) and Yield (Kgs/Acre)

Dzongkhag	Harvested Area (Acres)	Production (MT)	Yield (kg/acre)
Bumthang	155	222	1,435
Chhukha	2,187	2,887	1,320
Dagana	3,950	5,238	1,326
Gasa	238	298	1,250
Haa	144	189	1,315
Lhuentse	1,840	3,570	1,940
Monggar	1,200	1,340	1,116
Paro	3,849	8,537	2,218
Pemagatshel	207	220	1,065
Punakha	7,489	14,361	1,918
Samdrup Jongkhar	2,320	3,464	1,493
Samtse	7,219	10,612	1,470
Sarpang	4,342	6,669	1,536
Thimphu	590	1,313	2,225
Trashigang	3,400	5,004	1,472
Trashi yangtse	2,359	4,184	1,774
Trongsa	1,470	2,314	1,574
Tsirang	3,639	5,254	1,444
Wangdue	5,141	7,741	1,506
Zhemgang	1,317	1,673	1,270
Bhutan	**53,055**	**85,090**	**1,604**

Note: *The Dzongkhag wise cereal production for 2016 is exclusive of crop damages by the wild animals and natural calamities. For details on Dzongkhag wise estimates of cereals damaged by wild animals, refer* **"Topic 10: Crop Damaged by Natural Calamities and Food grain lost to the wild animals during the year 2016"** *from page number*

Table 12.2: Maize harvested area (Acres), Production (MT) and Yield (Kgs/Acre)

Dzongkhag	Harvested Area (Acres)	Production (MT)	Yield (Kgs/acre)
Chhukha	2,788	3,429	1,230
Dagana	6,051	6,323	1,045
Haa	146	140	964
Lhuentse	2,462	4,369	1,775
Monggar	9,374	15,495	1,653
Paro	47	7	157
Pemagatshel	3,452	4,745	1,374
Punakha	300	318	1,059
Samdrup Jongkhar	4,702	6,657	1,416
Samtse	4,048	5,262	1,300
Sarpang	4,138	6,103	1,475
Thimphu	4	4	1,134
Trashigang	7,400	13,552	1,831
Trashi yangtse	1,665	3,055	1,835
Trongsa	1,021	1,503	1,472
Tsirang	5,088	6,964	1,369
Wangdue	493	581	1,179
Zhemgang	3,431	3,527	1,028
Bhutan	**56,609**	**82,035**	**1,449**

Table 12.3: Wheat harvested area (Acres), Production (MT) and Yield (Kgs/Acre)

Dzongkhag	Harvested Area (Acres)	Production (MT)	Yield (Kgs/acre)
Bumthang	272	207	760
Chhukha	184	185	1,006
Dagana	46	12	269
Gasa	23	19	866
Haa	51	13	254
Lhuentse	10	15	1,460
Monggar	98	72	735
Paro	184	139	754
Pemagatshel	1	1	800
Punakha	654	436	666
Samdrup Jongkhar	40	32	795
Samtse	154	96	628
Sarpang	96	60	621
Thimphu	150	139	929
Trashigang	56	44	784
Trashiyangtse	3	1	370
Trongsa	364	171	470
Tsirang	50	18	360
Wangdue	1,204	817	679
Zhemgang	77	43	563
Bhutan	**3,717**	**2,521**	**678**

Table 12.4: Barley harvested area (Acres), Production (MT) and Yield (Kgs/Acre)

Dzongkhag	Harvested Area (Acres)	Production (MT)	Yield (Kgs/acre)
Bumthang	255	225	883
Chhukha	79	43	550
Dagana	21	7	353
Gasa	235	249	1,060
Haa	40	20	504
Lhuentse	2	2	952
Monggar	1,023	710	694
Paro	60	19	312
Pemagatshel	23	7	294
Punakha	25	10	417
Samdrup Jongkhar	77	35	456
Samtse	1	1	563
Sarpang	2	1	690
Thimphu	22	12	536
Trashigang	98	97	993
Trashi yangtse	2	1	626
Trongsa	277	147	530
Tsirang	12	2	193
Wangdue	177	101	570
Zhemgang	21	12	562
Bhutan	**2,451**	**1,702**	**694**

Table 12.5: Buckwheat harvested area (Acres), Production (MT) and Yield (Kgs/Acre)

Dzongkhag	Harvested Area (Acres)	Production (MT)	Yield (Kgs/acre)
Bumthang	769	616	800
Chhukha	798	378	474
Dagana	601	250	415
Haa	1,068	548	514
Lhuentse	37	17	468
Monggar	139	74	530
Paro	72	36	499
Pemagatshel	82	46	560
Punakha	129	73	569
Samdrup Jongkhar	489	308	629
Samtse	384	156	406
Sarpang	209	77	370
Trashigang	424	160	377
Trashiyangtse	64	34	532
Trongsa	584	373	639
Tsirang	250	88	352
Wangdue	565	346	613
Zhemgang	235	126	536
Bhutan	**6,897**	**3,705**	**537**

Table 12.6: Millet harvested area (Acres), Production (MT) and Yield (Kgs/Acre)

Dzongkhag	Harvested Area (Acres)	Production (MT)	Yield (Kgs/acre)
Bumthang	2	1	326
Chhukha	310	109	350
Dagana	393	203	515
Haa	78	41	521
Lhuentse	89	42	476
Monggar	39	16	408
Paro	4	2	538
Pemagatshel	318	294	927
Samdrup Jongkhar	124	65	525
Samtse	546	255	467
Sarpang	551	327	594
Trashigang	60	18	307
Trashi yangtse	190	147	772
Trongsa	55	28	511
Tsirang	359	114	319
Wangdue	2	1	244
Zhemgang	124	50	406
Bhutan	**3,245**	**1,714**	**528**

13 Vegetable Crops

Table 13.1: Potato harvested area (Acres), Production (MT) and Yield (Kgs/Acre)

Dzongkhag	Harvested Area (Acres)	Production (MT)	Yield (Kgs/acre)
Bumthang	710	4,931	6,943
Chhukha	1,112	8,841	7,954
Dagana	177	239	1,352
Gasa	138	569	4,114
Haa	334	1,794	5,374
Lhuentse	408	1,606	3,936
Monggar	2,588	5,492	2,122
Paro	984	4,444	4,515
Pemagatshel	517	1,998	3,861
Punakha	81	165	2,051
Samdrup Jongkhar	909	1,859	2,044
Samtse	144	270	1,871
Sarpang	90	110	1,213
Thimphu	259	1,195	4,618
Trashigang	1,878	7,259	3,864
Trashiyangtse	786	2,856	3,632
Trongsa	281	1,000	3,553
Tsirang	312	325	1,042
Wangdue	2,831	13,722	4,847
Zhemgang	98	147	1,499
Bhutan	**14,638**	**58,820**	**4,018**

Note: *The Dzongkhag wise Potato and Vegetable production for 2016 is exclusive of crop damages by wild animals and natural calamities. For details on Dzongkhag wise estimates of Potato and Vegetable damaged by wild animals, refer* "Topic **10: Crop Damaged by Natural Calamities and Food grain lost to the wild animals during the year 2016**" *from page number*

Table 13.2: Asparagus harvested area (Acres), Production (MT) and Yield (Kgs/Acre)

Dzongkhag	Area (Acres)	Production (MT)	Yield (Kgs/ acre)
Bumthang	3.1	4	1,281
Chhukha	4.4	2	451
Dagana	4.7	2	372
Gasa	1.1	1	1,245
Haa	4.4	2	490
Lhuentse	8.4	2	197
Monggar	38.9	10	267
Paro	120.3	95	790
Pemagatshel	25.6	2	61
Punakha	11.6	6	489
Samdrup Jongkhar	3.2	3	807
Samtse	2.4	1	551
Sarpang	2.7	1	448
Thimphu	24.5	25	1,029
Trashi gang	62.8	36	566
Trashiyangtse	28.8	7	242
Trongsa	31.6	6	198
Tsirang	5.4	2	441
Wangdue	32.6	32	977
Zhemgang	0.4	0.2	558
Bhutan	**417**	**239**	**574**

Table 14.3: Chilli harvested area (Acres), Production (MT) and Yield (Kgs/Acre)

Dzongkhag	Harvested Areas (Acres)	Production (MT)	Yield (Kgs/acre)
Bumthang	60	140	2,336
Chhukha	278	489	1,760
Dagana	233	186	798
Gasa	11	18	1,639
Ha	20	42	2,141
Lhuentse	296	781	2,638
Monggar	778	672	864
Paro	536	1,474	2,749
Pemagatshel	157	328	2,091
Punakha	353	873	2,471
Samdrup Jongkhar	271	297	1,095
Samtse	80	71	891
Sarpang	118	110	934
Thimphu	233	879	3,781
Trashi gang	623	898	1,441
Trashi yangtse	352	513	1,459
Trongsa	194	638	3,287
Tsirang	333	179	539
Wangdue	494	1,185	2,396
Zhemgang	120	135	1,124
Bhutan	**5,538**	**9,907**	**1,789**

Table 13.4: Cabbage harvested area (Acres), Production (MT) and Yield (Kgs/Acre)

Dzongkhag	Harvested Area (Acres)	Production (MT)	Yield (Kgs/acre)
Bumthang	30	119	3,951
Chhukha	83	185	2,234
Dagana	130	171	1,320
Gasa	19	43	2,288
Haa	96	340	3,528
Lhuentse	181	307	1,695
Monggar	331	349	1,052
Paro	236	1,064	4,511
Pemagatshel	78	117	1,497
Punakha	70	74	1,050
Samdrup Jongkhar	194	367	1,897
Samtse	80	98	1,230
Sarpang	92	287	3,103
Thimphu	153	870	5,689
Trashigang	326	694	2,130
Trashiyangtse	110	227	2,056
Trongsa	113	332	2,939
Tsirang	205	530	2,591
Wangdue	144	434	3,018
Zhemgang	68	78	1,157
Bhutan	**2,738**	**6,685**	**2,442**

Table 13.5: Cauliflower harvested area (Acres), Production (MT) and Yield (Kgs/Acre)

Dzongkhag	Harvested Area (Acres)	Production (MT)	Yield (Kgs/acre)
Bumthang	7	22	3,165
Chhukha	33	50	1,512
Dagana	54	47	874
Gasa	4	7	1,786
Haa	20	51	2,502
Lhuentse	104	144	1,383
Monggar	152	127	834
Paro	8	19	2,577
Pemagatshel	95	119	1,250
Punakha	337	270	800
Samdrup Jongkhar	96	145	1,503
Samtse	37	32	862
Sarpang	50	122	2,434
Thimphu	100	327	3,268
Trashigang	147	200	1,365
Trashiyangtse	45	81	1,804
Trongsa	55	109	1,988
Tsirang	96	72	747
Wangdue	43	108	2,518
Zhemgang	28	30	1,050
Bhutan	**1,512**	**2,082**	**1,377**

Table 13.6: Carrot harvested area (Acres), Production (MT) and Yield (Kgs/Acre)

Dzongkhag	Harvested Area (Acres)	Production (MT)	Yield (Kgs/acre)
Bumthang	6	24	3,734
Chhukha	34	62	1,844
Dagana	7	7	965
Gasa	2	3	1,548
Haa	55	79	1,423
Lhuentse	16	13	848
Monggar	55	36	655
Paro	141	428	3,037
Pemagatshel	6	6	1,045
Punakha	13	9	679
Samdrup Jongkhar	24	37	1,530
Samtse	6	6	999
Sarpang	9	3	373
Thimphu	47	322	6,850
Trashi gang	36	38	1,057
Trashiyangtse	11	13	1,220
Trongsa	56	69	1,219
Tsirang	15	8	578
Wangdue	57	106	1,874
Zhemgang	11	7	647
Bhutan	**607**	**1,276**	**2,103**

Table 13.7: Radish harvested area (Acres), Production (MT) and Yield (Kgs/Acre)

Dzongkhag	Harvested Area (Acres)	Production (MT)	Yield (Kgs/acre)
Bumthang	31	171	5,500
Chhukha	90	217	2,403
Dagana	151	321	2,133
Gasa	28	125	4,455
Haa	47	221	4,697
Lhuentse	138	218	1,585
Monggar	343	480	1,400
Paro	73	180	2,475
Pemagatshel	241	481	1,996
Punakha	118	224	1,900
Samdrup Jongkhar	184	357	1,942
Samtse	168	229	1,366
Sarpang	69	100	1,465
Thimphu	120	514	4,285
Trashigang	338	653	1,930
Trashiyangtse	77	224	2,906
Trongsa	106	393	3,704
Tsirang	215	318	1,482
Wangdue	243	956	3,940
Zhemgang	93	108	1,165
Bhutan	**2,871**	**6,490**	**2,261**

Table 13.8: Turnip harvested area (Acres), Production (MT) and Yield (Kgs/Acre)

Dzongkhag	Harvested Area (Acres)	Production (MT)	Yield (Kgs/acre)
Bumthang	64	356	5,557
Chhukha	39	152	3,862
Dagana	20	46	2,306
Gasa	23	52	2,272
Haa	229	2,072	9,048
Lhuentse	5	3	620
Monggar	5	6	1,176
Paro	60	257	4,285
Pemagatshel	4	3	670
Punakha	58	116	2,014
Samdrup Jongkhar	1	2	1,564
Samtse	4	6	1,592
Sarpang	1	1	1,142
Thimphu	75	503	6,711
Trashigang	5	12	2,262
Trashiyangtse	3	8	2,537
Trongsa	17	101	5,899
Tsirang	8	5	724
Wangdue	975	6,790	6,964
Zhemgang	6	7	1,095
Bhutan	**1,603**	**10,499**	**6,551**

Table 13.9: Beans harvested area (Acres), Production (MT) and Yield (Kgs/Acre)

Dzongkhag	Harvested Area(Acres)	Production (MT)	Yield (Kgs/acre)
Bumthang	5	9	1,836
Chhukha	175	280	1,600
Dagana	225	137	608
Gasa	3	5	1,856
Haa	23	27	1,169
Lhuentse	94	216	2,294
Monggar	561	331	590
Paro	160	337	2,104
Pemagatshel	142	108	759
Punakha	201	485	2,416
Samdrup Jongkhar	260	400	1,539
Samtse	279	228	820
Sarpang	150	121	807
Thimphu	22	71	3,209
Trashigang	285	364	1,275
Trashiyangtse	75	72	959
Trongsa	71	115	1,620
Tsirang	396	688	1,738
Wangdue	179	331	1,847
Zhemgang	79	83	1,056
Bhutan	**3,385**	**4,409**	**1,302**

Table 13.10: Peas harvested area (Acres), Production (MT) and Yield (Kgs/Acre)

Dzongkhag	Harvested Area (Acres)	Production (MT)	Yield (Kgs/acre)
Bumthang	4	8	2,308
Chhukha	107	166	1,551
Dagana	15	12	821
Gasa	3	3	1,126
Haa	111	147	1,326
Lhuentse	12	14	1,175
Monggar	47	64	1,362
Paro	120	152	1,264
Pemagatshel	15	10	703
Punakha	42	54	1,282
Samdrup Jongkhar	40	51	1,287
Samtse	10	8	761
Sarpang	13	8	643
Thimphu	45	86	1,916
Trashigang	40	42	1,065
Trashiyangtse	15	14	960
Trongsa	6	10	1,632
Tsirang	71	50	708
Wangdue	31	43	1,381
Zhemgang	50	70	1,400
Bhutan	**795**	**1,014**	**1,275**

Table 13.11: Tomato harvested area (Acres), Production (MT) and Yield (Kgs/Acre)

Dzongkhag	Harvested Area (Acres)	Production (MT)	Yield (Kgs/acre)
Bumthang	0.46	1	2,100
Chhukha	22	16	717
Dagana	17	26	1,545
Gasa	1	3	2,942
Haa	6	16	2,608
Lhuentse	9	8	886
Monggar	13	11	828
Paro	6	8	1,405
Pemagatshel	11	5	473
Punakha	26	47	1,825
Samdrup Jongkhar	35	40	1,147
Samtse	37	34	927
Sarpang	33	31	924
Thimphu	14	32	2,267
Trashigang	15	21	1,423
Trashiyangtse	10	20	2,039
Trongsa	14	21	1,551
Tsirang	34	25	731
Wangdue	31	81	2,586
Zhemgang	13	9	701
Bhutan	**347**	**455**	**1,310**

Table 13.12: Broccoli harvested area (Acres), Production (MT) and Yield (Kgs/Acre)

Dzongkhag	Harvested Area (Acres)	Production (MT)	Yield (Kgs/acre)
Bumthang	6	15	2,634
Chhukha	26	42	1,600
Dagana	32	29	887
Gasa	7	11	1,552
Haa	6	9	1,506
Lhuentse	32	44	1,361
Monggar	100	68	680
Paro	40	53	1,317
Pemagatshel	24	18	756
Punakha	10	13	1,208
Samdrup Jongkhar	42	63	1,491
Samtse	18	20	1,109
Sarpang	25	21	848
Thimphu	65	174	2,683
Trashigang	81	86	1,055
Trashi yangtse	28	37	1,313
Trongsa	50	81	1,643
Tsirang	47	37	789
Wangdue	70	166	2,363
Zhemgang	14	17	1,182
Bhutan	**725**	**1,004**	**1,385**

Table 13.13: Onion bulb harvested area (Acres), Production (MT) and Yield (Kgs/Acre)

Dzongkhag	Harvested Area(Acres)	Production (MT)	Yield (Kgs/acre)
Chhukha	15	11	728
Dagana	22	16	729
Haa	3	2	721
Lhuentse	16	22	1,339
Monggar	42	27	653
Paro	3	4	1,523
Pemagatshel	17	16	947
Punakha	7	10	1,506
Samdrup Jongkhar	43	35	816
Samtse	13	11	848
Sarpang	53	43	822
Thimphu	5	4	975
Trashigang	30	40	1,341
Trashi yangtse	28	31	1,094
Trongsa	27	53	1,939
Tsirang	87	50	583
Wangdue	28	30	1,054
Zhemgang	3	6	1,945
Bhutan	**442**	**414**	**935**

Table 13.14: Garlic harvested area (Acres), Production (MT) and Yield (Kgs/Acre)

Dzongkhag	Harvested Area(Acres)	Production (MT)	Yield (Kgs/acre)
Bumthang	7	6	921
Chhukha	43	55	1,261
Dagana	29	18	629
Gasa	31	42	1,348
Ha	18	14	802
Lhuentse	198	214	1,081
Monggar	220	81	369
Paro	3	6	1,881
Pemagatshel	72	34	473
Punakha	98	52	527
Samdrup Jongkhar	78	58	739
Samtse	18	31	1,697
Sarpang	13	13	1,007
Thimphu	3	3	769
Trashi gang	298	343	1,149
Trashiyangtse	106	87	815
Trongsa	33	19	572
Tsirang	62	19	313
Wangdue	59	69	1,173
Zhemgang	18	13	705
Bhutan	**1,409**	**1,176**	**835**

Table 13.15: Egg Plant harvested area (Acres), Production (MT) and Yield (Kgs/Acre)

Dzongkhag	Harvested Area (Acres)	Production (MT)	Yield (Kgs/acre)
Chhukha	13	14	1,060
Dagana	16	16	998
Gasa	0.4	1	1,318
Haa	2	3	1,747
Lhuentse	39	67	1,723
Monggar	11	8	709
Paro	80	180	2,250
Pemagatshel	6	5	763
Punakha	32	48	1,511
Samdrup Jongkhar	39	36	918
Samtse	17	15	858
Sarpang	28	18	641
Thimphu	3	8	2,806
Trashigang	26	25	940
Trashiyangtse	13	19	1,405
Trongsa	12	21	1,710
Tsirang	15	10	670
Wangdue	43	77	1,815
Zhemgang	12	15	1,217
Bhutan	**408**	**585**	**1,433**

Table 13.16: Lady Finger harvested area (Acres), Production (MT) and Yield (Kgs/Acre)

Dzongkhag	Harvested Area (Acres)	Production (MT)	Yield (Kgs/acre)
Chhukha	3.0	4	1,489
Dagana	1.5	2	1,277
Lhuentse	.9	1	1,242
Monggar	1.6	1	511
Pemagatshel	1.4	1	1,002
Punakha	1.1	2	1,327
Samdrup Jongkhar	5.2	5	875
Samtse	4.6	6	1,216
Sarpang	10.1	11	1,091
Trashi gang	2.7	2	749
Trashi yangtse	2.2	1	409
Trongsa	.3	0.43	1,719
Tsirang	5.2	2	472
Wangdue	2.5	3	1,017
Zhemgang	.9	1	1,005
Bhutan	**43**	**42**	**964**

Table 13.17: Green leaves harvested area (Acres), Production (MT) and Yield (Kgs/Acre)

Dzongkhag	Harvested Area (Acres)	Production(MT)	Yield (Kgs/acre)
Bumthang	10	17	1,692
Chhukha	71	113	1,590
Dagana	91	114	1,260
Gasa	11	18	1,671
Haa	30	48	1,600
Lhuentse	47	84	1,808
Monggar	230	199	866
Paro	31	37	1,181
Pemagatshel	52	51	973
Punakha	72	90	1,247
Samdrup Jongkhar	57	96	1,673
Samtse	129	190	1,482
Sarpang	74	160	2,176
Thimphu	55	134	2,436
Trashigang	129	143	1,104
Trashiyangtse	61	62	1,005
Trongsa	36	73	2,007
Tsirang	104	93	890
Wangdue	126	181	1,435
Zhemgang	41	34	817
Bhutan	**1,458**	**1,937**	**1,328**

Table 13.18: Tree Tomato Production (MT)

Dzongkhag	Production (MT)
Chhukha	7
Dagana	9
Gasa	4
Ha	6
Lhuentse	39
Monggar	37
Pemagatshel	15
Punakha	40
Samdrup Jongkhar	5
Samtse	8
Sarpang	13
Trashigang	19
Trashiyangtse	23
Trongsa	8
Tsirang	29
Wangdue	8
Zhemgang	7
Bhutan	**275**

Table 13.19: Dally Chilli Production (MT)

Dzongkhag	Production (MT)
Chhukha	6
Dagana	12
Ha	4
Lhuentse	1
Monggar	17
Pemagatshel	2
Punakha	0.28
Samdrup Jongkhar	14
Samtse	13
Sarpang	7
Trashigang	1
Trashiyangtse	2
Trongsa	0.43
Tsirang	17
Wangdue	15
Zhemgang	1
Bhutan	**112**

Table 13.20: Cucurbits Production (MT)

Dzongkhag	Cucumber Production (MT)	Pumpkin Production(MT)	Squash Production(MT)	Gourds Production (MT)
Chhukha	87	230	269	5
Dagana	52	331	94	8
Gasa	0.3	0.1		
Haa	6	6		0.16
Lhuentse	39	129	20	1
Monggar	12	45	13	0.16
Paro	19	43		
Pemagatshel	34	285	104	3
Punakha	450	128	86	36
Samdrup Jongkhar	199	566	434	15
Samtse	53	696	1,052	15
Sarpang	38	121	58	14
Thimphu	5	0.5		
Trashigang	34	115	51	3
Trashiyangtse	48	250	77	4
Trongsa	8	36	34	0.4
Tsirang	49	411	261	13
Wangdue	12	24	14	7
Zhemgang	47	255	59	0.4
Bhutan	**1,194**	**3,671**	**2,626**	**125**

14 Spices

Table 14.1: Ginger harvested area (Acres), Production (MT) and Yield (Kgs/Acre)

Dzongkhag	Harvested Area(Acres)	Production (MT)	Yield (Kgs/acre)
Chhukha	979	1,346	1,375
Dagana	180	140	778
Gasa	1	0	545
Haa	8	7	819
Lhuentse	5	5	994
Monggar	113	50	442
Pemagatshel	318	728	2,285
Punakha	6	5	831
Samdrup Jongkhar	1,038	2,662	2,566
Samtse	906	1,683	1,858
Sarpang	683	3,252	4,765
Trashigang	25	40	1,596
Trashiyangtse	20	25	1,255
Trongsa	30	83	2,776
Tsirang	292	690	2,365
Wangdue	26	31	1,180
Zhemgang	145	125	865
Bhutan	**4,773**	**10,871**	**2,278**

Table 14.2: Cardamom harvested area (Acres), Production (MT) and Yield (Kgs/Acre)

Dzongkhag	Harvested Area(Acres)	Production (MT)	Yield (Kgs/acre)
Chhukha	1,896	505	266
Dagana	1,075	358	333
Haa	1,048	307	294
Lhuentse	12	3	204
Monggar	14	2	160
Pemagatshel	217	2	10
Punakha	7	1	203
Samdrup Jongkhar	62	17	270
Samtse	4,698	1162	247
Sarpang	935	187	200
Trashi gang	4	1	221
Trongsa	317	53	167
Tsirang	657	124	188
Zhemgang	147	14	98
Bhutan	**11,086**	**2,736**	**247**

15 Oil Seeds

Table 15.1: Ground nut harvested area (Acres), Production (MT) and Yield (Kgs/Acre)

Dzongkhag	Harvested area(Acres)	Production (MT)	Yield (Kgs/acre)
Lhuentse	0.11	0.02	200
Monggar	15.11	8	545
Pemagatshel	38.42	20	528
Punakha	0.87	1	586
Samdrup Jongkhar	5.56	8	1,447
Samtse	0.13	0.03	240
Sarpang	0.10	0.02	203
Trashigang	80.84	65	805
Trashiyangtse	60.84	45	736
Tsirang	5.57	2	378
Zhemgang	0.04	0.01	400
Bhutan	**207.57**	**149**	**718**

Table 15.2: Sunflower harvested area (Acres), Production (MT) and Yield (Kgs/Acre)

Dzongkhag	Harvested Area(Acres)	Production (MT)	Yield (Kgs/acre)
Bumthang	9.39	5	541
Chhukha	0.99	0.40	400
Dagana	0.34	0.03	80
Lhuentse	0.03	0.01	200
Monggar	0.08	0.01	150
Pemagatshel	0.10	0.01	67
Sarpang	1.60	0.07	45
Trashigang	2.00	1	732
Trashi yangtse	0.07	0.03	500
Zhemgang	0.54	0.08	150
Bhutan	**15**	**7**	**474**

Table 15.3: Mustard harvested area (Acres), Production (MT) and Yield (Kgs/Acre)

Dzongkhag	Cultivated Area(Acres)	Production (MT)	Yield (Kgs/acre)
Bumthang	42	14	338
Chhukha	344	103	299
Dagana	500	190	379
Gasa	6	6	892
Ha	25	11	453
Lhuentse	8	5	696
Monggar	135	33	245
Paro	75	29	389
Pemagatshel	89	23	261
Punakha	115	29	252
Samdrup Jongkhar	138	82	597
Samtse	157	67	429
Sarpang	161	62	385
Thimphu	40	20	490
Trashigang	208	73	352
Trashi yangtse	9	1	128
Trongsa	83	25	297
Tsirang	76	21	280
Wangdue	105	76	723
Zhemgang	80	22	275
Bhutan	**2,395**	**892**	**370**

Table 15.4: Soya bean harvested area (Acres), Production (MT) and Yield (Kgs/Acre)

Dzongkhag	Harvested Area (Acres)	Production (MT)	Yield (Kgs/acre)
Chhukha	6	0.7	102
Dagana	41	0.8	20
Ha	7	3.6	519
Lhuentse	5	2.1	384
Monggar	59	34.7	590
Pemagatshel	137	90.3	661
Punakha	30	1.0	34
Samdrup Jongkhar	12	7.3	626
Samtse	14	4.9	349
Sarpang	23	1.4	60
Trashi gang	146	83.8	574
Trashiyangtse	25	13.1	527
Tsirang	16	3.5	218
Wangdue	1	0.4	410
Zhemgang	21	6.0	281
Bhutan	**544**	**254**	**466**

Table 15.5: Pyrilla (Naam) harvested area (Acres), Production (MT) and Yield (Kgs/Acre)

Dzongkhag	Harvested Area (Acres)	Production (MT)	Yield (Kgs/acre)
Ha	4.99	1	263
Lhuentse	1.50	0.2	125
Monggar	0.27	0.1	364
Pemagatshel	13.32	2	182
Punakha	3.67	1	139
Samdrup Jongkhar	8.70	5	591
Samtse	0.18	0.0	160
Sarpang	0.93	0.3	331
Trashigang	1.98	1	277
Tsirang	0.29	0.1	266
Zhemgang	5.46	1	182
Bhutan	**41.29**	**12**	**282**

16 Legumes and Pulses

Table 16.1: Rajma bean harvested area (Acres), Production (MT) and Yield (Kgs/Acre)

Dzongkhag	Harvested Area (Acres)	Production(MT)	Yield (Kgs/acre)
Chhukha	55	30	543
Dagana	503	259	515
Lhuentse	1	0.8	647
Monggar	502	347	690
Paro	1	0.4	856
Pemagatshel	53	48	893
Samdrup Jongkhar	87	39	450
Samtse	3	1.1	382
Sarpang	15	5	321
Trashigang	244	204	837
Trashiyangtse	8	8	979
Tsirang	90	50	558
Wangdue	1	0.3	393
Zhemgang	1	1.0	728
Bhutan	**1,565**	**994**	**635**

Table 16.2: Mung bean harvested area (Acres), Production (MT) and Yield (Kgs/Acre)

Dzongkhag	Harvested Area(Acres)	Production(MT)	Yield (Kgs/acre)
Chhukha	27	6	217
Dagana	505	335	664
Monggar	26	15	589
Pemagatshel	17	4	264
Punakha	1	0.2	267
Samdrup Jongkhar	28	12	422
Samtse	59	12	205
Sarpang	169	46	272
Trashigang	20	7	331
Trashiyangtse	3	0.9	284
Tsirang	95	43	455
Zhemgang	2	0.4	172
Bhutan	**952**	**482**	**506**

17 Roots and Tubers

Table 17.1: Sweet Potato harvested area (Acres), Production (MT) and Yield (Kgs/Acre)

Dzongkhag	Harvested Area (Acres)	Production (MT)	Yield (Kgs/acre)
Chhukha	0.2	0.1	737
Dagana	1	2	1,356
Ha	0.24	0.27	1,116
Lhuentse	0.03	0.03	1,000
Monggar	1	2	1,220
Pemagatshel	7	6	913
Punakha	0.3	0.5	1,611
Samdrup Jongkhar	5	6	1,155
Samtse	5	3	710
Sarpang	3	2	762
Trashigang	0.4	1	1,333
Trashiyangtse	1	0.3	415
Tsirang	5	4	812
Wangdue	0.3	0.2	880
Zhemgang	2	2	1,156
Bhutan	**31**	**29**	**940**

Table 17.2: Tapioca harvested area (Acres), Production (MT) and Yield (Kgs/Acre)

Dzongkhag	Harvested Area (Acres)	Production (MT)	Yield (Kgs/acre)
Chhukha	41	30	736
Dagana	42	84	1,991
Monggar	4	2	648
Pemagatshel	20	31	1,573
Samdrup Jongkhar	16	32	2,011
Samtse	109	184	1,683
Sarpang	13	13	992
Trashiyangtse	2	1	692
Tsirang	24	27	1,111
Zhemgang	6	9	1,425
Bhutan	**278**	415	**1,490**

18 Horticulture Fruit Crop Production

18.1: Apple Production and Yield

Dzongkhag	Total Trees(Nos)	Bearing Tree(Nos)	Production (MT)	Yield (Kgs/bearing tree)
Bumthang	3,470	2,956	67	23
Chhukha	2,763	1,987	64	32
Dagana	365	120	2	15
Gasa	85	48	0.96	20
Ha	17,074	13,761	371	27
Lhuentse	3,348	502	19	37
Monggar	1,530	557	7	13
Paro	103,662	85,913	2,995	35
Pemagatshel	509	19	0.25	13
Punakha	113	18	0.21	12
Thimphu	95,610	88,972	3,025	34
Trashigang	1,772	724	23	32
Trashi yangtse	10,567	498	4	8
Trongsa	123	103	2	15
Tsirang	285	10	0.1	12
Wangdue	1,626	520	9	18
Bhutan	**242,903**	**196,708**	**6,587**	**33**

18.2: Mandarin Production and Yield

Dzongkhag	Total Trees (Nos)	Bearing Tree (Nos)	Production (MT)	Yield (Kgs/ bearing tree)
Chhukha	108,426	52,720	1,396	26
Dagana	262,614	136,175	6,060	45
Lhuentse	19,872	5,046	189	37
Monggar	125,252	35,209	1,460	41
Pemagatshel	245,856	144,332	6,568	46
Punakha	12,504	7,578	150	20
Samdrup Jongkhar	225,283	102,712	6,414	62
Samtse	72,325	41,315	2,201	53
Sarpang	225,746	181,923	6,587	36
Trashigang	46,599	14,116	787	56
Trashiyangtse	24,166	5,304	177	33
Trongsa	27,946	15,672	501	32
Tsirang	108,447	75,875	6,461	85
Wangdue	10,683	6,343	214	34
Zhemgang	150,079	58,487	2,837	48
Bhutan	**1,665,797**	**882,807**	**42,003**	**48**

18.3: Areca nut Production and Yield

Dzongkhag	Total Trees (Nos)	Bearing Tree (Nos)	Production (MT)	Yield (Kgs/bearing tree)
Chhukha	77,432	43,261	455	11
Dagana	166,230	64,148	745	12
Monggar	2,950	1,439	14	10
Pemagatshel	15,463	3,548	40	11
Samdrup Jongkhar	77,350	46,986	1,087	23
Samtse	437,965	238,377	2,861	12
Sarpang	641,531	326,978	4,251	13
Tsirang	740	274	1	5
Zhemgang	3,548	1,065	13	12
Bhutan	**1,423,208**	**726,075**	**9,467**	**13**

19 Other Fruit Crops

19.1: Mango Production and Yield

Dzongkhag	Total Trees (Nos)	Bearing Tree (Nos)	Production (MT)	Yield (Kgs/bearing trees)
Chhukha	4,957	3,400	119	35
Dagana	8,936	1,961	53	27
Lhuentse	50	50	2	32
Monggar	5,336	1,814	49	27
Pemagatshel	20,521	1,269	40	31
Punakha	1,293	883	22	25
Samdrup Jongkhar	7,326	1,314	52	40
Samtse	11,217	5,740	70	12
Sarpang	8,098	3,658	138	38
Trashigang	1,641	382	13	34
Trashiyangtse	2,879	312	4	14
Trongsa	535	265	5	20
Tsirang	4,248	1,010	48	48
Wangdue	443	130	2	14
Zhemgang	4,672	1,306	28	21
Bhutan	**82,153**	**23,494**	**644**	**27**

19.2: Pear Production and Yield

Dzongkhag	Total Trees (Nos)	Bearing Tree (Nos)	Production (MT)	Yield (Kgs/bearing tree)
Bumthang	212	198	7	34
Chhukha	1,122	483	30	62
Dagana	1,584	1,038	104	101
Gasa	364	205	6	31
Haa	49	46	1	32
Lhuentse	5,027	878	41	46
Monggar	5,899	3,117	74	24
Paro	904	547	14	26
Pemagatshel	2,315	311	9	28
Punakha	2,507	1,754	138	78
Samdrup Jongkhar	969	477	23	47
Samtse	731	456	19	42
Sarpang	1,213	730	51	70
Thimphu	412	239	7	30
Trashigang	7,371	2,388	219	92
Trashiyangtse	3,735	1,382	36	26
Trongsa	1,244	380	10	25
Tsirang	1,408	1,035	131	127
Wangdue	1,690	795	39	49
Zhemgang	820	269	5	19
Bhutan	**39,575**	**16,726**	**963**	**58**

19.3: Peach Production and Yield

Dzongkhag	Total Trees (Nos)	Bearing Tree (Nos)	Production (MT)	Yield (Kgs/bearing tree)
Bumthang	152	116	4	31
Chhukha	625	285	14	48
Dagana	1,561	742	42	56
Gasa	77	68	5	80
Ha	110	15	1	76
Lhuentse	2,234	1,398	65	46
Monggar	2,322	1,814	101	56
Paro	1,796	1,577	66	42
Pemagatshel	3,417	1,726	129	74
Punakha	3,459	1,957	97	50
Samdrup Jongkhar	1,108	883	54	62
Samtse	935	817	36	45
Sarpang	242	171	11	65
Thimphu	520	510	34	67
Trashigang	2,603	1,858	119	64
Trashiyangtse	2,364	1,947	74	38
Trongsa	713	397	11	28
Tsirang	1,375	957	67	70
Wangdue	1,061	630	28	44
Zhemgang	413	261	14	52
Bhutan	**27,087**	**18,131**	**972**	**54**

19.4: Plum Production and Yield

Dzongkhag	Total Trees (Nos)	Bearing Tree (Nos)	Production (MT)	Yield (Kgs/bearing trees)
Bumthang	366	115	2	19
Chhukha	79	53	1	20
Dagana	1,144	701	35	50
Gasa	7	7	0	35
Haa	46	40	3	69
Lhuentse	2,390	905	36	40
Monggar	1,573	1,190	54	45
Paro	209	170	4	25
Pemagatshel	631	262	13	50
Punakha	257	132	3	19
Samdrup Jongkhar	751	470	25	54
Samtse	628	432	9	20
Sarpang	1,045	353	12	34
Thimphu	1,712	1,522	33	22
Trashigang	1,666	973	65	66
Trashiyangtse	1,346	588	14	24
Trongsa	558	81	2	24
Tsirang	984	822	61	74
Wangdue	58	36	1	40
Zhemgang	400	68	3	41
Bhutan	**15,849**	**8,920**	**376**	**42**

19.5: Walnut Production and Yield

Dzongkhag	Total Trees (Nos)	Bearing Tree (Nos)	Production (MT)	Yield (Kgs/bearing trees)
Bumthang	569	240	2	7
Chhukha	216	16	0.5	30
Dagana	1,375	46	1	27
Gasa	59	43	1	32
Haa	121	35	0.4	12
Lhuentse	1,272	154	5	32
Monggar	2,280	759	16	21
Paro	1,908	965	20	21
Pemagatshel	1,331	122	8	67
Punakha	2,559	1,840	40	22
Samdrup Jongkhar	696	61	3	44
Samtse	157	60	1	17
Sarpang	223	31	0	8
Thimphu	895	537	14	25
T/gang	2,757	1,152	37	32
T/yangtse	2,254	769	11	14
Trongsa	1,271	247	9	35
Tsirang	266	61	1	16
Wangdue	2,035	498	2	4
Zhemgang	1,828	347	9	26
Bhutan	**24,072**	**7,984**	**181**	**21**

19.6: Jack Fruit Production and Yield

Dzongkhag	Total Trees (Nos)	Bearing Tree (Nos)	Production (MT)	Yield (Kgs/bearing tree)
Chhukha	259	64	12	186
Dagana	4,792	2,493	336	135
Monggar	111	60	6	102
Pemagatshel	1,526	354	115	324
Punakha	16	6	0.4	70
Samdrup Jongkhar	792	452	91	202
Samtse	1,386	1,052	118	112
Sarpang	1,486	612	61	100
Trashigang	8	4	0.04	10
Trashiyangtse	94	4	1	200
Trongsa	48	4	0.5	120
Tsirang	281	104	19	185
Wangdue	13	12	0.1	13
Zhemgang	302	187	15	81
Bhutan	**11,113**	**5,406**	**775**	**143**

19.7: Guava Production and Yield

Dzongkhag	Total Trees (Nos)	Bearing Tree (Nos)	Production (MT)	Yield (Kgs/bearing tree)
Chhukha	723	413	6	16
Dagana	3,967	2,768	45	16
Lhuentse	494	349	14	39
Monggar	2,118	1,599	32	20
Pemagatshel	4,386	2,813	68	24
Punakha	7,019	5,363	111	21
Samdrup Jongkhar	2,477	1,642	50	31
Samtse	2,942	2,078	46	22
Sarpang	3,311	2,560	59	23
Trashigang	1,141	749	32	43
Trashiyangtse	953	578	15	26
Trongsa	2,218	1,894	57	30
Tsirang	2,287	1,781	83	47
Wangdue	1,560	1,286	30	23
Zhemgang	807	486	16	33
Bhutan	**36,405**	**26,360**	**665**	**25**

Table 19.8: Papaya Production and Yield

19.8.1: Papaya Production and Yield in first half yearly (January to June)

Dzongkhag	Total Trees (Nos)	Bearing Tree (Nos)	Production (MT)	Yield (Kgs/bearing trees)
Dagana	315	204	5	25
Monggar	164	148	2	14
Pemagatshel	80	62	3	53
Punakha	71	40	1	22
Samdrup Jongkhar	879	626	13	21
Samtse	550	314	4	13
Sarpang	2,289	1,346	26	19
Trashigang	51	43	1	21
Trashiyangtse	425	284	5	17
Trongsa	257	113	3	27
Tsirang	2,325	1,237	42	34
Wangdue	251	87	2	20
Zhemgang	72	47	1	16
Bhutan	**7,728**	**4,551**	**107**	**24**

19.8.2: Papaya Production and Yield in second half yearly (July to December)

Dzongkhag	Total Trees (Nos)	Bearing Tree (Nos)	Production (MT)	Yield (Kgs/bearing tree)
Chhukha	61	32	0.4	11
Dagana	612	465	10	21
Lhuentse	4	4	0.1	30
Monggar	370	362	5	14
Pemagatshel	1,256	576	4	6
Punakha	142	88	2	21
Samdrup Jongkhar	774	458	8	18
Samtse	1,278	725	10	13
Sarpang	2,782	2,244	52	23
Trashigang	257	140	5	37
Trashi yangtse	1,134	698	13	19
Trongsa	558	441	20	45
Tsirang	2,097	1,359	47	34
Wangdue	22	21	0.1	7
Zhemgang	61	27	0.2	9
Bhutan	**11,406**	**7,639**	**175**	**23**

19.9: Pomegranate Production and Yield

Dzongkhag	Total Trees (Nos)	Bearing Tree (Nos)	Production (MT)	Yield (Kgs/bearing tree)
Chhukha	73	38	0.28	7
Dagana	1,344	469	4	9
Lhuentse	157	122	2	20
Monggar	668	306	4	12
Paro	29	14	0.3	23
Pemagatshel	758	141	2	15
Punakha	366	233	5	22
Samdrup Jongkhar	272	107	1	9
Samtse	142	28	1	36
Sarpang	172	67	1	8
Trashigang	449	305	8	28
Trashiyangtse	699	302	5	17
Trongsa	1,289	855	18	21
Tsirang	510	326	5	15
Wangdue	1,720	904	26	28
Zhemgang	92	51	0.4	7
Bhutan	**8,740**	**4,270**	**83**	**19**

19.10: Litchi Production and Yield

Dzongkhag	Total Trees (Nos)	Bearing Tree (Nos)	Production (MT)	Yield (Kgs/bearing tree)
Chhukha	598	257	8	29
Dagana	2,192	252	9	35
Monggar	1,058	191	2	10
Pemagatshel	9,560	130	4	29
Punakha	4	4	0.1	30
Samdrup Jongkhar	2,528	396	8	21
Samtse	1,261	656	24	36
Sarpang	12,950	3,664	79	21
Trongsa	26	8	0.1	14
Tsirang	827	23	0.4	15
Zhemgang	801	21	0.3	16
Bhutan	**31,805**	**5,602**	**134**	**24**

19.11: Persimmon Production and Yield

Dzongkhag	Total Trees (Nos)	Bearing Tree (Nos)	Production (MT)	Yield (Kgs/bearing tree)
Chhukha	22	8	0.1	17
Dagana	672	335	5	15
Lhuentse	16	2	0.0	20
Monggar	446	113	3	27
Paro	49	28	0.6	21
Pemagatshel	358	42	0.8	19
Punakha	426	369	9	24
Samdrup Jongkhar	134	7	0.1	15
Samtse	61	41	2	48
Sarpang	136	65	0.9	14
Trashigang	61	21	0.2	11
Trashiyangtse	189	25	0.2	9
Trongsa	93	78	3	44
Tsirang	48	15	0.6	37
Wangdue	509	373	22	58
Zhemgang	32	32	0.8	24
Bhutan	**3,251**	**1,554**	**49**	**31**

19.12: Banana Production and Yield

Dzongkhag	Total Trees (Nos)	Bearing Tree (Nos)	Production (MT)	Yield (Kgs/bearing tree)
Chhukha	12,897	5,004	148	30
Dagana	40,972	14,667	471	32
Haa	838	284	5	16
Lhuentse	1,178	437	17	38
Monggar	23,227	9,155	144	16
Pemagatshel	28,664	4,549	148	32
Punakha	3,139	877	34	38
Samdrup Jongkhar	41,945	4,762	187	39
Samtse	48,439	14,643	427	29
Sarpang	61,321	21,951	607	28
Trashigang	10,513	3,159	63	20
Trashi yangtse	10,405	2,529	61	24
Trongsa	8,072	3,644	126	34
Tsirang	47,212	17,001	510	30
Wangdue	2,543	1,058	36	34
Zhemgang	8,774	3,841	95	25
Bhutan	**350,141**	**107,562**	**3,076**	**29**

19.13: Date Plum (Gendum) Production and Yield

Dzongkhag	Total Trees (Nos)	Bearing Tree (Nos)	Production (MT)	Yield (Kgs/bearing tree)
Chhukha	154	65	6	99
Dagana	474	289	12	42
Gasa	7	7	0.2	30
Lhuentse	598	51	2	34
Monggar	569	477	30	63
Pemagatshel	47	28	2	88
Punakha	143	121	3	24
Samdrup Jongkhar	202	132	3	24
Samtse	550	383	10	26
Trashigang	247	120	4	36
Trashiyangtse	251	147	3	22
Trongsa	7	7	0.2	25
Tsirang	150	136	3	25
Wangdue	64	35	1	35
Zhemgang	20	20	0.3	18
Bhutan	**3,484**	**2,017**	**82**	**41**

19.14: Other Fruit Production

Dzongkhag	Sugarcane Production (MT)	Passion Fruits Production (MT)	Pine Apple Production (MT)
Chhukha	18	10	2
Dagana	17	4	4
Ha	3	0.3	
Lhuentse	2	4	0.004
Monggar	6	11	5
Pemagatshel	23	11	5
Punakha	22	8	
Samdrup Jongkhar	48	7	12
Samtse	54	10	9
Sarpang	26	11	15
Trashigang	5	8	11
Trashi yangtse	26	5	
Trongsa	11	10	
Tsirang	53	15	2
Wangdue	22	2	
Zhemgang	9	3	1
Bhutan	**345**	**120**	**67**

20 Annex

20.1 Trend Graphs on Major Crops

Figure i : Paddy production trend for past ten years.

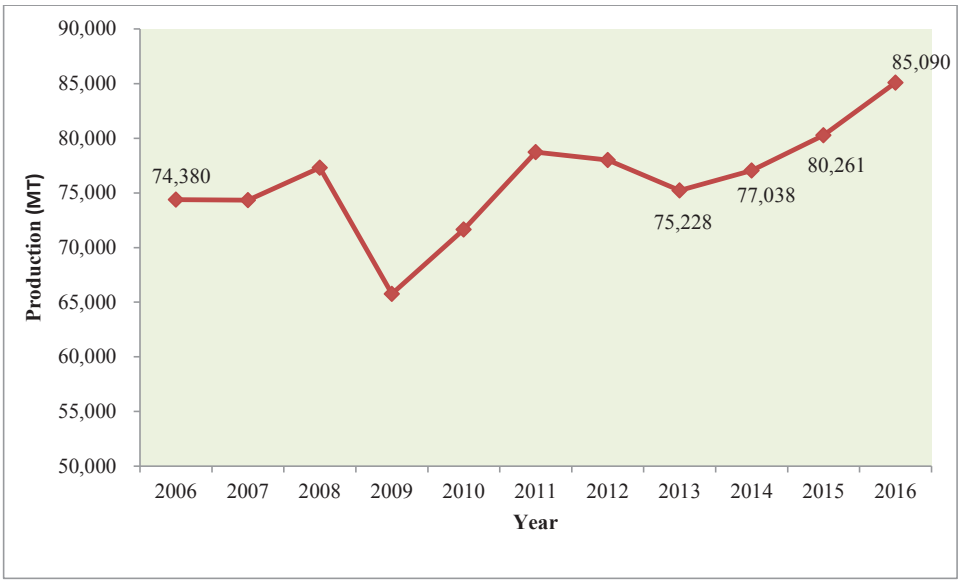


Figure ii: Maize production trend for past ten years.

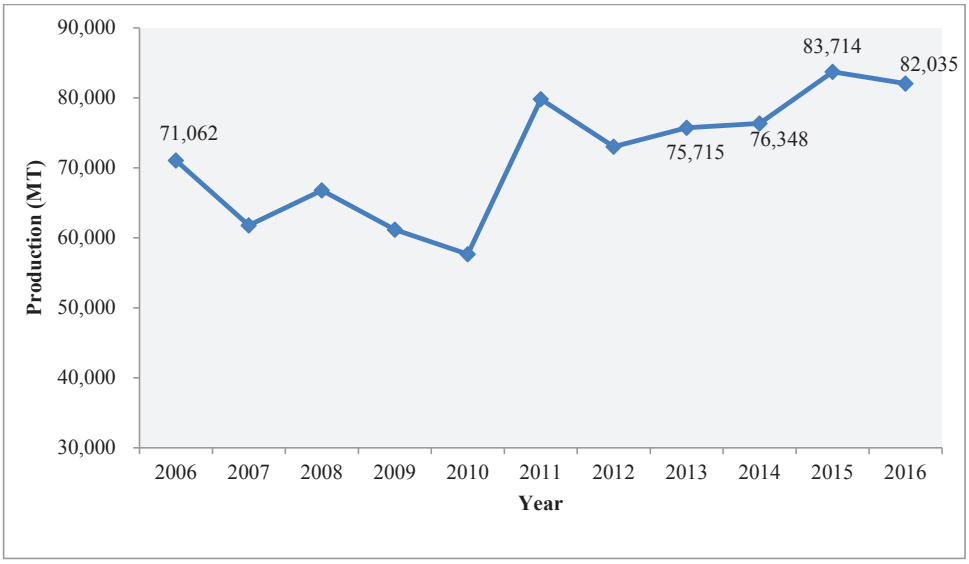


Figure iii: Wheat production trend for past ten years.

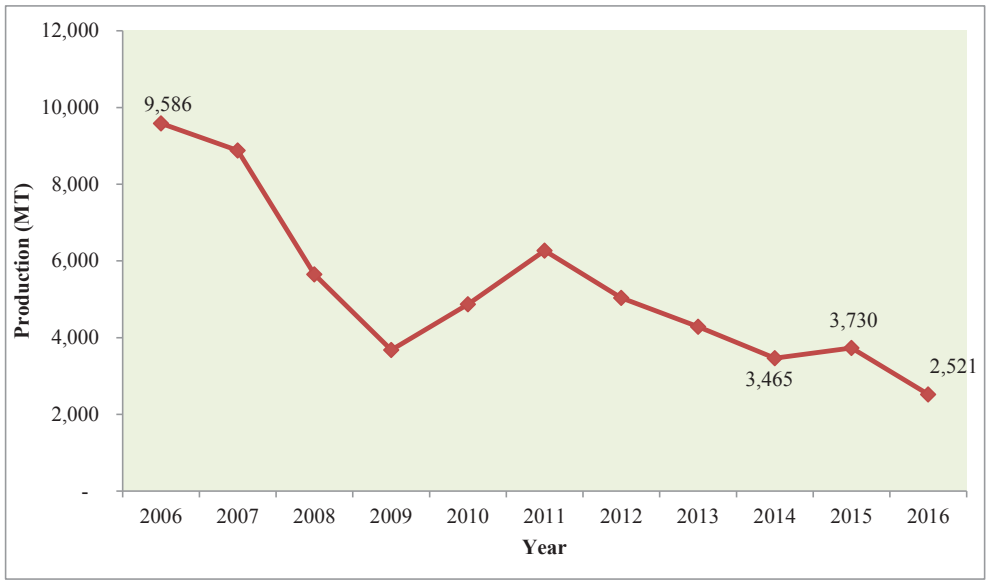


Figure iv: Buckwheat production trend for past ten years.

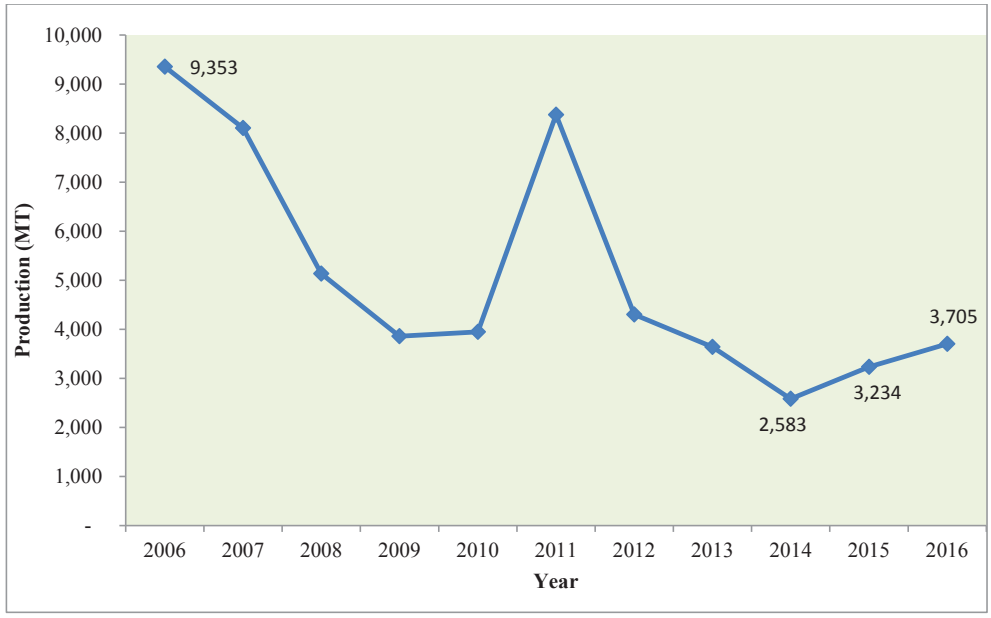


Figure v: Apple production trend for past ten years.

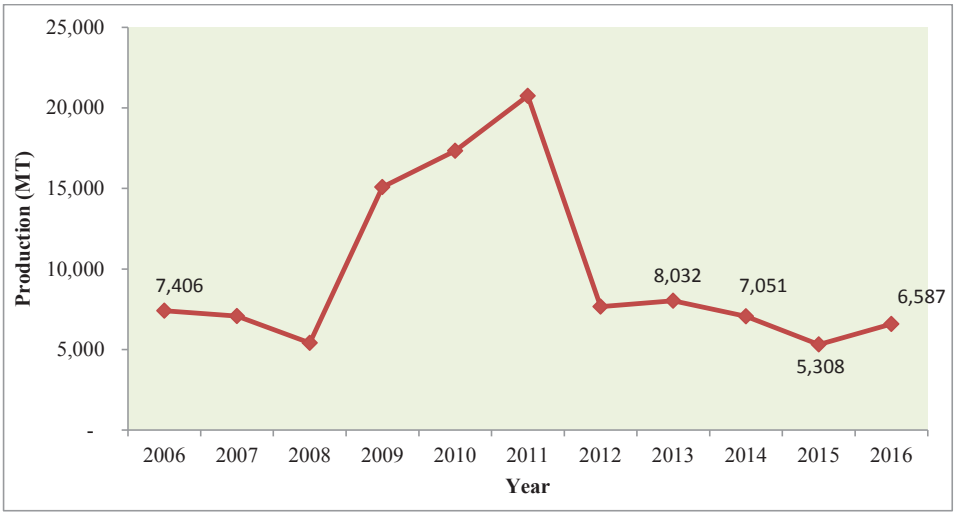


Figure vi: Mandarin production trend for past ten years.

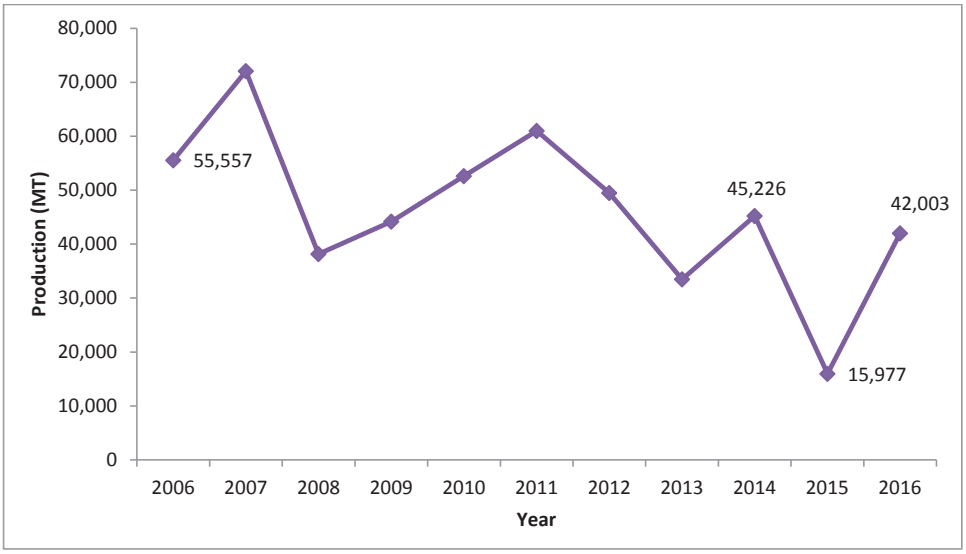


Figure vii: Potato production trend for past ten years.

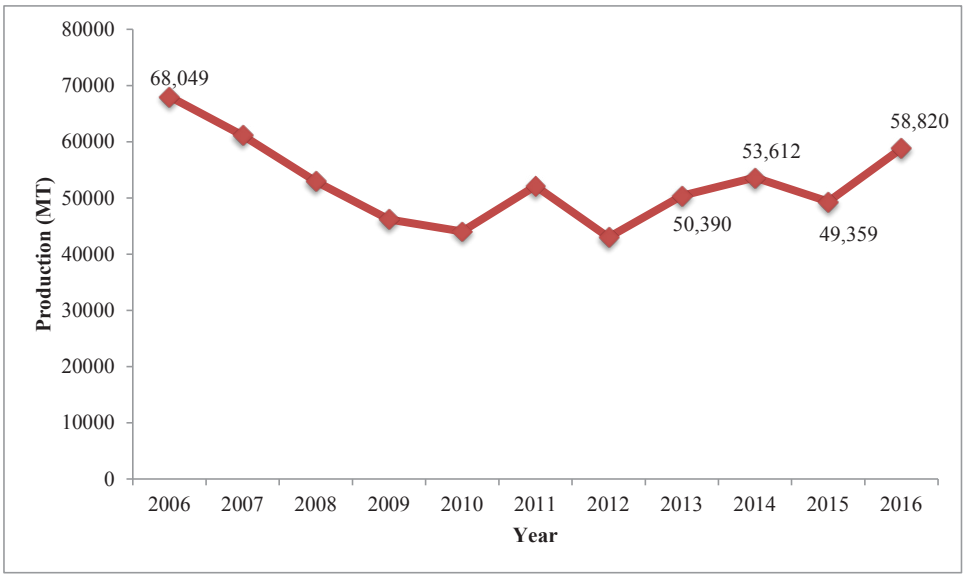


Figure viii: Cardamom production trend for past ten years.