AGRICULTURE STATISTICS 2015

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

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སོ་ནམ་ལས་ཁུངས། སོ་ནམ་སྐྱན་ཁག། དཔལ་ལྡན་འབྲུག་གཞུང།
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Tashichhodzong: Thimphu

Foreword

The Department of Agriculture is pleased to publish the Annual Agriculture Statistics for the year 2015. As usual, it contains data on land use, crop area, yield, production 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.

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 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

ས་ནམ་ལས་ཁུངས། ས་ནམ་སྐྱན་ལག། དཔལ་ལྡན་འབྲུག་གཞུང་།

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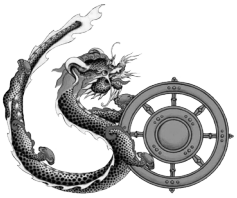

Acknowledgements

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 Agriculture Extension and Information Management section (AEIMS) of the Department is appreciated.

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

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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 surveywas initiatedto 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 2015 bi annual 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 2015 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 personals 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 agriculturecrop 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 2015 bi-annual Survey the 2014 sample size formulae was adopted and improved using additional information gathered in previous survey, using the information's 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" orMargin 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 bi annual 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 data collection was carried out between 13/11/2015 to 29/01/2016 by agriculture extension officials (EAs) posted in the gewogs 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 2015 survey is an improved version of the 2014 which was designed in CSPRO 6.1 version software. As per the mandate 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 on March 2016 at the Gewogs and Dzongkhags by the Dzongkhag Agriculture Sector Officials.

The raw field data was further cleaned& checked for outliers and inconsistencies by the regional and commodity coordinators at the regional ARDCs office. The processed data was then submitted to IMS DoA head quarter for analysis and production of annual agriculture statistics.

9) Data Analysis and Estimation

The data analysis was done from June to August 2016 by the AEIMS officials under the Department of Agriculture. Data analysis was done in STATA and SPSS version 20 analysis software.

Yield Estimation:

For the major cereal, horticulture and fruit crops the yield provided by the survey was alwayscross checked with the yield of the crop cutscarried 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 2015was 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 the each Gewog.

Therefore, the estimate of a *total value* (such as total production) is the product of the finalweight, 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 newupdated 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 2015 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. Where as in the second biannual survey which captures crop grown from 1st July to 31st Dec 2015 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%.

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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 from 13th November 2015 to 1st week of February 2016. The weights are used to estimate population parameters from the sample data.

Coverage of Rural households by the survey 2015

Table A. Coverage of Rural Households by the Survey from 1st January to June 2015 (1st half yearly).

Dzongkhag	Total HHs (Sample frame) Nh	Sample HHs/Sh	Percent Sampled	Enumerated HHs/ (Eh)	Percentage Coverage
Bumthang	1,151	382	33	373	98
Chhukha	2,889	949	33	942	99
Dagana	4,206	1,312	31	1,256	96
Gasa	487	256	53	249	97
Haa	1,300	519	40	498	96
Lhuentse	2,332	771	33	771	100
Mongar	5,363	1,706	32	1,404	82
Paro	2,886	957	33	944	99
Pemagatshel	3,237	1,032	32	950	92
Punakha	3,506	1,046	30	813	78
Samdrup Jongkhar	3,844	1,078	28	937	87
Samtse	5,869	1,591	27	1,588	100
Sarpang	3,592	1,156	32	1,099	95
Thimphu	965	450	47	450	100
Trashigang	6,952	1,684	24	1,679	100
Trashiyangtse	2,554	810	32	809	100
Trongsa	1,705	514	30	513	100
Tsirang	2,882	1,095	38	1,085	99
Wangdue	3,961	1,374	35	1,339	97
Zhemgang	1,877	717	38	708	99
Bhutan	**61,558**	**19,399**	**32**	**18,407**	**95**

Table B.Coverage of Rural Households by the Survey from 1st July to December 2015 (2nd half yearly).

Dzongkhag	Total HHs (Sample frame) Nh	Sample HHs/Sh	Percent Sampled	Enumerated HHs/ (Eh)	Percentage Coverage
Bumthang	1,151	382	33	373	98
Chhukha	2,889	949	33	942	99
Dagana	4,206	1,312	31	1,309	100
Gasa	487	256	53	53	21
Haa	1,300	519	40	498	96
Lhuentse	2,332	771	33	771	100
Mongar	5,363	1,706	32	1,409	83
Paro	2,886	957	33	944	99
Pemagatshel	3,237	1,032	32	950	92
Punakha	3,506	1,046	30	1,003	96
Samdrup Jongkhar	3,844	1,078	28	937	87
Samtse	5,869	1,591	27	1,588	100
Sarpang	3,592	1,156	32	1,100	95
Thimphu	965	450	47	450	100
Trashigang	6,952	1,684	24	1,497	89
Trashiyangtse	2,554	810	32	811	100
Trongsa	1,705	514	30	512	100
Tsirang	2,882	1,095	38	1,090	100
Wangdue	3,961	1,374	35	1,339	97
Zhemgang	1,877	717	38	710	99
Bhutan	**61,558**	**19,399**	**32**	**18,286**	**94**

1. Demographic Characteristics

Table 1.1: Farming Households Population in 2015

Dzongkhag	Responding Age		Responding Sex in		0-6 years		6-14 years		15-64 years		Above 64 years	
	Mean	Median	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Bumthang	46	47	16	84	376	314	600	459	1,502	1,662	310	368
Chhukha	47	46	63	37	443	373	801	794	3,955	4,196	650	594
Dagana	46	46	59	41	742	851	1,560	1,396	5,378	5,552	672	771
Gasa	44	42	50	50	46	147	250	113	790	803	25	72
Ha	46	46	44	56	259	259	395	430	1,550	1,763	337	286
Lhuentse	51	51	33	67	339	440	964	910	2,478	3,008	543	580
Monggar	44	44	42	58	1,171	1,289	1,574	1,409	6,102	7,251	1,109	1,281
Paro	49	49	37	63	475	492	1,255	1,254	4,080	4,653	847	927
Pemagatshel	46	46	52	48	330	301	391	339	3,578	3,920	961	886
Punakha	49	49	30	70	515	493	1,108	1,040	3,546	4,412	559	602
S/Jongkhar	47	48	68	32	566	601	1,205	1,167	4,177	4,595	647	501
Samtse	48	48	74	26	1,066	1,030	2,474	2,253	10,445	10,513	1,346	1,128
Sarpang	48	48	67	33	551	549	1,048	1,008	4,856	5,162	755	659
Thimphu	47	48	33	67	147	124	307	332	1,154	1,454	161	201
T/gang	48	48	61	39	918	948	3,232	2,770	9,264	9,746	1,349	1,249
T/yangtse	44	44	43	57	585	463	820	793	2,878	3,208	390	439
Trongsa	46	46	31	69	251	256	614	528	2,094	2,409	254	390
Tsirang	47	48	65	35	467	402	1,057	1,087	4,356	4,531	758	587
Wangdue	45	45	38	62	1,183	1,287	1,493	1,600	5,596	6,414	890	889
Zhemgang	46	46	52	47	178	225	317	326	1,732	1,977	326	326
Bhutan	**47**	**47**	**52**	**48**	**10,608**	**10,843**	**21,465**	**20,008**	**79,513**	**87,230**	**12,890**	**12,736**

Table 1.2: Dzongkhag wise estimated total population residing on farm by Sex in 2015

Dzongkhag	Male	Female	Population
Bumthang	2,788	2,804	5,592
Chhukha	5,849	5,956	11,806
Dagana	8,352	8,569	16,921
Gasa	1,111	1,134	2,245
Ha	2,542	2,738	5,279
Lhuentse	4,325	4,938	9,263
Monggar	9,957	11,230	21,187
Paro	6,657	7,326	13,983
Pemagatshel	5,259	5,446	10,705
Punakha	5,728	6,547	12,275
S/Jongkhar	6,595	6,865	13,460
Samtse	15,331	14,924	30,255
Sarpang	7,210	7,378	14,589
Thimphu	1,769	2,112	3,881
T/gang	14,763	14,713	29,476
T/yangtse	4,673	4,903	9,576
Trongsa	3,214	3,583	6,796
Tsirang	6,638	6,606	13,245
Wangdue	9,161	10,191	19,352
Zhemgang	2,553	2,854	5,407
Bhutan	**124,476**	**130,817**	**255,292**

Figure 1: Bhutan's total population residing on farm by sex, 2015.

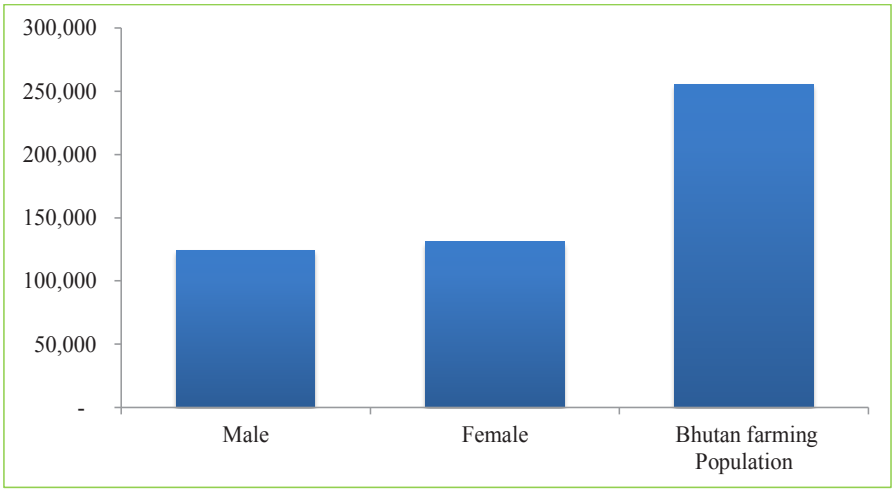
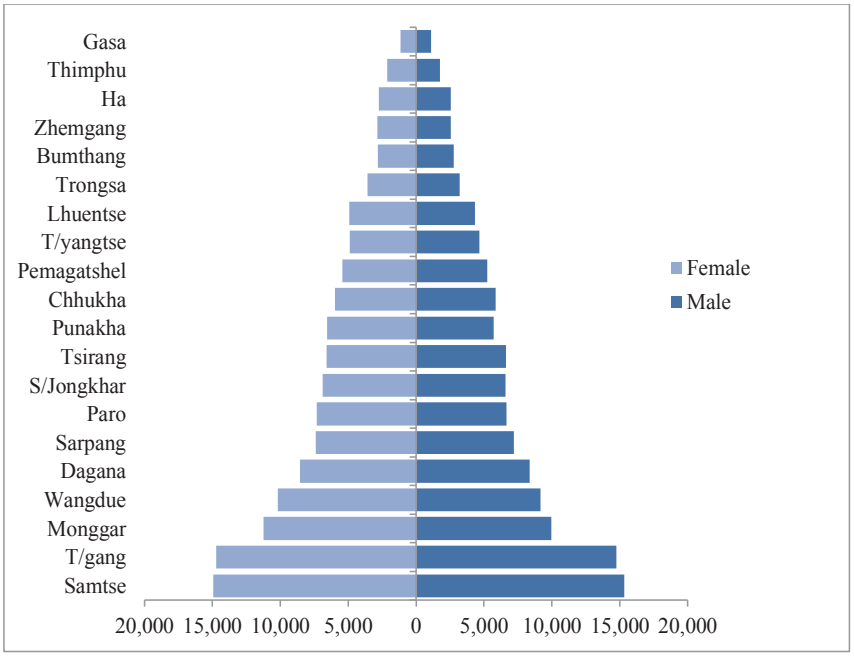


Figure 2: Dzongkhag wise Farming Population Pyramid by sex, 2015.



2. Land Utilization 2015

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 bi annual sample survey 2015 excluding the Gungtongs (empty HHs) and HHs having land but not engage in agriculture activities. The Kamzhing/Dry land left fellow could be much higher than the estimated figure below.

In year 2015 of the total estimated**137,928acres**of operational kamzhing land holdings **53,377acres** 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
Bumthang	1,010	2,878	99	99	3,988
Chhukha	6,362	2,019	418	78	8,459
Dagana	8,552	2,094	371	152	10,797
Gasa	421	7			428
Ha	2,278	879	12	36	3,192
Lhuentse	2,549	2,758	148	84	5,392
Monggar	7,224	6,075	239	142	13,442
Paro	3,575	440	47	51	4,066
Pemagatshel	4,420	8,576	243	77	13,073
Punakha	970	454	20	32	1,456
S/Jongkhar	5,268	5,397	151	150	10,815
Samtse	12,389	3,450	674	389	16,229
Sarpang	5,761	1,485	110	164	7,410
Thimphu	762	177	35	80	1,019
Trashigang	5,372	6,720	211	215	12,307
Trashiyangtse	1,776	1,734	110	166	3,677
Trongsa	1,699	3,609	85	88	5,396
Tsirang	5,736	1,187	149	186	7,109
Wangdue	3,509	992	221	267	4,767
Zhemgang	2,453	2,446	26	8	4,907
BHUTAN	**82,086**	**53,377**	**3,369**	**2,465**	**137,928**

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 gungtong and non agriculture engaged households 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(Acres)
Bumthang	150	
Chhukha	1,900	214
Dagana	3,552	527
Gasa	163	2
Ha	174	39
Lhuentse	1,830	243
Monggar	880	313
Paro	4,100	41
Pemagatshel	300	194
Punakha	6,529	335
Samdrup Jongkhar	2,429	104
Samtse	6,255	829
Sarpang	4,367	686
Thimphu	547	43
Trashigang	3,065	493
Trashiyangtse	2,000	343
Trongsa	1,422	489
Tsirang	3,300	774
Wangdue	4,941	482
Zhemgang	1,421	196
Bhutan	**49,325**	**6,345**

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**	49,325	80,261	1,627
	Maize	56,805	83,714	1,474
	Wheat	4,845	3,730	770
	Barley	2,520	1,800	714
	Buckwheat	5,147	3,234	628
	Millet	3,360	1,811	539
	Cereal Total	**122,002**	**174,550**	
Oil seeds	**Mustard**	2,422	925	382
	Groundnut	177	126	714
	Soya bean	527	220	417
	Sunflower	11	3	231
	Pyrilla/ Naam	68	18	269
	Oil Seeds Total	**3,205**	**1,292**	
Spices	**Cardamom**	10,610	2,091	197
	Ginger	3,674	7,434	2,024
	Spices Total	**14,284**	**9,525**	
Legumes & Pulses	**Rajma Bean**	1,357	847	624
	Mung Bean	921	466	505
	Lentil	353	82	232
	Legumes & Pulses Total	**2,632**	**1,395**	
Roots & Tubers	**Sweet Potato**	70	49	701
	Tapioca	293	437	1,489
	Collocacia	104	112	1,083
	Yam	37	48	1,283
	Roots & Tubers Total	**504**	**646**	

Note:*The Cereal production for 2015 is inclusive of crop damages by wild animals and natural calamities. For kind reference the details on Dzongkhag wise estimates of cereals damaged by wild animals is given on* **"Topic 10 : Crop Damaged by Natural Calamities and Food grain lost to the wild animals during the year 2015"***from page number 29-36.*

Table 3.2: Vegetables and Potato

Crop Name	Cultivated Area(acres)	Quantity Produced (MT)	Yield (Kg/Acre)
Asparagus	420	200	477
Chilli	4,183	7,073	1,691
Cabbage	2,256	5,209	2,309
Cauliflower	1,029	1,586	1,541
Carrot	559	1,094	1,955
Radish	2,812	5,840	2,077
Turnip	1,841	10,423	5,661
Beans	3,011	3,612	1,200
Peas	982	1,218	1,240
Tomato	441	627	1,422
Broccoli	623	831	1,334
Eggplant	459	694	1,510
LadyFinger	63	53	834
Green leaves	2,577	2,871	1,114
Onion Bulb	542	608	1,121
Garlic	1,263	899	712
Tree Tomato		341	
Cultivated Mushroom		19	
Dally Chilli		100	
Cucumber		1,697	
Pumpkin		3,746	
Squash		2,609	
Gourds		341	
Vegetable Total	**23,062**	**52,063**	
Potato	**12,008**	**49,359**	**4,111**

Note: The total vegetable and potato production is also inclusive of vegetable and potato damaged by the wild animals. For kind reference the details on Dzongkhag wise estimates of vegetable and potato damaged by wild animals is given on **"Topic 10 : Crop Damaged by Natural Calamities and Food grain lost to the wild animals during the year 2015"***from page number 29-36.*

4. Fruit Production

Table 4.1: Fruits

Commodities	Total Trees(No's)	Bearing Trees (No's)	Production (MT)	Yield (Kgs/bearing tree)
Apple	240,526	179,474	5,308	30
Mandarin	1,903,935	828,753	15,977	19
Areca nut	1,510,507	772,903	9,406	12
Mango	76,554	20,642	651	32
Pear	36,844	15,857	867	55
Peach	32,760	22,168	783	35
Plum	13,270	8,662	385	44
Walnut	28,662	8,299	211	25
Jackfruit	9,931	6,784	1,227	181
Guava	31,865	23,112	588	25
Papaya first half yearly	8,262	5,417	138	26
Papaya second half yearly	5,488	3,730	76	20
Pomegranate	6,114	3,502	63	18
Litchi	36,182	5,905	160	27
Persimmon	6,122	3,543	137	39
Banana first half yearly	358,926	120,038	1,686	14
Banana second half yearly	243,391	69,331	950	14
Sugarcane			508	
Passion Fruit			66	
Pine Apple			64	
BHUTAN			**39,252**	

5. Crop Utilization for 2015

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 (%)	
								Domestic	Export
Cereals	Barley	106	270	23	40	30	1	94	6
	Bitter Buckwheat	82	132	4	39	28	0.2	96	4
	Finger Millet	26	279	16	31	21	1	94	7
	Foxtail Millet	13	65	16	31	28	0.4	100	0
	Maize	1,119	3,681	1,656	18	17	29	97	3
	Paddy	1,183	667	667	35	30	19	98	2
	Sweet Buckwheat	103	92	24	35	30	1	99	1
	Wheat	193	582	79	34	25	3	98	2
Oil seeds	Mustard	24		64	51	50	2	86	14
	Sunflower	0.6		0.3	36	45	0.01	100	0
	Soya bean	16		38	119	43	3	98	2
	Groundnut	9		47	59	35	3	89	4
	Pyrilla	0.8		3	135	100	0.95	100	0
Pulses	Rajma Bean	53		363	56	50	15	79.9	17
	Mung Bean	20		124	75	85	9	95	3.3
	Lentil	5		11	115	110	1	99	1.1
Spices	Garlic	94		256	89	100	21	98	2
	Onion bulb			73	41	40	3	100	0
	Ginger	1,693		4,351	40	35	139	82	18
	Cardamom			847	1,364	1,400	1,144	70	30
Roots & Tubers	Sweet Potato	1		4	30	30	0.1	100	0
	Tapioca			31	21	20	1	97	3
	Collocacia	3		7	27	20	0.2	78	9
Cucurbits	Cucumber			422	24	20	11	100	0.1
	Pumpkin			182	14	10	2	100	0.3
	Squash			177	12	10	2	99	1
	Gourd			76	33	40	3	99	1

Table 5.2: Utilization of Vegetables and Potato.

Commodities	Quantity Retained for Seed(MT)	Quantity Sold(MT)	Mean Unit Price (Nu/Kg)	Median Unit Price (Nu/Kg)	Amount Earned (Million Nu)	Type of Market (%)	
						Domestic	Export
Asparagus		125	111	88	10	100	0.4
Chilli		2,666	61	50	147	98	2
Cabbage		2,308	21	20	48	98	2
Cauliflower		442	37	35	33	98	2
Carrot		721	35	33	21	93	7
Radish		389	13	10	5	50	0.4
Turnip		92	18	13	2	98	2
Beans		916	38	40	34	99	1
Peas		480	38	40	13	88	12
Tomato		106	36	35	4	97	2
Potato	7,389	29,466	20	20	532	74	26
Eggplant		87	28	28	2.8	87	0.2
Ladyfinger		3	27	25	0.1	80	0
Green leaves		681	21	18	14	100	0.2
Broccoli		248	46	40	12	99	2
Cultivated Mushroom		32	155	125	4	90	0.7
Dolaychilli		19	152	120	2.6	50	0

6. Fruit Utilization for 2015

Table 6.1: Utilization of Fruits

Commodities	Quantity Sold(MT)	Mean Unit Price (Nu/Kg)	Median Unit Price (Nu/Kg)	Amount Earned (Million Nu)	Type of Market (%)	
					Domestic	Export
Apple	4,337	31	28	129	73	27
Mandarin	10,362	25	20	169	74	26
Areca nut	6,430	25	21	150	82	17.9
Banana	551	23	20	11	98	2
Guava	73	28	20	2	100	0
Jackfruit	53	19	15	1	64	26
Litchi	73	34	30	2.5	95	4
Mango	120	47	50	5	94	6
Papaya	18	28	25	0.8	100	0
Passion fruit	9	35	40	0.3	99	0.6
Peach	85	37	30	3.6	100	0
Pear	121	35	30	3.8	98	0.5
Persimmon	52	42	40	2	100	-
Pine Apple	14	29	20	0.4	98	
Plum	51	26	25	1.3	100	0
Pomegranate	4	40	30	0.1	97	3.4
Sugarcane	47	26	20	1	99	1
Tree Tomato	64	42	40	2.4	100	0
Walnut	39	108	80	3	100	0

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	53	47
Chhukha	27	73
Dagana	40	60
Gasa	39	61
Ha	51	49
Lhuentse	57	43
Monggar	41	59
Paro	21	79
Pemagatshel	62	38
Punakha	30	70
S/Jongkhar	19	81
Samtse	27	73
Sarpang	39	61
Thimphu	43	57
T/gang	44	56
T/yangtse	63	37
Trongsa	42	58
Tsirang	33	67
Wangdue	30	70
Zhemgang	52	48
Bhutan	**41**	**59**

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

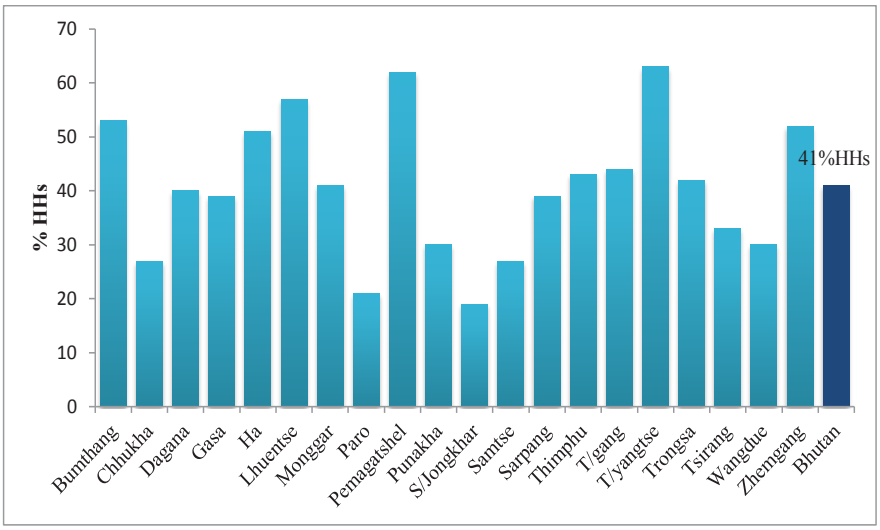


Figure 4: Rural household cash income from forest edible product and other activities in year 2014 (in million Nu.).

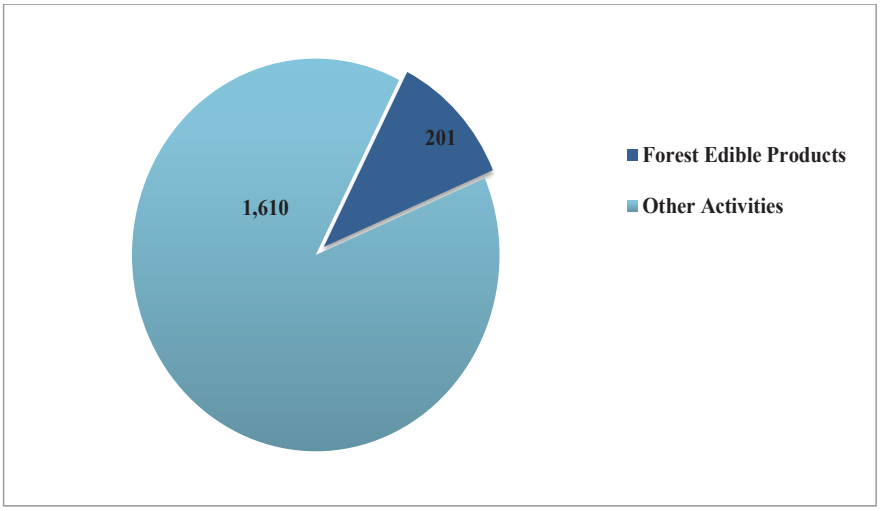


Table 7.2: Cash income from forest edible products and other activities in year 2015

Forest Edible Products	Amount Earned (Million Nu)
Bamboo products(Bamboo shoot)	1.9
Cane Products(Cane shoot/Patsha)	2
Fern(Nakay)	2.6
Damru	0.50
Medicinal Aromatic Plants & herbs	12
Wild Mushrooms (Cane shoot/Patsha)	15
Cordyceps	168
Total Amount Earned	**201**
Other Activities	**Amount Earned (Million Nu)**
Weaving(Weaving and sale of woven products)	102
Pottering(Carrying luggage and other loads)	75
Business/Contact works	1,052
Part time skilled labour(eg. Carpentry,Woodcrafting,traditional painting)	380
Total Amount Earned	**1,610**

Table 7.3: Cash income from processed cereal products

Processed Cereals	Quantity sold(MT)	Mean Unit Price(Nu/kg)	Median Unit Price(Nu/kg)	Amount Earned (Million Nu)	Type of Market	
					Domestic	Export
Rice	1,913	68	60	134	99	0.6
Zaw	188	70	63	14	88	0.9
Tengma	341	107	100	35	88	12
Kharang	19	41	35	0.9	93	6
Roasted Maize	59	38	38	4	100	0
Wheat	16	65	50	0.8	100	0
Buckwheat flour	7	73	75	0.5	100	0
Local Alcoholic Beverage out of cereals	-			15	100	0.2
Maykhuu	114	112	100	10	6	0

8. Food Security 2015

Table 8.1: Proportion of farming households by self sufficiency of food (Agriculture crops) for 2015

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	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Bumthang	53	47	35	38	43	45	41	33	38	38	33	27	28	29
Chhukha	60	40	15	25	28	33	31	18	21	20	16	11	14	12
Dagana	51	49	12	11	18	27	35	34	36	33	30	22	17	14
Gasa	29	71	68	70	72	90	90	87	10	10	10	8	0	0
Ha	70	30	24	27	28	29	29	13	12	10	10	12	14	14
Lhuentse	85	15	4	5	8	10	10	6	12	12	10	8	10	7
Monggar	96	4	1	1	2	3	3	3	4	2	2	1	1	1
Paro	81	19	8	9	13	15	16	8	10	9	8	8	9	9
Pemagatshel	73	27	5	7	9	16	14	12	10	9	5	6	17	6
Punakha	85	15	5	5	9	12	13	13	14	15	16	13	8	5
S/Jongkhar	70	30	6	17	9	16	19	16	7	7	6	5	10	7
Samtse	49	51	25	27	32	40	39	33	28	32	35	34	25	20
Sarpang	46	54	20	23	29	42	50	42	37	42	41	35	30	22
Thimphu	42	58	46	41	54	43	40	29	47	43	45	36	35	31
T/gang	80	20	20	21	11	7	6	5	8	8	7	6	8	10
T/yangtse	70	30	11	17	12	14	16	10	8	15	12	10	15	10
Trongsa	41	59	21	24	27	35	47	43	46	48	43	30	24	18
Tsirang	48	52	25	26	30	37	40	40	42	40	31	29	27	24
Wangdue	74	26	12	13	15	21	25	25	18	20	20	15	11	10
Zhemgang	54	46	29	29	19	27	34	33	15	14	14	23	28	40
Bhutan	**63**	**37**	**15**	**18**	**18**	**23**	**25**	**21**	**19**	**20**	**18**	**16**	**15**	**13**

Figure 5: Estimated proportion of farming households facing food (agriculture crops) shortage in the year 2015

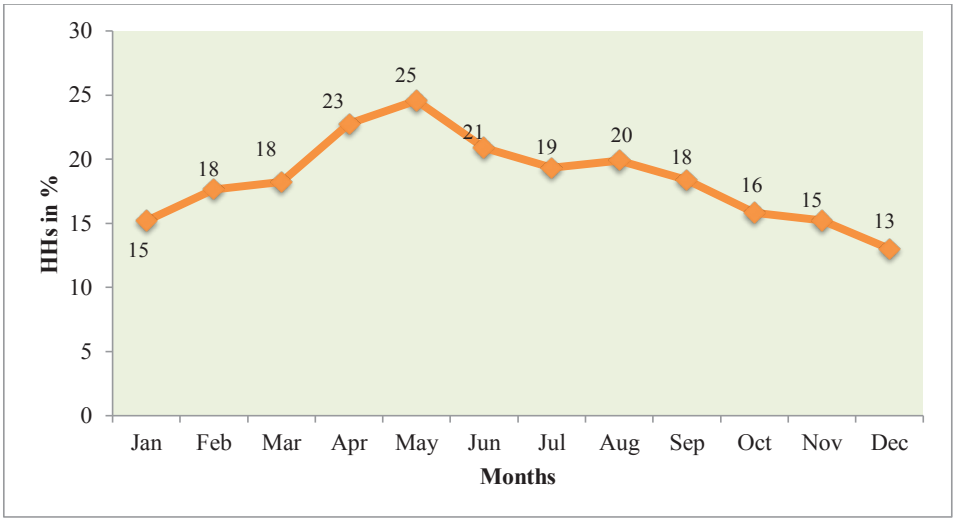
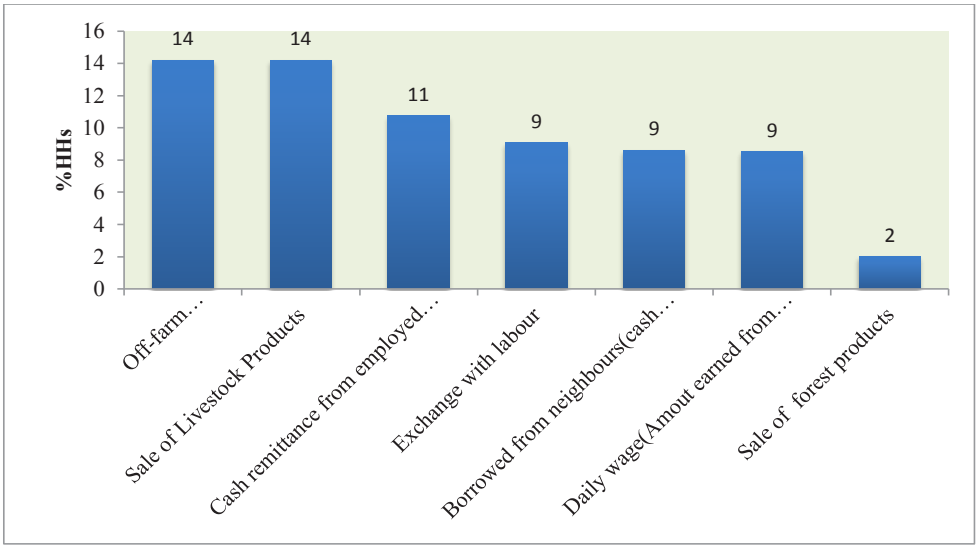


Table 8.2: Food Shortage coping mechanism in 2015

Coping Mechanism used	%HHs
Off-farm activities(weaving, pottering,Business/contact etc.)	**14**
Sale of Livestock Products	**14**
Cash remittance from employed members	**11**
Exchange with labour	**9**
Borrowed from neighbours(cash or agricultural products)	**9**
Daily wage(Amount earned from working in others field)	**9**
Sale of forest products	**2**

Figure 6: Proportion of HHs using various coping mechanisms to address the food (agriculture crops) shortage in the year 2015 for Bhutan.

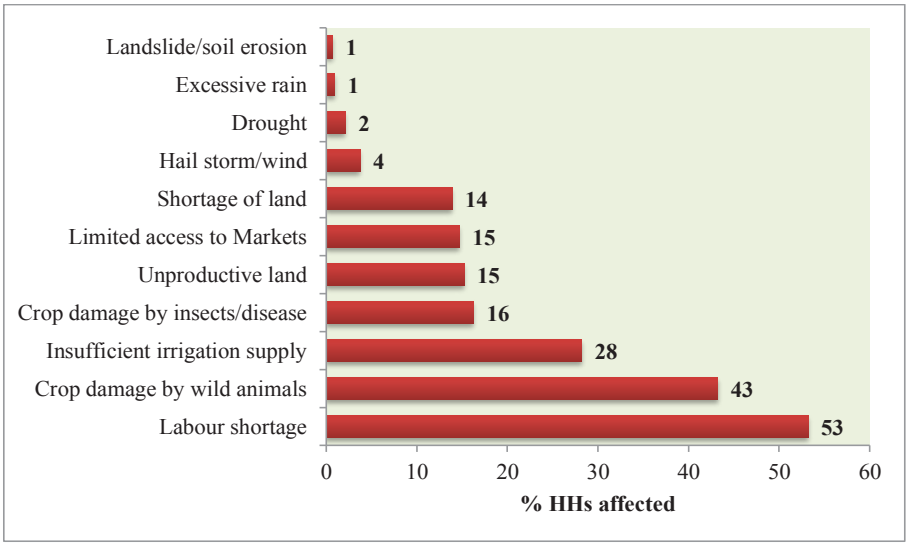


9. Farming Constraints Faced

Table 9: Proportion of HHs affected by the various farming constrains in the year 2015

Farming Constrains	% HHs affected by the various farming constrains
Labour shortage	53
Crop damage by wild animals	43
Insufficient irrigation supply	28
Crop damage by insects/disease	16
Unproductive land	15
Limited access to Markets	15
Shortage of land	14
Hail storm/wind	4
Drought	2
Excessive rain	1
Landslide/soil erosion	1

Figure 7: Percentage of farming HHs affected by the various constrains in the year 2015.



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	1	99
Chhukha	9	91
Dagana	13	87
Gasa	0	100
Ha	14	86
Lhuentse	12	88
Monggar	13	87
Paro	0	100
Pemagatshel	17	83
Punakha	8	92
S/Jongkhar	6	94
Samtse	4	96
Sarpang	1	99
Thimphu	1	99
T/gang	13	87
T/yangtse	20	80
Trongsa	12	88
Tsirang	7	93
Wangdue	10	90
Zhemgang	3	97
Bhutan	**8**	**92**

*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.

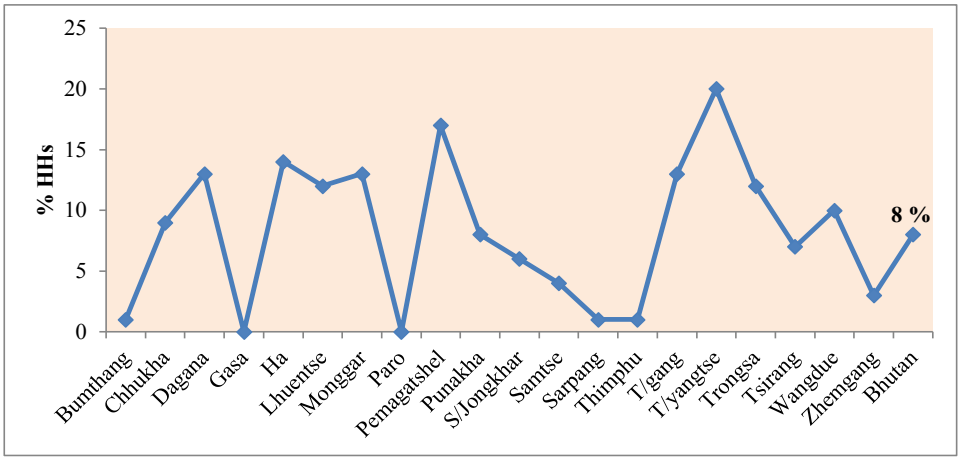


Table 10.2: Estimated Paddy area and quantity lost to the wild animals.

Dzongkhag	Paddy Area lost(Acres)	Quantity lost (MT)
Bumthang	2	2
Chhukha	62	52
Dagana	200	220
Ha	19	17
Lhuentse	105	136
Monggar	28	23
Paro	46	67
Pemagatshel	17	19
Punakha	174	235
Samdrup Jongkhar	104	112
Samtse	170	180
Sarpang	156	208
Thimphu	2	2
T/gang	42	52
T/yangtse	82	99
Trongsa	199	248
Tsirang	187	177
Wangdue	312	408
Zhemgang	68	76
Bhutan	**1,975**	**2,330**

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

Dzongkhag	Area lost(Acres)	Quantity lost(MT)
Chhukha	204	132
Dagana	392	185
Ha	52	31
Lhuentse	237	195
Monggar	479	407
Paro	2	0.5
Pemagatshel	183	145
Punakha	36	25
Samdrup Jongkhar	408	557
Samtse	260	246
Sarpang	542	497
Trashigang	275	316
Trashiyangtse	160	238
Trongsa	222	310
Tsirang	595	364
Wangdue	43	31
Zhemgang	131	72
Bhutan	**4,220**	**3,753**

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

Dzongkhag	Area lost(Acres)	Quantity lost (MT)
Bumthang	14	13
Chhukha	7	5
Dagana	10	5
Gasa	0.5	0.3
Ha	32	17
Lhuentse	2	0.6
Monggar	4	3
Paro	25	17
Pemagatshel	1	2
Punakha	25	16
Samdrup Jongkhar	4	8
Samtse	3	3
Sarpang	3	2
Thimphu	0.2	0.01
Trashigang	3	2
Trongsa	51	34
Tsirang	5	2
Wangdue	95	53
Bhutan	**286**	**182**

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

Dzongkhag	Area lost(Acres)	Quantity lost (MT)
Bumthang	6	5
Chhukha	2	1
Dagana	1	0.2
Ha	7	3
Monggar	7	3
Paro	3	0.35
Pemagatshel	0	0.06
Punakha	3	1
Samdrup Jongkhar	1	1
Trashigang	1	0.2
Trongsa	30	16
Tsirang	0	0.05
Wangdue	13	7
Bhutan	**76**	**39**

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

Dzongkhag	Area lost(Acres)	Quantity lost(MT)
Chhukha	16	9
Dagana	16	7
Ha	13	3
Monggar	5	2
Pemagatshel	2	0.5
Samdrup Jongkhar	3	4
Samtse	20	16
Sarpang	23	13
Trashigang	1	0.2
Trashiyangtse	6	4
Trongsa	0.4	0.2
Tsirang	17	3
Wangdue	0.4	0.4
Bhutan	**121**	**63**

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

Dzongkhag	Area lost(Acres)	Quantity lost (MT)
Bumthang	41	29
Chhukha	13	8
Dagana	12	10
Gasa	-	-
Ha	103	36
Lhuentse	0	-
Monggar	4	3
Paro	0	0.02
Pemagatshel	2	1
Punakha	5	2
Samdrup Jongkhar	16	8
Samtse	3	2
Sarpang	1	0.9
Trashigang	2	0.8
Trashiyangtse	0	0.3
Trongsa	65	35
Tsirang	2	0.3
Wangdue	29	16
Zhemgang	6	0.4
Bhutan	**304**	**153**

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

Dzongkhag	Area lost (Acres)	Quantity lost (MT)
Chhukha	11	12
Dagana	27	11
Ha	8	16
Lhuentse	6	5
Monggar	46	30
Paro	9	23
Pemagatshel	3	1
Punakha	48	20
Samdrup Jongkhar	7	8
Samtse	10	9
Sarpang	3	3
Trashigang	52	19
Trashiyangtse	13	18
Trongsa	55	137
Tsirang	109	39
Wangdue	16	20
Zhemgang	3	0.8
Bhutan	**429**	**373**

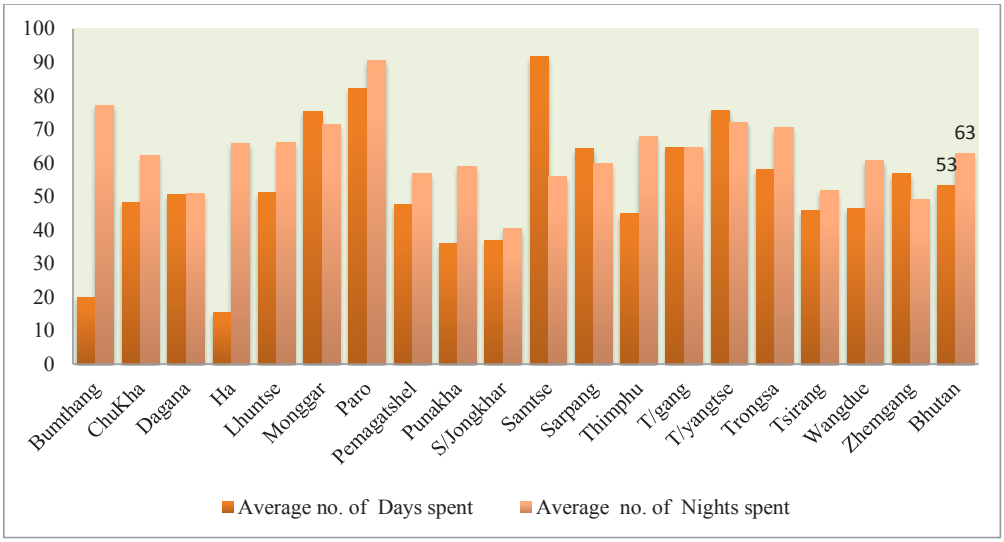
Table 10.9: Estimated Potato area and quantity lost to the wild animals.

Dzongkhag	Area Lost(Acres)	Quantity lost (MT)
Bumthang	7	57
Chhukha	33	86
Dagana	2	0.6
Gasa	0.8	0.2
Ha	53	163
Lhuentse	11	11
Monggar	69	50
Paro	64	198
Pemagatshel	27	28
Punakha	2	0.5
SamdrupJongkhar	13	16
Samtse	0.2	0.4
Sarpang	2	2
Thimphu	1.4	7
Trashigang	69	108
Trashiyangtse	33	72
Trongsa	22	37
Tsirang	9	3
Wangdue	82	245
Zhemgang	0.1	0.1
Bhutan	**502**	**1,083**

11. Dzongkhag wise estimated average number of days and nights spent in guarding crops from wild animal damages in 2015.

Dzongkhag	Average number of Days spent to guard Crop	Average number of Nights spent to guard Crop
Bumthang	20	77
Chhukha	48	62
Dagana	51	51
Ha	15	66
Lhuentse	51	66
Monggar	75	71
Paro	82	90
Pemagatshel	48	57
Punakha	36	59
SamdrupJongkhar	37	40
Samtse	92	56
Sarpang	64	60
Thimphu	45	68
Trashigang	64	65
Trashiyangtse	76	72
Trongsa	58	71
Tsirang	46	52
Wangdue	46	61
Zhemgang	57	49
Bhutan	**53**	**63**

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



12. Road Access in 2015

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

Table 12: 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	0.2	0	0
Chhukha	69	21	7	4
Dagana	67	25	7	2
Gasa	31	0	0	69
Ha	62	5	1	33
Lhuentse	64	21	16	0
Monggar	82	11	6	1
Paro	98	3	0	0
Pemagatshel	90	8	3	1
Punakha	95	5	0	0
Samdrup Jongkhar	66	19	10	6
Samtse	64	22	10	6
Sarpang	75	11	2	13
Thimphu	87	0	0	13
Trashigang	92	4	3	0
Trashiyangtse	83	11	5	1
Trongsa	73	22	4	1
Tsirang	88	11	2	0
Wangdue	84	8	4	4
Zhemgang	74	16	7	5
Bhutan	**79**	**12**	**5**	**4**

PART 2
DZONGKHAG LEVEL STATISTICS

13. Cereal Crops

Table 13.1: Paddy harvested area (Acres), production (MT) and yield (kgs/acre)

Dzongkhag	Harvested Area(Acres)	Production (MT)	Yield (Kgs/acre)
Bumthang	150	227	1,520
Chhukha	1,900	2,545	1,340
Dagana	3,552	5,442	1,532
Gasa	163	200	1,227
Ha	174	237	1,361
Lhuentse	1,830	3,283	1,794
Monggar	880	1,065	1,210
Paro	4,100	8,820	2,151
Pemagatshel	300	367	1,222
Punakha	6,529	11,971	1,833
Samdrup Jongkhar	2,429	3,492	1,438
Samtse	6,255	9,312	1,489
Sarpang	4,367	6,671	1,528
Thimphu	547	1,175	2,148
Trashigang	3,065	4,539	1,481
Trashiyangtse	2,000	2,939	1,469
Trongsa	1,422	2,381	1,674
Tsirang	3,300	4,715	1,429
Wangdue	4,941	9,043	1,830
Zhemgang	1,421	1,838	1,293
Bhutan	**49,325**	**80,261**	**1,627**

Note: *The Dzongkhag wise cereal production for 2015 is inclusive of crop damages by wild animals and natural calamities. For kind reference the details on Dzongkhag wise estimates of cereals damaged by wild animals is given on* **"Topic 10 : Crop Damaged by Natural Calamities and Food grain lost to the wild animals during the year 2015"***from page number 29-36.*

Table 13.2: Maize harvested area (Acres), production (MT) and yield (kgs/acre)

Dzongkhag	Harvested Area(Acres)	Production(MT)	Yield (kg/acre)
Chhukha	2,900	3,516	1,212
Dagana	5,932	6,385	1,076
Ha	223	189	848
Lhuentse	2,193	3,462	1,578
Monggar	9,739	16,509	1,695
Paro	49	34	702
Pemagatshel	4,000	6,745	1,686
Punakha	181	208	1,151
Samdrup Jongkhar	5,000	7,057	1,411
Samtse	5,800	7,206	1,242
Sarpang	3,608	5,297	1,468
Thimphu	4	3	690
Trashigang	6,400	10,439	1,631
Trashiyangtse	1,750	3,213	1,836
Trongsa	691	1,349	1,952
Tsirang	4,468	7,295	1,633
Wangdue	215	279	1,300
Zhemgang	3,652	4,528	1,240
Bhutan	**56,805**	**83,714**	**1,474**

Table 13.3: Wheat harvested area (Acres), production (MT) and yield (kgs/acre)

Dzongkhag	Harvested Area (acres)	Production (MT)	Yield (kg/acre)
Bumthang	372	332	894
Chhukha	270	254	941
Dagana	101	50	498
Gasa	48	41	862
Ha	485	357	736
Lhuentse	49	32	662
Monggar	214	145	679
Paro	650	527	811
Pemagatshel	22	18	808
Punakha	644	450	698
SamdrupJongkhar	41	43	1055
Samtse	116	76	657
Sarpang	14	10	705
Thimphu	140	111	790
Trashigang	124	107	868
Trashiyangtse	22	18	820
Trongsa	303	235	775
Tsirang	104	65	621
Wangdue	1,037	784	756
Zhemgang	88	73	828
Bhutan	**4,845**	**3,730**	**770**

Table 13.4: Barley harvested area (Acres), production (MT) and yield (kgs/acre)

Dzongkhag	Harvested Area(Acres)	Production (MT)	Yield (kg/acre)
Bumthang	273	233	852
Chhukha	81	42	515
Dagana	23	11	475
Gasa	181	187	1030
Ha	61	34	566
Lhuentse	2	2	1018
Monggar	734	512	698
Paro	64	30	458
Pemagatshel	26	10	383
Punakha	16	8	502
Samdrup Jongkhar	64	37	572
Samtse	2	1	533
Sarpang	4	2	538
Thimphu	8	5	655
Trashigang	185	157	849
Trashiyangtse	4	2	609
Trongsa	257	149	580
Tsirang	15	5	351
Wangdue	163	76	464
Zhemgang	357	297	834
Bhutan	**2,520**	**1,800**	**714**

Table 13.5: Buckwheat harvested area (Acres), production (MT) and yield (kgs/acre)

Dzongkhag	Harvested Area(Acres)	Production (MT)	Yield (kgs/acre)
Bumthang	871	696	799
Chhukha	522	340	652
Dagana	291	138	476
Ha	746	484	648
Lhuentse	38	20	520
Monggar	298	210	705
Paro	75	54	720
Pemagatshel	98	56	567
Punakha	111	62	564
SamdrupJongkhar	353	225	637
Samtse	153	88	573
Sarpang	63	19	296
Trashigang	334	201	601
Trashiyangtse	23	15	670
Trongsa	409	232	568
Tsirang	140	50	357
Wangdue	464	246	530
Zhemgang	159	99	620
Bhutan	**5,147**	**3,234**	**628**

Table 13.6: Millet harvested area (Acres), production (MT) and yield (kgs /acre)

Dzongkhag	Harvested Area (Acres)	Production (MT)	Yield(kg/acre)
Bumthang	3	1	420
Chhukha	427	199	465
Dagana	332	137	414
Ha	70	41	590
Lhuentse	43	27	638
Monggar	39	31	792
Paro	8	4	483
Pemagatshel	250	168	673
Samdrup Jongkhar	179	103	575
Samtse	529	306	579
Sarpang	640	360	562
Thimphu	1	0.2	227
Trashigang	52	27	517
Trashiyangtse	203	169	832
Trongsa	18	6	357
Tsirang	366	124	339
Wangdue	30	17	578
Zhemgang	172	90	524
Bhutan	**3,360**	**1,811**	**539**

14. Vegetable Crops

Table 14.1: Potato harvested area (Acres), production (MT) and yield (kgs/acre).

Dzongkhag	Harvested Area(Acres)	Production (MT)	Yield (Kg/acre)
Bumthang	629	4,364	6,935
Chhukha	920	6,927	7,529
Dagana	156	180	1,154
Gasa	80	277	3,454
Ha	488	2,365	4,846
Lhuentse	413	1,089	2,638
Monggar	1,903	4,920	2,585
Paro	799	3,875	4,850
Pemagatshel	509	1,378	2,706
Punakha	37	91	2,428
Samdrup Jongkhar	674	1,288	1,910
Samtse	110	211	1,918
Sarpang	130	164	1,264
Thimphu	320	2,079	6,496
Trashigang	1,588	5,561	3,503
Trashiyangtse	502	2,115	4,216
Trongsa	118	340	2,893
Tsirang	320	259	810
Wangdue	2,232	11,766	5,272
Zhemgang	80	109	1,371
Bhutan	**12,008**	**49,359**	**4,111**

Note: *The Dzongkhag wise Potato production for 2015 is inclusive of crop damages by wild animals and natural calamities. For kind reference the details on Dzongkhag wise estimates of potato damaged by wild animals is given on* **"Topic 10 : Crop Damaged by Natural Calamities and Food grain lost to the wild animals during the year 2015"***from page number 29-36.*

Table 14.2: Asparagus harvested area (Acres), production (MT) and yield (kgs/acre)

Dzongkhag	Harvested Area (Acres)	Production (MT)	Yield (kgs/acre)
Bumthang	2	2	1,381
Chhukha	3	2	671
Dagana	17	5	274
Gasa	0.41	0	410
Ha	6	2	317
Lhuentse	4	1	215
Monggar	16	10	631
Paro	82	56	683
Pemagatshel	23	4	150
Punakha	10	7	733
Samdrup Jongkhar	4	2	540
Samtse	3	2	650
Sarpang	0.80	0.4	515
Thimphu	19	21	1,075
Trashigang	130	35	271
Trashi yangtse	22	6	264
Trongsa	13	3	253
Tsirang	8	2	250
Wangdue	10	9	898
Zhemgang	47	31	667
Bhutan	**420**	**200**	**477**

Table 14.3: Chilli harvested area (Acres), production (MT) and yield (kgs/acre)

Dzongkhag	Harvested Areas (Acres)	Production (MT)	Yield (kgs/acre)
Bumthang	61	147	2,427
Chhukha	179	429	2,396
Dagana	224	142	635
Gasa	21	34	1,611
Ha	25	31	1,248
Lhuentse	291	534	1,833
Monggar	500	650	1,299
Paro	570	1,349	2,366
Pemagatshel	166	137	829
Punakha	278	599	2,157
Samdrup Jongkhar	165	186	1,129
Samtse	77	73	953
Sarpang	70	46	664
Thimphu	82	336	4,079
Trashigang	463	666	1,439
Trashi yangtse	280	407	1,457
Trongsa	114	235	2,069
Tsirang	228	160	700
Wangdue	325	851	2,619
Zhemgang	65	58	897
Bhutan	**4,183**	**7,073**	**1,691**

Table 14.4: Cabbage harvested area (Acres), production (MT) and yield (kgs/acre)

Dzongkhag	Harvested Area (Acres)	Production (MT)	Yield (kgs/acre)
Bumthang	35	138	3,922
Chhukha	74	189	2,565
Dagana	120	157	1,306
Gasa	12	25	2,107
Ha	44	112	2,574
Lhuentse	175	263	1,500
Monggar	300	360	1,199
Paro	267	1,136	4,248
Pemagatshel	102	108	1,065
Punakha	66	96	1,458
Samdrup Jongkhar	119	216	1,811
Samtse	73	134	1,843
Sarpang	68	93	1,360
Thimphu	68	355	5,225
Trashigang	267	545	2,040
Trashiyangtse	95	229	2,419
Trongsa	99	287	2,900
Tsirang	192	538	2,805
Wangdue	58	203	3,493
Zhemgang	22	24	1,087
Bhutan	**2,256**	**5,209**	**2,309**

Table 14.5: Cauliflower harvested area (Acres), production (MT) and yield (kgs/acre)

Dzongkhag	Harvested Area (Acres)	Production (MT)	Yield (kgs/acre)
Bumthang	16	54	3,377
Chhukha	23	42	1,809
Dagana	24	21	900
Gasa	3	4	1,587
Ha	11	23	2,030
Lhuentse	115	183	1,600
Monggar	117	154	1,307
Paro	16	30	1,824
Pemagatshel	69	90	1,297
Punakha	15	21	1,385
Samdrup Jongkhar	44	46	1,058
Samtse	41	62	1,507
Sarpang	48	40	835
Thimphu	68	252	3,713
Trashigang	149	198	1,329
Trashi yangtse	51	84	1,629
Trongsa	49	39	802
Tsirang	97	116	1,200
Wangdue	16	54	3,288
Zhemgang	56	72	1,287
Bhutan	**1,029**	**1,586**	**1,541**

Table 14.6: Carrot harvested area (Acres), production (MT) and yield (kgs/acre)

Dzongkhag	Harvested Area (Acres)	Production (MT)	Yield (kgs/acre)
Bumthang	9	30	3,226
Chhukha	92	345	3,753
Dagana	9	4	418
Gasa	2	4	1,784
Ha	16	24	1,527
Lhuentse	11	18	1,548
Monggar	65	61	935
Paro	75	185	2,466
Pemagatshel	12	10	864
Punakha	11	11	998
Samdrup Jongkhar	17	35	2,029
Samtse	6	8	1,364
Sarpang	13	8	643
Thimphu	32	129	3,959
Trashigang	54	67	1,235
Trashiyangtse	14	14	1,019
Trongsa	36	37	1,011
Tsirang	28	13	450
Wangdue	37	69	1,841
Zhemgang	19	24	1,247
Bhutan	**559**	**1,094**	**1,955**

Table 14.7: Radish harvested area (Acres), production (MT) and yield (kgs/acre)

Dzongkhag	Harvested Area (Acres)	Production (MT)	Yield (kgs/acre)
Bumthang	30	155	5,227
Chhukha	123	448	3,632
Dagana	137	279	2,033
Gasa	14	26	1,840
Ha	33	65	1,943
Lhuentse	139	189	1,362
Monggar	363	473	1,304
Paro	89	211	2,365
Pemagatshel	213	304	1,429
Punakha	112	212	1,893
Samdrup Jongkhar	210	456	2,168
Samtse	187	273	1,457
Sarpang	86	100	1,157
Thimphu	54	245	4,499
Trashigang	309	578	1,867
Trashiyangtse	73	201	2,750
Trongsa	106	195	1,844
Tsirang	253	406	1,600
Wangdue	218	944	4,337
Zhemgang	60	80	1,333
Bhutan	**2,812**	**5,840**	**2,077**

Table 14.8: Turnip harvested area (Acres), production (MT) and yield (kgs/acre)

Dzongkhag	Harvested Area (Acres)	Production (MT)	Yield (kgs/acre)
Bumthang	99	738	7,441
Chhukha	45	211	4,725
Dagana	10	19	1,875
Gasa	10	17	1,708
Ha	342	2,142	6,261
Lhuentse	6	9	1,353
Monggar	3	3	804
Paro	85	315	3,690
Pemagatshel	25	21	809
Punakha	32	78	2,414
S/Jongkhar	3	3	1,086
Samtse	2	4	1,554
Sarpang	2	1	371
Thimphu	57	311	5,480
T/gang	10	40	3,838
T/yangtse	1	2	1,782
Trongsa	23	56	2,412
Tsirang	5	3	747
Wangdue	1,073	6,446	6,006
Zhemgang	5	5	1,023
Bhutan	**1,841**	**10,423**	**5,661**

Table 14.9: Beans harvested area (Acres), production (MT) and yield (kgs/acre)

Dzongkhag	Harvested Area(Acres)	Production(MT)	Yield (kgs/acre)
Bumthang	9	20	2,293
Chhukha	163	248	1,519
Dagana	265	111	417
Gasa	6	11	1,720
Ha	20	28	1,409
Lhuentse	156	164	1,051
Monggar	324	284	875
Paro	151	316	2,095
Pemagatshel	129	83	639
Punakha	185	375	2,027
Samdrup Jongkhar	245	288	1,178
Samtse	293	327	1,116
Sarpang	101	91	900
Thimphu	35	66	1,883
Trashigang	251	270	1,077
Trashi yangtse	51	66	1,294
Trongsa	60	66	1,109
Tsirang	427	640	1,498
Wangdue	88	96	1,094
Zhemgang	52	64	1,215
Bhutan	**3,011**	**3,612**	**1,200**

Table 14.10: Peas harvested area (Acres), production (MT) and yield (kgs/acre)

Dzongkhag	Harvested Area (Acres)	Production (MT)	Yield (kgs/acre)
Bumthang	7	15	2,313
Chhukha	83	186	2,237
Dagana	19	12	608
Gasa	2	2	1,406
Ha	64	84	1,321
Lhuentse	38	45	1,200
Monggar	51	69	1,359
Paro	169	186	1,099
Pemagatshel	189	252	1,333
Punakha	48	48	997
SamdrupJongkhar	38	51	1,360
Samtse	11	14	1,279
Sarpang	14	10	731
Thimphu	34	50	1,496
Trashigang	37	38	1,018
Trashiyangtse	10	9	935
Trongsa	9	8	904
Tsirang	62	35	562
Wangdue	48	27	573
Zhemgang	51	75	1,467
Bhutan	**982**	**1,218**	**1,240**

Table 14.11: Tomato harvested area (Acres), production (MT) and yield (kgs/acre)

Dzongkhag	Harvested Area (Acres)	Production(MT)	Yield (kgs/acre)
Bumthang	8	20	2,529
Chhukha	30	50	1,679
Dagana	10	14	1,500
Gasa	1	1	1,200
Ha	3	8	2,595
Lhuentse	24	35	1,423
Monggar	18	21	1,168
Paro	36	66	1,841
Pemagatshel	11	16	1,519
Punakha	25	46	1,828
Samdrup Jongkhar	45	39	863
Samtse	40	58	1,461
Sarpang	31	31	1,001
Thimphu	13	27	2,100
Trashigang	28	26	955
Trashi yangtse	18	26	1,465
Trongsa	4	5	1,134
Tsirang	52	33	625
Wangdue	21	77	3,631
Zhemgang	23	26	1,137
Bhutan	**441**	**627**	**1,422**

Table 14.12: Broccoli harvested area (Acres), production (MT) and yield (kgs/acre)

Dzongkhag	Harvested Area(Acres)	Production(MT)	Yield (Kg/acre)
Bumthang	13	37	2,955
Chhukha	23	31	1,354
Dagana	26	19	716
Gasa	5	7	1,323
Ha	8	9	1,180
Lhuentse	29	28	987
Monggar	74	96	1,301
Paro	32	42	1,312
Pemagatshel	11	9	856
Punakha	23	29	1,299
Samdrup Jongkhar	34	55	1,603
Samtse	23	28	1,206
Sarpang	43	30	695
Thimphu	60	231	3,858
Trashi gang	53	63	1,176
Trashi yangtse	28	33	1,190
Trongsa	37	19	522
Tsirang	75	36	480
Wangdue	23	24	1,046
Zhemgang	3	3	900
Bhutan	**623**	**831**	**1,334**

Table 14.13: Onion bulb harvested area (Acres), production (MT) and yield (kgs/acre)

Dzongkhag	Harvested Area(Acres)	Production (MT)	Yield(kgs/acre)
Chhukha	25	22	870
Dagana	26	22	830
Ha	0.5	0.4	898
Lhuentse	15	16	1,091
Monggar	22	17	759
Paro	1.0	0.4	433
Pemagatshel	6	11	1,702
Punakha	19	24	1,224
Samdrup Jongkhar	60	44	727
Samtse	7	8	1,154
Sarpang	16	17	1,063
Thimphu	11	22	1,965
Trashi gang	250	292	1,170
Trashi yangtse	15	20	1,342
Trongsa	7	8	1,080
Tsirang	51	82	1,595
Wangdue	10	4	421
Zhemgang	1.2	1	649
Bhutan	**542**	**608**	**1,121**

Table 14.14: Garlic harvested area (Acres), production (MT) and yield (kgs/acre)

Dzongkhag	Harvested Area(Acres)	Production (MT)	Yield (kg/acre)
Bumthang	8	9	1,051
Chhukha	24	21	875
Dagana	72	21	289
Gasa	12	13	1,142
Ha	23	15	663
Lhuentse	111	108	974
Monggar	221	110	496
Paro	7	3	493
Pemagatshel	103	37	361
Punakha	74	54	731
SamdrupJongkhar	63	34	541
Samtse	12	9	782
Sarpang	20	18	907
Thimphu	6	12	1,935
Trashi gang	241	226	935
Trashi yangtse	77	74	961
Trongsa	38	41	1,100
Tsirang	68	21	312
Wangdue	54	54	994
Zhemgang	30	19	650
Bhutan	**1,263**	**899**	**712**

Table 14.15: Egg plant harvested area (Acres), production (MT) and yield (kgs/acre)

Dzongkhag	Harvested Area(Acres)	Production (MT)	Yield (kgs/acre)
Chhukha	14	28	1,974
Dagana	18	20	1,126
Gasa	0.3	0.7	2,057
Ha	2	3	1,224
Lhuentse	35	43	1,207
Monggar	15	28	1,892
Paro	74	169	2,300
Pemagatshel	20	28	1,357
Punakha	20	32	1,575
Samdrup Jongkhar	28	21	736
Samtse	24	27	1,117
Sarpang	15	13	859
Thimphu	2	5	2,365
Trashigang	71	114	1,620
Trashi yangtse	19	37	1,887
Trongsa	18	22	1,194
Tsirang	24	14	598
Wangdue	33	67	2,022
Zhemgang	27	24	901
Bhutan	**459**	**694**	**1,510**

Table 14.16: Ladyfinger harvested area (Acres), production (MT) and yield (kgs/acre)

Dzongkhag	Harvested Area(Acres)	Produced(MT)	Yield (Kg/acre)
Bumthang	0.2	0.2	933
Chhukha	3.1	5	1,571
Dagana	2.1	1	521
Ha	0.3	0.3	1,005
Lhuentse	2.3	2	660
Monggar	1.9	1	599
Paro	0.4	0.1	344
Pemagatshel	2.6	3	1,063
Punakha	1.7	2	978
Samdrup Jongkhar	5.5	3	547
Samtse	3.5	4	1,165
Sarpang	7.4	4	580
Trashi gang	13.9	10	703
Trashi yangtse	0.7	0.8	1,093
Trongsa	0.6	0.6	1,071
Tsirang	5.4	3	489
Wangdue	0.02	0.0	1,500
Zhemgang	11.5	14	1,197
Bhutan	**63**	**53**	**834**

Table 14.17: Green leavesharvested area (Acres), production (MT) and yield (kgs/acre)

Dzongkhag	Harvested Area(Acres)	Production (MT)	Yield(kgs /acre)
Bumthang	36	71	1,964
Chhukha	134	307	2,296
Dagana	167	183	1,094
Gasa	12	16	1,337
Ha	32	40	1,252
Lhuentse	121	120	992
Monggar	202	142	703
Paro	77	117	1,530
Pemagatshel	144	93	645
Punakha	134	151	1,126
Samdrup Jongkhar	139	145	1,043
Samtse	300	446	1,487
Sarpang	112	106	952
Thimphu	45	93	2,081
Trashi gang	300	260	869
Trashi yangtse	74	99	1,338
Trongsa	67	72	1,067
Tsirang	310	198	637
Wangdue	132	176	1,340
Zhemgang	39	35	893
Bhutan	**2,577**	**2,871**	**1,114**

Table 14.18: Tree tomatoproduction (MT)

Dzongkhag	Production (MT)
Chhukha	14
Dagana	10
Gasa	15
Ha	5
Lhuentse	34
Monggar	56
Pemagatshel	9
Punakha	64
Samdrup Jongkhar	16
Samtse	5
Sarpang	16
Trashi gang	31
Trashi yangtse	19
Trongsa	8
Tsirang	24
Wangdue	14
Zhemgang	2
Bhutan	**341**

Table 14.19: Dally Chilliproduction (MT)

Dzongkhag	Production (MT)
Chhukha	7
Dagana	8
Ha	3
Lhuentse	0.38
Monggar	13
Pemagatshel	0.95
Punakha	0.40
Samdrup Jongkhar	8
Samtse	29
Sarpang	7
Trashi gang	3
Trashi yangtse	2
Trongsa	0.49
Tsirang	16
Wangdue	1
Zhemgang	0.85
Bhutan	**100**

Table 14.20: Cucurbits production (MT)

Dzongkhag	Cucumber Produced(MT)	Pumpkin Produced(MT)	Squash Produced(MT)	Gourds Produced(MT)
Bumthang	0.3	3	0	0
Chhukha	135	297	369	40
Dagana	106	440	197	10
Gasa	0.03	0	4	0
Ha	12	22	35	7
Lhuentse	62	114	63	4
Monggar	159	352	81	1
Paro	32	58	0	0
Pemagatshel	94	258	81	3
Punakha	309	133	197	83
S/Jongkhar	165	336	193	34
Samtse	77	404	498	51
Sarpang	38	93	47	12
Thimphu	4	6	0	0
Trashigang	187	366	243	35
Trashiyangtse	95	384	59	11
Trongsa	20	38	32	3
Tsirang	95	303	465	41
Wangdue	86	96	40	5
Zhemgang	20	43	4	1
Bhutan	**1,697**	**3,746**	**2,609**	**341**

15. Spices

Table 15.1: Ginger harvested area (Acres), production (MT) and yield (kgs/acre)

Dzongkhag	Harvested Area (Acres)	Production (MT)	Yield (kgs/acre)
Chhukha	707	1,499	2,122
Dagana	119	115	965
Ha	3	3	832
Lhuentse	3	3	1,109
Monggar	75	61	817
Pemagatshel	170	155	912
Punakha	5	3	631
Samdrup Jongkhar	754	1,799	2,386
Samtse	975	2,258	2,315
Sarpang	396	656	1,656
Trashigang	29	27	917
Trashiyangtse	11	18	1,575
Trongsa	17	23	1,380
Tsirang	282	662	2,352
Wangdue	45	61	1,350
Zhemgang	82	91	1,106
Bhutan	**3,674**	**7,434**	**2,024**

Table 15.2: Cardamom harvested area (Acres), production (MT) and yield (kgs/acre)

Dzongkhag	Harvested Area(Acres)	Production (MT)	Yield (kg/acre)
Chhukha	2,051	396	193
Dagana	875	131	150
Ha	880	156	177
Monggar	13	0.4	29
Pemagatshel	97	0.5	5
Samdrup Jongkhar	58	8	134
Samtse	4,868	1,180	242
Sarpang	1,015	169	167
Trashigang	4	0.5	140
Trongsa	186	12	63
Tsirang	487	33	67
Zhemgang	75	5	66
Bhutan	**10,610**	**2,091**	**197**

16. Oil Seeds

Table 16.1: Ground nut harvested area (acres), production (MT) and yield (kgs/acre)

Dzongkhag	Harvested Area(Acres)	Production(MT)	Yield (kgs/acre)
Chhukha	.121	0.03	233
Dagana	.565	0.07	118
Monggar	5	2	475
Pemagatshel	26	14	550
Punakha	1	1	1240
SamdrupJongkhar	6	8	1298
Samtse	0.1	0.04	280
Trashigang	70	45	652
Trashi yangtse	60	50	839
Trongsa	1	0.07	100
Tsirang	8	5	578
Bhutan	**177**	**126**	**714**

Table 16.2: Sunflower harvested area (acres), production (MT) and yield (kgs/acre)

Dzongkhag	Harvested Area(Acres)	Production(MT)	Yield (kgs/acre)
Bumthang	2.3	0.76	330
Chhukha	.1	0.0	124
Dagana	.1	0.0	345
Ha	1	0.3	275
Monggar	1	0.1	162
Pemagatshel	2	0.1	45
Samdrup Jongkhar	0.4	0.1	249
Sarpang	1	0.3	257
Trashigang	2	0.7	314
Bhutan	**11**	**3**	**231**

Table 16.3: Mustard harvested area (acres), production (MT) and yield (kgs/acre)

Dzongkhag	Harvested Area(Acres)	Production (MT)	Yield (kgs/acre)
Bumthang	40	13	322
Chhukha	509	238	468
Dagana	213	69	323
Gasa	11	4	394
Ha	59	20	334
Lhuentse	27	12	439
Monggar	157	51	327
Paro	153	49	322
Pemagatshel	30	9	294
Punakha	111	28	256
Samdrup Jongkhar	200	92	462
Samtse	186	83	445
Sarpang	126	44	350
Thimphu	14	9	619
Trashigang	202	92	456
Trashiyangtse	31	4	121
Trongsa	69	16	233
Tsirang	119	38	320
Wangdue	125	35	279
Zhemgang	40	18	447
Bhutan	**2,422**	**925**	**382**

Table 16.4: Soya bean harvested area (acres), production (MT) and yield (kgs/acre)

Dzongkhag	Harvested Area(Acres)	Production (MT)	Yield (kgs/acre)
Chhukha	2	0.7	321
Dagana	5	1	196
Ha	14	6	453
Lhuentse	2	1	617
Monggar	158	76	477
Pemagatshel	40	25	620
Punakha	2	1	604
Samdrup Jongkhar	16	10	592
Samtse	35	13	388
Sarpang	2	0.5	203
Trashigang	90	47	524
Trashiyangtse	127	26	207
Trongsa	2	0.4	193
Tsirang	24	6	261
Wangdue	0.3	0.1	417
Zhemgang	8	6	743
Bhutan	**527**	**220**	**417**

Table 16.5: Pyrilla(Naam)harvested area (acres), production (MT) and yield (kgs/acre)

Dzongkhag	Harvested Area(Acres)	Production (MT)	Yield (kgs/acre)
Chhukha	2	0.8	340
Dagana	0.5	0.2	300
Ha	16	3	168
Monggar	2	0.6	320
Pemagatshel	19	6	311
Punakha	3	0.8	266
Samdrup Jongkhar	8	4	450
Samtse	0.4	0.1	214
Sarpang	4	0.7	200
Trashigang	3	0.8	319
Trashiyangtse	0.9	0.3	350
Trongsa	4	0.2	65
Tsirang	2	0.6	284
Wangdue	0.6	0.2	290
Zhemgang	3	0.6	197
Bhutan	**68**	**18**	**269**

17. Legumes and Pulses

Table 17.1: Rajma bean harvested area (acres), production (MT) and yield (kgs/acre)

Dzongkhag	Harvested Area(Acres)	Production(MT)	Yield (kgs/acre)
Chhukha	44	16	377
Dagana	244	82	337
Lhuentse	15	3	183
Monggar	590	429	727
Paro	2	3	1,396
Pemagatshel	67	76	1,126
Samdrup Jongkhar	82	40	493
Samtse	11	9	748
Sarpang	5	3	603
Trashigang	120	90	746
Trashiyangtse	2	0.5	325
Tsirang	111	46	418
Wangdue	5	3	591
Zhemgang	60	47	779
Bhutan	**1,357**	**847**	**624**

Table 17.2: Mung bean harvested area (acres), production (MT) and yield (kgs/acre)

Dzongkhag	Harvested Area(Acres)	Production(MT)	Yield (kgs/acre)
Chhukha	4	2	457
Dagana	180	129	717
Lhuentse	7	0.5	79
Monggar	172	112	647
Pemagatshel	19	11	591
SamdrupJongkhar	66	21	317
Samtse	130	35	270
Sarpang	135	41	304
Trashigang	25	15	592
Trashiyangtse	39	4	104
Tsirang	84	59	702
Zhemgang	60	37	614
Bhutan	**921**	**466**	**505**

Table 17.3: Lentilharvested area (acres), production (MT) and yield (kgs/acre)

Dzongkhag	Harvested Area(Acres)	Production(MT)	Yield (kgs/acre)
Chhukha	12	2	137
Dagana	8	2	242
Lhuentse	2	0.5	337
Pemagatshel	7	2	258
SamdrupJongkhar	73	23	321
Samtse	122	33	271
Sarpang	39	9	219
Trashigang	69	5	78
Tsirang	23	6	256
Bhutan	**353**	**82**	**232**

18. Roots and Tubers

Table 18.1: Sweet Potato harvested area (acres), production (MT) and yield (kgs/acre)

Dzongkhag	Harvested area(Acres)	Production(MT)	Yield (kgs/acre)
Chhukha	4	3	683
Dagana	9	6	668
Ha	2	0.7	336
Lhuentse	0.3	0.4	1,500
Monggar	3	1	512
Pemagatshel	4	6	1,500
Punakha	1	1	1,057
Samdrup Jongkhar	9	9	939
Samtse	9	6	641
Sarpang	3	2	773
Trashigang	6	4	754
Trashi yangtse	6	2	292
Trongsa	1	0.5	500
Tsirang	12	5	435
Zhemgang	2	3	1,315
Bhutan	**70**	**49**	**701**

Table 18.2: Tapioca harvested area (acres), production (MT) and yield (kgs/acre)

Dzongkhag	Harvested Area(Acres)	Production(MT)	Yield (kgs/acre)
Chhukha	31	37	1,201
Dagana	21	21	1,005
Monggar	2	2	911
Pemagatshel	23	35	1,526
Punakha	0.10	0.2	2,000
Samdrup Jongkhar	32	52	1,608
Samtse	93	204	2,192
Sarpang	26	32	1,236
Trashigang	7	7	1,000
Trashiyangtse	0.8	2	3,124
Tsirang	51	36	700
Zhemgang	7	9	1,323
Bhutan	**293**	**437**	**1,489**

Table 18.3: Collocacia harvested area (acres), production (MT) and yield (kgs/acre)

Dzongkhag	Harvested Area(Acres)	Production (MT)	Yield (kgs/acre)
Chhukha	15	14	978
Dagana	5	6	1,355
Ha	3	5	1,983
Monggar	12	6	473
Pemagatshel	5	6	1,240
Samdrup Jongkhar	11	5	416
Samtse	29	38	1,299
Sarpang	8	7	866
Trashigang	0.04	0.04	1,000
Trashiyangtse	3	4	1,133
Tsirang	11	11	1,000
Zhemgang	2	11	4,324
Bhutan	**104**	**112**	**1,083**

Table 18.4: Yamharvested area (acres), production (MT) and yield (kgs/acre)

Dzongkhag	Harvested Area(Acres)	Production(MT)	Yield(kgs/acre)
Chhukha	3	4	1,390
Dagana	2	2	960
Ha	0.1	0.3	2,400
Monggar	3	8	2,638
Pemagatshel	3	5	1,461
Samdrup Jongkhar	8	8	1,000
Samtse	6	7	1,204
Sarpang	2	3	1,076
Trashigang	0.5	0.7	1,500
Tsirang	9	11	1,167
Bhutan	**37**	**48**	**1,283**

Horticulture Fruit Crop Production in 2015

19. Major Fruit Crops

Table 19.1: Apple production and yield in 2015

Dzongkhag	Total Trees	Bearing Trees	Production(MT)	Yield (kgs/bearing tree)
Bumthang	7,573	5,097	111	22
Chhukha	1,846	1,520	41	27
Dagana	219	107	1	13
Ha	19,826	14,941	310	21
Lhuentse	1,831	435	10	23
Monggar	2,888	763	16	21
Paro	134,774	105,427	3,213	30
Pemagatshel	391	81	0.9	11
Punakha	98	44	0.9	21
Thimphu	57,608	48,131	1,543	32
Trashigang	2,758	1,089	34	31
Trashiyangtse	9,007	466	4	9
Trongsa	192	97	0.4	5
Tsirang	107	17	0.05	3
Wangdue	1,408	1,260	22	17
Bhutan	**240,526**	**179,474**	**5,308**	**30**

Table 19.2: Mandarin production and yield in 2015

Dzongkhag	Total Trees	Bearing Trees	Quantity produced (MT)	Yield (kgs/bearing tree)
Chhukha	167,191	73,737	1,380	19
Dagana	250,285	111,012	2,886	26
Lhuentse	26,706	5,700	245	43
Monggar	193,284	48,310	2,271	47
Pemagatshel	208,733	70,932	572	8
Punakha	23,498	14,300	215	15
S/Jongkhar	250,932	150,718	452	3
Samtse	82,185	58,250	816	14
Sarpang	219,300	141,939	3,042	21
T/gang	84,000	15,320	460	30
T/yangtse	31,750	9,274	139	15
Trongsa	14,750	5,377	167	31
Tsirang	160,200	85,688	2,560	30
Wangdue	10,134	4,642	103	22
Zhemgang	180,988	33,554	671	20
Bhutan	**1,903,935**	**828,753**	**15,977**	**19**

Table 19.3: Areca nut production and yield in 2015

Dzongkhag	Total Trees	Bearing Trees	Production(MT)	Yield (kgs/bearing tree)
Chhukha	65,988	55,933	959	17
Dagana	119,605	61,567	554	9
Monggar	2,621	932	13	14
Pemagatshel	11,673	3,666	25	7
S/Jongkhar	94,366	59,069	915	15
Samtse	567,087	296,630	3,100	10
Sarpang	646,003	293,723	3,818	13
Zhemgang	3,163	1,383	20	15
Bhutan	**1,510,507**	**772,903**	**9,406**	**12**

20. Other Fruit Crops

Table 20.1: Mango production and yield in 2015

Dzongkhag	Total Trees	Bearing Trees	Production (MT)	Yield (kgs/bearing trees)
Chhukha	5,957	3,466	87	25
Dagana	9,565	1,195	37	31
Lhuentse	115	35	1	34
Monggar	7,434	3,207	103	32
Pemagatshel	21,911	1,502	39	26
Punakha	2,432	1,164	39	34
Samdrup Jongkhar	8,042	2,387	86	36
Samtse	4,033	2,384	93	39
Sarpang	5,254	2,295	92	40
Trashigang	1,340	676	17	26
Trashiyangtse	2,138	204	4	18
Trongsa	457	191	4	19
Tsirang	3,645	978	29	30
Wangdue	651	234	5	20
Zhemgang	3,580	722	16	22
Bhutan	**76,554**	**20,642**	**651**	**32**

Table 20.2:Pear production and yield in 2015

Dzongkhag	Total Trees	Bearing Trees	Production(MT)	Yield (kgs/bearing trees)
Bumthang	426	339	12	35
Chhukha	942	578	37	65
Dagana	1,140	884	68	77
Gasa	92	71	8	111
Ha	106	69	2	23
Lhuentse	2,119	872	26	30
Monggar	6,560	2,242	81	36
Paro	2,381	449	14	31
Pemagatshel	1,291	307	13	42
Punakha	2,623	1,917	100	52
Samdrup Jongkhar	1,380	506	25	50
Samtse	880	592	31	52
Sarpang	997	455	24	53
Thimphu	230	202	8	40
Trashigang	7,711	3,078	181	59
Trashiyangtse	3,808	863	11	13
Trongsa	969	392	8	22
Tsirang	1,254	944	168	178
Wangdue	1,643	1,042	49	47
Zhemgang	293	57	1	25
Bhutan	**36,844**	**15,857**	**867**	**55**

Table 20.3:Peach production and yield in 2015

Dzongkhag	Total Trees	Bearing Tree	Production (MT)	Yield (Kgs/ bearing tree)
Bumthang	473	335	10	30
Chhukha	854	672	32	47
Dagana	1,336	950	32	34
Ha	194	153	5	31
Lhuentse	2,705	1,787	43	24
Monggar	4,999	2,561	84	33
Paro	2,372	1,882	69	37
Pemagatshel	2,070	1,296	41	32
Punakha	2,072	1,559	48	31
Samdrup Jongkhar	2,010	1,590	84	53
Samtse	1,020	885	33	37
Sarpang	454	232	5	21
Thimphu	494	409	14	35
Trashigang	4,395	2,765	145	53
Trashi yangtse	3,083	2,374	52	22
Trongsa	846	570	10	18
Tsirang	1,150	769	35	45
Wangdue	1,423	1,004	30	30
Zhemgang	810	376	11	30
Bhutan	**32,760**	**22,168**	**783**	**35**

Table 20.4:Plumproduction and yield in 2015

Dzongkhag	Total Trees	Bearing Trees	Production (MT)	Yield (kgs / bearing tree)
Bumthang	399	335	10	30
Chhukha	151	129	8	60
Dagana	794	582	28	48
Ha	27	20	0.7	35
Lhuentse	1,015	613	22	36
Monggar	2,596	1,561	70	45
Paro	291	230	7	31
Pemagatshel	542	439	21	48
Punakha	668	575	21	37
Samdrup Jongkhar	704	525	22	43
Samtse	574	394	13	33
Sarpang	125	98	5	53
Thimphu	312	272	11	39
Trashigang	2,423	1,172	67	57
Trashi yangtse	1,051	665	18	28
Trongsa	271	149	3	22
Tsirang	827	742	51	69
Wangdue	213	135	5	39
Zhemgang	286	26	0.9	36
Bhutan	**13,270**	**8,662**	**385**	**44**

Table 20.5:Walnut production and yield in 2015

Dzongkhag	Total Trees	Bearing Tree	Production(MT)	Yield (kgs/bearing tree)
Bumthang	1,141	527	4	8
Chhukha	634	146	7	50
Dagana	642	133	5	36
Ha	210	94	1.0	10
Lhuentse	857	177	7	40
Monggar	4,555	648	16	25
Paro	2,174	1,079	40	37
Pemagatshel	1,844	321	10	32
Punakha	2,429	855	15	17
Samdrup Jongkhar	915	150	5	31
Samtse	100	5	0.08	15
Sarpang	84	18	0.18	10
Thimphu	702	502	7	14
Trashigang	5,058	1,905	62	32
Trashi yangtse	2,994	790	11	14
Trongsa	546	144	2	15
Tsirang	656	76	2	23
Wangdue	1,650	505	12	23
Zhemgang	1,472	225	6	26
Bhutan	**28,662**	**8,299**	**211**	**25**

Table 20.6: Jack Fruit production and yield in 2015

Dzongkhag	Total Trees	Bearing Trees	Production(MT)	Yield (Kgs/bearing tree)
Chhukha	204	91	10	108
Dagana	679	180	32	180
Monggar	222	86	9	105
Pemagatshel	1,475	677	85	125
Punakha	68	20	1	53
Samdrup Jongkhar	2,159	1,748	315	180
Samtse	2,687	2,253	464	206
Sarpang	1,600	1,300	273	210
Trashi gang	12	4	0	10
Trashi yangtse	24	10	1	84
Trongsa	59		-	
Tsirang	329	132	17	128
Zhemgang	412	283	21	73
Bhutan	**9,931**	**6,784**	**1,227**	**181**

Table 20.7: Guava production and yield in 2015

Dzongkhag	Total Trees	Bearing Trees	Production (MT)	Yield (kgs/bearing tree)
Chhukha	652	468	14	30
Dagana	3,095	1,867	30	16
Lhuentse	426	348	11	31
Monggar	2,465	1,602	48	30
Paro	23	10	0.3	29
Pemagatshel	2,643	1,406	39	28
Punakha	6,476	5,745	132	23
Samdrup Jongkhar	2,440	1,764	62	35
Samtse	1,726	1,284	44	34
Sarpang	2,370	1,513	25	16
Trashigang	1,546	943	29	31
Trashiyangtse	1,097	861	20	24
Trongsa	1,148	998	30	30
Tsirang	3,767	2,929	75	26
Wangdue	1,335	1,028	19	19
Zhemgang	656	345	9	25
Bhutan	**31,865**	**23,112**	**588**	**25**

Table 20.8: Papaya production and yield in 2015

Table20.8.1: Papaya production and yield in first half yearly (1st January to June 2015).

Dzongkhag	Total Trees	Bearing Trees	Production(MT)	Yield(Kgs/Bearing tree)
Chhukha	63	52	1	20
Dagana	750	450	11	25
Monggar	467	355	5	13
Pemagatshel	310	59	2	27
Punakha	67	45	0.8	18
Samdrup Jongkhar	1,356	603	12	20
Samtse	566	409	12	29
Sarpang	2,193	1,703	51	30
Trashigang	83	20	0.2	11
Trashiyangtse	341	311	5	16
Trongsa	120	90	3	29
Tsirang	1,747	1,202	35	29
Wangdue	74	46	0.5	11
Zhemgang	126	72	1	14
Bhutan	**8,262**	**5,417**	**138**	**26**

Table20.8.2: Papaya production and yield in second half yearly (1st July to December 2015).

Dzongkhag	Total Trees	Bearing Trees	Production(MT)	Yield (Kgs/ bearing tree)
Chhukha	23	20	0.3	16
Dagana	573	314	4	14
Lhuentse	4	4	0.1	15
Monggar	305	228	3	11
Pemagatshel	162	62	2	38
Punakha	110	77	2	22
Samdrup Jongkhar	1,056	691	12	17
Samtse	153	102	2	17
Sarpang	1,066	802	11	13
Trashigang	255	173	4	26
Trashiyangtse	367	319	8	26
Trongsa	38	26	0.8	29
Tsirang	1,324	873	26	29
Wangdue	20	8	0.6	76
Zhemgang	34	29	0.5	16
Bhutan	**5,488**	**3,730**	**76**	**20**

Table20.9: Pomegranate production and yield in 2015.

Dzongkhag	Total Trees	Bearing Tree	Production (MT)	Yield (Kgs/bearing tree)
Chhukha	25	25	0.2	6
Dagana	710	401	5	12
Lhuentse	161	121	3	23
Monggar	723	356	7	20
Paro	93	49	1	25
Pemagatshel	472	21	0.34	16
Punakha	508	293	6	20
SamdrupJongkhar	148	101	1	13
Samtse	144	27	0.58	22
Sarpang	124	68	0.92	14
Trashigang	461	295	6	20
Trashiyangtse	607	459	7	14
Trongsa	528	277	4	15
Tsirang	833	575	12	21
Wangdue	532	416	9	22
Zhemgang	43	17	0.16	10
Bhutan	**6,114**	**3,502**	**63**	**18**

Table20.10: Litchi production and yield in 2015

Dzongkhag	Total Trees	Bearing Trees	Production(MT)	Yield (kgs/bearing tree)
Chhukha	463	119	5	42
Dagana	1,968	278	8	28
Monggar	156	30	0.5	16
Pemagatshel	12,173	157	3	20
Punakha	13	4	0.04	10
SamdrupJongkhar	2,523	643	22	34
Samtse	1,851	970	36	37
Sarpang	15,860	3,604	84	23
Trongsa	19	7	0.1	14
Tsirang	494	59	1	18
Zhemgang	663	32	0.6	18
Bhutan	**36,182**	**5,905**	**160**	**27**

Table20.11:Persimmonproduction and yield in 2015

Dzongkhag	Total Trees	Bearing Trees	Production(MT)	Yield (Kgs/bearing tree)
Chhukha	7	7	0.3	40
Dagana	86	70	4	58
Ha	9	9	0.1	13
Lhuentse	84	8	0.3	34
Monggar	978	483	19	40
Paro	431	319	15	48
Pemagatshel	78	21	0.3	15
Punakha	1,182	1,009	41	41
Samtse	56	56	4	72
Sarpang	26	17	0.1	4
Thimphu	44	33	0.98	30
Trashigang	529	209	4	17
Trashiyangtse	999	237	2	10
Trongsa	377	64	1	21
Tsirang	245	145	1	10
Wangdue	989	854	42	50
Zhemgang	3	3	0.04	15
Bhutan	**6,122**	**3,543**	**137**	**39**

Table20.12:Banana production and yield in 2015

Table20.12.1: Banana production and yield in first half yearly (1st January to June 2015).

Dzongkhag	Total Trees	Bearing Trees	Production (MT)	Yield (Kgs/ bearing tree)
Chhukha	17,717	7,020	100	14
Dagana	36,142	16,399	225	14
Ha	1,431	355	4	13
Lhuentse	1,338	328	3	11
Monggar	25,023	3,767	56	15
Pemagatshel	32,743	5,622	83	15
Punakha	3,724	1,149	21	19
SamdrupJongkhar	46,001	12,206	160	13
Samtse	42,780	16,040	250	16
Sarpang	43,505	19,048	253	13
Trashigang	10,503	3,631	62	17
Trashiyangtse	8,870	1,259	18	14
Trongsa	5,649	2,196	36	16
Tsirang	71,799	25,668	344	13
Wangdue	3,258	1,885	25	13
Zhemgang	8,443	3,466	43	12
Bhutan	**358,926**	**120,038**	**1,686**	**14**

Table20.12.2: Banana production and yield in second half yearly (1st July to December 2015).

Dzongkhag	Total Trees	Bearing Trees	Production(MT)	Yield (Kgs/bearing tree)
Chhukha	4,617	1,557	23	15
Dagana	16,160	4,717	55	12
Ha	496	147	2	13
Lhuentse	1,401	386	4	9
Monggar	20,570	4,601	74	16
Pemagatshel	25,396	3,799	76	20
Punakha	2,045	1,105	24	21
Samdrup Jongkhar	28,156	3,300	47	14
Samtse	16,702	6,452	103	16
Sarpang	27,737	10,646	143	13
Trashigang	18,920	5,463	65	12
Trashiyangtse	9,706	1,895	31	16
Trongsa	4,555	1,843	31	17
Tsirang	58,096	19,392	215	11
Wangdue	2,671	1,658	27	16
Zhemgang	6,165	2,372	31	13
Bhutan	**243,391**	**69,331**	**950**	**14**

Table 20.13: Other Fruit production and yield in 2015

Dzongkhag	Sugarcane Production(MT)	Pine Apple Production(MT)	Passion fruits Production(MT)
Chhukha	28	2	8
Dagana	43	7	3
Ha	5		0.7
Lhuentse	2		3
Monggar	9	4	5
Pemagatshel	131	4	5
Punakha	37	0.6	10
Samdrup Jongkhar	60	19	5
Samtse	37	9	4
Sarpang	25	14	9
Trashigang	16	1	5
Trashi yangtse	26	0.17	2
Trongsa	10	0.03	1
Tsirang	66	2	5
Wangdue	9	0.01	
Zhemgang	4	1	1
Bhutan	**508**	**64**	**66**

Annex

Land conversion cases from 1998 to 2015

a. Recommended cases

sl no	Dzongkhag	Recommended Cases																		
		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
1	Chhukha	0	0	0	0	0	0	0	1	2	0	0	0	1	0	0	1	0	2	**7**
2	Dagana	0	0	0	0	0	0	0	0	6	0	6	2	4	6	5	1	14	3	**47**
3	Gasa	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	**3**
4	Lhuentse	0	0	0	0	1	0	0	0	0	1	0	1	0	1	5	1	0	0	**10**
5	Mongar	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	4	2	0	**8**
6	Pemagatshel	0	0	0	0	1	0	0	5	0	0	0	0	0	0	0	0	0	0	**6**
7	Paro	0	2	2	9	17	13	10	7	17	11	16	13	9	14	4	1	1	0	**146**
8	Punakha	1	4	1	5	11	2	0	1	10	9	6	27	3	17	14	8	0	26	**145**
9	Samtse	0	0	0	1	0	0	0	0	6	4	2	4	0	4	2	4	3	12	**42**
10	SamdrupJongkhar	0	0	0	0	0	0	0	0	0	0	0	0	4	0	2	1	0	0	**7**
11	Sarpang	0	1	5	5	2	1	0	0	0	3	12	8	3	8	10	3	2	0	**63**
12	Thimphu	10	1	0	1	5	6	1	0	17	25	17	26	11	2	13	11	2	0	**148**
13	Trashigang	1	0	0	0	0	3	0	11	0	1	0	17	8	0	3	3	0	0	**47**
14	Trashiyangtse	1	0	0	0	3	1	0	2	0	0	5	0	6	1	2	5	0	0	**26**
15	Tsirang	1	0	0	0	0	1	0	0	9	16	4	1	0	4	4	4	0	1	**45**
16	Trongsa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	7	6	**15**
17	Wangdue	1	0	1	1	5	2	0	4	5	6	3	4	4	12	4	4	0	11	**67**

b. Not Recommended cases

Sl.no	Dzongkhag	Not Recommended Area (acres)																		
		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
1	Chhukha	0	0	0	0	0	0	0	0	0	3	0	0	1	1	1	3	0	0	**9**
2	Dagana	0	0	0	0	0	0	0	0	1	0	7	0	11	5	14	0	54	0	**92**
3	Gasa	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	**10**
4	Lhuentse	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	**2**
5	Mongar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0	**6**
6	Pemagatshel	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	**2**
7	Paro	1	2	1	4	6	17	15	5	24	12	42	17	12	10	3	3	0	0	**174**
8	Punakha	7	0	1	0	0	4	4	5	15	32	11	17	17	27	24	24	0	20	**208**
9	Samtse	0	0	0	0	0	0	0	0	0	1	12	8	6	1	19	7	0	0	**54**
10	SamdrupJongkhar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	**1**
11	Sarpang	0	2	2	0	0	8	0	0	0	0	18	27	50	14	5	6	0	0	**132**
12	Thimphu	8	1	0	0	0	8	13	0	18	30	19	26	26	0	45	14	0	0	**208**
13	Trashigang	0	0	0	0	0	0	0	11	0	0	0	0	3	0	0	0	0	0	**14**
14	Trashiyangtse	0	0	0	0	0	1	0	0	0	0	4	0	1	0	0	0	0	0	**6**
15	Tsirang	0	0	0	0	0	0	0	0	17	24	6	3	3	29	7	25	0	0	**114**
16	Trongsa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
17	Wangdue	0	0	0	0	0	0	0	15	0	4	3	6	6	6	24	2	0	3	**69**
	Total Cases																			**1101**