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DEPARTMENT OF AGRICULTURE
MINISTRY OF AGRICULTURE
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Contact Address.
Information Management Section
Department of Agriculture
Ministry of Agriculture
Ph. # 322228/331316
Fax. # 323562
E-mail : imsdoa@moa.gov.bt
:d_wangchuk@moa.gov.bt

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དཔལ་ལྡན་འབྲུག་གཞུང་
སོ་ནམ་སྨན་ཁག།
བཀྲ་ཤིས་ཆོ་ས་རྫོང་།
ཐིམ་ཕུ།

DEPARTMENT OF AGRICULTURE
Royal Government of Bhutan
Ministry of Agriculture
Tashichhodzong: Thimphu

"Walking the Extra Mile"

Foreword

The responsibility of collecting and maintaining of Agriculture statistics was handed over to us by PPD from 2004. The Agriculture Statistics 2004 is the first publication by the Department of Agriculture in continuation to the RNR Statistics published earlier. This publication presents comprehensive data on land use and crop production for the 20 Dzongkhags based on Agriculture Census 2004. The data are presented in two nominal volumes. Volume-I contains brief descriptions of the objective, census design, methodology, coverage and the data at Dzongkhag level. Volume-II an annex to Volume I and presents data by geogs.

The agriculture Census 2004 was carried out entirely by our Geog Agriculture Extension Agent using a set of questionnaires designed by the department of agriculture in consultation with the Dzongkhags.

The Department of Agriculture commends the inputs provided by the Dzongkhag administration and support from the rural communities. Further, the Department appreciates the contribution of field staff on data collection.

I hope that the data will provide information not only for the purpose of planning and policy but also on the performance of agriculture programmes. Feedback from readers and users of this dataset is requested for further improvement on the process, methods and data.

Lastly, I congratulate my colleagues in Department of Agriculture for successfully bringing out this publication. Their sincere committement and hard work have been crucial in bringing out this important publication. Such efforts will go a long way in improving the information for agriculture development.

Thimphu, 13th Janaury 2006

Sherub Gyaltshen
DIRECTOR

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1.1 Introduction

The Policy and Planning Division of the Ministry of Agriculture handed over the responsibility of data collection to the line departments of the Ministry in 2004. Since then, the Department of Agriculture has taken full initiative to institutionalize the information management at various levels; Geog, Dzongkhag and Department. Dzongkhag Agricultural Data Processors have been appointed in the Dzongkhags. They are the focal person for any agricultural related information. At the Geog level, the Geog Agriculture Extension Agents are made responsible for collection, updation, and documentation of any agricultural related information. Information Management Section was set up in the department to manage the information at the department level. The department in consultation with Dzongkhags developed guidelines on data collection. This was followed by briefing of all the field staffs in the dzongkhags on the guidelines and the importance of agriculture data and its management. The agriculture census was then conducted by involving the Geog Agriculture Extension Agents as enumerators. Further, to strengthen the information management, all the Data Processors of 20 Dzongkhags were trained on the basic computer operation and database designing. The Department has emphasized data documentation at geog and Dzongkhag.

1.2 Objectives

The overall objective of the annual agricultural census is to establish a reliable database on crop production and land use for planning and monitoring of agriculture development programmes. The immediate objective is to generate data needed for preparation of the 10FYP and to assess the achievements of the current plan. Further, the result from this census is also to provide a basis to improve upon the sample frame for preparation of annual agriculture survey.

1.3 Methodology

A set of questionnaire was developed by the department in consultation with field staffs of Dzongkhags and other departments. The questionnaire was designed to gather the data on production of major crops and land use status. It was designed to collect the data seasonally i.e the enumeration has to commence soon after the harvest of crops since most of the farmers do not maintain agriculture records. However, due to various reasons the questionaaire briefing could not be done on time and the data collection was done in the winter season of the year 2004. Before the fieldwork, the extension agents were briefed on the methods and usage of field questionnaire.

The census was a complete enumeration with no stratifications adopted. Households served as the ultimate unit from whom data were collected by administering a set of structured questionnaire.

1.3.1 Processing, Validation and Analysis of Data

Since the responsibility of information management was devolved to the field staffs, the enumeration and validation of data at Geog and Dzongkhag level was done by the Geog Agriculture Extension Agents and Dzongkhag Agriculture Officer respectively. The

Extension Agents enumerated each and every rural household. The data was then validated and sent to Dzongkhag. The Agriculture Data Processor in the Dzongkhag compiled the data gathered from Geogs. The validation and analysis at the Dzongkhag level was done by the Dzongkhag Agriculture Officer and the information was submitted to information management section of the Department. The Information Management Section revalidated the information gathered from Dzongkhags and Geogs. The revalidation was done by organizing meeting with the Dzongkhag Agriculture Officers. It was further compiled and analysed to get the country level data. The analysed data was then presented to the representatives from divisions and departments for comments and endorsement.

1.3.2 Data limitations

The Agriculture Statistics 2004 presents agricultural data (crop production, land use, etc.) related to the rural farming households for the year 2004. This is the first publication by the department. There may be weaknesses on the process and the data itself.

Despite efforts to cover all households, the actual coverage accomplished was only 87 percent. There were absentee households on seasonal migration, away on pilgrimage, hot spring and businesses, etc.

Even though Extension Agents were trained on the methodology of data collection and punching, one cannot completely avoide the human error.

The primary sources of data are farmers who are not educated and do not maintain farm records. Although the census was designed to collect the data every after each crop harvest, actual implementation in the field did not happen as envisaged due to various reasons. Therefore data precision mainly depends on their memory recalls.

2 1.4 Results of the Survey.

3 Table: 1.4.1 Dzongkhag wise Agricultural area registered under different Land use (Acres), 2004

Dzongkhag	Wet Land	Dry Land	Fallow	Tseri	Orchard	Kitchen Garden
Bumthang	-	4,680	9,336	1,154	134	220
Gasa	283	430	171	2	-	27
Ha	111	2,190	362	1,065	67	113
Lhuentse	3,190	7,625	770	887	2	307
Mongar	2,003	24,366	1,175	640	17	61
Paro	3,954	6,744	593	733	679	535
Pemagatshel	146	15,528	2,022	229	22	65
Punakha	6,656	884	923	143	64	373
Sarpang	6,504	14,928	130	3,025	2,432	59
Thimphu	2,737	7,671	943	155	681	260
Trashigang	4,745	36,721	2,637	736	45	215
Trongsa	2,572	3,261	1,242	1,910	36	138
Wangdue	6,792	3,518	1,167	393	51	465
Yangtse	3,516	10,533	3,231	65	4	15
Chhukha	2,706	11,654	75	23,008	-	256
Dagana*	3,190	13,248	31	3,196	-	84
SamdrupJongkhar*	1,721	21,499	1,256	29,561	-	7
Samtse*	9,604	15,257	141	13,997	-	2
Tsirang*	6,388	24,262	231	3,260	-	1
Zhemgang*	2,596	9,044	247	16,549	-	131
Total	**69,414**	**234,043**	**26,683**	**100,708**	**4,234**	**3,334**

Source: Department of Survey and Land Records, MoA, Thimphu 2005
*1. * As per the Thram records for 6 Dzongkhgas and rest cadastral survey data, source: DSLR, 2004*
2. Note: The area under cadestral survey pertains to the registered area and may not conform to the ground area as it has not been updated for those land Owners who have not paid up for the excess land.
3. The dry land also covers orchard land.
4. - : The information not available.

Area and Production of Cereal Crops

Cereal crops mainly comprised of paddy, maize, wheat, barley, millet, buckwheat and oats. On an average 127,125 acres are under cereal crop cultivation. The total cereal production was 156,304 MT in the year 2004. Paddy and maize cultivation continues to be important. This was clearly indicated by the statistic of 36.34 percent and 42.43 percent of the actual harvested area under paddy and maize cultivation respectively. Although there was reduction in the harvested area, the total cereal production is reported to be good. The total harvested area has reduced compared to the previous years, as a result of loss to urban expansion, industries and government infrastructure developments on wet lands. Priority has been accorded to increase the levels of food self sufficiency and food security by transferring new technology and introducing paddy cultivation in the high land regions. The statistics published in this publication reflect only harvested areas and it was collected by our field staff stationed at the geogs.

Paddy is cultivated on area of 46,585 acres and continues to be the preferred staple food in Bhutan. The area under paddy cultivation has decreased due to lose of Wet Land to urban expansion, industries and government infrastructure developments. However yields per unit area have increasd. In year 2004, paddy production was 54,325 MT an increased about 8,500 MT from 2003 production.

Maize is a dryland crop cultivated in almost all the dzongkhags. An area of 53,938 acres of land is under maize cultivation producing 90,566 MT of maize grain. Mostly grown in the six eastern Dzongkhags where maize predominates and is also the staple food of the people. The overall maize yields have increased from 1005 kg per acre in 2000 (RNR Census) to 1679 kg per acre in 2004. This was mainly due to introduction of improved varieties and use of fertiizers.

Wheat and barley are generally grown on dry lands but they are also cultivated as second crop to paddy in the irrigated lands. While significant part of the wheat crop is generally cut as green fodder for cattle, the remaining is harvested to supplement food consumption.

Buckwheat, millet, and oats are minor cereals thinly spread out across the country. These cereals are cultivated on 16,231 acres of land.

4 Legumes and Oil Seeds

Oil seeds like mustards and grain legumes like Mung beans, beans, are grown on small quantities to meet the home consumption and for sale in the local markets. An Area of 4,503 acres of Mustard was cultivated with total production of 1,767 MT in 2004.

Table: **1.4.2 . Harvested Area under cereal crops (Acres) in 2004**

Dzongkhag	Paddy	Maize	Wheat	Barley	Millet	Buckwheat	Oats
Bumthang	7	-	564	526	-	649	6
Chhukha	1,279	1,294	639	-	-	-	-
Dagana	3,406	6,286	207	102	1,003	845	1
Gasa	130	-	111	178	-	47	-
Ha	169	112	597	141	38	329	-
Lhuentse	1,282	2,309	91	7	101	4	-
Mongar	1,317	6,116	20	276	28	174	-
Paro	2,990	12	988	164	22	107	32
Pemagatshel	110	1,391	6	41	68	55	-
Punakha	4,401	147	591	49	2	123	20
S/Jongkhar	1,832	5,132	108	122	677	979	136
Samtse	8,220	9,137	627	69	2,678	603	-
Sarpang	7,636	4,945	58	4	1,556	344	2,189
Thimphu	1,523	18	496	24	-	4	2
Trashi Yangtse	939	1,211	14	26	88	88	150
Trashigang	2,553	8,247	44	92	68	573	5
Trongsa	1,620	901	552	463	38	605	9
Tsirang	2,951	4,103	87	18	510	154	58
Wangdue	3,129	111	1,513	366	56	340	12
Zhemgang	1,092	2,467	272	119	393	265	-
Total	**46,585**	**53,938**	**7,583**	**2,789**	**7,325**	**6,288**	**2,618**

5 Table 1.4.3 Cereal Crops Production (Metric Tonnes) in 2004

Dzongkhag	Paddy	Maize	Wheat	Barley	Millet	Buck Wheat	Oats
Bumthang	11		514	431	-	502	3
Chhukha	1,507	2,163	323	-	-	-	-
Dagana	2,967	10,771	118	35	398	235	-
Gasa	117	-	54	125	-	20	-
Ha	138	181	337	55	14	110	-
Lhuentse	1,405	4,936	80	5	77	3	-
Mongar	1,500	12,967	7	95	5	45	-
Paro	4,876	4	557	99	21	47	25
Pemagatshel	140	1,309	5	25	50	25	-
Punakha	6,906	296	226	23	0	59	7
S/Jongkhar	1,385	8,326	31	47	236	277	55
Samtse	6,640	12,203	258	25	603	143	-
Sarpang	9,762	8,237	31	1	615	114	709
Thimphu	1,965	17	529	23	0	3	2
Trashi Yangtse	1,257	2,633	8	15	47	20	96
Trashigang	3,913	14,765	24	32	21	273	1
Trongsa	1,487	1,377	239	188	20	209	3
Tsirang	2,511	5,492	20	3	118	33	15
Wangdue	4,883	214	736	152	25	265	6
Zhemgang	956	4,677	95	44	117	127	-
Total	**54,325**	**90,566**	**4,191**	**1,421**	**2,369**	**2,510**	**922**

Table 1.4.4 Paddy Area (Acre) and Production (Metric tonnes) in 2004

Dzongkhag	Havested Area	Total production	Yield(kg/Acre)
Bumthang	7	11	1,681
Chhukha	1,279	1,507	1,178
Dagana	3,406	2,967	871
Gasa	130	117	900
Ha	169	138	813
Lhuentse	1,282	1,405	1,096
Mongar	1,317	1,500	1,138
Paro	2,990	4,876	1,631
Pemagatshel	110	140	1,279
Punakha	4,401	6,906	1,569
S/Jongkhar	1,832	1,385	756
Samtse	8,220	6,640	808
Sarpang	7,636	9,762	1,278
Thimphu	1,523	1,965	1,290
Trashi Yangtse	939	1,257	1,339
Trashigang	2,553	3,913	1,533
Trongsa	1,620	1,487	918
Tsirang	2,951	2,511	851
Wangdue	3,129	4,883	1,561
Zhemgang	1,092	956	875
Total	**46,585**	**54,325**	**1,166**

Table 1.4.5 Maize Area (Acre) and Production (Metric tonnes) in 2004

Dzongkhag	Havested Area	Total production	Yield(kg/Acre)
Chhukha	1,294	2,163	1,672
Dagana	6,286	10,771	1,713
Ha	112	181	1,623
Lhuentse	2,309	4,936	2,138
Mongar	6,116	12,967	2,120
Paro	12	4	357
Pemagatshel	1,391	1,309	941
Punakha	147	296	2,009
S/Jongkhar	5,132	8,326	1,622
Samtse	9,137	12,203	1,336
Sarpang	4,945	8,237	1,666
Thimphu	18	17	969
Trashi Yangtse	1,211	2,633	2,173
Trashigang	8,247	14,765	1,790
Trongsa	901	1,377	1,527
Tsirang	4,103	5,492	1,339
Wangdue	111	214	1,922
Zhemgang	2,467	4,677	1,896
Total	**53,938**	**90,566**	**1,679**

Table 1.4.6 Barley Area (Acre) and Production (Metric tonnes) in 2004

Dzongkhag	Havested Area	Total production	Yield(kg/Acre)
Bumthang	526	431	820
Dagana	102	35	346
Gasa	178	125	699
Ha	141	55	393
Lhuentse	7	5	688
Mongar	276	95	343
Paro	164	99	602
Pemagatshel	41	25	608
Punakha	49	23	466
S/Jongkhar	122	47	382
Samtse	69	25	354
Sarpang	4	1	307
Thimphu	24	23	925
Trashi Yangtse	26	15	559
Trashigang	92	32	346
Trongsa	463	188	406
Tsirang	18	3	174
Wangdue	366	152	414
Zhemgang	119	44	365
Total	**2,789**	**1,421**	**509**

Table: 1.4.7 Foxtail Millet Area (Acre) and Production (Metric tonnes) in 2004

Dzongkhag	Havested Area	Total production	Yield(kg/Acre)
Dagana	74	20	273
Mongar	28	5	184
Paro	1	0	208
Pemagatshel	45	29	647
Punakha	2	0	165
S/Jongkhar	175	80	457
Samtse	63	10	160
Sarpang	93	33	350
Trashi Yangtse	8	6	811
Trashigang	2	0	223
Tsirang	50	12	237
Wangdue	17	8	502
Zhemgang	229	71	311
Total	**787**	**276**	**351**

Table 1.4.8 Finger Millet Area (Acre) and Production (Metric tonnes) in 2004

Dzongkhag	Havested Area	Total production	Yield(kg/Acre)
Dagana	929	378	407
Ha	38	14	377
Lhuentse	101	77	767
Paro	21	21	967
Pemagatshel	23	21	929
Punakha	0	0	265
S/Jongkhar	502	156	311
Samtse	2,615	593	227
Sarpang	1,462	582	398
Thimphu	0	0	571
Trashi Yangtse	80	41	512
Trashigang	67	21	314
Trongsa	38	8	209
Tsirang	460	118	256
Wangdue	40	17	432
Zhemgang	164	45	278
Total	**6,538**	**2,093**	**320**

Table 1.4.8 Sweet Buck wheat Area (Acre) and Production (Metric tonnes) in 2004

Dzongkhag	Havested Area	Total production	Yield(kg/Acre)
Bumthang	354	272	767
Dagana	444	135	305
Gasa	31	13	424
Ha	180	44	248
Mongar	123	35	281
Paro	41	18	436
Pemagatshel	16	7	438
Punakha	41	11	277
S/Jongkhar	835	239	287
Samtse	447	112	251
Sarpang	217	68	312
Thimphu	1	1	1,220
Trashi Yangtse	2	2	929
Trashigang	492	240	487
Trongsa	176	52	293
Tsirang	137	26	190
Wangdue	83	47	567
Zhemgang	87	40	458
Total	**3,705**	**1,361**	**367**

Table 1.4.9 Bitter Buck wheat Area (Acre) and Production (Metric tonnes) in 2004

Dzongkhag	Havested Area	Total production	Yield(kg/Acre)
Bumthang	294.45	230.00	781
Dagana	400.43	100.05	249
Gasa	16.35	6.54	400
Ha	149.45	65.24	436
Lhuentse	3.71	3.05	822
Mongar	50.97	10.68	209
Paro	65.67	29.41	447
Pemagatshel	39.15	18.16	463
Punakha	81.73	47.86	585
S/Jongkhar	144.60	38.22	264
Samtse	156.14	30.35	194
Sarpang	127.58	46.47	364
Thimphu	3.13	2.10	670
Trashi Yangtse	86.39	17.92	207
Trashigang	80.64	33.03	409
Trongsa	429.22	157.81	367
Tsirang	16.74	7.04	420
Wangdue	257.26	218.12	847
Zhemgang	178.78	86.85	485
Total	**2,582.39**	**1,148.90**	**444**

Table 1.4.10 Wheat Area (Acre) and Production (Metric tonnes) in 2004

Dzongkhag	Havested Area	Total production	Yield(kg/Acre)
Bumthang	564	514	912
Chhukha	639	323	506
Dagana	207	118	570
Gasa	111	54	486
Ha	597	337	564
Lhuentse	91	80	875
Mongar	20	7	332
Paro	988	557	563
Pemagatshel	6	5	926
Punakha	591	226	382
S/Jongkhar	108	31	284
Samtse	627	258	411
Sarpang	58	31	537
Thimphu	496	529	1,066
Trashi Yangtse	14	8	599
Trashigang	44	24	545
Trongsa	552	239	433
Tsirang	87	20	233
Wangdue	1,513	736	487
Zhemgang	272	95	348
Total	**7,583**	**4,191**	**553**

Table 1.4.11 OatsArea (Acre) and Production (Metric tonnes) in 2004

Dzongkhag	Havested Area	Total production	Yield(kg/Acre)
Bumthang	6	3	556
Dagana	1	0	440
Paro	32	25	786
Punakha	20	7	332
S/Jongkhar	136	55	408
Sarpang	2,189	709	324
Thimphu	2	2	761
Trashi Yangtse	150	96	640
Trashigang	5	1	311
Trongsa	9	3	325
Tsirang	58	15	263
Wangdue	12	6	486
Total	**2,618**	**922**	**352**

.

Table 2.1 Area (Acre) and Production (Metric tonnes) of Mustard in 2004

Dzongkhag	Havested Area	Total production	Yield(kg/Acre)
Bumthang	115	28	246
Chhukha	412	119	290
Dagana	308	125	405
Gasa	43	12	267
Ha	26	12	450
Lhuentse	55	43	778
Mongar	105	28	266
Paro	180	56	312
Pemagatshel	27	23	863
Punakha	375	136	364
S/Jongkhar	281	96	341
Samtse	424	128	301
Sarpang	328	110	336
Thimphu	165	59	360
Trashi Yangtse	94	11	113
Trashigang	289	136	472
Trongsa	213	202	946
Tsirang	370	177	477
Wangdue	461	175	379
Zhemgang	232	92	395
Total	**4,503**	**1,767**	**392**

Table 2.2 Area (Acre) and Production (Metric tonnes) of Peas in 2004

Dzongkhag	Havested Area	Total production	Yield(kg/Acre)
Bumthang	2	6	3,287
Chhukha	37	35	942
Dagana	15	20	1,405
Gasa	3	2	542
Ha	53	110	2,081
Lhuentse	10	12	1,186
Mongar	13	17	1,271
Paro	164	254	1,551
Pemagatshel	1	1	902
Punakha	51	80	1,562
S/Jongkhar	3	2	777
Samtse	26	29	1,111
Sarpang	0	1	1,957
Thimphu	1	1	618
Trashi Yangtse	5	5	1,130
Trashigang	22	24	1,089
Trongsa	1	2	1,808
Tsirang	9	13	1,434
Wangdue	24	40	1,642
Zhemgang	8	8	1,098
Total	**448**	**662**	**1,478**

Table 2.3 Area (Acre) and Production (Metric tonnes) of Rajma Beans in 2004

Dzongkhag	Havested Area	Total production	Yield(kg/Acre)
Dagana	95.09	32.76	344
Lhuentse	9.28	10.68	1,150
Mongar	196.24	94.62	482
Paro	6.67	6.12	917
Pemagatshel	197.73	177.95	899
Punakha	1.66	1.49	897
S/Jongkhar	100.33	52.16	519
Samtse	111.95	101.23	904
Sarpang	38.44	25.81	671
Thimphu	4.75	12.42	2,614
Trashi Yangtse	2.43	0.91	374
Trashigang	227.06	61.20	269
Tsirang	119.55	21.56	180
Wangdue	11.17	12.23	1,094
Zhemgang	13.27	7.71	581
Total	**1,135.62**	**618.85**	**544**

Table 2.4 Area (Acre) and Production (Metric tonnes) of Soy Bean in 2004

Dzongkhag	Havested Area	Total production	Yield(kg/Acre)
Dagana	20.02	5.83	291
Ha	0.49	0.25	510
Lhuentse	159.82	100.86	631
Mongar	95.49	34.99	366
Pemagatshel	60.47	24.80	410
Punakha	8.59	3.53	410
S/Jongkhar	275.05	69.87	254
Samtse	26.83	9.26	345
Sarpang	2.11	0.91	431
Thimphu	2.48	2.96	1,193
Trashi Yangtse	284.97	96.61	339
Trashigang	618.18	582.53	942
Trongsa	3.80	1.12	294
Tsirang	64.23	24.78	385
Wangdue	32.17	29.39	913
Zhemgang	28.80	17.68	613
Total	**1,683.50**	**1,005.37**	**597**

Table 2.5 Area (Acre) and Production (Metric tonnes) of Pulse Mung Dhal in 2004

Dzongkhag	Havested Area	Total production	Yield(kg/Acre)
Dagana	106.30	46.57	438
S/Jongkhar	21.05	6.39	303
Samtse	8.81	3.34	379
Sarpang	1.42	0.74	521
Tsirang	30.91	4.51	145
Total	**168.49**	**61.55**	**365**

Table 2.6 Area (Acre) and Production (Metric tonnes) of Beans in 2004

Dzongkhag	Havested Area	Total production	Yield(kg/Acre)
Chhukha	40	27	667
Dagana	237	61	259
Gasa	6	3	506
Ha	8	10	1,335
Lhuentse	15	16	1,048
Mongar	187	191	1,022
Paro	29	43	1,514
Pemagatshel	67	73	1,096
Punakha	77	122	1,576
S/Jongkhar	77	54	705
Samtse	99	21	216
Sarpang	69	47	676
Thimphu	24	71	2,908
Trashi Yangtse	86	42	494
Trashigang	203	205	1,013
Trongsa	20	23	1,150
Tsirang	137	263	1,915
Wangdue	58	63	1,088
Zhemgang	53	35	653
Total	**1,492**	**1,370**	**919**

3 Production of Vegetable Crops

Different types of vegetables are cultivated across the country mostly on subsistence level, contributing substantially to family's nutritional consumption requirements. Although the census has not been able to estimate increase in vegetable productions, areas close to urban or accessible to motor roads produce substantial amount of vegetables for sale. Some of the major ones are chili, radish, turnip and potato, ginger, radish, turnip, beans, broccoli, cabbage, green leaves are produced on substaintial amount for sale in the local markets.

In an agregate, the total harvested area under vegetable was 24,605 acres and the total production was 78,043 MT. Potato contributed 60.74 percent, ginger 8 percent and chilli 5.7 percent of the the total production.
However, in the past few years many Bhutanese farming communities have taken up vegetable cultivation as it has comparative advantages upon cereal crops in respect to income generation

Potato is important source of cash income and cultivated on large scale mainly in the west, central and in the east. The cultivation has been enhanced further by the Bhutan Potato Development Program. The major potato growing dzongkhags are

Wangduephodrang, Trashigang, Chhukha, Bumthang, Paro and Mongar. These dzongkhags togather cultivates 8,455 acres and produced 47,403 MT. The national average yield of potato is 5,606 kg per acre while the highest yield level reported was 11,010 kg by Bumthang dzongkhag.

Chili, although a part of spice group is generally consumed like any other vegetables in this country. It forms an important part of the family diet and also as an important source of cash income to the farmers. Chili is cultivated in both wet and dry lands mainly in the mid hills from the west to east.

Radish is another important crop mainly produced for domestic consumption. It is a dryland crop and forms an important part of the family diet. Substantial amount of the produces sold go to institutions like schools and army establishments, which are appropriate for mass feeding. Like radish, turnip is also a dryland crop produced for domestic consumption. People consume it, but most of it goes as feed for cattle and pigs. Its cultivation is well adapted especially to high land areas with production level reaching 4,137 MT. Both turnip and radish are high volume low value crops with no external markets foreseen.

Numerous minor vegetable crops are cultivated in this country. While many do exist as a kitchen garden crop, others such as tomato and carrots, squash gourds and onion are expanding in the more accessible areas. Spices traditionally have been an integral part of most Bhutanese diets. Generally ginger, onion, garlic and cardamom are used in the preparation of curry dishes. Bhutanese in southern region use ginger and cardamom in tea, believed to have healing effects on body.

Ginger was cultivated on 3,517 acres in the sub-tropical regions, mainly in the foothills. The total production in the year 2004 was 6,225 MT. It is an important cash crop generally sold off to local and neighbouring markets in India. Garlic and onion are grown in small quantities primarily to meet home consumption.

Table 3.1 Area (Acre) and Production (Metric tonnes) of Potato in 2004

Dzongkhag	Havested Area	Total production	Yield(kg/Acre)
Bumthang	657	7,234	11,012
Chhukha	1,282	7,705	6,011
Dagana	171	614	3,598
Gasa	37	35	939
Ha	211	1,783	8,439
Lhuentse	82	291	3,530
Mongar	954	3,929	4,118
Paro	806	2,415	2,996
Pemagatshel	164	529	3,222
Punakha	55	240	4,375
S/Jongkhar	253	651	2,573
Samtse	82	258	3,138
Sarpang	134	704	5,255
Thimphu	235	1,239	5,261
Trashi Yangtse	258	1,405	5,442
Trashigang	1,769	8,444	4,774
Trongsa	100	632	6,339
Tsirang	180	484	2,684
Wangdue	985	8,692	8,827
Zhemgang	40	121	3,016
Total	**8,455**	**47,403**	**5,606**

Table 3.2 Area (Acre) and Production (Metric tonnes) of Sweet Potato in 2004

Dzongkhag	Havested Area	Total production	Yield(kg/Acre)
Dagana	37.82	66.92	1,769
Lhuentse	0.21	0.36	1,714
Mongar	12.90	18.94	1,468
Pemagatshel	4.05	8.36	2,064
Punakha	2.66	3.40	1,278
S/Jongkhar	5.32	11.33	2,129
Samtse	8.72	31.49	3,611
Sarpang	1.27	2.25	1,771
Thimphu	0.05	0.13	2,600
Trashi Yangtse	11.72	26.88	2,293
Trashigang	7.36	17.34	2,355
Trongsa	1.10	1.65	1,500
Tsirang	26.64	54.27	2,037
Wangdue	5.13	8.58	1,672
Zhemgang	27.95	45.05	1,611
Total	**152.90**	**296.95**	**1,942**

Table 3.3 Area (Acre) and Production (Metric tonnes) of Radish in 2004

Dzongkhag	Havested Area	Total production	Yield(kg/Acre)
Bumthang	6	50	9,114
Chhukha	49	104	2,110
Dagana	323	215	666
Gasa	33	50	1,492
Ha	125	792	6,331
Lhuentse	61	213	3,518
Mongar	284	881	3,105
Paro	97	243	2,518
Pemagatshel	96	355	3,710
Punakha	50	72	1,455
S/Jongkhar	135	239	1,773
Samtse	227	88	387
Sarpang	68	90	1,320
Thimphu	44	227	5,188
Trashi Yangtse	31	105	3,350
Trashigang	303	790	2,609
Trongsa	57	314	5,474
Tsirang	110	162	1,470
Wangdue	168	441	2,634
Zhemgang	114	197	1,728
Total	**2,379**	**5,628**	**2,366**

Table 3.4 Area (Acre) and Production (Metric tonnes) of Turnip in 2004

Dzongkhag	Havested Area	Total production	Yield(kg/Acre)
Bumthang	3	24	9,004
Chhukha	49	104	2,108
Dagana	18	16	841
Gasa	8	15	1,854
Ha	122	1,016	8,352
Lhuentse	1	1	1,630
Mongar	9	22	2,465
Paro	188	649	3,454
Pemagatshel	1	4	2,874
Punakha	28	47	1,718
S/Jongkhar	1	3	1,857
Thimphu	41	198	4,799
Trashi Yangtse	3	5	1,759
Trashigang	2	5	1,987
Trongsa	24	109	4,493
Tsirang	3	5	1,760
Wangdue	451	1,903	4,224
Zhemgang	10	13	1,288
Total	**961**	**4136**	**4304**

Table 3.5 Area (Acre) and Production (Metric tonnes) of Broccoli 2004

Dzongkhag	Havested Area	Total production	Yield(kg/Acre)
Bumthang	1	1	818
Dagana	7	2	330
Ha	1	1	650
Lhuentse	11	16	1,488
Mongar	4	3	814
Paro	4	3	792
Punakha	1	0	355
S/Jongkhar	0	0	1,000
Sarpang	3	2	942
Thimphu	4	8	2,275
Trashi Yangtse	2	2	984
Trashigang	8	8	1,025
Trongsa	1	1	814
Tsirang	1	0	446
Wangdue	5	3	635
Zhemgang	6	2	279
Total	**59**	**54**	**921**

Table 3.6 Area (Acre) and Production (Metric tonnes) of Cabbage in 2004

Dzongkhag	Havested Area	Total production	Yield(kg/Acre)
Bumthang	5	41	8,294
Chhukha	127	244	1,927
Dagana	14	30	2,126
Gasa	6	5	828
Ha	7	22	3,005
Lhuentse	35	204	5,876
Mongar	81	188	2,310
Paro	147	486	3,315
Pemagatshel	15	45	2,978
Punakha	3	7	2,676
S/Jongkhar	6	11	1,806
Samtse	2	2	1,357
Sarpang	8	17	2,054
Thimphu	10	32	3,179
Trashi Yangtse	22	37	1,649
Trashigang	104	324	3,113
Trongsa	5	9	1,894
Tsirang	16	21	1,334
Wangdue	68	121	1,793
Zhemgang	23	43	1,905
Total	**703**	**1,890**	**2,690**

Table 3.7 Area (Acre) and Production (Metric tonnes) of Carrot in 2004

Dzongkhag	Havested Area	Total production	Yield(kg/Acre)
Bumthang	1	4	6,000
Chhukha	29	33	1,126
Dagana	5	2	333
Gasa	2	1	648
Ha	5	8	1,375
Lhuentse	1	3	2,179
Mongar	10	21	2,144
Paro	37	52	1,418
Punakha	1	1	2,545
Sarpang	2	3	1,177
Thimphu	11	29	2,556
Trashi Yangtse	9	15	1,613
Trashigang	4	5	1,215
Trongsa	1	1	1,390
Tsirang	0	0	1,174
Wangdue	17	32	1,870
Zhemgang	5	2	424
Total	**141**	**212**	**1,503**

Table 3.8 Area (Acre) and Production (Metric tonnes) of Cauliflower in 2004

Dzongkhag	Havested Area	Total production	Yield(kg/Acre)
Bumthang	7.5	46.0	6,167
Chhukha	0.5	0.8	1,733
Dagana	2.7	5.0	1,832
Ha	0.7	2.5	3,535
Lhuentse	5.0	13.2	2,628
Mongar	20.0	27.0	1,351
Paro	0.2	0.1	636
Pemagatshel	2.4	4.4	1,833
Punakha	0.0	0.1	2,666
S/Jongkhar	0.8	1.8	2,307
Samtse	0.3	0.4	1,500
Sarpang	1.2	3.0	2,576
Thimphu	4.3	8.9	2,093
Trashi Yangtse	3.0	5.2	1,738
Trashigang	15.7	49.2	3,125
Trongsa	0.5	1.3	2,851
Tsirang	0.9	1.5	1,644
Wangdue	11.7	25.0	2,132
Zhemgang	7.6	11.2	1,482
Total	**84.9**	**206.7**	**2,434**

Table 3.9 Area (Acre) and Production (Metric tonnes) of Chili in 2004

Dzongkhag	Havested Area	Total production	Yield(kg/Acre)
Bumthang	2	7	3,790
Chhukha	255	352	1,381
Dagana	172	64	372
Gasa	10	4	411
Ha	27	50	1,891
Lhuentse	175	369	2,110
Mongar	392	417	1,063
Paro	323	492	1,524
Pemagatshel	78	153	1,960
Punakha	185	623	3,366
S/Jongkhar	90	85	946
Samtse	80	16	203
Sarpang	30	28	924
Thimphu	77	211	2,731
Trashi Yangtse	118	292	2,481
Trashigang	574	457	795
Trongsa	111	295	2,649
Tsirang	83	74	890
Wangdue	201	402	2,004
Zhemgang	77	63	827
Total	**3,060**	**4,455**	**1,456**

Table 3.10 Area (Acre) and Production (Metric tonnes) of Ginger in 2004

Dzongkhag	Havested Area	Total production	Yield(kg/Acre)
Chhukha	58	340	5,901
Dagana	39	76	1,928
Lhuentse	2	3	1,757
Mongar	3	9	2,833
Pemagatshel	18	50	2,844
Punakha	1	2	1,935
S/Jongkhar	1,559	2,045	1,312
Samtse	483	1,869	3,871
Sarpang	148	322	2,174
Thimphu	0	0	2,500
Trashi Yangtse	1	4	2,381
Trashigang	17	70	4,134
Trongsa	1	2	2,940
Tsirang	1,143	1,338	1,170
Wangdue	10	35	3,417
Zhemgang	34	61	1,790
Total	**3,517**	**6,225**	**1,770**

Table 3.11 Area (Acre) and Production (Metric tonnes) of Squash in 2004

Dzongkhag	Havested Area	Total production	Yield(kg/Acre)
Ha	1	1	1,081
Lhuentse	5	28	5,146
Pemagatshel	7	17	2,412
Punakha	3	7	2,455
S/Jongkhar	10	31	3,195
Samtse	131	126	959
Sarpang	18	81	4,622
Thimphu	3	12	4,248
Trashi Yangtse	1	8	5,190
Trashigang	4	14	3,689
Trongsa	0	1	7,286
Tsirang	11	78	7,266
Wangdue	1	5	3,503
Zhemgang	4	11	2,714
Total	**199**	**419**	**2,102**

Table 3.12 Area (Acre) and Production (Metric tonnes) of Tomato in 2004

Dzongkhag	Havested Area	Total production	Yield(kg/Acre)
Bumthang	0.55	0.65	1,181
Dagana	20.29	7.47	368
Ha	0.12	0.07	583
Lhuentse	4.87	8.56	1,757
Mongar	8.85	20.78	2,348
Paro	25.00	60.41	2,416
Pemagatshel	0.57	0.13	228
Punakha	6.99	11.74	1,679
S/Jongkhar	7.18	4.19	583
Samtse	1.14	0.48	421
Sarpang	9.58	18.81	1,963
Thimphu	7.69	13.60	1,768
Trashi Yangtse	0.47	0.48	1,021
Trashigang	3.97	10.33	2,602
Trongsa	1.50	8.60	5,733
Tsirang	5.45	4.49	823
Wangdue	7.68	4.61	600
Zhemgang	18.96	4.30	226
Total	**130.86**	**179.70**	**1,373**

Tabel 3.13 Area (Acre) and Production (Metric tonnes) of Gourd in 2004

Dzongkhag	Havested Area	Total production	Yield(kg/Acre)
Dagana	11.34	9.08	800
Ha	18.03	7.19	398
Lhuentse	1.77	0.68	384
Mongar	8.93	4.72	528
Punakha	1.16	0.34	293
Samtse	13.98	4.35	311
Sarpang	1.16	0.16	137
Trashi Yangtse	0.10	0.01	100
Trashigang	2.60	1.93	742
Tsirang	1.09	0.33	302
Wangdue	6.83	3.56	521
Zhemgang	1.99	0.36	180
Total	**68.98**	**32.71**	**474**

Table 3.14 Area (Acre) and Production (Metric tonnes) of Onion in 2004

Dzongkhag	Havested Area	Total production	Yield(kg/Acre)
Chhukha	16	13	857
Dagana	22	10	442
Ha	1	2	1,255
Lhuentse	16	14	874
Mongar	14	8	527
Pemagatshel	15	12	808
Punakha	15	8	494
S/Jongkhar	6	3	437
Samtse	1	1	496
Sarpang	1	1	939
Thimphu	12	11	904
Trashi Yangtse	13	18	1,364
Trashigang	169	202	1,198
Trongsa	3	4	1,234
Tsirang	11	5	463
Wangdue	15	10	678
Zhemgang	7	3	420
Total	**339**	**324**	**956**

Table 3.15 Area (Acre) and Production (Metric tonnes) of Green leaves in 2004

Dzongkhag	Havested Area	Total production	Yield(kg/Acre)
Bumthang	3.40	2.61	767
Chhukha	54.34	71.01	1,306
Dagana	112.15	55.47	494
Gasa	3.94	3.32	842
Ha	12.90	16.87	1,307
Lhuentse	23.27	38.68	1,662
Mongar	94.67	99.33	1,049
Paro	27.98	22.32	797
Pemagatshel	30.98	28.20	910
Punakha	23.60	32.96	1,396
S/Jongkhar	47.36	49.47	1,044
Samtse	279.59	216.88	775
Sarpang	112.49	149.12	1,325
Thimphu	26.96	40.79	1,512
Trashi Yangtse	26.08	33.40	1,280
Trashigang	196.69	265.35	1,349
Trongsa	9.43	17.20	1,823
Tsirang	106.93	117.52	1,099
Wangdue	487.21	940.61	1,930
Zhemgang	90.01	67.43	749
Total	**1,769.98**	**2,268.54**	**1,281**

Tabel 3.16 Area (Acre) and Production (Metric tonnes) of Garlic in 2004

Dzongkhag	Havested Area	Total production	Yield(kg/Acre)
Ha	0.11	0.12	1,090
Lhuentse	1.09	3.82	3,504
Pemagatshel	1.33	0.44	330
Punakha	2.27	3.37	1,484
S/Jongkhar	1.00	2.05	2,050
Trashi Yangtse	12.72	38.95	3,062
Trashigang	1.75	2.80	1,600
Tsirang	0.38	0.46	1,210
Wangdue	1.60	2.62	1,637
Zhemgang	0.08	0.11	1,375
Total	**22.33**	**54.74**	**2,451**

Tabel 3.18 Cardamom Area (acre) and Production in (MT) 2004

Dzongkhag	Area(Acre)	Production(MT)	Yield kg(Acre)
Chhukha	357.0	73.4	205
Dagana	460.2	90.1	195
Ha	470.9	85.8	182
Mongar	1.8	0.5	296
Pemagatshel	4.0	1.1	262
Punakha	0.3	0.1	220
S/Jongkhar	14.0	2.4	170
Samtse	2894.8	548.9	189
Sarpang	40.5	8.1	201
Thimphu	0.6	0.1	100
Trashigang	3.3	0.7	201
Trongsa	0.1	0.0	183
Tsirang	25.6	3.5	137
Total	**4273.1**	**814.6**	**190**

4 Productions of Tree Fruit Crops

Statistically 3.54 million trees are grown on an area of 13,268 hectares in various parts of the country. However, only 1.5 million trees are reported to bear fruits. Apples, oranges and arecanuts are major tree fruit crops cultivated on commercial scales. The produce of these crops are exported to neighbouring countries like India and Bangladesh. Other minor tree fruit crops include walnut, plum, pear, peach, guava, pomegranate, persimmon, mango, banana, and apricot. Over the years the production of walnut, mango and banana has gained momentum. This was mainly because of its high demand in the markets and also due to good shelf life of walnut.

The total tree fruit crops production from the bearing tree was 44,755 MT in the year 2004. Apple, orange and arecanut accounts for 93.27 percent of the production.

Tabel 4.1 Numbers of Trees, Production (MT) and Yield of Apple in 2004

Dzongkhag	Total Trees	Bearing	Prod(MT)	Yield per Tree(kg)
Bumthang	12,463	7,575	161.77	21
Chhukha	5,887	3,184	86.39	27
Dagana	279	98	1.92	20
Ha	21,903	12,267	167.69	14
Lhuentse	1,622	746	15.23	20
Mongar	1,669	486	9.74	20
Paro	20,3628	13,5526	2,860.89	21
Pemagatshel	392	48	1.23	26
Punakha	1,286	204	4.17	20
S/Jongkhar	369	382	4.2	11
Thimphu	13,0381	81,097	2,514.72	31
Trashi Yangtse	1,158	875	20.18	23
Trashigang	1,279	518	9.51	18
Trongsa	625	76	1.4	18
Tsirang	22	22	0.5	23
Wangdue	3,984	2,973	57.74	19
Zhemgang	12	5	0.1	20
Total	**386,959**	**246,082**	**5,917**	**24**

Table 4.2 Numbers of Trees, Production (MT) and Yield of Citrus in 2004

Dzongkhag	Total Trees	Bearing	Prod(MT)	Yield per Tree(kg)
Chhukha	304,912	212,563	5,675	27
Dagana	151,079	93,518	3,532	38
Ha	370	296	8	27
Lhuentse	10,250	4,823	201	42
Mongar	46,884	20,303	794	39
Pemagatshel	58,813	30,675	1,130	37
Punakha	34,831	16,203	388	24
S/Jongkhar	336,521	161,618	4,614	29
Samtse	182,867	138,717	3,477	25
Sarpang	268,501	118,998	6,088	51
Thimphu	1,911	1,312	43	33
Trashi Yangtse	11,270	5,842	167	29
Trashigang	15,889	7,369	256	35
Trongsa	6,680	2,623	28	11
Tsirang	260,323	99,113	3,501	35
Wangdue	13,960	7,790	265	34
Zhemgang	126,251	61,644	1,748	28
Total	**1,831,312**	**983,407**	**31,915**	**32**

Table 4.3 Numbers of Trees, Production (MT) and Yield of Peach in 2004

Dzongkhag	Total Trees	Bearing	Prod(MT)	Yield per Tree(kg)
Bumthang	199	71	1	8
Chhukha	1,939	1,799	22	12
Dagana	1,085	804	30	37
Ha	316	125	5	39
Lhuentse	3,515	2,164	86	40
Mongar	2,199	1,598	57	36
Paro	1,266	857	21	24
Pemagatshel	558	443	22	49
Punakha	790	613	19	31
S/Jongkhar	1,359	1,177	49	42
Samtse	115	85	2	24
Sarpang	174	168	8	49
Thimphu	827	547	19	35
Trashi Yangtse	818	742	18	25
Trashigang	4,466	2,579	162	63
Trongsa	287	225	7	29
Tsirang	285	263	9	34
Wangdue	679	474	22	47
Zhemgang	444	299	15	51
Total	**21,321**	**15,033**	**574**	**38**

Table 4.4 Numbers of Trees, Production (MT) and Yield of Pear in 2004

Dzongkhag	Total Trees	Bearing	Prod(MT)	Yield per Tree(kg)
Bumthang	211	176	3.17	18
Chhukha	301	203	2.66	13
Dagana	978	624	26.34	42
Ha	18	11	0.30	27
Lhuentse	1,498	1,342	46.78	35
Mongar	1,409	681	21.78	32
Paro	435	327	7.10	22
Pemagatshel	59	29	1.24	43
Punakha	1,259	750	21.38	29
S/Jongkhar	152	74	6.70	91
Samtse	294	201	8.59	43
Sarpang	316	309	4.01	13
Thimphu	971	665	17.53	26
Trashi Yangtse	833	817	32.75	40
Trashigang	1,684	775	17.95	23
Trongsa	276	184	6.75	37
Tsirang	1,764	1,549	38.26	25
Wangdue	1,172	733	29.44	40
Zhemgang	9	9	0.20	22
Total	**13,639**	**9,459**	**292.93**	**31**

Table 4.5 Numbers of Trees, Production (MT) and Yield of Walnut in 2004

Dzongkhag	Total Trees	Bearing	Prod(MT)	Yield per Tree(kg)
Bumthang	2,896	169	1.78	11
Chhukha	305	96	0.96	10
Dagana	570	307	5.40	18
Ha	780	56	0.94	17
Lhuentse	4,168	341	13.51	40
Mongar	6,619	1,096	7.39	7
Paro	949	464	12.12	26
Pemagatshel	328	113	2.63	23
Punakha	26	6	0.20	33
S/Jongkhar	722	180	3.81	21
Thimphu	542	207	6.07	29
Trashi Yangtse	2,155	1,551	29.50	19
Trashigang	4,454	1,199	32.00	27
Trongsa	954	111	2.02	18
Wangdue	625	137	2.82	21
Zhemgang	450	78	1.89	24
Total	**26,543**	**6,111**	**123**	**20**

Table 4.6 Numbers of Trees, Production (MT) and Yield of Pomogranete in 2004

Dzongkhag	Total Trees	Bearing	Prod(MT)	Yield per Tree(kg)
Punakha	28	24	0.48	20
Thimphu	70	30	1.35	45
Trashi Yangtse	11	9	0.55	61
Wangdue	103	19	1.00	53
Total	**212**	**82**	**3.38**	**41**

Table 4.7 Numbers of Trees, Production (MT) and Yield of Persimmon in 2004

Dzongkhag	Total Trees	Bearing	Prod(MT)	Yield per Tree(kg)
Ha	1	1	0.08	75
Mongar	304	89	3.30	37
Paro	15	10	0.51	51
Punakha	1,576	1,275	46.02	36
Trashi Yangtse	41	1	0.02	22
Trashigang	41	4	0.24	60
Wangdue	559	489	37.68	77
Total	**2,537**	**1,869**	**87.84**	**47**

Table 4.8 Numbers of Trees, Production (MT) and Yield of Plum in 2004

Dzongkhag	Total Trees	Bearing	Prod(MT)	Yield per Tree(kg)
Bumthang	221	73	2.13	29
Dagana	350	297	11.72	39
Ha	37	26	0.73	28
Lhuentse	939	770	34.33	45
Mongar	852	642	34.77	54
Paro	281	204	4.84	24
Pemagatshel	437	290	15.99	55
Punakha	304	210	5.66	27
S/Jongkhar	155	114	1.56	14
Samtse	7	4	0.11	28
Sarpang	5	5	0.23	47
Thimphu	314	193	6.56	34
Trashi Yangtse	740	560	11.31	20
Trashigang	1,353	802	17.41	22
Trongsa	107	69	2.14	31
Tsirang	549	500	22.84	46
Wangdue	275	172	6.63	39
Zhemgang	53	40	2.93	73
Total	**6,979**	**4,971**	**181.89**	**37**

Table 4.9 Numbers of Trees, Production (MT) and Yield of Guava in 2004

Dzongkhag	Total Trees	Bearing	Prod(MT)	Yield per Tree(kg)
Dagana	694	608	34.62	57
Lhuentse	20	20	0.50	25
Mongar	50	24	1.26	53
Pemagatshel	177	145	6.34	44
Punakha	2,488	2,028	44.09	22
S/Jongkhar	896	561	12.70	23
Samtse	2		-	
Trashi Yangtse	46	25	0.71	28
Trongsa	25	25	0.90	36
Wangdue	304	271	7.50	28
Zhemgang	336	193	2.05	11
Total	**5,038**	**3,900**	**110.68**	**28**

Table 4.10 Numbers of Trees, Production (MT) and Yield of Arecanut in 2004

Dzongkhag	Total Trees	Bearing	Prod(MT)	Yield per Tree(kg)
Chhukha	73711	34667	955.71	28
Dagana	1083	59	0.64	11
S/Jongkhar	53409	17481	343.99	20
Samtse	127485	44497	670.06	15
Sarpang	449743	71290	1,448.27	20
Tsirang	39	20	0.31	16
Total	**705470**	**168014**	**3,418.98**	**20**

Table 4.11 Numbers of Trees, Production (MT) and Yield of Apricot in 2004

Dzongkhag	Total Trees	Bearing	Prod(MT)	Yield per Tree(kg)
Chhukha	34	21	0.21	10
Dagana	1	1	0.09	90
Ha	2	2	0.09	45
Mongar	34	5	0.13	26
Paro	53	42	1.06	25
Punakha	54	47	0.90	19
Sarpang	1312	581	11.09	19
Thimphu	98	64	2.07	32
Trashigang	4	3	-	-
Trongsa	24	16	0.50	31
Wangdue	24	5	0.20	40
Zhemgang	2	2	0.04	20
Total	**1642**	**789**	**16.38**	**21**

Table 4.12 Numbers of Trees, Production (MT) and Yield of Banana in 2004

Dzongkhag	Total Trees	Bearing	Prod(MT)	Yield per Tree(kg)
Chhukha	992	3397	75.17	22
Dagana	11409	9397	396.11	42
Ha	41	59	1.95	33
Lhuentse	2733	898	19.11	21
Mongar	16312	1570	20.06	13
Pemagatshel	3496	1228	26.91	22
Punakha	2634	1366	26.19	19
S/Jongkhar	18359	8942	143.30	16
Samtse	27738	10215	183.45	18
Sarpang	30272	10126	185.44	18
Thimphu	313	217	5.23	24
Trashi Yangtse	1236	621	21.02	34
Trashigang	12932	5364	95.97	18
Trongsa	1003	342	4.76	14
Tsirang	12366	10566	184.84	17
Wangdue	851	572	21.16	37
Zhemgang	2764	1372	24.42	18
Total	**145451**	**66252**	**1,435.07**	**22**

Table 4.13 Numbers of Trees, Production (MT) and Yield of Mango in 2004

Dzongkhag	Total Trees	Bearing	Prod(MT)	Yield per Tree(kg)
Dagana	1348	719	19.77	27
Lhuentse	853	126	2.90	23
Mongar	4803	1445	55.00	38
Pemagatshel	665	337	8.93	27
Punakha	1196	328	7.74	24
S/Jongkhar	1720	545	14.85	27
Samtse	286	113	3.49	31
Sarpang	2247	548	19.08	35
Trashi Yangtse	427	99	5.20	53
Trashigang	1239	233	10.55	45
Trongsa	177	44	1.96	44
Tsirang	201	88	3.45	39
Wangdue	1119	474	34.01	72
Zhemgang	1920	27	1.31	49
Total	**18201**	**5126.22**	**188.23**	**37**

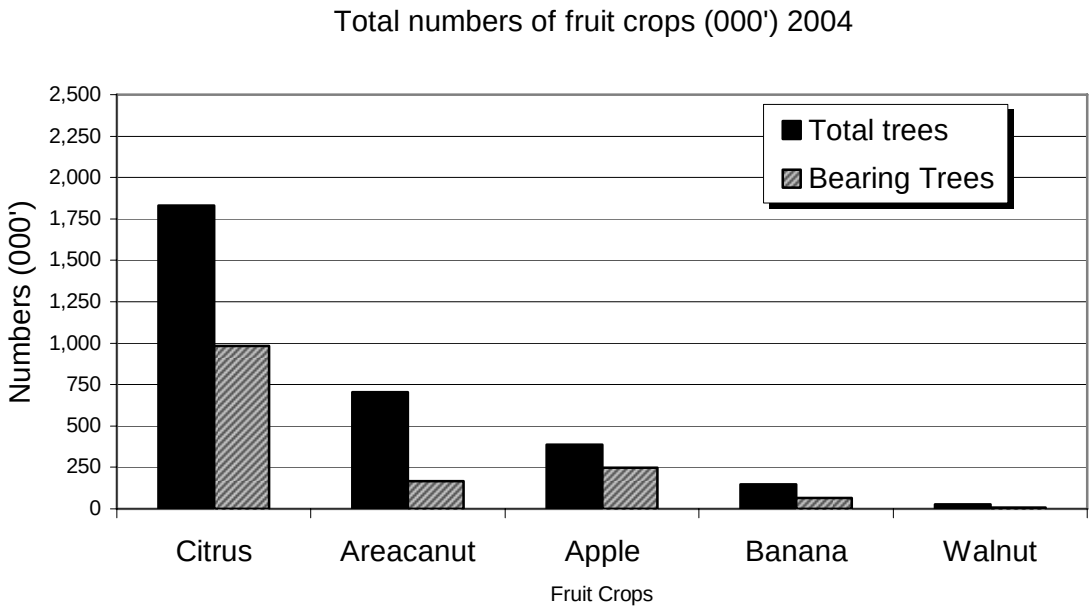

Figure 4.1 Total numbers of bearing and non-bearing trees

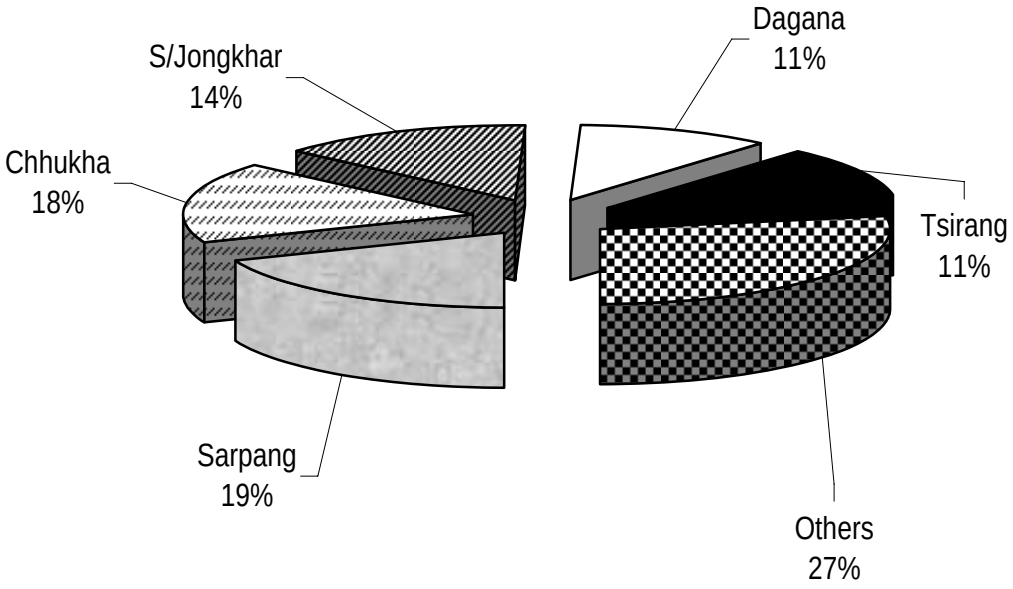

Figure 4.2 Five largest orange producing Dzongkhags

Agricultural Machinery

The Agricultural Machinery Centre at Paro alongwith three regional centres at Paro, Bajo and Khangma supplies farm machinery, tools and implements to the Dzongkhags. Through the regional offices, the centre also provides repair and installation services to the farmers. While still active in procurement and supplies of machinery and equipments, the Centre is gradually shifting its focus to research. It is the government policy to slowly withdraw from procurement and supply of machinery services which can be done by private entrepreneurs.

Supply of Farm Machinery in (Nos.) to Dzongkhags in 2004

Dzongkhag	Power Tiller	Diesel Engine	Electric Motor	Attachaki	Rice huller	Corn flake machine	Oil Expeller	Chaft cutter power	Sugar cane crusher
Thimphu	27	4	4	4	6	1	1	1	
Paro	35	2	12	6	11				2
Ha	10			1					
Chhukha	10	1	1	2	2				
Samtse	10		3	3	3				
Punakha	25	6			12				
Gasa	10								
Wangdue	26	7	2	3	11		1		
Tsirang	8	10		9	9				
Dagana	10	4		3	4				
Bumthang	26		2	2	3				
Trongsa	25	2	2	2	3	3			
Zhemgang	10	4	5	7	7	6			
Sarpang	26	2	4	2	7				
Lhuentse	2	20	1	20	16	1			
Mongar	12	17		17	6	8			
Trashigang	7	8	2	11	9	1	1		
Yangtse	2	8	1	9	11				
Pemagatshel	4	3		4					
S/Jongkhar		6	3	9	2	3			
Total	**285**	**104**	**42**	**114**	**122**	**23**	**3**	**1**	**2**

Source: AMC, Paro, 2005.

3. Farm Roads

The cumulative farm road progress across the country as of June 2005 is 324.4 kms against the total plan target of 587.6 km.

Farm Roads Constructed from fiscal year 2003/04 to 2004/05

Dzongkhag PLANNED	Target for 9th Plan(Km)	Achievement		
		2003-04 (Km)	2004-05 (Km)	Total (Km)
Bumthang	9	20.6	4.5	25.1
Chhukha	15	3.5	6.5	10
Dagana	24	8.25	5	13.25
Gasa	14	0	2	2
Haa	5	0	4.3	4.3
Lhuentse	65	10.7	11.5	22.2
Mongar	13	12	5.3	17.3
Paro	42	7.52	12.15	19.67
Pemagatshel	18	17.62	0	17.62
Punakha	15	6.42	3.9	10.32
Samdrupjongkhar	97	7.2	10.8	18
Samtse	14	3.49	9	12.49
Sarpang	10	8	0	8
Thimphu	36.6	7.25	6.8	14.05
Trashigang	68	22.5	12	34.5
Trashiyangtse	45	12.5	0	12.5
Trongsa	9	1.8	4.2	6
Tsirang	10	2	8	10
Wangdiphodrang	22	13	7.28	20.28
Zhemgang	17	5.91	2	7.91
Spillover from 8th plan				
Lhuentse	11	11	0	11
Samdrup Jongkhar	12	12	0	12
Bumthang	11	11	0	11
Dagana	5	5	0	5
TOTAL	**587.67**	**209.2**	**115.23**	**324.4**

Source: Engineering Division, DoA, 2005

4. Power Tiller Tracks

Although the power tiller track construction was initiated in the year 2003, the construction started only in the fiscal year 2004-2005. In total 10 kms of power tiller track was constructed in the fiscal year 2004-2005.

Power Tiller Track Constructed in the from fiscal year 2004-2005

Dzongkhag	Planned Target (Km)	2004-05 (Km)
Lhuentse	52	2
Paro	5.5	0.5
Trongsa	30	7.5
Haa	3.7	0
Mongar	8.54	0
Trashigang	10	0
Trashiyangtse	16	0
Zhemgang	5	0
Tsirang	5	0
Dagana	19	0
Punakha	7.25	0
TOTAL	**161.99**	**10**

Source: Engineering Division, DoA, 2005.

5. Irrigation Channel

To assure adequate irrigation for the irrigated crops a total length of 156.18 kms of irrigation channel were constructed and 563.69 km were renovated from the year 2001 to 2004.

Irrigation channel contrusted in fiscal year 2004-2005

Sl. No.	Dzongkhag	New construction(km)	Renovation(km)
1	Bumthang	0.00	4.00
2	Chhukha	0.00	3.94
3	Dagana*	4.00	0.00
4	Gasa*	0.00	16.00
5	Haa	0.00	2.60
6	Lhuentse*	4.30	24.00
7	Mongar	5.10	12.32
8	Paro*	4.50	19.88
9	Pemagatshel	1.50	7.00
10	Punakha	0.00	34.59
11	Samdrupjongkhar*	0.00	4.71
12	Samtse*	10.00	10.00
13	Sarpang	9.00	19.50
14	Thimphu	3.00	7.00
15	Trashigang	14.50	2.60
16	Trashiyangtse	1.00	13.50
17	Trongsa*	12.50	12.00
18	Tsirang	0.00	12.88
19	Wangdiphodrang*	0.00	15.05
20	Zhemgang*	3.00	12.80
	TOTAL	**72.40**	**234.37**

** constructed or renovated in the year 2004*
source: Dzongkhag Agriculture Sectors , 2005

8. Seeds and Fruit Plants supplied to Dzongkhags in 2004

Dzongkhag	Cereal seeds	Vegetable seeds	Oil Seeds	Seed Potato	Apple	Orange	Mango	Walnut	Other fruits
	Kgs	Kgs	Kgs	MT	Nos.	Nos.	Nos.	Nos.	Nos.
Thimphu	32,400	124	1,529	59	2,412			1,220	135
Paro	14,905	593	1,639	28	9,574	405		199	1,340
Ha	650	8	932	6	1,507			325	120
Chhukha	6,972	97	1,325	14				12	-
Samtse	9,660	53	1,068				105		397
Punakha	3,350	-	-	19		1,356			65
Gasa	-	19	203	8					-
Wangdue	7,817	110	1,250	2	450	168	505		857
Tsirang	-	3	-						-
Dagana	1,560	10	403	6		700			-
Bumthang	-	28	35	49					-
Trongsa	200	10	2	11	1,102	364			-
Zhemgang	2,895	41	913	22					45
Sarpang	6,555	9	1,074			1,500	715	-	5,931
Lhuentse	2,200	37	256	4		968		160	-
Mongar	2,661	90	346	11		1,201			-
Trashigang	5,176	207	1,074			440	30		-
Yangtse	2,615	16	519	4		2,492		600	-
Pemagatshel	3,300	14	10	4		667			-
S/Jongkhar	1,200	8	1	4		1,200			-
Total	**104,116**	**1,475**	**12,576**	**252**	**15,045**	**11,461**	**1,355**	**2,516**	**8,890**

Source: DSC, Paro, 2005.

Quantity (MT) of chemical supplied to Dzongkhags in 2004

Dzongkhag	Urea	Suphala	SSP	TSP	CAN	MoP	Borax	Bonemeal	KG Mix	Butachlor
Thimphu	77.35	75.50	66.50	4.42	1.25	17.30	0.40	3.80	0.00	19.40
Paro	110.06	105.40	9.90	1.60	1.50	1.70	0.35	0.60	0.00	65.75
Ha	10.00	22.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chhukha	44.41	109.30	4.45	2.52	0.00	0.02	0.00	1.20	0.75	4.83
Samtse	6.75	5.20	0.85	2.00	0.00	1.72	0.00	0.40	0.00	3.00
Punakha	98.00	45.45	9.00	0.00	0.00	0.00	0.00	2.00	0.00	34.50
Gasa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wangdue	125.35	208.60	27.00	8.90	0.00	0.10	0.00	0.30	0.00	62.45
Tsirang	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dagana	13.05	2.00	2.25	0.00	0.00	0.80	0.00	0.00	0.00	5.25
Bumthang	156.38	40.60	305.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trongsa	8.00	14.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00
Zhemgang	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.25
Sarpang	2.50	1.50	2.50	0.00	0.00	0.00	0.00	0.00	0.00	4.00
Lhuentse	45.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.62
Mongar	118.50	1.50	6.20	0.00	0.00	0.00	0.00	1.00	1.00	3.70
Trashigang	513.53	160.90	32.50	16.00	0.00	1.30	0.10	0.75	0.00	12.20
Yangtse	96.98	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.90
Pemagatshel	66.00	13.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
S/Jongkhar	8.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**1,500**	**805**	**467**	**35**	**3**	**23**	**1**	**11**	**2**	**252**

Source: DSC, Paro, 2005.

6. Observed Weather Reports

Heavy monsoon was experienced in 2004 compared to the past events and it caused heavy landslides and flash floods especially in eastern part of the country. The calamity caused lost of lives of several people and damaged infrastructure and properties. It also cut of power supply, and disrupted road links to several parts of Bhutan.

While most of the months throughout the year were comparatively wetter than past years July was the wettest month of all. Specifically Sarbang was the wettest Dzongkhag in 2004 but Punakha and Wangdi valley received comparatively less rainfall.

August was the hottest month in 2004. While the annual average temperature in Bhutan in 2004 was approximately 17 degree Celsius, the average temperature in August was approximately 20 degree Celsius.

Average Temperature (degree centigrade) and Rainfall (mm) records of 2005

Dzongkhag		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Bumthang	MaxT	10.2	12.0	17.0	15.4	19.4	20.7	20.9	21.3	16.4	17.7	14.1	12.3
	MinT	-2.6	-2.5	4.0	6.7	10.5	13.3	14.1	14.7	10.6	8.4	1.4	-2.1
	RF	0.9	0.0	0.2	4.3	2.7	5.3	3.9	3.2	1.5	5.1	0.0	0.0
Chukha	MaxT	11.1	16.4	22.1	21.4	23.0	24.2	22.1	23.5	22.9	22.3	20.4	17.5
	MinT	2.6	6.0	12.1	13.5	16.8	18.2	18.8	20.0	17.7	15.2	10.3	7.7
	RF	2.2	1.1	1.3	4.7	6.5	6.4	12.1	3.3	5.6	3.0	0.1	0.0
Dagana	MaxT	9.8	12.1	16.1	19.3	23.0	22.4	22.2	24.4	22.8	20.7	15.4	13.0
	MinT	9.1	11.1	11.0	14.9	17.2	21.2	21.2	20.8	21.1	19.6	11.1	11.2
	RF	0.9	0.3	1.9	2.5	1.9	5.7	9.9	2.7	3.0	5.0	0.0	0.2
Gasa	MaxT	9.6	9.5	13.7	15.2	17.6	21.0	23.0	22.7	21.5	19.1	16.2	10.4
	MinT	-1.3	-1.4	4.2	7.9	10.4	13.5	13.3	12.5	11.9	10.3	6.1	-1.3
	RF	1.0	2.3	1.9	1.7	6.0	10.2	14.0	15.4	3.7	2.8	0.8	0.9
Haa	MaxT	9.0	9.8	14.5	14.5	16.3	17.6	18.1	20.2	12.4	15.5	11.8	11.1
	MinT	-5.3	-2.9	2.9	6.5	11.3	13.6	15.6	15.6	3.3	7.0	1.2	-1.5
	RF	1.0	0.1	0.9	1.5	1.2	4.4	4.3	5.2	0.0	2.9	0.0	0.0
Lhuentse	MaxT	23.0	24.8	29.4	27.4	27.3	29.8	32.2	26.4	25.9	23.0	19.0	16.7
	MinT	3.2	4.2	10.6	11.5	11.6	14.1	17.3	18.0	17.3	12.9	10.5	5.1
	RF	0.6	0.4	1.2	5.1	5.2	1.6	4.6	3.2	3.0	5.2	0.0	0.0
Mongar	MaxT	15.4	25.2	22.2	22.1	23.2	25.8	24.2	28.6	26.5	24.3	20.9	17.6
	MinT	5.5	6.7	11.7	11.8	15.6	17.2	17.9	18.5	17.7	14.6	9.4	7.0
	RF	0.3	0.0	0.6	2.7	3.4	2.5	11.2	0.0	1.2	4.5	0.1	0.0
Punakha	MaxT	20.4	22.4	26.1	26.5	29.8	30.3	27.4	26.4	29.1	27.9	24.7	21.9
	MinT	7.0	5.7	11.2	13.3	17.4	18.0	17.3	16.1	18.5	15.5	9.0	5.4
	RF	0.4	0.1	0.6	0.8	2.7	4.0	2.8	1.8	2.7	2.2	0.0	0.0
Paro	MaxT	14.2	14.3	18.8	20.0	21.4	24.1	29.9	26.5	25.3	15.8	10.6	9.4
	MinT	4.5	3.3	9.6	12.0	15.0	18.2	19.6	19.3	18.3	14.1	8.2	2.9
	RF		1.5	0.5	0.8	1.3	2.3	4.0	3.4	2.4	2.1	0.0	0.0
Pemagatshel	MaxT	17.9	19.2	21.2	22.0	24.1	25.7	25.9	26.5	25.4	26.0	28.0	20.5
	MinT	4.5	5.0	7.3	6.5	4.4	12.7	17.6	7.8	6.1	11.7	9.6	7.7
	RF	0.4	0.5	3.3	9.2	10.1	15.4	23.4	2.6	5.0	6.8	0.1	0.1

Dzongkhag		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
S/Jongkhar	MaxT	23.0	26.6	29.9	27.3	31.3	31.8	30.7	34.4	30.7	29.2	28.6	26.7
	MinT	12.4	14.0	17.9	19.9	21.9	23.6	23.3	24.5	24.1	21.5	17.0	12.4
	RF	0.0	1.6	3.7	9.6	14.4	16.1	35.7	5.2	12.1	12.3	0.0	0.3
Samtse	MaxT	20.5	24.4	26.6	27.3	29.5	29.0	28.1	29.9	28.3	26.7	26.9	24.9
	MinT	13.4	15.2	15.1	20.1	22.7	23.7	23.7	24.9	24.1	21.9	18.3	16.0
	RF	1.0	0.4	1.9	6.5	19.1	28.2	44.3	23.1	21.4	12.4	1.5	0.8
Sarpang	MaxT	22.7	25.2	20.6	25.9	25.8	30.1	28.5	32.5	25.7	28.6	28.2	25.7
	MinT	14.5	15.1	9.6	15.9	17.7	22.1	22.6	23.4	21.5	21.2	17.9	15.9
	RF	0.5	1.1	3.9	12.9	28.5	35.3	60.2	13.5	15.7	13.7	0.3	0.1
Thimphu	MaxT	13.7	16.1	20.5	21.0	21.9	23.3	23.2	24.8	24.8	21.2	19.2	17.6
	MinT	-3.9	-2.1	3.8	7.7	11.0	13.5	14.6	14.1	12.7	7.2	-0.7	-3.9
	RF	0.7	0.2	0.4	1.1	1.2	4.1	5.6	6.3	1.2	2.7	0.0	0.0
Trashigang	MaxT	19.2	20.0	24.3	22.4	23.2	24.6	24.0	26.5	26.4	24.5	22.7	20.2
	MinT	6.9	9.8	15.4	14.9	17.6	19.8	19.8	20.4	19.5	18.3	14.7	11.7
	RF	0.0	0.0	0.7	7.3	4.5	7.5	13.3	9.2	4.4	6.9	0.0	0.0
Trashi Yangtse	MaxT	7.6	11.2	14.5	19.9	22.0	23.5	22.7	25.3	23.6	21.0	18.0	15.6
	MinT	4.6	8.8	11.6	10.5	13.9	16.3	17.2	17.3	16.6	12.3	6.3	3.2
	RF	0.5	0.2	0.5	4.3	2.8	6.5	9.2	5.7	3.7	4.7	0.0	0.0
Trongsa	MaxT	10.1	19.2	23.7	22.3	23.9	25.5	24.6	27.0	26.2	23.9	21.7	20.2
	MinT	2.3	2.8	14.4	16.3	19.0	20.9	21.7	21.6	21.5	16.7	6.9	6.1
	RF	0.8	0.3	1.3	5.5	4.6	6.6	8.5	5.9	4.9	6.7	0.2	0.0
Tsirang	MaxT	15.0	17.1	20.7	21.0	22.7	23.7	23.5	24.9	23.9	21.8	19.5	17.4
	MinT	4.7	5.4	11.2	13.0	15.5	17.2	17.9	17.9	17.6	13.7	7.8	6.1
	RF	0.5	0.3	1.3	4.9	3.8	13.1	16.0	4.5	3.0	6.3	0.1	0.0
Wangdi	MaxT	19.2	20.0	24.3	25.2	26.7	28.0	26.4	29.1	27.2	25.5	22.8	20.1
	MinT	6.4	7.4	13.6	15.5	18.2	20.5	20.8	21.2	20.3	16.4	9.7	7.1
	RF		0.2	0.3	0.9	1.7	2.7	4.1	2.4	3.2	2.8	0.0	
Zhemgang	MaxT	12.4	13.4	16.6	16.3	19.3	21.1	19.7	21.0	19.4	17.9	15.9	13.1
	MinT	5.0	6.6	12.9	13.7	16.6	18.1	18.1	19.2	17.6	14.8	11.4	8.7
	RF	0.9	0.2	1.1	5.1	7.1	10.7	14.1	3.3	4.4	4.2	0.0	0.0

Source: Agromet Office, CoRRB, MoA, 2005

Table 7. Commodities exported in 2004

Crops	Unit (MT)	Source
Apple	2,439.36	*BAFRA,MoA*
Oranges	18,577.66	*BAFRA,MoA*
Cardamom	135.79	*BAFRA,MoA*
Potatoes	22,835.00	*AMS, MoA*
Cabbages	920.00	*Auction yard, P/ling*
Beans	50.00	*Auction yard, P/ling*
Carrots	273.00	*Auction yard, P/ling*
Chili	126.00	*Auction yard, P/ling*
Peas	419.00	*Auction yard, P/ling*
Radish	168.00	*Auction yard, P/ling*