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## **Renewal Natural Resources (RNR) Census 2009**

### **Ministry of Agriculture & Forests**

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## Foreward

The Ministry of Agriculture & Forests is pleased to bring out the publication of the RNR Census 2009 which is the second of its kind in the history of RNR Sector. The publication presents comprehensive statistics on agriculture; livestock; some qualitative data on forestry; land holdings; constraints to agricultural development; accessibility to motor roads, markets and service centers; sources of cash income; status on food grain self-sufficiency; agriculture marketing; and inputs distribution.

The statistics are presented in two volumes: volume-I at national and dzongkhag levels, and volume-II at geog level. The database at household level of the census is maintained at the Policy and Planning Division. The household data will be useful for further analyses to facilitate government plans and programs to assist small farmers effectively.

The RNR census 2009 is an outcome of comprehensive coverage both in terms of households and data parameters. Therefore, the census results provide a highly accurate baseline statistics for the RNR Sector for targeting and monitoring of development programmes; and for improvement of the RNR statistical information system.

The Ministry of Agriculture & Forests extends appreciation for technical guidance provided by the National Statistics Bureau (NSB) during the whole process of preparation to completion of the RNR Census 2009. The Ministry also commends the Technical Departments and staff of the Information Management Sections for their excellent collaborations and contributions. Further the deepest appreciation must also be extended to our RNR colleagues in the 20 dzongkhags and 205 geogs for their unwavering support and cooperation while conducting the census.

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Lastly, I congratulate the Information Management Section of the Policy and Planning Division, Ministry of Agriculture & Forests for successful coordination and bringing out the publication of the RNR Census 2009.



Dr. Pema Gyamtsho  
MINISTER

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## Acronyms

AEC	Agriculture Extension Center
AMC	Agricultural Machinery Center
CEs	Census Enumerators
CFT	Cubic feet
CWG	Census Working Group
DANIDA	Danish International Development Assistance
DCCs	Dzongkhag Census Co-ordinators
DCSs	Dzongkhag Census Supervisors
DNRMC	Decentralized Natural Resource Management Component
DoA	Department of Agriculture
DoFPS	Department of Forest & Park Services
DoL	Department of Livestock
Dozs.	Dozens
FCB	Food Corporation of Bhutan
FMU	Forest Management Unit
FYM	Farmyard Manure
GDP	Gross Domestic Product
HQs.	Headquarters
IFPRI	International Food Policy Research Institute
IMS	Information Management Section
Kgs.	Kilogram
LEC	Livestock Extension Center
Ltrs.	Liters
LUPP	Land Use Planning Project
M <sup>3</sup>	Cubic meter
MoAF	Ministry of Agriculture & Forests
MT	Metric Tonne
NLC	National Land Commission
Nos.	Numbers
NPPC	National Plant Protection Center
NRDCL	Natural Resource Development Corporation Limited
NSB	National Statistics Bureau
NWFP	Non-wood forest products
PP Chemicals	Plant Protection Chemicals
Qty.	Quantity
RAMC	Regional Agricultural Machinery Center



RNR	Renewable Natural Resources
RNR EC	Renewable Natural Resource Extension Center
SYB	Statistical Yearbook

### **Descriptions**

Agricultural Constraints	Hindrances to achieving full benefits of RNR resources potential.
Agricultural Inputs	Inputs applied to support production and productivity.
Bearing Trees	Fruit trees that have reached a level of maturity where fruits are produced.
Chemical Fertilizer	Manufactured chemical compounds such as phosphate, potassium, nitrogen and other mixed and complex fertilizers applied to soil to enhance or improve production.
Dry Land	Agricultural land where crops are grown without irrigation.
Edible Items	Non-wood forest products that can be consumed by human.
Farm Household	A person or group of persons operating as one economic unit and engaged in agricultural production.
Food Grain Security	Consumers' access to food at all times, meaning that a person has enough food grains to feed all through the year.
Handicraft Items	Furnitures and other wood and non-wood byproducts.
Herbicides	Chemical substances used for controlling unwanted weeds that compete with crops for nutrients, space and water.
Improved breed	Breed of animals, which has through human technology improved upon the off-springs of local stock or breeds of higher quality directly imported into the country.
Kitchen Garden	Part of the cultivated farmlands generally used growing vegetables and other horticulture crops. Kitchen gardens are generally located in the homestead.

Land Leased in	Temporary land sharing arrangement where a person takes over somebody's land for cultivation. The produce is shared, generally on a 50-50 basis or a fixed rent as mutually agreed between the two parties.
Land Leased out	It is the reverse of land leased in but similar arrangements adopted by both the parties.
Land Left Fallow	Land left uncultivated for a certain period of time to allow soil replenish its own fertility but could be due to shortage of farm labour.
Land Tenure	Land status or rights under which land is held or operated.
Land Use	Land operated by the farm household for various RNR productions.
Livestock	Domesticated animals such as cattle, yak, sheep, goats, pigs, horses, etc. including poultry.
Local Breed	Breed of animals indigenous or native to the country.
Medicinal Items	Plants capable of producing medicinal or aromatic substances, e.g. lemongrass, chirata, pipla etc.)
Medicinal Plants	Plants with medicinal value.
Nearest motor-road points	Any kind of motorable road (highway, feeder road, farm road, approach road etc.) that is nearest to the household.
Nearest RNR Extension Centers	RNR related extension centers that are nearest to the household, such as RNR Extension Centers, Livestock Extension Centers and Agriculture Extension Centers.
Own Land Operated	An area legally possessed and cultivated by the land owner him/herself.
Paddy	Rice-paddy with husk (rough grain)
Pesticide/Insecticide	Poisonous chemicals substances applied in the field crops to control animal pests and insects.
Poultry	Birds such as hens, cocks, ducks, etc. whether native or improved.
Rice	Rice-paddy without husk (net grain).
Wetland	A terraced area, which has access to artificially provided irrigation to grow other than paddy. There are rainfed wetlands too but terrached.

## Executive Summary

The RNR Census 2009, which is the second of its kind in the country, aimed to capture information on RNR activities and production for the year 2008. The data was collected from at least 57,412 (93.2 percent) of the 61,578 rural households listed as having engaged in agricultural farming activities across 205 geogs and extended municipal areas in 20 dzongkhags. The remaining 4,166 (6.8 percent) households accounted for absentees or non-respondents. However, the figures have been compensated for the missing households wherever applicable. Compare to RNR Census 2000 an increased by 1.7 percent in the number of agricultural households and 5.4 percent in the number of households enumerated was recorded for 2008.

The analyses of the census results confirm that there was an improvement on the rural access to motor-roads. The proportion of rural households within less than 1 hour walking distance to motor-road points has increased to 53.0 percent and within 6 hours walking distance to 90.0 percent in 2008 from 40.2 percent and 83.5 percent respectively in 2000. Consequently, farm mechanization has also been improved as indicated by availability of higher numbers of major serviceable farm machineries reported for 2008 compared to 2000. However, in the context of the means of land cultivation, the analyses revealed that about 88.22 percent of the households reported to have been still using bullocks, 7.52 percent using power tillers / other machineries and 0.99 percent of the rural households digging manually.

For more than half of the rural households (59.4 percent), horticulture crops appeared to be the main sources of cash income followed by livestock products (33.6 percent) and off-farm activities (32.0 percent). However, for Gasa dzongkhag livestock production, transport services by yaks / horses and non-wood forest products reported to have been the important sources of cash income to 56.7 percent, 37.4 percent and 30.7 percent of the households respectively.

The rural farming communities did experience certain farming constraints during 2008. At least 55.74 percent of the rural households were affected by wildlife crop damaged and 30.61 percent households reported to have faced insufficient irrigation problem. Some of the important constraints reported were limited access to market for 21.67 percent households, affected by insects/pests and diseases on crops for 21.65 percent households and land shortage for 20.07percent households. However, while ranking in order of severity, insufficient irrigation, crop damaged by wildlife and land shortage appeared to be the most severe constraints. Maize accounts for the larger amount (69.38 percent) of the total cereal grains destroyed by wildlife while paddy accounts for 27.39

percent. Wildboar was responsible for destroying major amount (63.34 percent) of the total losses of cereal grains to wildlife. In general, about 6.16 percent of the cereal cultivated area has been estimated to have affected by wildlife with corresponding productions lost estimates of 3.26 percent while an estimated area of 1.77 percent of the potato cultivated area was reported to have destroyed with production losses estimates of 1.29 percent.

The overall decrease of 14 percent in agricultural land area has been observed from the findings of the study. Compared to 2000 data, the wetland area was decreased by 11 percent and dryland by 17 percent. However, the cash-crop-land (orchard) has increased by 12.1 percent. Consequently, the area put under the crop cultivation in general has also been decreased in 2008 although not much difference has been observed in the quantity of production. However, upon the completion of the ongoing nationwide cadastral land survey and granting of land kidu the agricultural land area is expected to be drastically changed which will have great impact on the crop productions.

As concerning to livestock, the yak population has increased by 15.9 percent and goats population by 9.1 percent compared to 2000. However, there has been a drastic decreased in the population of pigs, sheep, horses, and poultry by 54.1 percent, 47.0 percent, 19.9 percent and 14.3 percent respectively. Not much difference has been revealed in cattle population and diary productions but there was a drastic decrease in quantity of all types of meat productions.

In regards to the forestry sector, at least 89.76 percent of the households reported to be aware of the forestry rules. The forest management unit system (FMUS) was reported to have been known by about 38.76 percent, of which at least 79.12 percent has experienced positive impact while only 13.35 percent experienced the negative impact. About 79.48 percent of the households were of the opinion that the presence of electricity would reduce pressures on the forest resources. At least 16.61 percent of the households have reported to have registered as members to community forestry. The reasons for not being the community forestry members was that they were not aware of it (31.18%), no forest area (29.15%) and no interest (10.9%) of the households.

The survey questionnaire also included a section on the marketing of the farm products and expenditure on the food commodities. The analysis of this section reveals that a total of 2,027.95 millions ngultrum has been generated from sale of cereal grains and horticulture crops (78.55%), livestock products (14.90%) and forest products and byproducts (6.55%). A total of 832.43 millions ngultrum has been spent on the purchased of food commodities such as food grains (36.64%),

dairy products (14.5%), eggs (0.85%), fish (4.76%), meats (17.79%), cooking oil (16.17%), sugar (0.78%) and vegetables and others (8.51%).

As concerning to food-grain security situation, there was a slight decrease on the proportion of rural households with food-grain shortage from 56.2 percent in 2000 to 54.5 percent in 2008. However, the average food-grain shortage months has increased from 2.2 percent in 2000 to 3.5 percent in 2008. Food-grains production was reported to be not feasible for about 55 percent of the rural households in Gasa, 5 percent in Chhukha, 3.7 percent in Paro and 3.6 percent in Bumthang. At the national level the proportion of rural households for whom the food-grain production was not feasible, accounts for 1.6 percent.. The analyses on the cereal-grain production and purchased quantity indicated that the rural households were at least 86 percent self-sufficient in cereal-grains and only 14 percent was purchased to realize the total requirement.

With intention to fulfilling the information requirement at various administrative units and stages of developments, the findings of the census have been presented at national/sub-national and geog levels as volume I and volume II respectively. The volume II is presented in the separate publication. Furthermore, the households' level database is maintained and can be made available for analysis for various planning and other purposes as might be required in the future.



## CHAPTER I

### **1.1 Background**

Bhutan is predominantly an agrarian economy with about 69 percent of the population residing in the rural areas (RNR 10<sup>th</sup> Plan). The Renewable Natural Resources (RNR) Sector consisting of agriculture, livestock and forestry, provides livelihood to at least 66.6 percent of the population according to the Bhutan Living Standard Survey (BLSS) 2007 and its contribution to national GDP was 18.9 percent in 2008 (NSB SYB 2009). The agricultural practices have changed tremendously over the decades but the availability of baseline data however, has been mostly from the RNR census 2000.

The RNR Census 2009 is the second of its kind in the history of the Ministry of Agriculture & Forests in the country. The first RNR Census one was conducted in 2000. The census mainly focuses on the rural and extended municipal areas of the country where natural resources sector still dominates the development occupation of the populace. Broadly, the census covers activities and productions, socio-economic conditions and food security status, vital issues and constraints associated with the natural resources sector encompassing agriculture, livestock and forestry. The data was collected from the households in rural and extended municipal areas by administering structured questionnaires. The RNR extension officials with agriculture, livestock and forestry background posted in all 205 geogs of the country carried out the field data collection. The Decentralized Natural Resources Management (DNRM) Component under the Danida-supported Environment and Urban Sector Programme Support (EUSPS) of the MoA had sponsored the implementation of the RNR Census 2009.

### **1.2 Objective**

The natural resources sector (agriculture, livestock and forestry) continues to be the mainstay of the economy and livelihood. Because of the predominance of the sector in the rural economy, the availability of statistics on the RNR activities has ever become the unequivocal prime mover in the rural development. However, due to lack of sufficient, comprehensive and reliable data, the planning and execution of RNR development plans and programmes has often been handicapped. Therefore, the principal objectives of the RNR Census 2009 are the following:

- To provide updated and reliable statistical information on RNR activities at all administrative units for efficient monitoring, planning and policy making
- To enable an efficient study of small holding communities to facilitate government plans and programs to assist small farmers effectively.
- To provide baseline data for monitoring of millennium development goals (MDGs), particularly poverty and food security situations
- To provide basis for improvement of the RNR statistical information system and
- To facilitate the ongoing Royal Government's efforts to streamline information sharing and evaluation of planned development activities.

### **1.3 Scope and Coverage**

The RNR Census 2009 result presents the data for the year 2008 on the agricultural holdings, agricultural inputs, productions, collection of forest products and production of forest byproducts, marketing, accessibility to basic service centers and motor roads, food security status, issues and constraints of the farming households in the rural and extended municipal areas of the country.

The RNR Census 2009 aimed for complete enumeration of all households in the country engaged in RNR activities and production. However, of the 61,578 households listed as having engaged in the RNR activities only 57,412 (93.23 percent) households could be captured and 4,166 (6.77 percent) households turned out to be absentees. The absentees were those households whom the enumerators either failed to established contact with or found nobody representing them for enumeration even after three visits. The reasons for the absentees were to do with people on migration, involved in distant located off-farm activities, and away on pilgrimage and business.

### **1.4 Design and Data Collection Method**

The international agricultural census methodology adopted by Food and Agriculture Organization (FAO) of the United Nations (UN) was followed but customized to local conditions and requirements. The experiences accumulated by the ministry during the last 10 years or so, by way of implementation of the first RNR Census in 2000 and several consecutive surveys and other ad-hoc studies, served as the principal module in the overall process of the census



design and implementation. The lessons learnt and weaknesses identified, during implementation and monitoring of RNR Sector's 9<sup>th</sup> Plan (2002-2008) and preparation of the 10<sup>th</sup> Plan (2008-2013), in the context of availability and reliability of agricultural statistics, have been to the best possible extent incorporated, the technical expertise and guidance of National Statistic Bureau collaborated and comments of the relevant stakeholders integrated in the planning and design of the Census.

The data was collected through enumeration of individual households by administering a structured and close-ended questionnaire covering the activities of agriculture, livestock and forestry. The households' lists congregated from all the Geog RNR Extension Centers served as the basis for developing the census households list. The enumerators visited individual households but for few instances due to the scattered nature of settlements and distances between them, the respondents (farmers) had to be gathered at appropriate locations for the interview. The households that the enumerators failed to meet with or found no representatives even after three visits were considered as absentees or the non-respondents.

### **1.5 Data collection Period**

The RNR Census 2009 was intended to presents the data on RNR activities for the period between January 2008 and December 2008. It was imperative to have the data captured when farmers' (respondents) memory still could reveal the truth about their farming activities and production for the immediate past year. The data collection was therefore, targeted to be carried out in January 2009 which is the closest to the past year 2008. However due to severe winter climatic conditions the whole communities of certain geogs at extremely higher elevated parts of the country had been on seasonal migration to various warmer places. Some geogs still practices the traditional routine of remaining away for as long as two – three months from their villages on off-farm activities elsewhere. Therefore, the RNR Census operation in Laya and Lunana (Gasa) and Naja (Paro) had to be postponed and could be executed only in the month of July and August 2009 but the data collected was still for the year 2008.

### **1.6 Data Validation**

The data validation was scrutinized at three key components to bring down errors to the bare minimum.

- **At design of questionnaire:** The survey questionnaire, as mentioned earlier was generally a close-ended type. In other words, the

questionnaire was designed in a way that in most cases, the enumerators have to just write codes, tick and select from the list in order to ensure uniformity and prevent misspellings of the entries.

- **At field data collection:** Field data collection was done by the Extension Officers posted in the geogs. These officers were subject specialists and well acquainted in the local farming system and reasonably versed in local dialects. The briefing on the methodology and use of the questionnaire, provided for the enumerators, the supervisors and the field coordinators prior to the field data collection was an added value that impacted in an appropriate interviewing of the farmers and proper recording of the responses. The enumerators were provided with enumeration manual each for reference during the data collection. Further, the field supervisors, at the end of each day, checked the completed questionnaires for completeness and errors.
- **At data computation:** Computer literate recruits have done the data computation after having availed one week training on database operation. The database was designed in a same style and sequence as that of the questionnaire for easy operation and typographical errors were prevented by allowing imputing of codes, checking or ticking the boxes, and selection from the dropdown menu. Validation checks were also assigned to reject and popup alert messages in case the wrong or unintentional entries were made. Further, constant backstopping and close supervision have been ensured by assigning a permanent technical expert for the whole data computation period.

## **1.7 Data Processing**

The database was designed in MS Access Software and data entry was done in 20 computers by 20 temporary recruits, meaning the database was replicated into 20 files. After completion of the data entry, the contents of these 20 files have been merged to form a single file through establishment of union queries followed by once again validation wherever necessary and synchronization of data. Transformation of some variables (from codes to names, names to codes and check and tick boxes to absolute numbers) was required depending on the type and purpose of the data. The entire data organization and processing was performed through establishing queries in the MS Access program. Some analyses were also done in the same program but for major and in-depth analytical and graphical presentation purposes the dataset generated by the Access queries were exported to MS Excel program.

## **1.8 Organization of the census**

The scale of task and the complexities involved in the implementation of such a nationwide census is notably an enormous venture. Such an exercise by nature has administrative and political influence and therefore demands authority and integrated views and commitments of all relevant stakeholders. Because of these underlying reasons arrangement of the layers of people in the hierarchy with defined distinct roles and responsibilities was established as elaborated below.

## **1.9 RNR Census Working Group (CWG)**

The staff of the Information Management Sections (IMS) of the Policy and Planning Division (PPD), Department of Livestock (DoL), Department of Agriculture (DoA) and Department of Forests & Park Services (DoFPS) formed the CWG. The responsibilities of this group included planning and preparation of technical aspects of data collection materials which involves designing of questionnaires, developing methodologies, estimation of timeframe and budgetary requirement, training of field coordinators, supervisors and enumerators. The NSB focal person (a senior statistician) served as the technical advisor to the CWG throughout the whole processes of preparations and implementations. The National RNR Census Coordinator (NCO) was appointed from the IMS of PPD for overall management and coordination of the census implementation in the country.

## **1.10 Dzongkhag RNR Census Coordinators (DCCs)**

The 20 DCCs were appointed (1 each for every dzongkhag) from among the 3 RNR sector heads (livestock, agriculture and forests). The DCCs were mandated for overall coordination of the census implementation in the dzongkhags. Their specific roles were to liaise with local leaders, mobilize field supervisors and enumerators, and monitor progress based on the work plan and submission of the completed questionnaires to the National Census Coordinators. Further, the DCCs were also to verify the daily subsistence allowance (DSA) claim of the field supervisors and enumerators, submit to the NCO and disburse the payment.

## **1.11 Dzongkhag RNR Census Supervisors (DCSs)**

Again the dzongkhag RNR sector (livestock, agriculture and forests) heads and their assistants served as the field supervisors. They were accountable to the DCCs and specifically responsible for mobilization of enumerators, supervision, checking the completed questionnaires for their completeness in an intended

manner and submit to the DCCs. There were at least over 60 supervisors distributed across the country.

### ***1.12 RNR Census Enumerators (CEs)***

The RNR extension officers posted in the geogs and trainees from College of Natural Resources (CNR) on field attachment have carried out the field enumeration. The enumerators were to complete the data collection in the geogs where they have been posted but depending on the size of the geogs, they needed to be adjusted or reshuffled to cover larger geogs. There were about 730 extension officers of agriculture, livestock and forestry backgrounds posted in 205 geogs of the country.

## **CHAPTER II**

### **Presentation of the detail outcome of the census**

This chapter provides the detail findings of the RNR Census 2009 on rural access to fundamentals facilities and services, agricultural inputs, sources of monetary income, farming constraints, land holdings and utilizations, agriculture and livestock productions, forestry resources and issues, marketing and food security for the year 2008.

It also contains some related statistics generated from the secondary data such as forest products supplied by the Department of Forests & Park Services (DoFPS) and Natural Resource Development Corporation Limited (NRDCL) for rural and urban consumptions in the country. The country's topographical (slope and altitudes) information presented in this publication has been derived from the Atlas of Bhutan produced by Land Use and Planning Project (LUPP) in 1997. Also some essential secondary information such as RNR infrastructures, agricultural inputs, food commodities purchased and distributed by Food Corporation of Bhutan (FCB) and food commodity average prices have also been presented in the annexures for use by general public.

#### **2.1 Access to Fundamental Services**

Access to basic services and motor roads are the most crucial components in the development of rural economy and livelihood. As of April 2010, there are at least 138 RNR Extension Centers (RNR EC), 40 Agriculture Extension Centers (AEC) and 42 Livestock Extension Centers (LEC) distributed across the country to cater extension services needs of the rural farming communities.

About 1390 kilometers of farm roads and 123 kilometers of power tiller tracks have been constructed to help farm mechanization and increase production; provide access to markets, technologies and inputs etc. A total length of 2660 kilometers of irrigational channel has been recorded to be fully functional as of April 2010.

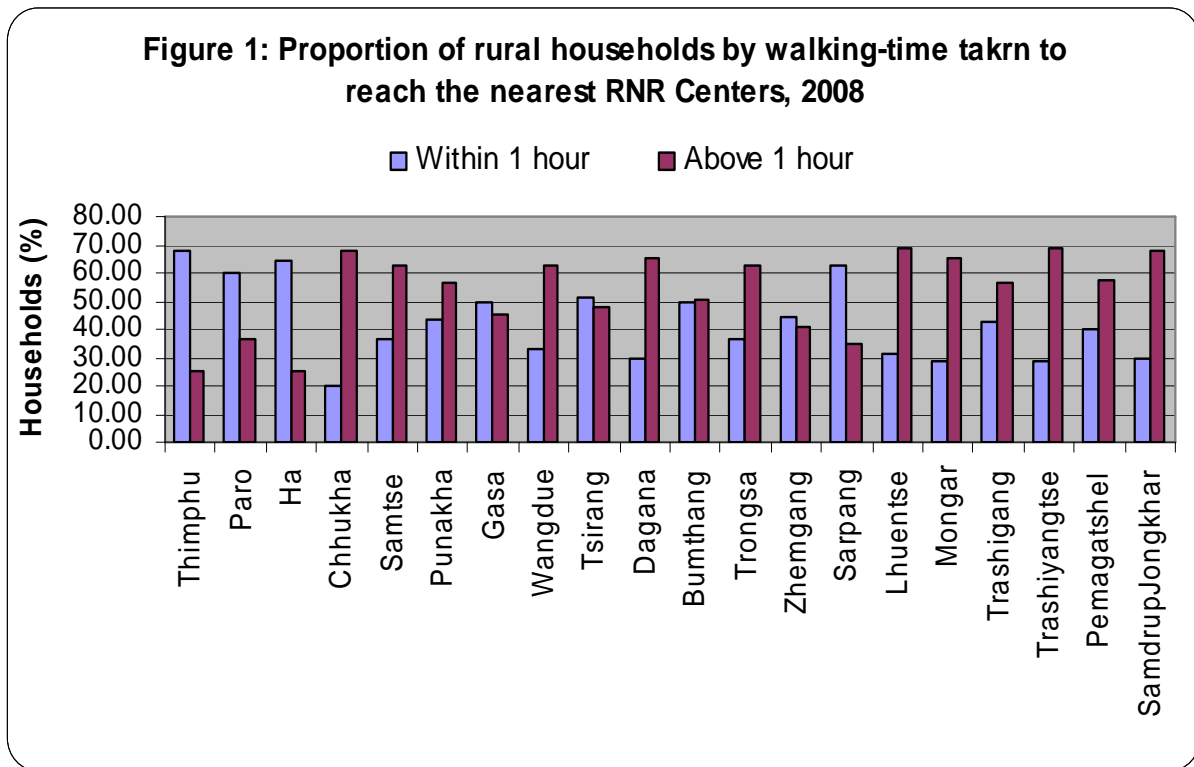
Today there are at least 61 active commission agents across the country for access by the farming communities for agricultural inputs such as seeds and fertilizers. These commission agents are affiliated to National Seed Center in Paro.

In regards to farm mechanization, there is one Agricultural Machinery Center (AMC) in Paro which is supported by three Regional Agricultural Machinery Centers (RAMC) located at Bajo (Wangdue), Khangma (Trashigang) and Bhur (Sarpang).

The rural communities also have easy access to all sorts of agricultural credit packages of small, medium and big scales for enhancement of investment opportunities.

### 2.1.1 Walking distances to nearest RNR centers

The RNR Centers here refer to the RNR Extension Centers, Agriculture Extension Centers and Livestock Extension Centers. Rural access to these centers and their services are crucial for enhancement of agriculture productivity and economic development. According to the census result, Thimphu dzongkhag has majority

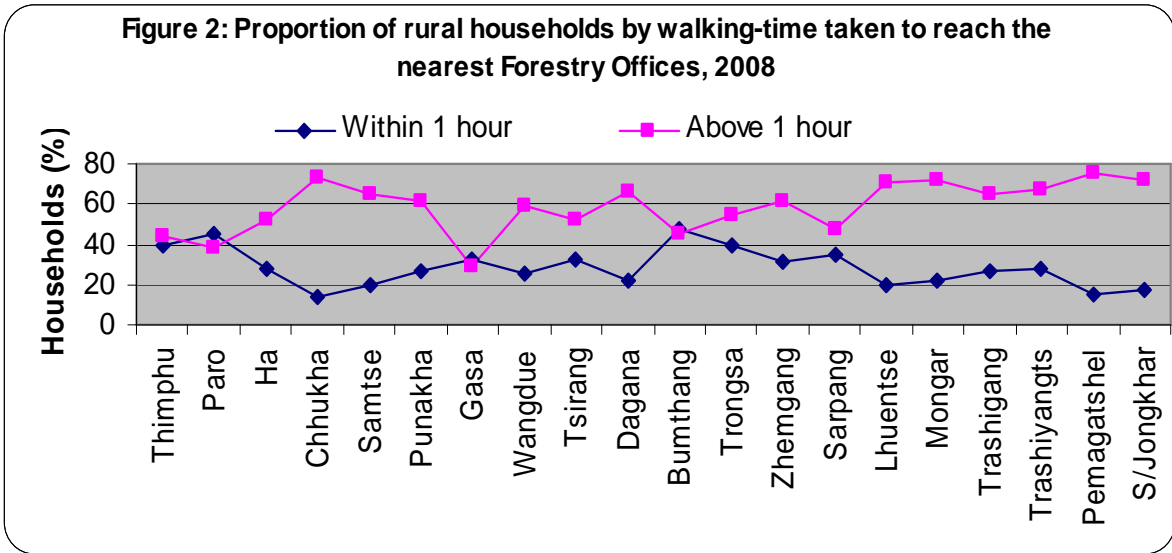


(68.11%) of its rural households residing within 1 hour walking distance to the nearest RNR centers followed by Ha and Sarpang with 63% and 62.65% and Paro and Tsirang with 59.76% and 51.33 households. Chhkha has the least proportion (19.92%) followed by Trashiyangtse (29.08%), Mongar (29.11%), S/Jongkhar (29.15%) and Dagana (29.53%) of the households within walking distance of 1 hour to the nearest RNR centers. At the national level, at least 40 percent and 60 percent of the rural households resided within and above walking distances of 1 hour respectively. See Figure 1 and Table 1.

### 2.1.2 Walking distances to nearest Forestry Offices

The forestry offices here refer to the Range Offices, Beat Offices, Forest Management Units, Parks and Territorial Divisional Offices. These offices provide support and monitor the harvest and utilization of the forest resources. In 2008

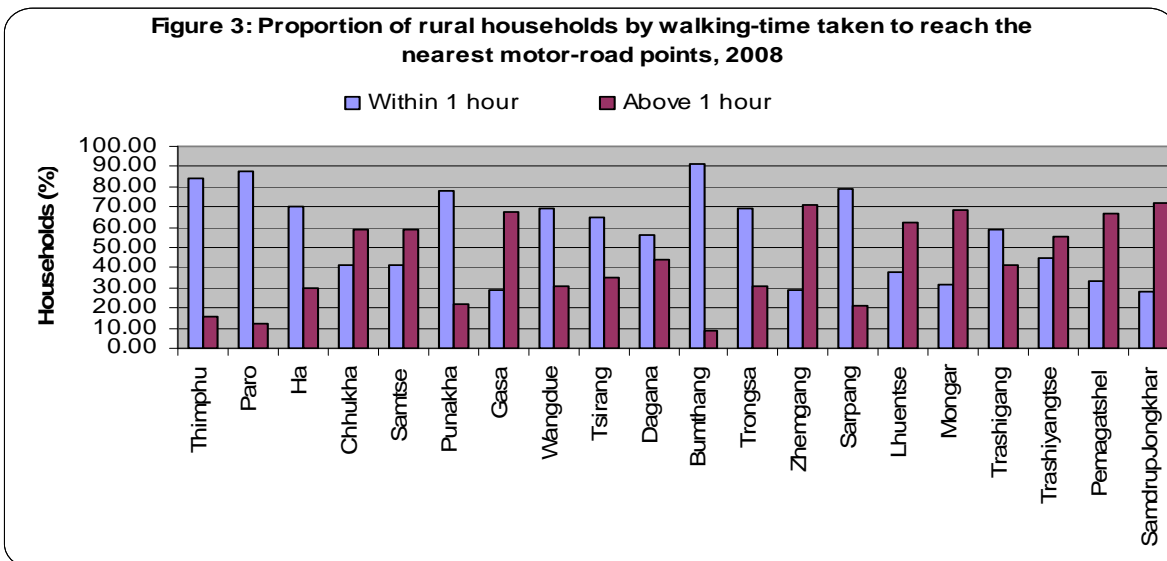
as revealed by the RNR Census 2009, Bumthang dzongkhag had more access with at least 47 percent followed by Paro dzongkhag with 45.02 percent of the households within walking distances of 1 hour. Chhukha dzongkhag had the least proportion of 13.93 percent followed by Pemagatshel with 15.04 percent,



S/Jongkhar with 17.86 percent and Samtse with 19.54 percent of the households within the walking distances of 1 hour to the nearest forestry offices. At the national level however, the majority (40.90%) of the rural households was concentrated within the walking distances of above 1 hour to the nearest forestry offices. See Figure 2 and Table 1.

### 2.1.3 Walking distances to nearest Motor Road Points

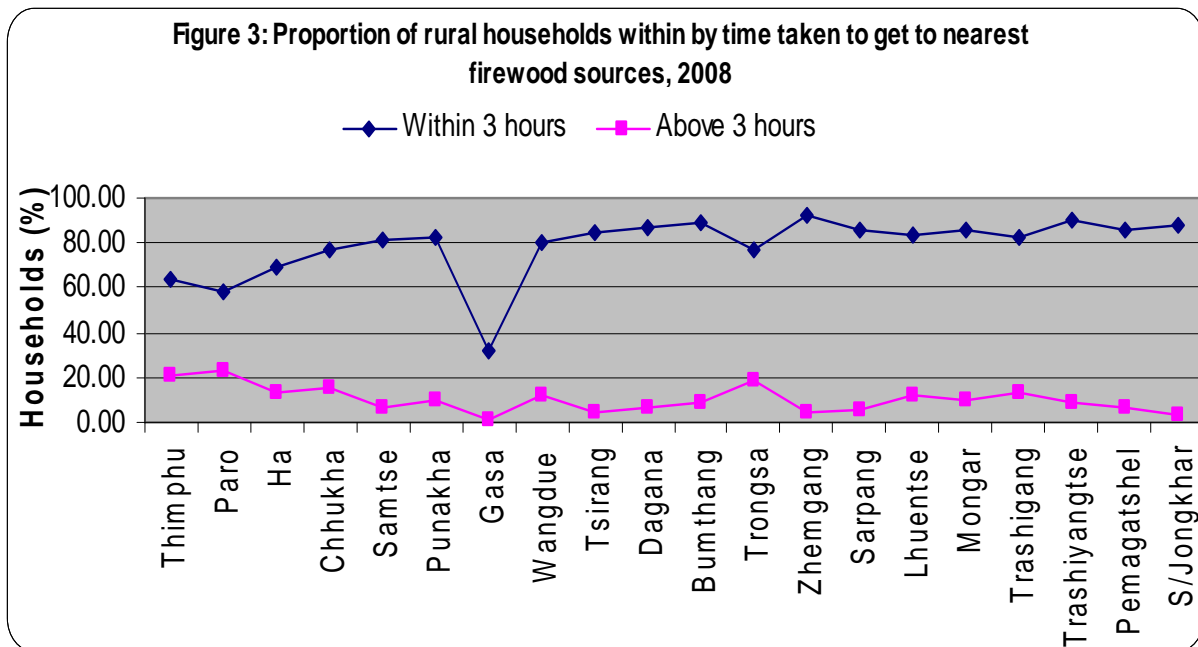
The motor roads here refer to all types of motorable roads such as national highway roads, district roads, approach roads, fedder roads, farm roads and



power tiller tracks. Improving of rural access to motor roads has been a biggest challenge given the rugged terrain and scattered settlements of the rural population. As the motor road access was seen as one of the important strategies to reduce poverty, the Ministry of Agriculture & Forests has always given highest priority for construction of farm roads and power tiller tracks. The RNR Census 2009 confirms that in 2008, Bumthang dzonkhag had the highest proportion (91.27%) followed by Paro (87.78%) and Thimphu (84.52%) of the households residing within the walking distances of 1 hour to motor road points. The most deprived dzongkhags were Gasa with 56.12 percent and Zhemgang with 63.23 percent of the households still have to walk more than 6 hours to reach to motor road points. Figure 3 shows the overall status while Table 1 gives the detail information on the general motor road access by rural households at dzongkhag level.

### 2.1.4 Walking distances to nearest Firewood Sources

Bhutan is considered a firewood-self-sufficient state and the major source for energy for cooking, home lighting and heating has traditionally been firewood. The domestic consumption of electricity is marginal and therefore the firewood still represents the major source for energy consumption for majority of the



population. However with the ever increasing population the availability of firewood is becoming less abundant at the proximity of the human settlements. The domestic electricity consumers is expected to increase with the ongoing emphasis on rural electrification programs which will minize the pressure on forest resources for firewood. Figure 3 depicts the proportion of rural households by distances to the nearest firewood sources in terms of walking-time taken in 2008.



**Table 1: Walking time taken by rural households to nearest RNR Extension Centers and Motor-Road Points, 2008**

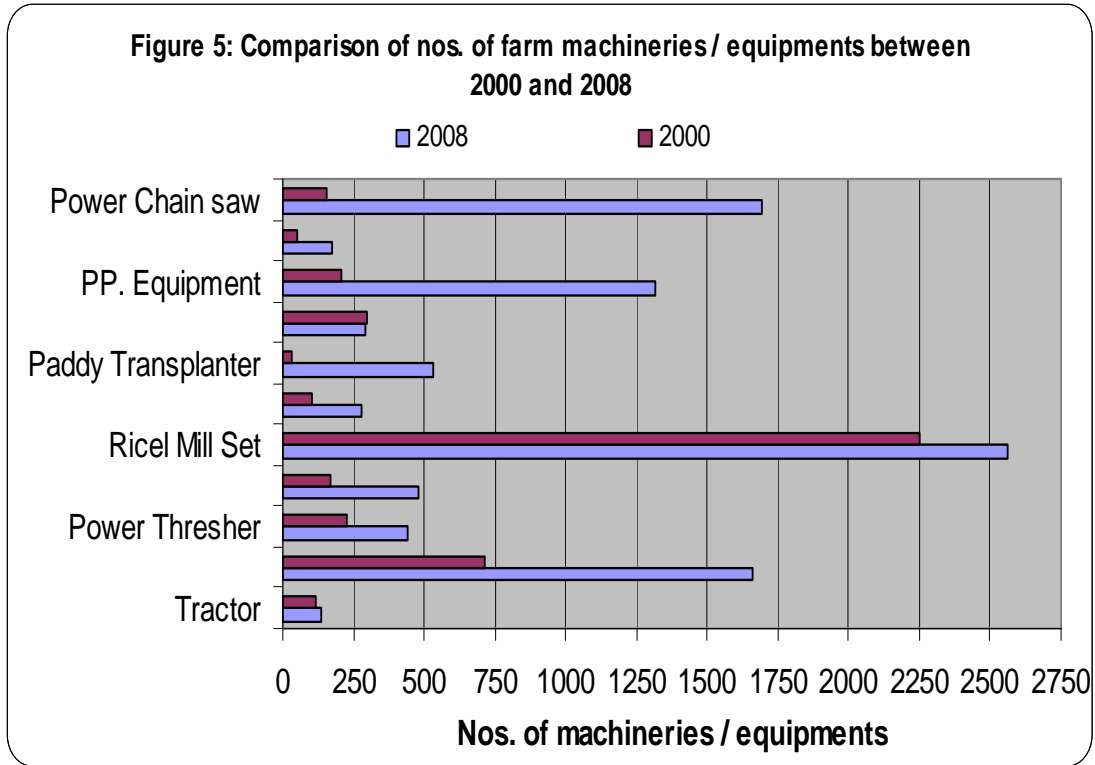
Dzongkhag	RNR Extension Centers						Motor-road points			
	Less than 1 hour	1-3 hours	3-6 hours	Less than 1 hour	1-3 hours	3-6 hours	6 hours - 1 day	More than 1 day	6 hours - 1 day	More than 1 day
Thimphu	68.1	21.9	3.0	0.5	6.5	84.5	2.7	0.5	0.3	12.0
Paro	59.8	26.8	6.2	3.5	3.2	87.8	6.1	3.6	0.8	1.4
Ha	63.9	16.6	6.6	1.8	11.1	69.9	2.9	0.7	0.5	26.1
Chhukha	19.9	26.7	22.4	18.5	12.5	40.9	18.8	12.6	8.7	19.1
Samtse	36.3	35.2	21.2	6.5	0.8	41.0	22.0	12.4	11.3	13.4
Punakha	43.8	45.2	10.5	0.5	0.0	78.0	19.6	2.2	0.3	0.0
Gasa	49.2	19.9	10.2	14.8	0.9	28.6	2.8	8.6	0.5	55.7
Wangdue	32.9	45.8	9.4	7.5	4.4	68.9	19.1	5.0	5.6	1.5
Tsirang	51.3	41.1	6.2	0.8	0.5	64.6	29.5	5.0	0.6	0.3
Dagana	29.5	39.3	18.2	7.4	5.6	56.3	20.9	11.9	8.8	2.2
Bumthang	49.3	34.8	13.3	2.6	0.1	91.3	3.6	3.8	1.2	0.2
Trongsa	37.0	39.5	18.1	5.3	0.2	69.0	17.2	3.2	10.4	0.2
Zhemgang	44.7	24.0	8.9	8.5	14.1	29.3	5.6	1.9	13.3	49.9
Sarpang	62.7	25.7	7.1	2.3	2.3	79.3	5.7	3.1	4.9	7.1
Lhuentse	31.1	30.1	30.1	8.4	0.4	37.8	24.0	18.7	14.6	4.9
Mongar	29.1	38.3	18.5	8.5	5.6	31.5	25.6	19.3	5.4	18.1
Trashigang	42.8	34.0	17.4	4.8	0.9	58.5	19.4	8.6	8.2	5.4
Trashiyangtse	29.1	52.4	10.7	5.6	2.3	45.0	30.3	14.3	8.9	1.5
Pemagatshel	39.7	35.3	13.1	8.7	3.3	33.2	23.7	19.0	16.8	7.4
S/Jongkhar	29.2	35.8	23.0	9.0	3.2	27.7	15.8	19.8	14.5	22.3
Bhutan	40.1	34.9	15.0	6.4	3.6	53.6	18.2	10.2	7.7	10.3

**Table 2: Walking time taken by rural households to nearest Forestry Offices and Firewood Sources, 2008**

Dzongkhag	Forestry Offices					Firewood Sources				
	Less than 1 hour	1-3 hours	3-6 hours	6 hours - 1 day	More than 1 day	Less than 1 hour	1-3 hours	3-6 hours	6 hours - 1 day	More than 1 day
Thimphu	39.8	32.3	3.5	0.7	7.4	28.2	47.4	17.1	4.1	3.1
Paro	45.0	29.5	4.7	2.3	2.3	23.2	48.9	17.1	6.6	4.2
Ha	28.1	33.4	7.4	1.5	10.1	24.7	58.9	7.9	6.0	2.5
Chhukha	13.9	34.8	15.6	15.8	6.8	19.1	64.3	14.0	1.4	1.3
Samtse	19.5	37.4	15.4	9.6	3.1	35.5	56.6	5.1	0.8	2.1
Punakha	27.1	48.0	8.0	1.9	3.9	43.5	46.1	6.4	0.6	3.4
Gasa	32.8	27.7	0.7	0.5	0.0	51.7	45.5	2.8	0.0	0.0
Wangdue	26.0	43.9	10.1	3.8	1.1	39.0	48.4	8.4	3.7	0.5
Tsirang	32.8	41.6	8.2	0.7	2.0	58.9	35.7	2.2	0.4	2.8
Dagana	22.0	39.6	16.0	5.6	5.4	40.4	52.5	4.8	0.9	1.5
Bumthang	47.4	39.1	3.5	1.0	1.8	32.1	59.3	4.7	1.9	2.0
Trongsa	39.4	46.9	4.5	2.1	0.5	26.6	53.6	6.9	10.0	2.9
Zhemgang	31.0	23.7	6.7	9.3	21.5	34.0	61.4	2.3	0.9	1.4
Sarpang	35.0	35.6	6.8	1.7	3.6	40.4	53.2	4.7	0.3	1.4
Lhuentse	19.8	36.8	22.0	11.2	1.0	30.7	57.0	10.9	1.4	0.1
Mongar	21.5	48.7	12.9	6.0	4.1	23.8	65.3	7.5	2.2	1.1
Trashigang	26.2	47.3	13.3	3.7	1.2	24.1	62.4	11.0	1.2	1.3
Trashiyangtse	27.4	54.8	7.8	3.9	1.0	30.2	61.3	6.3	1.9	0.3
Pemagatshel	15.0	40.1	21.4	8.7	5.1	27.4	65.1	6.3	0.9	0.3
S/Jongkhar	17.9	47.6	12.7	7.9	3.6	19.9	75.9	3.4	0.5	0.3
Bhutan	26.0	40.9	11.7	5.7	3.9	31.7	57.5	7.5	1.8	1.5

### 2.1.5 Farm Machineries and Equipments

The farm mechanization plays a pivotal role in the agricultural development of the country. For promotion of farm mechanization in the country there is one Agriculture Machinery Center (AMC) in Paro with 3 regional centers (RAMC) at Bajo (Wangdue), Bhur (Sarpang) and Khangma (Trashigang). The AMC has established numbers of agro-based enterprises in the country such as rice mills, flour mills, oil mills, power tillers etc. The comparison of available numbers of machineries in 2008 with that of 2000 indicates the overwhelming demands for such labor saving machineries and equipments. Figure 5 shows the differences in the quantity of available machineries and equipments between 2000 and 2008. *See also Table 2.*



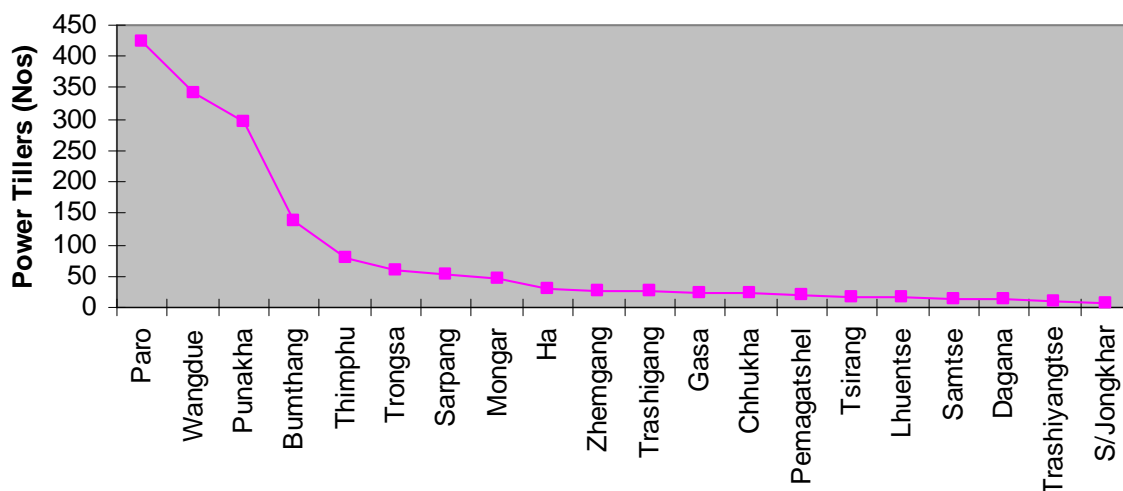
**Table 3a: Availability of serviceable farm machineries and equipments (Nos), 2008**

Dzongkhags	Availability of serviceable farm machineries and equipments during 2008 (Nos)									
	Tractor	Power Tiller	Power Thresher	Diesel Engine Thresher	Rice Mill Set	Oil Mill Set	Power Reaper	Maize Sheller	Paddy Transplanter	Bullock-drawn Plow
Thimphu	14	80	21	6	55	5	1	0	6	14
Paro	16	425	130	20	155	5	43	2	107	4
Ha	0	30	1	0	9	120	0	1	0	0
Chhukha	4	23	3	1	92	3	4	13	0	17
Samtse	1	14	0	0	94	3	0	2	1	0
Punakha	5	297	102	17	512	27	1	0	198	0
Gasa	1	24	16	1	20	0	0	0	0	0
Wangdue	27	341	133	61	349	37	4	8	209	13
Tsirang	2	15	2	1	102	8	0	9	2	1
Dagana	1	13	3	3	99	6	1	11	4	28
Bumthang	47	137	11	9	12	3	1	0	1	5
Trongsa	2	58	3	14	108	8	1	4	2	3
Zhemgang	3	27	1	3	67	12	0	5	0	25
Sarpang	5	54	4	1	60	4	0	21	1	2
Lhuentse	1	15	1	1	188	1	0	4	1	19
Mongar	4	46	5	135	114	11	1	38	0	3
Trashigang	1	26	0	50	326	9	2	43	2	244
Trashiyangtse	0	10	0	83	159	9	0	6	1	1
Pemagatshel	2	21	2	56	7	3	0	5	0	4
S/Jongkhar	0	6	1	17	37	2	0	6	0	1
<b>Bhutan</b>	<b>136</b>	<b>1662</b>	<b>439</b>	<b>479</b>	<b>2565</b>	<b>276</b>	<b>59</b>	<b>178</b>	<b>535</b>	<b>384</b>

**Table 3b: Availability of serviceable farm machineries and equipments (Nos), 2008**

Dzongkhags	Availability of serviceable farm machineries and equipments during 2008 (Nos)										
	Rotary Paddy Weeder	Power Sprayer	PP Equipment	Secature	Water Pump	Power Chain Saw	Hand-operated Winnower	Corn Flake Machine	Vegetables / Fruits Drier	Silo	
Thimphu	7	35	77	80	7	61	5	0	0	1	
Paro	67	72	162	356	134	106	34	0	1	2	
Ha	0	11	38	58	2	9	1	0	0	1	
Chhukha	1	37	440	5	0	39	0	0	0	0	
Samtse	1	7	67	1	5	25	0	1	0	6	
Punakha	8	4	24	14	6	158	6	1	15	2	
Gasa	2	3	1	0	0	15	4	0	1	0	
Wangdue	8	50	149	28	8	284	7	2	9	1	
Tsirang	3	10	108	49	1	76	3	3	0	3	
Dagana	2	24	57	58	6	71	3	2	1	0	
Bumthang	2	11	78	23	2	202	3	0	0	105	
Trongsa	0	2	2	2	0	158	2	22	1	8	
Zhemgang	0	1	0	5	0	47	1	37	2	19	
Sarpang	1	5	71	14	1	43	1	5	0	0	
Lhuentse	0	2	1	2	1	93	63	8	1	0	
Mongar	1	5	11	20	0	112	0	40	1	6	
Trashigang	2	1	4	9	1	69	10	10	4	12	
Trashiyangtse	1	1	0	5	0	73	1	3	1	0	
Pemagatshel	4	3	19	18	0	28	6	10	0	1	
S/Jongkhar	0	8	7	10	3	27	1	0	0	0	
<b>Bhutan</b>	<b>110</b>	<b>292</b>	<b>1316</b>	<b>757</b>	<b>177</b>	<b>1696</b>	<b>151</b>	<b>144</b>	<b>37</b>	<b>167</b>	

**Figure 6: Nos. of serviceable power tillers available with the rural households in 2008**



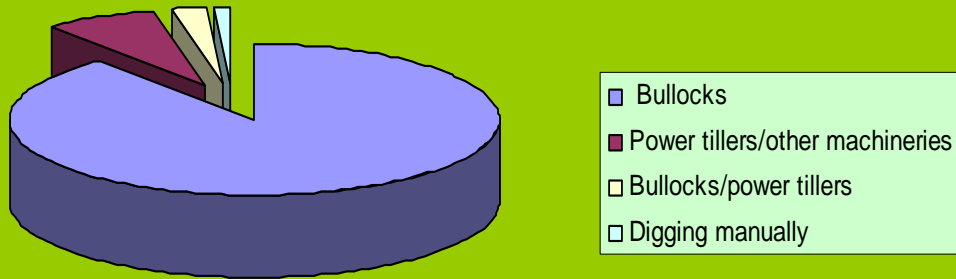
## 2.1.6 Means of Land Cultivation

The analyses of the census indicated that there was an improvement on the farm mechanization as a result of improvement in the rural accessibility to motorable-roads in 2008 compared to 2000. However, in the context of the means of land cultivation, the result reveals that about 88.22 percent of the households reported to have been still using bullocks, 7.52 percent using power tillers / other machineries and 0.99 percent of the rural households digging manually at the national level. Going by the proportion of rural households in the dzongkhags using power tillers and other machineries for land cultivation, (See Table 3) Paro (44.03%) and Bumthang (40.90%) followed by Punakha (33.35%), Wangdue (32.47%) and Gasa (30.49%) dzongkhags were found to be better-off in the context of the farm mechanization. The dzongkhags with proportion of less than 1 percent of the rural households in the dzongkhags using power tillers and other machineries were Samtse, Chhukha, Dagana, Mongar, Trashiyangtse and Samdrupjongkhar.

**Table 4: Percent households by various means of land cultivation, 2008**

Dzongkhags	Percent households by various means of land cultivation used			
	Bullocks	Power tillers/other machineries	Bullocks/power tillers	Digging manually
Thimphu	64.97	23.57	4.43	7.03
Paro	44.67	44.03	9.60	1.71
Ha	82.73	7.23	5.72	4.32
Chhukha	98.64	0.75	0.62	0.00
Samtse	99.36	0.49	0.12	0.03
Punakha	60.11	33.35	6.50	0.05
Gasa	64.53	30.49	4.27	0.72
Wangdue	61.02	32.47	4.11	2.40
Tsirang	98.55	1.00	0.17	0.28
Dagana	99.04	0.76	0.17	0.03
Bumthang	43.40	40.90	14.30	1.40
Trongsa	88.54	4.62	5.05	1.80
Zhemgang	93.29	3.09	3.03	0.59
Sarpang	92.44	3.61	3.72	0.23
Lhuentse	96.44	2.23	1.21	0.12
Mongar	98.05	0.86	1.05	0.04
Trashigang	96.26	1.63	1.15	0.96
Trashiyangtse	96.69	0.96	0.92	1.43
Pemagatshel	89.71	3.60	1.25	5.44
S/Jongkhar	98.62	0.86	0.22	0.31
Bhutan	89.22	7.52	2.26	0.99

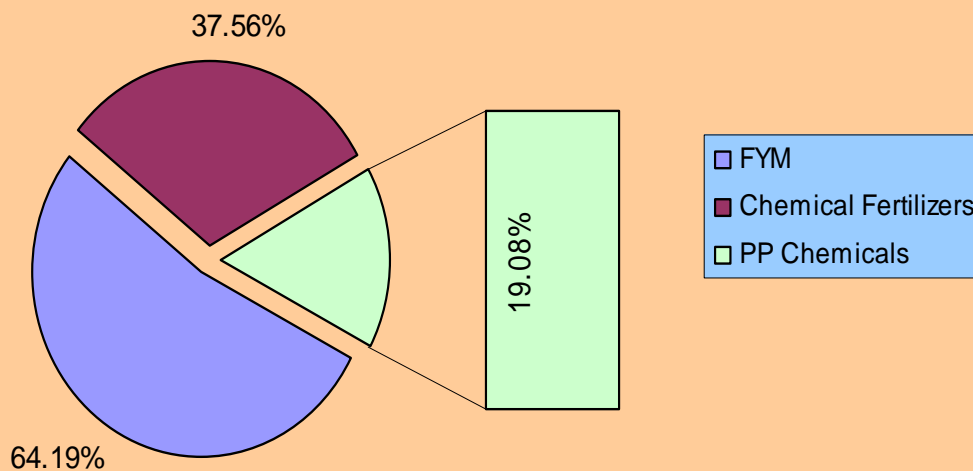
**Figure 7: Proportion of rural households by means of land cultivation used in 2008**



### 2.1.7 Fertilizers and Plant Protection Chemicals

Farmyard manure (FYM) and chemical fertilizers are the two major sources of soil nutrient for crop production. The FYM is produced locally while the chemical fertilizers are imported. Bhutanese farmers also use certain plant protection chemicals against pests / diseases and unwanted vegetations for optimum crop

**Figure 8: Proportion of rural households who used various fertilizers and plant protection chemicals during 2009**



productions. According to Figure 5 above, Gasa dzongkhag however, has the highest (91.22%) and Zhemgang the least (19.69%) proportion of households applying FYM.

**Table 5: Percent households by quantity of organic, chemical fertilizers and PP Chemicals used, 2008**

Dzongkhags	Organic Fertilizers		Chemical Fertilizers		Plant Protection Chemicals	
	Households (%)	Quantity (MT)	Households (%)	Quantity (MT)	Households (%)	Quantity (MT)
Thimphu	53.54	1,923.51	66.67	135.89	48.11	18.73
Paro	79.28	5,890.25	83.15	280.56	67.71	449.37
Ha	75.92	2,350.74	51.09	45.40	30.96	15.16
Chhukha	48.13	3,043.41	11.90	22.62	15.84	20.97
Samtse	72.41	6,645.13	2.19	21.10	4.21	10.90
Punakha	85.59	5,575.48	70.54	159.73	48.50	28.54
Gasa	91.22	822.85	0.00	0.00	0.23	1.00
Wangdue	83.98	8,412.88	64.58	141.14	46.14	40.29
Tsirang	76.12	5,267.56	10.64	46.80	18.26	12.11
Dagana	64.16	2,798.26	7.58	31.25	16.11	12.01
Bumthang	63.05	2,008.68	92.17	158.55	15.50	6.48
Trongsa	64.66	985.00	20.42	22.95	13.92	4.20
Zhemgang	19.69	942.01	2.16	0.75	6.87	5.88
Sarpang	32.37	2,292.17	7.55	32.35	8.48	21.75
Lhuentse	70.67	2,965.91	36.52	186.61	9.85	5.25
Mongar	67.91	9,699.75	37.20	297.98	7.02	14.08
Trashigang	66.22	6,521.45	74.23	631.62	5.79	6.94
Trashiyangtse	79.68	3,494.86	64.40	205.49	6.17	4.16
Pemagatshel	54.64	3,855.49	38.20	135.43	6.42	6.68
S/Jongkhar	34.50	1,235.75	10.05	76.15	5.56	6.30
<b>Bhutan</b>	<b>64.19</b>	<b>76,731.14</b>	<b>37.56</b>	<b>2,632.35</b>	<b>19.08</b>	<b>690.78</b>



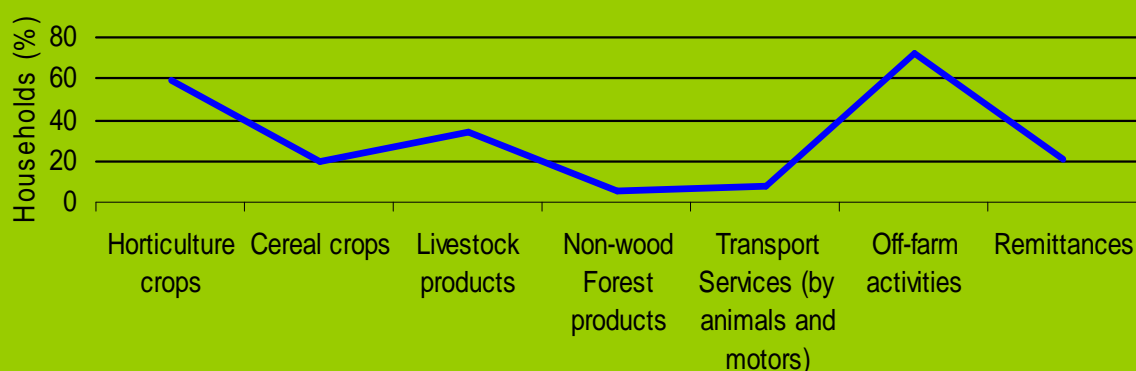
## 2.2 Monetary Income Sources

The monetary income here refers to the amount of money received during the period from January 2008 to December 2008 by rural households. While the monetary income sources refer to activities and products in exchange of which the monetary income (cash) was accumulated. See Table 4 - 5 and Figure 9 - 10.

**Table 6: Percent households by various sources of monetary income, 2008**

Dzongkhags	Percent households by various sources of monetary income						
	Horticulture crops	Cereal crops	Livestock products	Non-wood forest products	Transport Services (by animals and motors)	Off-farm activities	Remittances
Thimphu	59.61	15.04	33.36	20.52	11.04	50.78	5.89
Paro	79.65	35.33	27.84	2.59	7.63	54.05	8.86
Ha	55.74	14.96	43.99	8.10	14.96	70.97	17.90
Chhukha	69.20	12.15	38.11	3.31	4.89	65.92	11.70
Samtse	67.32	12.63	29.24	1.19	1.46	72.41	17.71
Punakha	58.05	47.34	19.00	13.30	4.12	63.75	25.80
Gasa	23.49	19.30	56.74	30.70	38.14	16.74	1.16
Wangdue	65.74	14.44	53.08	18.75	6.23	59.17	18.04
Tsirang	65.29	16.62	34.08	0.89	3.12	70.99	22.42
Dagana	59.05	10.72	39.36	1.43	2.59	80.84	13.93
Bumthang	72.47	26.62	32.05	16.60	7.64	59.65	16.27
Trongsa	57.89	35.73	47.32	6.86	4.57	59.62	14.98
Zhemgang	58.59	33.62	37.09	3.58	39.99	66.89	30.94
Sarpang	53.41	13.78	37.58	2.16	3.56	81.16	23.72
Lhuentse	32.34	23.44	34.87	9.24	4.28	79.83	29.07
Mongar	50.98	20.48	35.94	4.12	13.40	72.63	18.41
Trashigang	47.51	27.78	27.33	1.87	7.41	80.85	26.53
Trashiyangtse	46.01	18.53	27.65	3.94	4.44	90.80	27.24
Pemagatshel	68.00	8.72	19.26	1.94	12.49	69.80	31.97
S/Jongkhar	64.82	18.30	37.51	11.80	15.74	74.23	23.61
Bhutan	59.41	20.03	33.60	5.58	8.13	72.79	20.61

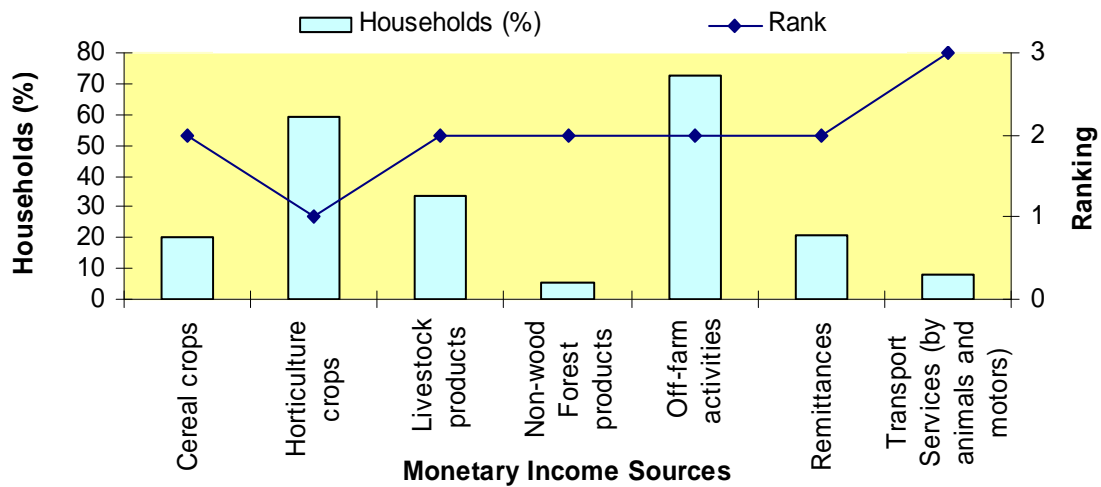
**Figure 9: Proportion of rural households by sources of monetary income, 2008**



**Table 7: Ranking of monetary income sources in order of importance (1 the most and 3 the least important), 2008**

Dzongkhags	Ranking of monetary income sources in order of importance (1 the most and 3 the least important)						
	Horticulture crops	Cereal crops	Livestock products	Non-wood forest products	Transport Services (by animals and motors)	Off-farm activities	Remittances
Thimphu	1	1	3	3	3	1	2
Paro	1	2	3	2	2	2	1
Ha	1	2	2	2	1	2	1
Chhukha	1	2	2	2	3	2	2
Samtse	1	2	3	2	2	2	2
Punakha	1	1	2	3	2	2	3
Gasa	1	2	2	2	3	2	3
Wangdue	1	3	2	3	2	2	1
Tsirang	1	2	2	2	2	2	2
Dagana	2	3	2	3	3	1	1
Bumthang	1	2	3	3	3	3	1
Trongsa	3	2	1	3	2	2	2
Zhemgang	1	2	3	2	3	2	2
Sarpang	3	2	1	3	3	1	1
Lhuentse	2	1	3	1	3	1	2
Mongar	1	2	2	2	2	1	2
Trashigang	1	2	2	2	2	2	3
Trashiyangtse	1	2	2	3	1	1	2
Pemagatshel	1	2	1	2	3	2	1
S/Jongkhar	1	2	1	3	3	2	1
Bhutan	1	2	2	2	3	2	2

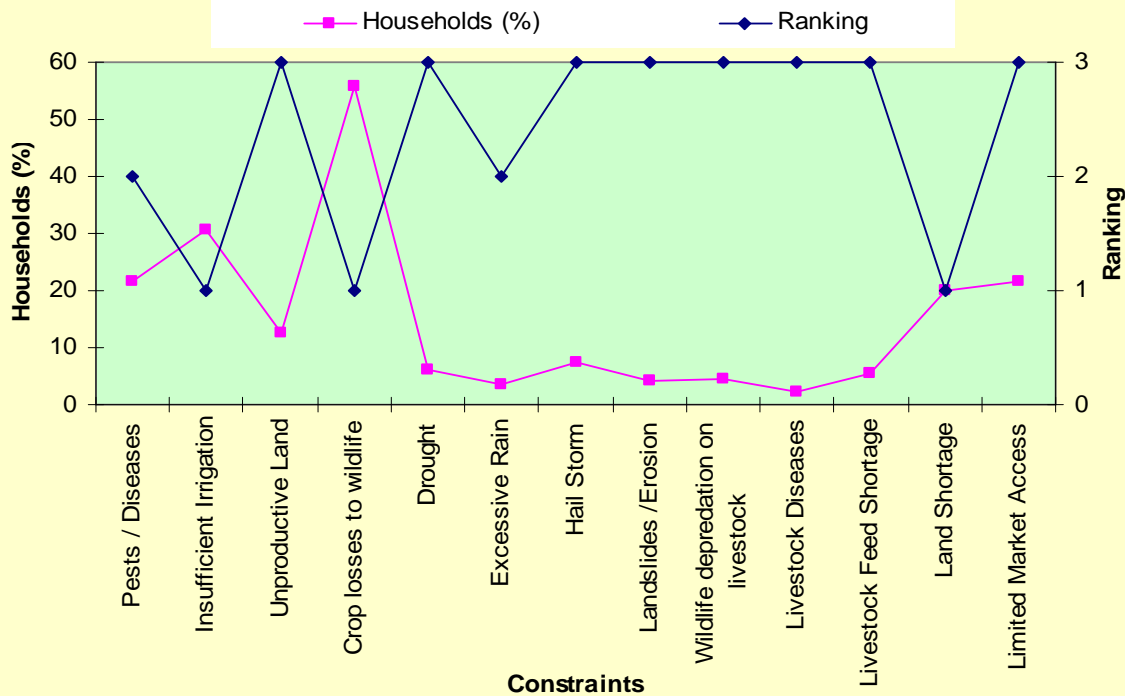
**Figure 10: Proportion of rural households and ranking of the monetary income sources, 2008**



### 2.3 Farming Constraints

Figure 11 shows that at least 55.74 percent of the rural households were affected by crop-damaged by wildlife and 30.61 percent of the rural households reported

**Figure 11: Proportion of rural households and ranking of the farming constraints, 2008**



to have faced insufficient irrigation problem. Some of the important constraints reported were limited access to markets for 21.67 percent, pests/diseases infestation on crops for 21.65 percent and land shortage for 20.07 percent of the

rural households. However, while ranking in order of severity (1 the most severe and 3 the least severe), insufficient irrigation, crop damaged by wildlife and land shortage appeared to be the most severe constraints followed by pests/diseases and excessive rain during 2008. The following tables will show the details.

**Table 8a: Percent households by various constraints encountered during 2008**

Dzongkhags	Insect /Diseases	Insufficient Irrigation	Unproductive Land	Crop damaged by wildlife	Drought	Excessive Rain	Hail Storm
Thimphu	17.0	28.9	9.1	37.3	5.0	2.3	3.4
Paro	17.6	45.9	11.8	34.6	14.7	2.8	1.2
Ha	19.0	26.9	12.2	63.8	11.0	4.0	3.5
Chhukha	18.1	28.0	19.5	52.7	9.7	8.0	12.3
Samtse	18.6	42.0	15.8	52.0	4.2	3.6	4.4
Punakha	20.5	51.3	6.7	38.4	3.0	2.8	0.8
Gasa	17.1	6.5	13.2	24.9	2.5	5.1	6.5
Wangdue	23.2	38.0	16.8	47.6	7.6	3.0	2.5
Tsirang	15.2	37.8	11.8	57.4	3.5	1.3	3.0
Dagana	28.9	47.2	20.9	55.5	5.8	1.3	1.1
Bumthang	13.2	6.4	11.2	60.9	6.0	26.1	3.1
Trongsa	17.6	42.1	9.6	70.7	5.2	2.9	4.9
Zhemgang	21.4	33.1	13.6	73.9	2.1	2.3	5.3
Sarpang	10.9	44.0	12.5	55.1	3.6	2.1	2.0
Lhuentse	29.1	26.1	10.1	52.1	5.6	4.2	3.7
Mongar	31.8	16.3	10.3	58.7	9.5	2.9	18.4
Trashigang	28.8	17.3	8.0	64.3	6.0	3.5	10.1
Trashiyangtse	25.6	35.4	10.9	72.5	4.6	1.0	10.4
Pemagatshel	15.0	4.6	9.3	61.0	7.4	4.2	21.2
S/Jongkhar	26.3	16.9	11.5	58.6	2.7	2.0	9.0
Bhutan	21.7	30.6	12.5	55.7	6.1	3.6	7.3

**Table 8b: Percent households by various constraints encountered during 2008**

Dzongkhags	Landslides /Erosion	Wildlife depredation on livestock	Livestock Diseases	Livestock Feed Shortage	Land Shortage	Limited Market Access
Thimphu	0.8	8.5	5.1	9.8	31.8	12.7
Paro	0.6	2.9	1.6	5.1	27.1	9.2
Ha	0.8	8.9	1.8	8.9	23.4	18.1
Chhukha	6.2	3.4	2.9	6.4	21.7	24.5
Samtse	6.1	1.3	1.5	3.8	25.9	33.6
Punakha	3.5	8.0	2.0	6.5	32.8	18.9
Gasa	3.7	31.2	18.2	24.3	33.0	30.0
Wangdue	1.4	13.9	4.3	15.1	31.3	18.1
Tsirang	3.7	0.4	0.8	3.0	23.5	23.9
Dagana	7.3	4.1	4.8	4.1	21.0	23.9
Bumthang	0.6	9.0	5.2	6.0	21.1	12.1
Trongsa	2.2	14.3	2.6	5.3	26.4	17.9
Zhemgang	9.3	8.9	3.2	3.6	11.8	27.9
Sarpang	5.5	2.5	5.0	3.6	22.6	21.3
Lhuentse	6.0	3.2	1.3	1.3	22.6	18.4
Mongar	4.2	2.6	1.4	4.3	11.0	21.6
Trashigang	5.3	4.5	1.9	6.8	13.4	15.1
Trashiyangtse	5.2	1.6	0.7	5.5	10.7	8.4
Pemagatshel	2.4	1.7	0.8	3.8	8.0	21.4
S/Jongkhar	3.1	2.4	1.0	2.1	12.1	35.1
Bhutan	4.3	4.5	2.4	5.4	20.1	21.7

**Table 9: Ranking of the farm constraints (1 the most and 3 the least important constraints), 2008**

Dzongkhags	Ranking of the farm constraints (1 the most and 3 the least important constraints)												
	Insect /diseases	Insufficient irrigation	Unproductive land	Crop lost to wildlife	Drought	Excessive rain	Hail storm	Land slides /erosion	Wildlife depredation on livestock	Livestock diseases	Livestock feed shortage	Land shortage	Limited market access
Thimphu	2	1	1	1	2	3	3	3	3	3	3	1	2
Paro	2	1	1	2	3	1	2	3	3	2	2	3	1
Ha	2	3	1	2	3	2	3	2	2	3	3	1	1
Chhukha	1	1	3	3	2	3	3	2	3	3	2	2	1
Samtse	3	1	3	2	3	2	3	2	3	3	3	1	1
Punakha	2	1	3	2	2	3	3	2	3	3	3	1	3
Gasa	2	0	3	1	2	2	2	2	3	2	3	1	2
Wangdue	2	1	3	2	2	2	3	1	2	3	3	1	1
Tsirang	3	1	2	2	3	3	3	2	3	3	3	1	3
Dagana	3	1	2	2	3	2	3	2	3	3	3	1	3
Bumthang	1	2	1	1	3	3	1	1	2	3	2	2	3
Trongsa	2	3	3	1	2	3	3	3	3	3	1	3	1
Zhemgang	3	2	2	1	3	3	2	3	1	3	3	2	3
Sarpang	3	3	3	2	3	2	2	3	3	3	3	1	1
Lhuentse	3	1	2	2	3	2	3	2	3	3	3	1	2
Mongar	2	1	2	1	2	3	2	2	3	3	3	3	3
Trashigang	2	3	3	1	2	2	3	3	3	3	3	3	3
Trashiyangtse	2	2	3	1	3	2	3	3	3	3	3	3	3
Pemagatshel	3	3	2	1	3	3	2	3	2	3	3	3	3
S/Jongkhar	3	1	2	1	2	2	2	3	3	3	3	1	3
Bhutan	2	1	3	1	3	2	3	3	3	3	3	1	3

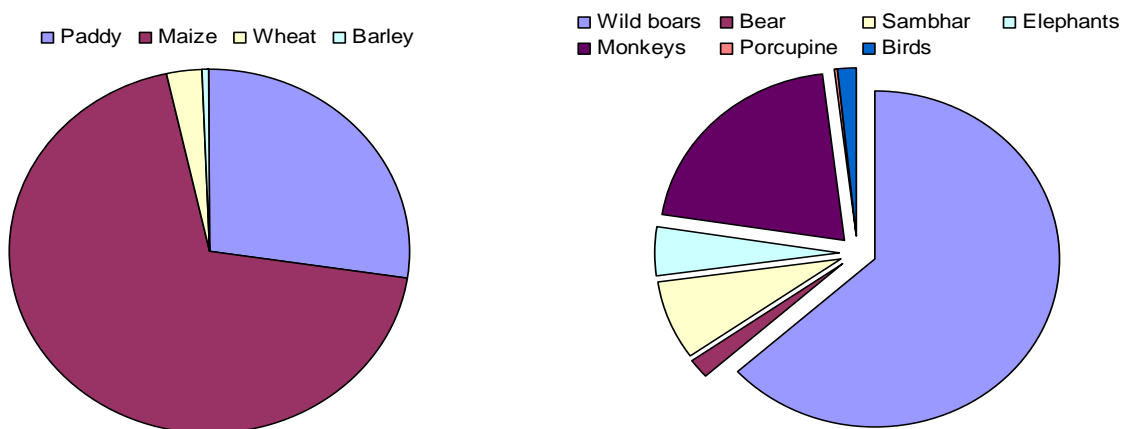
**Table 10a: Losses of cereals production to wildlife, 2008**

Dzongkhags	Losses of each cereal production as percentage of the total cereal production lost to wildlife			
	Paddy	Maize	Wheat	Barley
Thimphu	69.11	1.13	29.75	0.00
Paro	70.60	2.58	24.37	2.45
Ha	8.21	49.31	38.77	3.71
Chhukha	19.76	77.47	2.77	0.00
Samtse	30.29	68.80	0.91	0.00
Punakha	80.54	11.20	7.78	0.49
Gasa	53.02	0.00	42.72	4.26
Wangdue	77.33	9.71	10.94	2.02
Tsirang	26.60	72.78	0.62	0.00
Dagana	36.57	62.78	0.52	0.13
Bumthang	11.81	0.65	52.30	35.24
Trongsa	45.42	41.98	10.35	2.25
Zhemgang	19.57	79.86	0.49	0.09
Sarpang	24.12	75.48	0.40	0.00
Lhuentse	38.92	61.08	0.00	0.00
Mongar	4.05	94.83	0.75	0.37
Trashigang	13.39	86.44	0.13	0.04
Trashiyangtse	28.02	71.89	0.09	0.00
Pemagatshel	0.93	98.45	0.55	0.07
S/Jongkhar	29.89	69.84	0.27	0.00
<b>Bhutan</b>	<b>27.39</b>	<b>69.38</b>	<b>2.76</b>	<b>0.47</b>

**Table 10b: Losses of cereals production to wildlife, 2008**

Dzongkhags	Losses of cereals production by each animal as percentage of the total cereals production lost to wildlife						
	Wild boars	Bear	Sambhar	Elephants	Monkeys	Porcupine	Birds
Thimphu	77.58	0.95	17.09	0.00	0.00	0.00	4.38
Paro	87.76	1.41	9.54	0.00	0.34	0.00	0.96
Ha	53.93	15.12	20.90	0.00	5.47	0.86	3.73
Chhukha	34.76	11.64	13.66	0.00	32.87	0.69	6.38
Samtse	15.31	1.37	1.70	19.98	58.82	0.50	2.31
Punakha	69.02	0.65	21.10	0.00	7.97	0.00	1.26
Gasa	10.38	7.65	73.68	0.00	8.29	0.00	0.00
Wangdue	65.11	0.80	25.86	0.00	5.94	0.98	1.30
Tsirang	87.31	0.84	1.80	0.00	8.81	0.00	1.24
Dagana	53.95	2.61	12.61	0.00	27.22	0.93	2.69
Bumthang	67.06	5.01	22.57	0.00	0.00	3.23	2.14
Trongsa	83.54	0.63	11.24	0.00	4.02	0.00	0.57
Zhemgang	69.03	7.25	7.43	0.00	14.63	0.64	1.01
Sarpang	54.64	1.49	4.13	17.43	20.59	0.16	1.56
Lhuentse	79.13	1.01	7.57	0.00	11.75	0.27	0.27
Mongar	60.55	0.78	8.10	0.00	27.77	0.40	2.41
Trashigang	86.78	0.00	2.71	0.00	9.59	0.10	0.80
Trashiyangtse	79.87	0.00	2.90	0.00	15.87	1.13	0.24
Pemagatshel	73.11	1.94	8.27	0.00	16.12	0.00	0.56
S/Jongkhar	68.27	0.41	4.97	7.49	18.41	0.00	0.45
Bhutan	63.34	1.98	7.56	4.59	20.50	0.36	1.66

**Figure 12: Losses of each cereal as percentage of the total cereal lost and share of each wild animal as percentage of the total cereals destroyed by wildlife.**





**Table 11a: Affected harvested area and crop production losses due to wildlife, 2008**

Dzongkhags	Affected harvested area and crop production lost to wildlife							
	Paddy				Maize			
	Area affected (hectares)	Production lost (MT)	Area affected (%)	Production lost (%)	Area affected (hectares)	Production lost (MT)	Area affected (%)	Production lost (%)
Thimphu	13.7	27.5	5.7	2.9	0.3	0.5	2.4	1.9
Paro	16.9	28.2	1.3	0.5	1.6	1.0	2.3	0.9
Ha	4.7	6.0	7.8	2.4	38.6	35.9	21.3	7.9
Chhukha	33.9	53.4	4.4	1.9	158.5	209.1	8.5	4.3
Samtse	104.1	152.4	3.6	1.4	260.8	346.2	8.7	4.6
Punakha	77.7	191.2	3.7	2.0	16.6	26.6	10.6	7.8
Gasa	1.2	2.6	1.6	0.8	0.0	0.0	0.0	0.0
Wangdue	55.5	117.8	3.7	1.8	10.1	14.8	7.5	5.0
Tsirang	77.7	108.4	5.4	1.9	285.6	296.7	13.1	5.2
Dagana	122.8	148.7	7.8	2.4	298.3	255.3	11.0	3.6
Bumthang	1.3	3.7	3.4	2.8	0.2	0.2	2.3	1.0
Trongsa	44.8	66.9	8.2	3.2	44.0	61.8	11.2	7.2
Zhemgang	25.4	35.9	4.7	1.8	122.3	146.6	8.3	3.9
Sarpang	100.7	152.6	5.7	2.1	386.4	477.4	14.4	6.8
Lhuentse	17.8	48.0	2.5	1.8	37.8	75.3	4.4	3.7
Mongar	12.1	16.4	1.5	0.6	227.2	383.9	6.6	4.6
Trashigang	38.6	86.1	3.4	2.0	235.2	556.1	8.6	9.3
Trashiyangtse	32.5	70.8	4.5	2.8	74.9	181.7	9.1	11.1
Pemagatshel	1.2	2.8	1.4	1.0	172.6	297.6	7.2	5.4
S/Jongkhar	66.5	124.5	6.6	3.1	183.7	291.0	8.6	5.7
<b>Bhutan</b>	<b>849.2</b>	<b>1443.9</b>	<b>4.4</b>	<b>1.9</b>	<b>2554.5</b>	<b>3657.5</b>	<b>9.4</b>	<b>5.5</b>

**Table 11b: Affected harvested area and crop production losses due to wildlife, 2008**

Dzongkhags	Estimates of affected harvested area and crop production lost to wildlife							
	Wheat				Barley			
	Area affected (hectares)	Production lost (MT)	Area affected (%)	Production lost (%)	Area affected (hectares)	Production lost (MT)	Area affected (%)	Production lost (%)
Thimphu	7.32	11.84	8.68	6.47	0.00	0.00	0.00	0.00
Paro	12.72	9.74	2.84	1.18	0.99	0.98	1.84	1.21
Ha	41.59	28.22	14.28	5.50	2.48	2.70	9.22	5.11
Chhukha	6.94	7.46	4.08	2.65	0.00	0.00	0.00	0.00
Samtse	3.95	4.58	2.50	1.73	0.00	0.00	0.00	0.00
Punakha	16.08	18.46	3.82	2.42	1.12	1.16	5.23	2.91
Gasa	1.35	2.08	2.06	1.70	0.19	0.21	0.92	0.64
Wangdue	17.69	16.67	3.28	1.76	4.47	3.08	3.27	1.35
Tsirang	2.32	2.51	4.34	2.91	0.00	0.00	0.00	0.00
Dagana	1.68	2.12	2.77	1.85	1.02	0.52	2.44	0.71
Bumthang	14.38	16.20	6.43	4.14	9.58	10.91	5.98	4.44
Trongsa	15.06	15.24	8.01	4.73	3.14	3.32	3.49	2.49
Zhemgang	0.99	0.90	1.74	1.00	0.61	0.16	1.58	0.28
Sarpang	2.70	2.55	13.86	7.13	0.00	0.00	0.00	0.00
Lhuentse	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mongar	2.17	3.02	1.00	0.79	1.02	1.49	0.30	0.30
Trashigang	0.84	0.82	1.01	0.60	0.32	0.28	0.22	0.14
Trashiyangtse	0.12	0.22	0.97	0.90	0.00	0.00	0.00	0.00
Pemagatshel	0.38	1.66	1.14	2.36	0.54	0.22	0.94	0.25
S/Jongkhar	0.52	1.12	1.15	1.56	0.00	0.00	0.00	0.00
<b>Bhutan</b>	<b>148.81</b>	<b>145.39</b>	<b>4.67</b>	<b>2.57</b>	<b>25.49</b>	<b>25.02</b>	<b>1.94</b>	<b>1.22</b>

**Table 11c: Estimates of affected harvested area and crop production lost to wildlife, 2008**

Dzongkhags	Estimates of affected harvested area and crop production lost to wildlife							
	Potato				Apple		Mandarin	
	Area affected (hectares)	Production lost (MT)	Area affected (%)	Production lost (%)	Production lost (MT)	Production lost (%)	Production lost (MT)	Production lost (%)
Thimphu	6.51	31.61	3.72	2.21	8.86	0.53	0.00	0.00
Paro	5.65	24.21	1.32	0.68	2.24	0.07	0.00	0.00
Ha	8.53	36.68	4.23	2.23	1.97	0.59	0.00	0.00
Chhukha	4.42	26.51	1.06	0.73	0.00	0.00	16.90	0.77
Samtse	0.00	0.00	0.00	0.00	0.12	0.00	14.43	0.76
Punakha	0.17	1.00	0.26	0.26	0.00	0.00	0.20	0.06
Gasa	0.41	2.00	2.01	1.54	0.00	0.00	0.00	0.00
Wangdue	36.57	226.87	4.78	3.08	0.00	0.00	0.75	0.36
Tsirang	0.85	1.00	0.45	0.09	0.00	0.00	13.61	0.22
Dagana	0.32	0.65	0.22	0.07	0.00	0.00	22.33	0.35
Bumthang	16.23	90.38	3.53	2.26	0.00	0.00	0.00	0.00
Trongsa	0.91	7.13	1.24	1.30	0.00	0.00	0.50	0.32
Zhemgang	0.20	0.80	0.17	0.10	0.00	0.00	9.14	0.54
Sarpang	0.00	0.00	0.00	0.00	0.00	0.00	12.32	0.20
Lhuentse	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mongar	3.66	14.65	0.67	0.40	0.00	0.00	5.25	0.50
Trashigang	11.01	54.53	1.47	1.02	0.00	0.00	0.00	0.00
Trashiyangtse	1.42	9.20	0.59	0.68	0.00	0.00	0.00	0.00
Pemagatshel	1.15	9.08	0.36	0.40	0.00	0.00	3.83	0.05
S/Jongkhar	0.00	0.00	0.00	0.00	0.00	0.00	10.64	0.26
<b>Bhutan</b>	<b>98.01</b>	<b>536.30</b>	<b>1.77</b>	<b>1.29</b>	<b>13.18</b>	<b>0.24</b>	<b>109.89</b>	<b>0.29</b>

**Table 12a: Nos. of livestock killed by wildlife, 2008**

Dzongkhags	Nos. of livestock killed by wildlife											
	Cattle				Yaks				Horses			
	Tigers	Leopards	Bears	Wild Dogs	Tigers	Leopards	Bears	Wild Dogs	Tigers	Leopards	Bears	Wild Dogs
Thimphu	9	16	11	18	11	43	3	76	4	7	0	0
Paro	8	9	11	17	2	47	0	6	4	5	0	0
Ha	3	7	2	44	0	20	0	17	0	1	1	12
Chhukha	8	0	0	87	0	0	0	0	2	0	0	0
Samtse	5	17	1	11	0	0	0	0	0	0	0	0
Punakha	73	59	3	113	0	0	0	0	4	4	0	0
Gasa	0	0	5	16	3	97	33	12	0	21	1	0
Wangdue	128	201	1	79	48	14	3	1	12	27	0	0
Tsirang	0	1	0	6	0	0	0	0	0	0	0	0
Dagana	29	24	2	44	0	0	0	0	0	0	0	0
Bumthang	51	3	7	34	3	8	2	23	4	8	0	3
Trongsa	125	75	3	30	0	0	0	0	1	4	0	0
Zhemgang	15	57	2	92	0	0	0	0	0	8	0	1
Sarpang	57	15	16	33	0	0	0	0	0	0	0	0
Lhuentse	3	12	1	24	0	0	0	0	0	7	0	0
Mongar	36	36	4	58	0	0	0	0	15	1	0	0
Trashigang	72	79	7	21	0	0	0	12	14	9	5	1
Trashiyangtse	14	12	0	4	0	7	3	5	5	8	0	1
Pemagatshel	34	4	1	10	0	0	0	0	0	1	0	0
S/Jongkhar	46	21	1	22	0	0	0	0	2	1	0	0
<b>Bhutan</b>	<b>716</b>	<b>648</b>	<b>78</b>	<b>763</b>	<b>67</b>	<b>236</b>	<b>44</b>	<b>152</b>	<b>67</b>	<b>112</b>	<b>7</b>	<b>18</b>

**Table 12b: Nos. of livestock killed by wildlife, 2008**

Dzongkhags	Nos. of livestock killed by wildlife												
	Sheep					Goats			Pigs		Poultry		
	Wolves	Leopards	Jackals / Foxes	Bears	Wild Dogs	Wolves	Leopards	Jackals / Foxes	Wild Dogs	Leopards	Wolves	Leopards	Jackals / Foxes
Thimphu	0	0	0	0	0	0	0	0	0	0	0	0	9
Paro	8	9	0	0	0	0	0	0	0	0	0	0	3
Ha	3	7	0	0	0	0	0	0	0	7	3	4	14
Chhukha	8	0	10	8	6	2	16	3	1	1	0	27	334
Samtse	5	17	0	17	6	4	44	1	7	1	23	70	323
Punakha	73	59	0	0	0	0	1	0	0	1	2	28	53
Gasa	0	0	0	0	0	0	0	0	0	0	0	8	1
Wangdue	128	201	0	8	0	0	13	0	0	12	1	4	99
Tsirang	0	1	0	0	3	0	5	0	1	0	20	12	57
Dagana	29	24	0	0	1	6	31	0	6	0	76	114	263
Bumthang	51	3	0	11	11	0	0	0	0	0	0	0	0
Trongsa	125	75	0	0	0	0	0	0	0	0	16	0	17
Zhemgang	15	57	0	0	0	0	0	0	0	10	0	24	119
Sarpang	57	15	0	0	6	0	2	0	7	0	0	0	37
Lhuentse	3	12	0	0	0	0	0	0	0	0	0	13	34
Mongar	36	36	0	0	0	0	1	0	0	1	13	2	126
Trashigang	72	79	1	9	27	0	1	0	6	4	0	14	62
Trashiyangtse	14	12	0	0	0	0	4	0	0	3	0	0	23
Pemagatshel	34	4	0	0	0	0	1	0	0	0	0	2	26
S/Jongkhar	46	21	0	0	0	7	8	2	0	1	0	4	236
<b>Bhutan</b>	<b>716</b>	<b>648</b>	<b>11</b>	<b>53</b>	<b>60</b>	<b>19</b>	<b>127</b>	<b>6</b>	<b>28</b>	<b>41</b>	<b>154</b>	<b>326</b>	<b>1836</b>

**Table 13: Percent households affected by wildlife depredation on livestock, 2008**

Dzongkhags	Percent households affected by wildlife depredation by type of livestock						
	Cattle	Yaks	Horses	Sheep	Goats	Pigs	Poultry
Thimphu	4.01	2.52	0.71	0.00	0.00	0.00	0.24
Paro	1.61	0.39	0.32	0.00	0.00	0.00	0.04
Ha	2.43	1.85	0.76	0.00	0.00	0.25	0.50
Chhukha	1.82	0.00	0.09	0.18	0.47	0.03	1.73
Samtse	0.35	0.00	0.00	0.14	0.50	0.02	1.18
Punakha	8.43	0.00	0.38	0.00	0.04	0.13	1.01
Gasa	3.46	6.93	2.77	0.00	0.00	0.00	1.15
Wangdue	11.82	1.36	0.76	0.60	0.30	0.23	1.09
Tsirang	0.22	0.00	0.00	0.03	0.13	0.00	0.41
Dagana	2.49	0.00	0.00	0.13	0.70	0.00	1.73
Bumthang	5.30	0.90	0.98	0.49	0.00	0.00	0.00
Trongsa	12.92	0.00	0.46	0.00	0.00	0.00	1.08
Zhemgang	6.75	0.00	0.45	0.00	0.00	0.23	2.89
Sarpang	1.72	0.00	0.00	0.13	0.26	0.00	0.10
Lhuentse	1.55	0.00	0.33	0.00	0.00	0.00	0.94
Mongar	1.88	0.00	0.25	0.00	0.08	0.06	0.80
Trashigang	2.34	0.17	0.45	0.24	0.03	0.05	0.44
Trashiyangtse	1.37	0.12	0.40	0.00	0.08	0.08	0.20
Pemagatshel	1.72	0.00	0.03	0.00	0.03	0.03	0.45
S/Jongkhar	1.97	0.00	0.11	0.00	0.14	0.06	1.38
Bhutan	2.96	0.28	0.28	0.11	0.19	0.05	0.86

**Table 14: Nos. of livestock killed by wildlife by adult and young categories, 2008**

Dzongkhags	Cattle			Yaks			Horses			Others			
	Total	Adult	Young	Total	Adult	Young	Total	Adult	Young	Sheep	Goats	Pigs	Poultry
Thimphu	54	31	23	133	65	68	11	4	7	0	0	0	9
Paro	45	29	16	55	25	30	9	6	3	0	0	0	3
Ha	56	38	18	37	18	19	14	9	5	0	0	7	21
Chhukha	95	53	42	0	0	0	2	1	1	32	22	1	361
Samtse	34	20	14	0	0	0	0	0	0	30	56	1	416
Punakha	248	178	70	0	0	0	8	6	2	0	1	1	83
Gasa	21	14	7	145	69	76	22	17	5	0	0	0	9
Wangdue	409	239	170	66	41	25	39	32	7	71	13	12	104
Tsirang	7	4	3	0	0	0	0	0	0	3	6	0	89
Dagana	99	50	49	0	0	0	0	0	0	5	43	0	453
Bumthang	95	66	29	36	27	9	15	9	6	37	0	0	0
Trongsa	233	158	75	0	0	0	5	4	1	0	0	0	33
Zhemgang	166	86	80	0	0	0	9	3	6	0	0	10	143
Sarpang	121	62	59	0	0	0	0	0	0	9	9	0	37
Lhuentse	40	15	25	0	0	0	7	4	3	0	0	0	47
Mongar	134	73	61	0	0	0	16	12	4	0	1	1	141
Trashigang	179	97	82	12	7	5	29	18	11	106	7	4	76
Trashiyangtse	30	11	19	15	8	7	14	10	4	0	4	3	23
Pemagatshel	49	24	25	0	0	0	1	1	0	0	1	0	28
S/Jongkhar	90	51	39	0	0	0	3	2	1	0	17	1	240
<b>Bhutan</b>	<b>2,205</b>	<b>1,299</b>	<b>906</b>	<b>499</b>	<b>260</b>	<b>239</b>	<b>204</b>	<b>138</b>	<b>66</b>	<b>293</b>	<b>180</b>	<b>41</b>	<b>2,316</b>

## **2.4 Agriculture**

Bhutan being largely agrarian, the agriculture is the main source of livelihood for the people. Its contribution to national GDP was 9.1 percent in 2008 (NSB SBY 2009) and accounted for 78.55 percent of the monetary income of the rural households for 2008 (RNR Census 2009). The agricultural production system encompasses production of both cereal and horticulture crops. The cereals are cultivated mostly on wetland and dry land while horticulture consisting of vegetables, pulses, spices, oilseeds, is produced exclusively on dry land except for few cases where irrigation is not a problem during the dry seasons.

Wetlands are terraced fields which is traditionally irrigated and used mainly for paddy cultivation although, cultivation of complementary crops such as wheat and some vegetables is not uncommon in some of the farms located close to the urban centers. Dry lands are characterized by steeper slopes as compared to the wetlands and mostly occur where scope for irrigation is poor. This category of land is primarily used for growing food crops such as maize, wheat, buckwheat, millet and horticulture crops. Another important category of land is “cash crop land” commonly known as “orchard” which is exclusively used for fruits production.

The area suitable for agricultural production is limited by the steep and rugged terrain, altitude, high priority given to maintaining forest cover of at least 60 percent and losses of agricultural area for urbanizations and other developmental activities.

### **2.4.1 Agricultural Land Holdings and Utilizations**

The analyses of the RNR census 2009 revealed that, of the total agricultural land holdings of 94,902.57 hectares, wetland accounted for 20.57 percent (19,522.81 hectares) owned by 51.81 percent of the rural households, dry land accounted for 69.19 percent (65,665.44 hectares) owned by 86.01 percent of the rural households and cash crop land which is commonly known as orchard accounted for 10.24 percent (9,714.32 hectares) owned by 17.37 percent of the rural households.

Land holdings are fairly evenly distributed in the country but highly fragmented with small parcels of land in different locations. The majority (54.25%) of the rural households owned less than or up to 3 acres (1.2 hectares) each, 39.04 percent of the households owned above 3 to 10 acres (1.21 – 4 hectares) each and



6.92 percent of the households owned more than 10 acres (4.01 hectares) each of agricultural land. On an average, the rural households owned about 4 acres (1.6 hectares) of agricultural land. The landless rural households were recorded to 1.05 percent sporadically distributed across all 20 districts.

At least 59.22 percent of the rural households had cultivated their own land, 7.32 percent of the rural households had leased out, 10.44 percent had leased in and 23.02 percent of the rural households had left their land fallow in 2008. See Table 14, 15 and 16 for details.

The National Land Commission (NLC) is currently re-doing nationwide cadastral survey and verification of agricultural land holdings. On the other hand, the land *kidu* (welfare grant) is being granted for the landless farmers in the country. It is expected that the agricultural area size will increase once these two exercises are completed.

**Table 15: Percent households owning land and distribution by land use types, 2008**

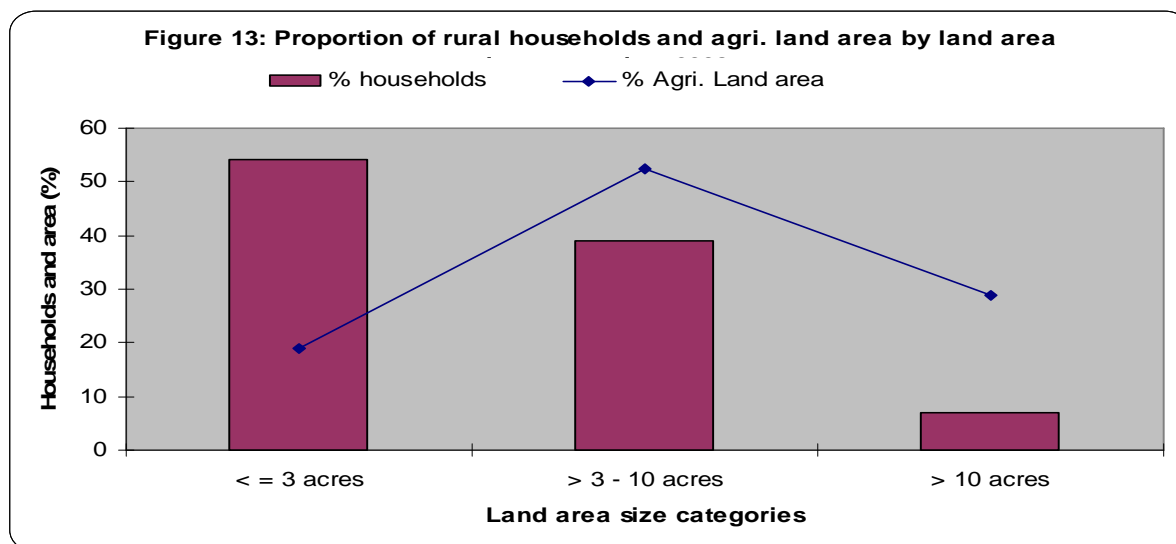
Dzongkhags	Percent households owning land	Percent distribution of households by land use types			Percent households without land
		Wetland	Dryland	Cash Crop land	
Thimphu	98.76	33.20	74.76	15.32	1.24
Paro	99.06	60.97	77.71	16.70	0.94
Ha	98.29	12.76	82.35	18.78	1.71
Chhukha	99.76	48.82	90.04	40.89	0.24
Samtse	98.83	56.73	85.69	34.85	1.17
Punakha	98.35	81.46	68.35	3.90	1.65
Gasa	99.30	27.00	70.54	2.35	0.70
Wangdue	97.99	60.15	77.42	1.84	2.01
Tsirang	98.64	63.65	85.71	26.75	1.36
Dagana	99.58	66.81	89.32	22.57	0.42
Bumthang	99.84	4.45	93.29	2.80	0.16
Trongsa	99.84	75.06	92.61	1.65	0.16
Zhemgang	99.83	72.86	93.84	21.35	0.17
Sarpang	99.35	51.66	84.49	24.97	0.65
Lhuentse	99.72	72.62	93.47	0.79	0.28
Mongar	99.61	39.01	92.45	4.82	0.39
Trashigang	98.60	53.91	89.97	4.17	1.40
Trashiyangtse	98.02	71.68	84.43	0.65	1.98
Pemagatshel	98.67	11.71	87.37	28.00	1.33
S/Jongkhar	98.23	33.13	86.50	23.87	1.77
Bhutan	98.95	51.81	86.01	17.37	1.05

**Table 16: Land holdings by land use types, 2008**

Dzongkhags	Land holding area by land use types (Hectares)				Average (Hectares /households)
	Wetland	Dryland	Cash Crop land	Total	
Thimphu	234.79	679.94	220.01	1,134.74	0.89
Paro	1,138.90	2,319.75	512.59	3,971.24	1.42
Ha	72.47	1,278.93	177.65	1,529.05	1.28
Chhukha	867.08	6,021.54	1,344.89	8,233.51	2.42
Samtse	3,318.16	10,318.07	2,252.76	15,888.99	2.40
Punakha	1,875.14	665.63	44.96	2,585.73	1.09
Gasa	81.65	221.46	33.94	337.05	0.78
Wangdue	1,740.40	1,448.34	97.81	3,286.55	1.09
Tsirang	1,689.62	3,366.86	751.31	5,807.79	1.82
Dagana	1,717.51	4,494.68	749.54	6,961.73	2.23
Bumthang	65.53	4,120.70	42.87	4,229.10	3.45
Trongsa	499.02	1,221.40	10.57	1,730.99	1.34
Zhemgang	595.63	2,926.81	299.97	3,822.41	2.17
Sarpang	1,902.90	4,181.22	1,349.53	7,433.65	1.93
Lhuentse	622.28	1,433.22	11.04	2,066.54	1.14
Mongar	448.10	4,066.30	199.03	4,713.43	1.00
Trashigang	1,097.59	5,717.45	77.87	6,892.91	1.16
Trashiyangtse	552.64	1,563.03	12.16	2,127.83	0.86
Pemagatshel	140.26	4,553.40	1,074.76	5,768.42	1.71
S/Jongkhar	863.14	5,066.71	451.06	6,380.91	1.79
<b>Bhutan</b>	<b>19,522.81</b>	<b>65,665.44</b>	<b>9,714.32</b>	<b>94,902.57</b>	<b>1.66</b>

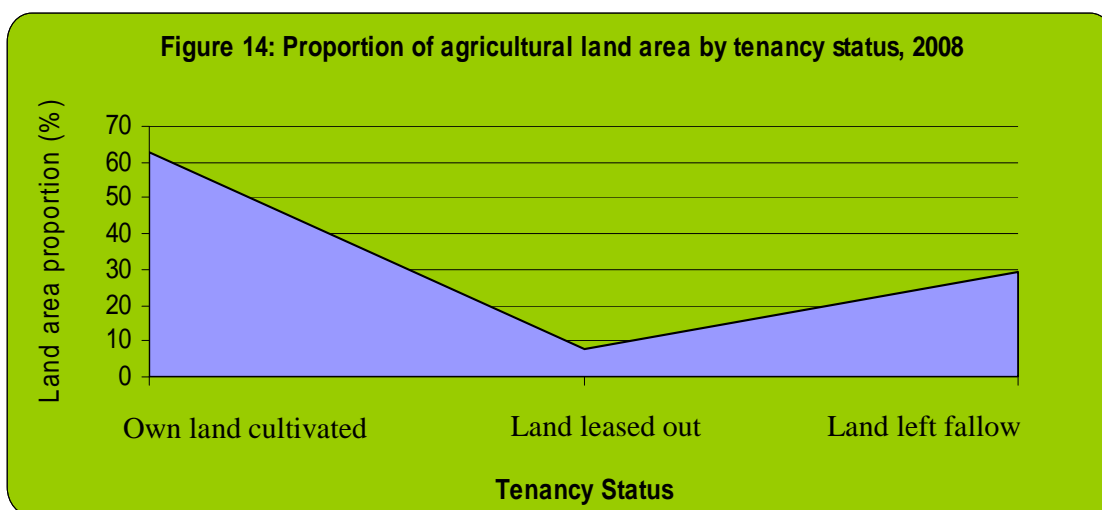
**Table 17: Percent households and area by land holding size categories, 2008**

Dzongkhags	Less than 1 Acre		1 - 3 Acres		3 - 5 Acres		5 - 10 Acres		Above 10 Acres	
	Households (%)	Area (%)	Households (%)	Area (%)	Households (%)	Area (%)	Households (%)	Area (%)	Households (%)	Area (%)
Thimphu	43.3	8.1	33.5	25.6	11.3	19.2	7.5	22.8	3.5	24.3
Paro	21.9	3.2	39.9	22.4	21.8	24.4	13.6	26.5	3.5	23.6
Ha	23.8	3.0	40.8	25.9	20.5	25.3	10.1	22.2	4.7	23.6
Chhukha	10.9	0.8	27.8	9.6	19.3	13.0	25.7	31.1	16.5	45.6
Samtse	17.0	0.8	16.4	5.8	20.0	14.6	31.2	36.3	15.1	42.5
Punakha	27.2	4.6	42.4	31.8	18.8	28.1	9.9	25.1	1.8	10.5
Gasa	46.2	12.6	38.5	33.9	10.8	20.8	4.0	13.9	1.2	18.7
Wangdue	26.3	4.3	42.6	29.6	18.2	26.6	10.8	26.7	2.2	12.9
Tsirang	11.4	1.0	24.1	10.9	27.3	25.7	33.1	45.2	4.4	17.3
Dagana	10.0	0.7	21.1	8.7	25.4	20.5	35.1	45.5	8.4	24.6
Bumthang	17.2	0.8	19.3	4.6	13.2	6.2	16.7	14.6	33.3	73.8
Trongsa	20.5	3.3	42.7	25.1	19.2	23.0	13.2	28.7	4.3	19.9
Zhemgang	8.2	0.7	26.4	10.6	24.9	19.6	30.8	42.8	9.7	26.3
Sarpang	27.2	1.2	11.4	5.3	20.0	19.6	33.7	46.8	7.7	27.1
Lhuentse	22.8	5.4	49.2	35.8	17.4	26.1	8.7	22.7	1.8	10.1
Mongar	19.9	5.1	56.4	44.7	16.9	27.0	5.7	15.8	0.9	7.5
Trashigang	23.6	4.8	46.8	31.4	16.0	22.7	10.3	25.8	3.0	15.3
Trashiyangtse	27.9	7.5	54.6	49.7	12.3	23.5	4.2	13.6	0.7	5.7
Pemagatshel	18.5	2.6	40.3	20.0	18.8	18.9	15.4	28.3	6.5	30.4
S/Jongkhar	18.3	1.5	23.5	11.0	26.7	23.4	23.6	37.2	7.8	27.0
Bhutan	20.3	2.3	34.0	16.6	19.6	19.9	19.2	32.4	6.9	28.8



**Table 18: Proportion of land holding area by types of landuse and utilizations, 2008**

Dzongkhags	Percent land holding area by types of landuse			Percent land area by land utilizations		
	Wetland	Dryland	Cash Crop land	Own cultivated	Leased out	Left fallow
Thimphu	20.69	59.92	19.39	76.76	10.35	12.89
Paro	28.68	58.41	12.91	82.68	6.43	10.89
Ha	4.74	83.64	11.62	76.83	2.49	20.68
Chhukha	10.53	73.13	16.33	66.49	4.52	28.99
Samtse	20.88	64.94	14.18	65.75	13.20	21.05
Punakha	72.52	25.74	1.74	64.78	17.66	17.55
Gasa	24.22	65.71	10.07	68.10	6.97	24.93
Wangdue	52.96	44.07	2.98	67.0	14.8	18.2
Tsirang	29.09	57.97	12.94	75.2	7.6	17.2
Dagana	24.67	64.56	10.77	73.5	8.6	17.9
Bumthang	1.55	97.44	1.01	32.9	2.1	65.0
Trongsa	28.83	70.56	0.61	57.7	9.1	33.2
Zhemgang	15.58	76.57	7.85	54.9	2.2	42.9
Sarpang	25.60	56.25	18.15	66.2	6.7	27.0
Lhuentse	30.11	69.35	0.53	63.2	7.9	28.9
Mongar	9.51	86.27	4.22	68.3	2.6	29.1
Trashigang	15.92	82.95	1.13	50.1	6.8	43.2
Trashiyangtse	25.97	73.46	0.57	49.1	6.5	44.4
Pemagatshel	2.43	78.94	18.63	45.2	4.1	50.7
S/Jongkhar	13.53	79.40	7.07	54.6	5.5	39.9
Bhutan	20.57	69.19	10.24	62.74	7.68	29.43



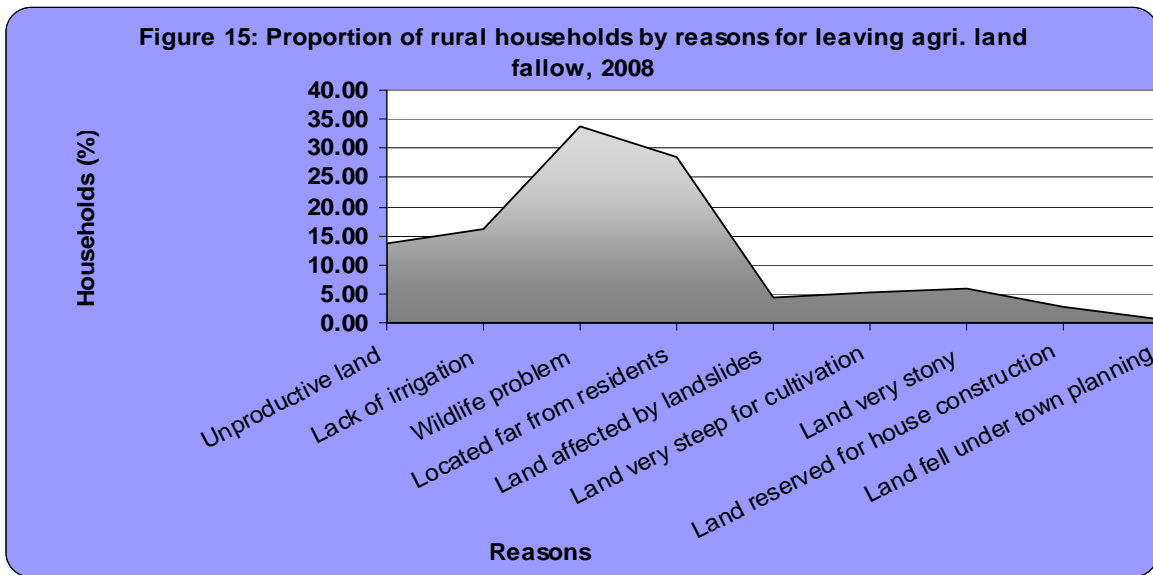
**Table 19: Proportion of households by land utilizations, 2008**

Dzongkhags	Proportion of households by land utilizations (percent)			
	Own land cultivated	Land leased out	Land leased in	Land left fallow
Thimphu	63.51	10.14	14.28	12.07
Paro	72.63	6.99	9.12	11.25
Ha	68.88	4.30	5.71	21.12
Chhukha	67.48	4.75	5.74	22.03
Samtse	55.22	11.70	14.43	18.64
Punakha	49.71	9.24	23.25	17.79
Gasa	68.85	2.83	3.36	24.96
Wangdue	54.11	11.08	14.77	20.04
Tsirang	65.82	7.54	9.61	17.03
Dagana	67.04	7.52	9.51	15.93
Bumthang	45.02	5.54	10.82	38.62
Trongsa	57.98	7.37	13.90	20.75
Zhemgang	60.06	2.76	4.10	33.08
Sarpang	58.61	6.05	14.86	20.48
Lhuentse	61.17	7.17	10.41	21.25
Mongar	66.45	2.90	3.68	26.97
Trashigang	54.39	8.58	9.52	27.51
Trashiyangtse	53.85	7.45	9.07	29.62
Pemagatshel	53.70	4.84	5.86	35.60
S/Jongkhar	58.00	5.81	9.61	26.58
Bhutan	59.22	7.32	10.44	23.02

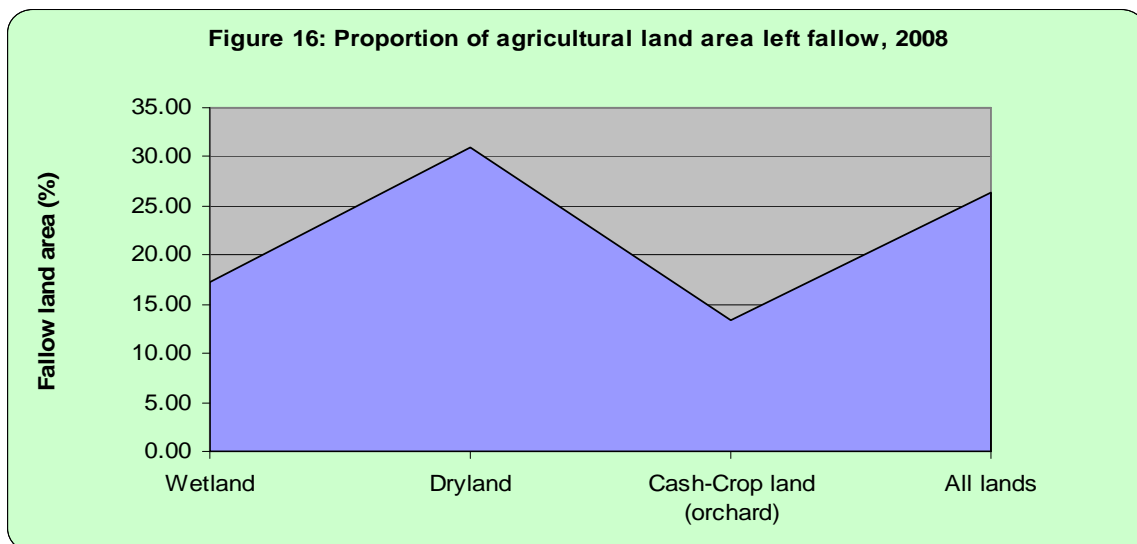
**Table 20: Percent households by reasons for leaving agricultural land fallow, 2008**

Dzongkhags	Percent households by reasons for leaving agricultural land fallow								
	Unproductive land	Lack of irrigation	Wildlife problem	Located far from residents	Land affected by landslides	Land very steep for cultivation	Land very stony	Land reserved for house construction	Land fell under town planning
Thimphu	27.49	11.11	19.30	19.88	1.17	6.43	4.09	19.88	1.75
Paro	11.29	22.40	26.10	19.58	0.88	1.94	5.29	6.70	0.71
Ha	14.98	11.31	38.84	36.39	1.22	6.12	10.09	2.14	0.61
Chhukha	19.84	13.64	18.22	14.68	7.82	12.24	13.64	1.11	1.03
Samtse	34.74	14.73	24.38	15.47	11.22	14.19	14.89	6.53	1.52
Punakha	6.61	25.81	30.35	23.22	5.06	2.98	3.11	3.63	0.65
Gasa	3.39	4.24	14.41	16.10	0.85	1.69	0.00	0.00	0.85
Wangdue	11.44	30.74	26.62	28.73	5.12	4.21	4.76	2.20	0.46
Tsirang	19.52	26.73	15.42	10.31	4.20	8.51	6.51	1.40	0.10
Dagana	23.95	30.01	19.65	19.26	10.17	9.38	13.29	2.15	0.49
Bumthang	11.10	2.57	48.95	63.67	0.58	2.80	3.50	4.79	0.93
Trongsa	7.69	10.26	63.92	58.61	2.20	5.31	4.58	1.10	0.18
Zhemgang	13.83	25.27	35.88	39.01	3.46	7.49	5.35	0.16	0.33
Sarpang	14.67	38.61	39.29	21.15	5.05	2.59	6.07	1.50	0.20
Lhuentse	10.54	7.97	38.11	35.68	3.92	1.89	2.30	0.00	0.68
Mongar	8.82	12.96	25.83	22.10	3.35	3.72	4.92	0.55	2.80
Trashigang	6.80	14.15	56.07	33.15	7.35	2.62	2.72	0.36	0.36
Trashiyangtse	7.46	11.93	63.95	18.27	5.66	2.61	3.11	0.62	0.44
Pemagatshel	7.92	3.49	37.27	40.54	2.28	2.91	2.64	0.22	0.58
S/Jongkhar	12.44	6.98	34.48	35.99	2.79	6.40	4.77	0.58	0.06
Bhutan	13.73	16.25	33.85	28.59	4.22	5.30	5.78	2.78	0.74

Figure 15 shows that because of the wildlife problems on crops at least 33.85 percent of the rural households have left portion of their agricultural land uncultivated. The agricultural land being located far away from the residences was also another important reasons for leaving the land fallow as reported by 28.59 percent of the rural households. Lack of irrigation and unproductive lands were also reported to have influenced 16.25 percent and 13.73 percent of the rural households respectively to leave portion of their land holdings fallow in 2008. Other factors such as “landslides, land steepness, rocky land, houses constructions, town planning” have also been reported to be posing certain degree of limitations on the use of agricultural land for crops production.



As can be seen from the Figure 16, at least 26.32 percent (24,974.76 hectares) of the total agricultural land area of 94,902.57 hectares have been left fallow in 2008. Of this fallow area the wetland area accounted for 17.29 percent, dry land for 30.92 percent and cash-crop land (orchard) for 13.30 percent.



**Table 21: Wetland utilization and operational area (Hectares) 2008**

Dzongkhags	Wetland utilization and operational area (Hectares)				
	Own land cultivated (1)	Leased out (2)	Leased in (3)	Left fallow (4)	Operational land area (5)=(1)+(2)+(4)
Thimphu	116.87	43.82	82.75	11.17	171.87
Paro	891.15	180.67	217.26	28.72	1,100.54
Ha	51.76	11.81	6.20	9.46	73.03
Chhukha	562.66	64.26	59.60	136.36	763.27
Samtse	2,014.67	852.75	812.29	490.40	3,357.81
Punakha	1,294.78	391.27	799.58	199.18	1,885.23
Gasa	59.07	4.35	3.69	12.75	76.17
Wangdue	1,142.68	378.36	287.53	253.52	1,774.56
Tsirang	1,133.56	247.59	316.50	265.17	1,646.32
Dagana	1,240.21	213.35	238.48	263.09	1,716.66
Bumthang	17.20	17.96	4.40	8.82	43.97
Trongsa	354.59	58.86	121.65	74.91	488.35
Zhemgang	381.19	34.73	62.14	193.13	609.04
Sarpang	1,329.33	215.04	451.77	595.64	2,140.02
Lhuentse	425.73	94.26	79.22	132.76	652.75
Mongar	335.70	26.19	30.19	112.86	474.76
Trashigang	523.72	150.80	160.77	252.76	927.28
Trashiyangtse	328.53	67.68	75.15	153.43	549.64
Pemagatshel	28.58	5.00	4.94	81.83	115.40
S/Jongkhar	475.54	70.02	192.95	118.42	663.98
<b>Bhutan</b>	<b>12,746.31</b>	<b>3,152.26</b>	<b>4,027.08</b>	<b>3,376.18</b>	<b>19,274.75</b>



**Table 22: Dryland utilization and operational area (Hectares), 2008**

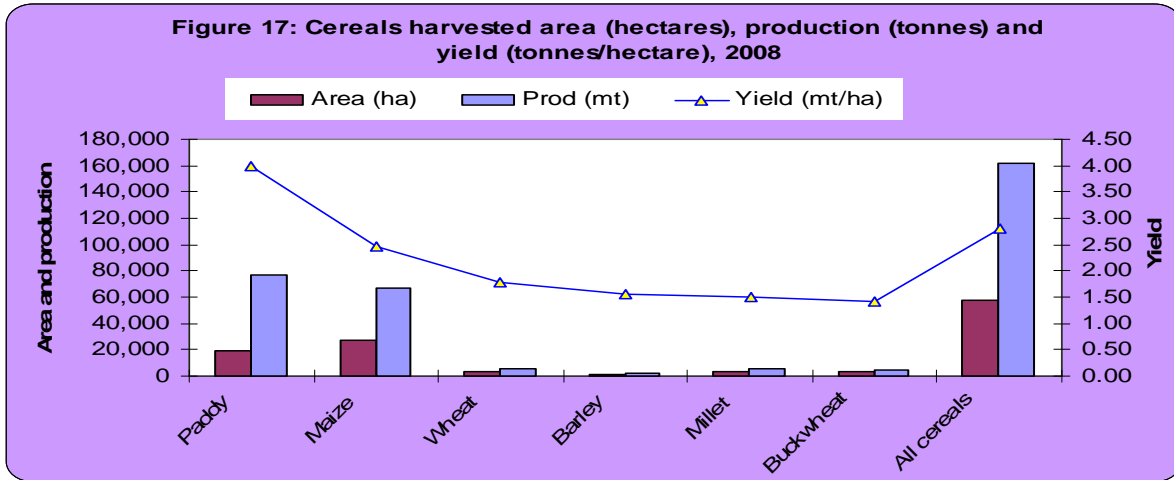
Dzongkhags	Dryland utilization and operational area (Hectares)				
	Own land cultivated (1)	Leased out (2)	Leased in (3)	Left fallow (4)	Operational land area (5)=(1)+(2)+(4)
Thimphu	381.93	30.75	52.81	71.18	483.86
Paro	1,728.74	44.28	21.46	342.52	2115.54
Ha	956.67	23.81	42.52	273.60	1254.08
Chhukha	3,142.06	221.11	208.99	1,650.96	5014.13
Samtse	6,441.61	972.11	857.85	2,085.41	9499.13
Punakha	353.23	21.51	13.87	212.59	587.33
Gasa	124.49	14.70	0.74	52.17	191.36
Wangdue	1,031.05	85.07	82.40	318.31	1434.43
Tsirang	2,535.82	160.46	199.58	559.12	3255.4
Dagana	2,999.49	324.47	281.60	804.72	4128.68
Bumthang	1,411.42	65.81	134.91	2,624.46	4101.69
Trongsa	580.57	78.83	44.05	432.39	1091.79
Zhemgang	1,337.60	40.72	56.29	1,287.26	2665.58
Sarpang	2,999.05	268.39	1,235.19	961.16	4228.6
Lhuentse	902.71	58.50	51.81	427.85	1389.06
Mongar	2,819.41	82.27	84.50	1,123.65	4025.33
Trashigang	2,598.77	229.92	164.01	2,157.40	4986.09
Trashiyangtse	809.25	66.92	50.57	724.72	1600.89
Pemagatshel	1,970.94	190.92	180.75	2,335.94	4497.8
S/Jongkhar	2,002.44	199.37	183.27	1,860.91	4062.72
<b>Bhutan</b>	<b>37,127.25</b>	<b>3,177.57</b>	<b>3,904.65</b>	<b>20,306.89</b>	<b>60613.49</b>

**Table 23: Cash Crop land utilization and operational area (Hectares), 2008**

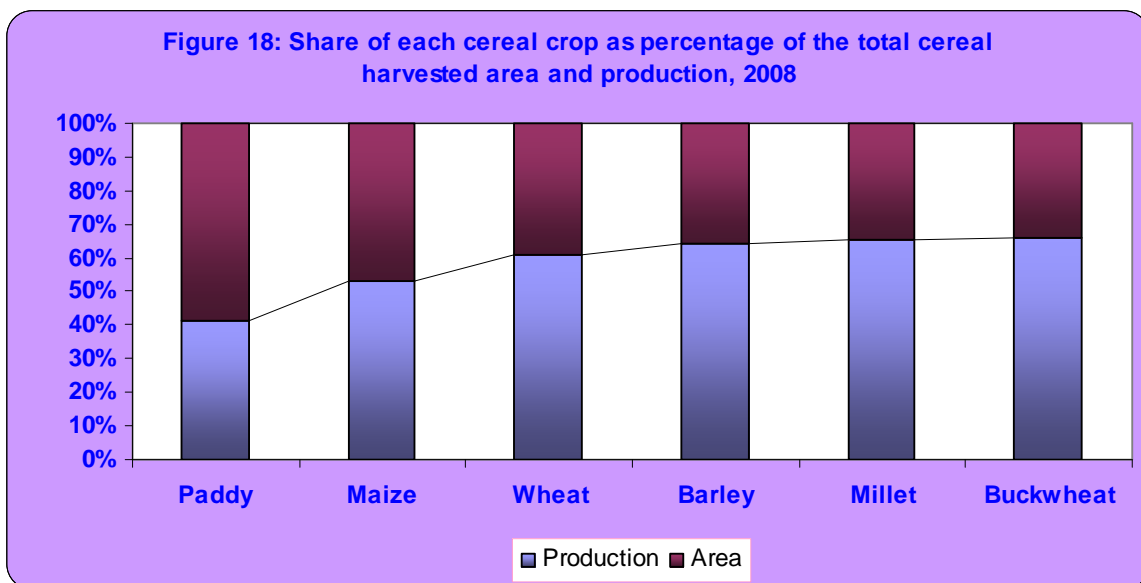
Dzongkhags	Cash Crop land utilization and operational area (Hectares)				
	Own land cultivated (1)	Leased out (2)	Leased in (3)	Left fallow (4)	Operational land area (5)=(1)+(2)+(4)
Thimphu	127.02	1.85	2.06	12.27	141.13
Paro	452.40	0.35	0.21	7.96	460.71
Ha	116.70	0.00	0.66	4.07	120.78
Chhukha	857.29	7.69	11.69	116.28	981.26
Samtse	1,594.72	113.81	469.46	488.73	2,197.26
Punakha	23.59	1.46	6.57	2.02	27.07
Gasa	30.32	0.00	0.00	0.00	30.32
Wangdue	85.23	0.25	0.06	1.21	86.68
Tsirang	545.68	8.54	27.70	94.11	648.34
Dagana	702.66	17.21	17.07	74.27	794.14
Bumthang	7.58	0.34	0.00	0.00	7.92
Trongsa	7.65	2.15	0.32	0.61	10.41
Zhemgang	304.62	0.52	6.24	6.09	311.23
Sarpang	897.62	25.25	88.74	457.61	1,380.48
Lhuentse	14.31	0.00	0.00	0.00	14.31
Mongar	79.68	0.22	0.00	0.28	80.18
Trashigang	50.75	0.11	0.00	1.58	52.44
Trashiyangtse	4.97	0.00	0.00	16.01	20.98
Pemagatshel	376.60	4.60	0.18	7.85	389.05
S/Jongkhar	444.97	5.05	9.26	11.02	461.04
<b>Bhutan</b>	<b>6,731.36</b>	<b>189.62</b>	<b>643.11</b>	<b>1291.69</b>	<b>8,212.67</b>

## 2.4.1 Cereal Crops

The agricultural farming in the country revolves around growing food grains for self-sustenance with about 69% percent of the population depending on it for their livelihood (10<sup>th</sup> Plan Document). The major food grain commodities grown in the country are paddy and maize. Other minor cereals include wheat, barley, buckwheat and millet. A total agricultural land area of 58,043 hectares was put under cereal crops and produced 161,954 tonnes of cereal grains in 2008. The yield of all cereal crops all together stood at 2.79 tonnes per hectare.



Paddy and maize are the two main staple food-grains for the Bhutanese people and are grown in larger scale across all 20 districts. The paddy accounted for 33.35 percent of the total area put under the cereal crops and 47.74 percent of the total cereal production. The maize shared 46.91 percent of the area and 41.23 percent of the production while the rest of the cereal crops (wheat, barley, buckwheat and millet) accounted for only 19.74 percent of the area and 11.03 percent of the total cereal production. See Figure 18.



**Table 24: Harvested area, production and yield of Paddy and Maize, 2008**

Dzongkhags	Paddy			Maize		
	Area (Hectares)	Production (MT)	Yield (MT/Hectare)	Area (Hectares)	Production (MT)	Yield (MT/Hectare)
Thimphu	239	941	3.94	12.79	23.50	1.84
Paro	1,308	5,796	4.43	68.58	115.03	1.68
Ha	60	245	4.06	180.99	452.75	2.50
Chhukha	771	2,753	3.57	1,857.95	4,815.40	2.59
Samtse	2,932	10,825	3.69	2,998.27	7,532.18	2.51
Punakha	2,081	9,797	4.71	155.98	339.45	2.18
Gasa	77	313	4.05	1.34	2.02	1.50
Wangdue	1,483	6,542	4.41	134.95	295.20	2.19
Tsirang	1,443	5,708	3.95	2,185.92	5,734.15	2.62
Dagana	1,578	6,234	3.95	2,702.13	7,089.44	2.62
Bumthang	37	131	3.55	8.91	19.51	2.19
Trongsa	545	2,096	3.85	392.96	860.83	2.19
Zhemgang	538	1,989	3.70	1,465.59	3,773.53	2.57
Sarpang	1,776	7,197	4.05	2,681.04	7,056.60	2.63
Lhuentse	709	2,749	3.88	869.30	2,027.38	2.33
Mongar	827	2,937	3.55	3,446.70	8,414.41	2.44
Trashigang	1,138	4,235	3.72	2,722.93	5,971.08	2.19
Trashiyangtse	721	2,501	3.47	824.76	1,635.75	1.98
Pemagatshel	87	280	3.22	2,383.78	5,494.12	2.30
S/Jongkhar	1,008	4,044	4.01	2,131.92	5,127.48	2.41
<b>Bhutan</b>	<b>19,356.46</b>	<b>77,314.40</b>	<b>3.99</b>	<b>27,226.79</b>	<b>66,779.81</b>	<b>2.45</b>

**Table 25: Harvested area, production and yield of Wheat and Barley, 2008**

Dzongkhags	Wheat			Barley		
	Area (Hectares)	Production (MT)	Yield (MT/Hectare)	Area (Hectares)	Production (MT)	Yield (MT/Hectare)
Thimphu	84	183	2.17	11.04	18.80	1.70
Paro	448	826	1.84	53.82	80.98	1.50
Ha	291	513	1.76	26.95	52.88	1.96
Chhukha	170	282	1.66	30.86	49.02	1.59
Samtse	158	265	1.67	48.52	80.12	1.65
Punakha	421	764	1.82	21.38	39.66	1.86
Gasa	66	122	1.86	20.68	32.42	1.57
Wangdue	540	949	1.76	136.81	227.94	1.67
Tsirang	53	86	1.61	7.17	16.35	2.28
Dagana	61	115	1.89	41.75	73.08	1.75
Bumthang	224	391	1.75	160.38	245.95	1.53
Trongsa	188	322	1.71	89.78	133.25	1.48
Zhemgang	57	89	1.57	38.71	57.40	1.48
Sarpang	19	36	1.84	5.43	9.54	1.76
Lhuentse	18	21	1.18	2.84	4.33	1.52
Mongar	217	383	1.77	338.19	490.98	1.45
Trashigang	83	135	1.62	144.28	202.83	1.41
Trashiyangtse	12	24	1.93	16.25	31.35	1.93
Pemagatshel	33	70	2.12	57.15	88.45	1.55
S/Jongkhar	45	72	1.58	62.31	115.42	1.85
<b>Bhutan</b>	<b>3,188.71</b>	<b>5,647.34</b>	<b>1.77</b>	<b>1,314.31</b>	<b>2,050.76</b>	<b>1.56</b>

**Table 26: Harvested area, production and yield of Buckwheat and Millets, 2008**

Dzongkhags	Buckwheat			Millet		
	Area (Hectares)	Production (MT)	Yield (MT/Hectare)	Area (Hectares)	Production (MT)	Yield (MT/Hectare)
Thimphu	9	10	1.20	1.31	1.26	0.96
Paro	124	95	0.76	20.73	28.25	1.36
Ha	245	412	1.69	21.56	28.55	1.32
Chhukha	386	559	1.45	437.33	586.54	1.34
Samtse	258	437	1.69	961.71	1,346.94	1.40
Punakha	74	109	1.47	1.08	1.76	1.63
Gasa	4	6	1.43	1.77	2.29	1.29
Wangdue	142	213	1.49	23.48	37.15	1.58
Tsirang	98	175	1.78	280.32	390.59	1.39
Dagana	198	312	1.57	357.76	484.11	1.35
Bumthang	285	432	1.52	2.11	2.33	1.10
Trongsa	106	155	1.46	11.96	16.41	1.37
Zhemgang	148	239	1.61	123.71	160.47	1.30
Sarpang	132	217	1.65	571.77	862.54	1.51
Lhuentse	11	17	1.54	49.83	72.47	1.45
Mongar	235	313	1.33	25.48	35.74	1.40
Trashigang	325	472	1.45	68.04	125.23	1.84
Trashiyangtse	9	19	2.14	167.00	262.75	1.57
Pemagatshel	252	401	1.59	238.34	370.58	1.55
S/Jongkhar	396	545	1.38	153.99	208.08	1.35
<b>Bhutan</b>	<b>3,437.62</b>	<b>5,137.54</b>	<b>1.49</b>	<b>3,519.30</b>	<b>5,024.04</b>	<b>1.43</b>

**Table 27: Quantity of cereals and potato production retained for seeds (MT), 2008**

Dzongkhags	Quantity of cereals and potato production retained for seeds (MT)							
	Total Cereals	Paddy	Maize	Wheat	Barley	Buckwheat	Millets	Potato
Thimphu	16.23	10.09	1.51	3.33	0.47	0.79	0.04	187.69
Paro	100.66	57.98	5.87	26.78	3.92	5.59	0.52	561.48
Ha	57.84	2.53	28.36	9.06	1.24	16.10	0.55	195.60
Chhukha	330.66	29.32	265.78	5.31	1.16	20.95	8.14	396.16
Samtse	561.93	107.04	423.77	5.19	1.91	9.30	14.74	22.99
Punakha	136.04	93.29	21.91	14.85	0.93	5.01	0.04	19.78
Gasa	11.64	3.21	0.12	5.29	2.63	0.34	0.05	10.70
Wangdue	117.02	64.18	17.53	18.37	5.49	11.08	0.37	964.57
Tsirang	387.66	58.01	318.60	1.72	0.39	4.01	4.93	46.28
Dagana	418.12	59.22	340.54	1.96	1.65	9.30	5.45	44.59
Bumthang	29.12	1.42	1.14	7.31	5.95	13.23	0.07	600.83
Trongsa	91.12	21.91	53.85	5.98	3.14	6.08	0.16	57.59
Zhemgang	218.99	21.70	181.11	1.71	1.29	10.37	2.82	40.27
Sarpang	434.43	66.89	350.34	0.64	0.22	6.00	10.34	17.22
Lhuentse	150.37	27.07	121.71	0.37	0.10	0.28	0.85	39.01
Mongar	572.03	31.49	506.99	6.92	11.75	14.36	0.51	289.71
Trashigang	474.40	45.99	397.31	2.45	4.74	22.41	1.50	652.94
Trashiyangtse	145.82	27.96	111.97	0.48	0.75	0.40	4.25	104.59
Pemagatshel	320.86	3.90	292.47	1.20	1.92	13.11	8.26	258.22
S/Jongkhar	394.54	39.93	316.03	1.45	2.81	30.99	3.34	64.39
<b>Bhutan</b>	<b>4,969.48</b>	<b>773.15</b>	<b>3,756.89</b>	<b>120.37</b>	<b>52.46</b>	<b>199.69</b>	<b>66.93</b>	<b>4,574.57</b>

**Table 28: Percent households retaining portion of cereals and potato for seeds, 2008**

Dzongkhags	Percent households retaining portion of cereals and potato for seeds						
	Paddy	Maize	Wheat	Barley	Buckwheat	Millets	Potato
Thimphu	32.31	4.72	14.54	4.32	1.49	0.16	23.19
Paro	61.43	10.86	38.28	6.99	10.00	2.87	32.11
Ha	9.82	25.34	46.90	12.08	60.15	8.39	27.94
Chhukha	41.73	72.91	12.46	2.53	32.94	44.93	14.28
Samtse	55.27	69.59	7.40	2.45	17.16	50.76	2.56
Punakha	87.78	22.29	49.01	5.39	13.99	0.29	3.37
Gasa	24.02	1.62	44.11	12.93	2.77	1.62	10.16
Wangdue	56.64	16.48	44.12	19.79	18.14	4.57	33.43
Tsirang	56.17	81.30	5.24	1.07	13.43	35.17	7.00
Dagana	63.24	83.98	4.28	4.03	18.16	35.01	6.65
Bumthang	6.20	2.69	35.48	31.57	35.64	0.24	62.23
Trongsa	78.58	65.66	35.42	21.42	20.73	3.17	9.20
Zhemgang	64.53	91.20	8.23	7.55	30.48	31.27	10.67
Sarpang	51.96	81.21	1.17	0.55	13.64	45.90	2.39
Lhuentse	74.16	81.07	1.77	0.44	1.77	10.85	10.35
Mongar	38.35	94.65	9.73	16.90	15.02	2.33	23.75
Trashigang	47.57	86.33	3.53	7.71	16.28	7.73	25.23
Trashiyangtse	77.30	83.67	2.26	3.15	1.98	25.52	16.49
Pemagatshel	5.86	87.31	2.26	5.89	21.61	20.10	14.66
S/Jongkhar	32.09	82.29	3.90	9.46	34.90	19.20	6.91
Bhutan	49.54	67.26	13.53	7.45	18.55	21.86	15.44



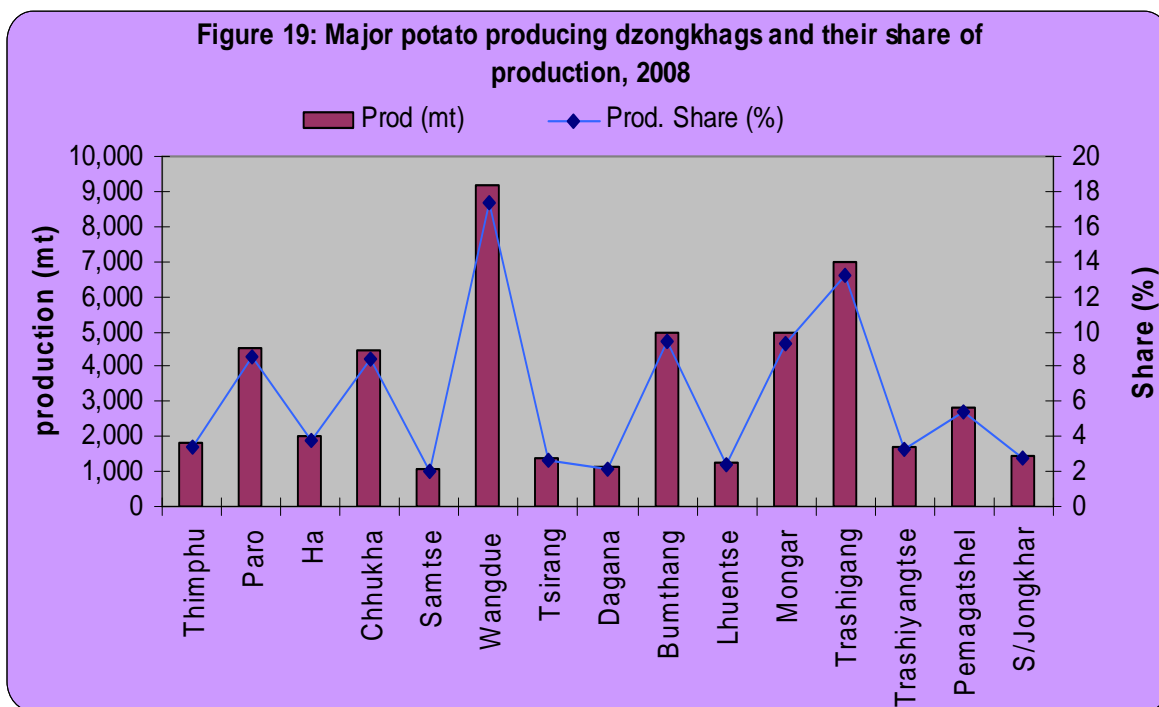
## 2.4.2 Horticulture Crops

The horticulture crops are categorized into vegetables, pulses, spices, oilseeds and fruits. The **vegetables** comprised of potato, cabbage, carrot, cauliflower, asparagus, broccoli, pumpkin, radish, spinach, tomato and turnip; the **pulses** comprised of beans, dhal, mung bean, peas and rajma bean; the **spices** comprised of cardamom, chili, ginger, garlic and onion; the **oilseeds** comprised of mustard, soyabean, sunflower, sesame and groundnut and the **fruits** comprised of apple, mandarin, walnut, plum, pear and peach etc. Mushrooms cultivation was also found to have been in practice at some places but not in significant scale. According to the census results, the major six (6) commodities among the horticulture crops appeared to be potato, chili, cardamom, apple, mandarin and arecanut. Radish and turnip were also found to have grown relatively in larger quantity, the major proportion of which goes as livestock feeds as practiced mostly by the rural people in the higher elevated parts of the country.

**Table 29: Harvested area, production and yield of potato, mustard and chili, 2008**

Dzongkhags	Potato			Mustard			Chili		
	Area (Hectares)	Production (MT)	Yield (MT/Hectare)	Area (Hectares)	Production (MT)	Yield (MT/Hectare)	Area (Hectares)	Production (MT)	Yield (MT/Hectare)
Thimphu	174.7	1797.5	10.3	22.8	43.7	1.9	78.2	208.1	2.7
Paro	451.6	4556.0	10.1	95.6	168.8	1.8	313.2	922.3	2.9
Ha	197.8	2007.0	10.2	51.3	89.1	1.7	36.8	52.1	1.4
Chhukha	407.9	4472.0	11.0	177.9	325.4	1.8	167.6	281.8	1.7
Samtse	168.2	1080.1	6.4	222.1	392.0	1.8	300.6	248.8	0.8
Punakha	64.4	477.1	7.4	141.6	261.4	1.9	259.8	702.1	2.7
Gasa	20.1	165.2	8.2	15.1	17.7	1.2	10.8	19.8	1.8
Wangdue	762.1	9207.8	12.1	103.1	191.0	1.9	208.0	454.4	2.2
Tsirang	188.0	1381.7	7.4	141.2	258.4	1.8	194.5	320.3	1.7
Dagana	146.8	1146.3	7.8	158.2	299.5	1.9	161.4	254.4	1.6
Bumthang	457.4	4998.3	10.9	54.0	87.9	1.6	26.0	53.5	2.1
Trongsa	72.1	674.8	9.4	50.4	103.5	2.1	122.1	256.1	2.1
Zhemgang	115.5	966.2	8.4	59.6	109.2	1.8	110.1	214.8	2.0
Sarpang	118.0	823.6	7.0	188.9	328.9	1.7	122.5	188.4	1.5
Lhuentse	166.1	1249.5	7.5	14.4	29.3	2.0	153.7	344.5	2.2
Mongar	552.7	4958.7	9.0	93.1	179.0	1.9	478.9	920.8	1.9
Trashigang	753.0	6990.7	9.3	169.8	343.7	2.0	476.7	835.7	1.8
Trashiyangtse	244.5	1726.7	7.1	10.4	17.5	1.7	242.8	457.7	1.9
Pemagatshel	318.4	2837.9	8.9	49.4	96.6	2.0	195.2	311.6	1.6
S/Jongkhar	180.6	1442.7	8.0	120.9	236.2	2.0	167.2	265.4	1.6
Bhutan	5559.8	52959.4	9.5	1939.7	3578.8	1.8	3826.1	7312.5	1.9

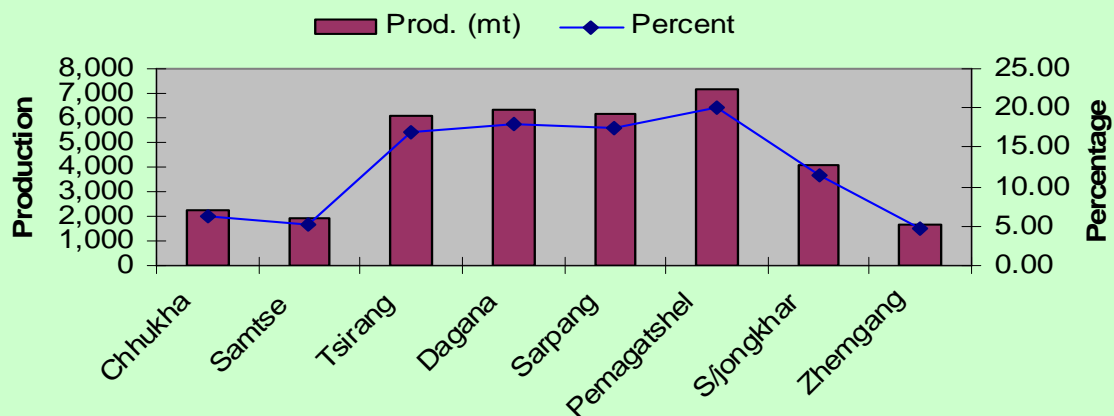
Except for potato, the production of all types of vegetables was observed to have fairly evenly distributed across all the districts. The major potato producing dzongkhags as revealed by the analysis of the census results were Wangdue accounting for 17 percent (9,208 tonnes), Trashigang accounting for 13 percent (6,991 tonnes), Bumthang, Mongar and Paro accounting for 9 percent (4,998, 4959 and 4,556 tonnes respectively) and Chhukha accounting for 8 percent (4,472 tonnes) of the total potato production in the country.



The major proportion (56.77%) of the country’s apple production was produced by at least 65.38 percent of the rural households in Paro followed by Thimphu dzongkhag accounting for 30.81 percent produced by 54.87 percent of the rural households in 2008.

The largest mandarin producers were Pemagatshel, Dagana, Sarpang, Tsirang and Samdrupjongkhar accounting for 18.71 percent produced by 72.32 percent households, 16.65 percent produced by 48.05 percent households, 16.14 percent produced by 38.66 percent households, 15.87 percent produced by 57.64 percent households and 10.60 percent produced by 51.82 percent of the rural households respectively. Arecanut production was appeared to be somewhat confined to Samtse, Sarpang, Chhukha, Dagana and Samdrupjongkhar contributing 38.46 percent, 31.92 percent, 10.67 percent, 9.73 percent and 9.22 percent respectively to the total arecanut production of the country in 2008.

**Figure 20: Mandarin production by selected dzongkhags, 2008**



**Table 30a: Production of vegetables (MT), 2008**

Dzongkhags	Production (MT)					
	Potato	Cabbage	Carrot	Cauliflower	Asparagus	Broccoli
Thimphu	1,797.49	54.81	51.08	31.85	16.85	30.49
Paro	4,555.98	499.00	86.32	7.73	50.42	5.08
Ha	2,006.97	32.72	11.98	7.64	4.57	3.24
Chhukha	4,471.98	74.26	43.23	10.10	2.69	21.12
Samtse	1,080.06	26.73	5.97	13.43	3.01	42.01
Punakha	477.12	16.15	8.91	2.17	6.38	23.96
Gasa	165.19	3.74	1.04	0.81	1.13	1.65
Wangdue	9,207.77	33.63	20.81	5.04	14.41	9.76
Tsirang	1,381.67	45.78	12.79	23.26	3.53	39.56
Dagana	1,146.27	31.79	12.31	17.46	1.31	22.64
Bumthang	4,998.31	66.38	17.20	16.68	0.99	8.41
Trongsa	674.76	41.14	9.36	17.61	0.58	13.41
Zhemgang	966.20	39.85	3.52	14.42	3.77	17.48
Sarpang	823.55	34.73	9.30	17.80	2.32	42.31
Lhuentse	1,249.47	77.62	2.16	33.48	1.91	12.55
Mongar	4,958.72	117.14	24.95	49.58	24.18	35.47
Trashigang	6,990.65	136.80	13.59	35.38	11.55	19.98
Trashiyangtse	1,726.65	100.35	7.08	39.76	22.07	27.91
Pemagatshel	2,837.91	54.11	8.48	8.77	4.66	7.19
S/Jongkhar	1,442.71	66.20	13.34	17.49	0.25	15.59
<b>Bhutan</b>	<b>52,959.43</b>	<b>1,552.95</b>	<b>363.42</b>	<b>370.49</b>	<b>176.57</b>	<b>399.82</b>

**Table 30b: Production of vegetables (MT), 2008**

Dzongkhags	Production (MT)					
	Pumpkin	Radish	Spinach	Tomato	Turnip	Others
Thimphu	22.44	173.83	85.72	5.41	183.51	13.13
Paro	73.96	203.74	113.59	62.42	738.83	90.63
Ha	46.58	142.58	83.42	1.82	1,047.35	38.03
Chhukha	134.16	253.96	375.32	19.01	197.39	528.76
Samtse	204.39	331.33	751.92	81.15	12.30	876.21
Punakha	83.76	224.19	172.60	32.53	112.04	210.00
Gasa	2.69	22.07	9.52	0.22	24.45	10.15
Wangdue	63.65	669.85	175.95	16.69	2,376.38	132.52
Tsirang	198.60	337.98	424.47	69.52	19.78	494.42
Dagana	190.12	253.25	341.57	39.26	48.61	280.41
Bumthang	12.34	113.34	61.67	5.09	152.84	5.38
Trongsa	33.95	283.28	80.85	4.42	95.62	48.20
Zhemgang	145.71	213.41	183.70	6.38	9.43	207.48
Sarpang	135.79	300.62	430.65	71.62	3.51	423.45
Lhuentse	75.75	149.20	125.41	7.70	3.45	100.41
Mongar	273.09	625.46	373.04	18.32	25.99	381.56
Trashigang	269.27	665.26	508.84	28.62	12.17	237.46
Trashiyangtse	184.94	217.92	198.67	9.91	6.44	152.31
Pemagatshel	218.49	439.49	282.52	16.07	7.31	291.45
S/Jongkhar	153.77	356.35	364.69	20.90	2.54	296.39
<b>Bhutan</b>	<b>2,523.45</b>	<b>5,977.10</b>	<b>5,144.11</b>	<b>517.07</b>	<b>5,079.94</b>	<b>4,818.35</b>

**Table 31: Production of spices (MT), 2008**

Dzongkhags	Spices Production (MT)				
	Cardamom	Chili	Garlic	Ginger	Onion
Thimphu	0.00	208.12	9.85	0.74	14.97
Paro	0.00	922.34	18.65	2.21	26.05
Ha	52.88	52.12	21.22	10.64	13.43
Chhukha	178.85	281.82	15.38	350.92	26.19
Samtse	502.46	248.81	40.19	1,401.80	35.53
Punakha	0.00	702.12	46.10	5.60	155.50
Gasa	0.00	19.75	5.26	0.00	6.81
Wangdue	0.00	454.39	73.66	11.20	151.21
Tsirang	11.64	320.29	57.67	170.87	98.59
Dagana	116.19	254.36	60.20	126.11	125.00
Bumthang	0.00	53.50	42.54	0.59	16.19
Trongsa	9.31	256.10	27.38	24.00	42.51
Zhemgang	1.57	214.79	27.80	50.57	14.40
Sarpang	34.26	188.35	30.43	347.68	56.79
Lhuentse	0.00	344.52	167.48	9.59	98.67
Mongar	3.36	920.84	367.12	71.23	238.52
Trashigang	5.46	835.68	523.48	65.57	354.38
Trashiyangtse	2.68	457.65	250.29	37.99	107.91
Pemagatshel	6.09	311.55	193.74	115.57	49.47
S/Jongkhar	17.53	265.40	101.99	332.13	69.55
<b>Bhutan</b>	<b>942.26</b>	<b>7,312.50</b>	<b>2,080.41</b>	<b>3,135.01</b>	<b>1,701.68</b>

**Table 32: Production of oilseeds (MT), 2008**

Dzongkhags	Oilseed Production (MT)				
	Mustard	Soyabean	Sunflower	Sesame	Groundnut
Thimphu	43.45	0.00	0.00	0.00	0.00
Paro	159.99	2.21	0.03	0.00	3.01
Ha	80.90	0.00	0.00	0.86	0.05
Chhukha	310.02	34.62	0.00	3.50	0.75
Samtse	372.75	38.11	0.41	1.59	4.92
Punakha	246.56	3.77	0.47	0.00	2.08
Gasa	16.98	0.10	0.00	0.00	0.00
Wangdue	180.58	8.69	0.10	0.33	0.20
Tsirang	246.85	47.83	0.43	1.26	3.52
Dagana	275.03	33.53	0.35	0.83	0.62
Bumthang	85.88	0.00	1.61	0.12	0.00
Trongsa	97.61	1.02	0.00	0.00	0.00
Zhemgang	99.07	13.47	0.72	2.80	0.25
Sarpang	290.94	13.07	0.74	11.60	2.27
Lhuentse	25.58	31.08	0.00	0.58	0.00
Mongar	168.49	83.08	1.34	1.37	13.93
Trashigang	327.61	155.80	0.35	0.53	64.09
Trashiyangtse	16.73	100.03	0.00	0.10	64.99
Pemagatshel	85.46	121.30	1.34	0.68	39.56
S/Jongkhar	222.93	41.35	0.02	9.97	0.65
<b>Bhutan</b>	<b>3,353.40</b>	<b>729.04</b>	<b>7.91</b>	<b>36.09</b>	<b>200.87</b>

**Table 33: Production of pulses and mushrooms (MT), 2008**

Dzongkhags	Pulses and Mushrooms Production (MT)					
	Beans	Dhal	Mung bean	Peas	Rajma bean	Mushrooms
Thimphu	71.83	1.60	0.42	43.69	0.92	1.93
Paro	152.17	0.65	0.77	178.06	32.12	1.42
Ha	39.69	0.96	0.00	60.74	1.39	0.02
Chhukha	258.66	155.59	1.57	99.04	23.87	0.49
Samtse	251.63	330.73	19.77	4.97	46.36	0.58
Punakha	292.62	0.31	0.31	48.83	6.04	0.12
Gasa	13.11	0.10	0.00	3.89	0.00	0.08
Wangdue	177.74	0.18	0.00	21.73	3.08	0.78
Tsirang	226.12	129.51	56.74	44.07	80.52	0.42
Dagana	176.04	100.50	17.66	18.39	67.16	0.04
Bumthang	59.17	0.42	0.00	24.08	0.22	0.29
Trongsa	62.35	0.38	0.10	3.36	1.29	0.31
Zhemgang	117.87	0.51	9.47	1.28	5.98	1.05
Sarpang	173.22	145.43	9.55	9.94	27.98	0.38
Lhuentse	110.79	0.00	0.33	2.32	6.68	0.18
Mongar	355.40	40.81	35.26	52.21	156.97	0.15
Trashigang	330.41	3.72	15.25	51.92	126.15	0.04
Trashiyangtse	163.57	1.13	23.92	25.42	10.74	0.10
Pemagatshel	216.49	6.25	29.92	28.68	33.85	0.05
S/Jongkhar	210.34	64.44	30.21	30.07	74.38	0.22
<b>Bhutan</b>	<b>3,459.22</b>	<b>983.22</b>	<b>251.22</b>	<b>752.68</b>	<b>705.69</b>	<b>8.66</b>

**Table 34: Percent households producing fruits, 2008**

Dzongkhags	Percent households producing fruits								
	Apple	Mandarin	Arecanut	Peach	Pear	Plum	Walnut	Mango	Others
Thimphu	54.87	0.00	0.47	15.09	8.10	7.00	22.96	0.08	1.26
Paro	65.38	0.00	0.29	21.08	7.74	3.98	22.26	0.00	4.77
Ha	34.98	3.44	0.59	15.44	3.27	4.61	14.35	0.50	10.15
Chhukha	4.47	36.79	15.34	12.81	7.05	1.65	6.58	8.40	43.55
Samtse	0.00	27.76	36.46	7.92	6.71	1.06	0.50	10.78	54.08
Punakha	3.58	53.18	0.13	22.25	26.93	8.30	14.58	18.54	26.13
Gasa	7.62	0.00	0.00	8.08	13.86	1.15	1.39	0.00	0.69
Wangdue	10.49	30.52	0.23	19.17	17.74	4.50	7.61	3.61	14.66
Tsirang	1.10	57.64	1.66	19.08	30.03	19.67	2.76	12.74	53.03
Dagana	1.95	48.05	12.88	17.87	19.63	9.21	5.53	16.75	50.83
Bumthang	41.92	0.00	0.24	11.42	7.91	8.32	21.70	0.00	0.00
Trongsa	5.26	31.63	0.39	12.45	10.90	8.43	11.52	4.64	17.40
Zhemgang	0.00	71.62	5.85	22.81	3.52	6.30	15.10	11.41	35.81
Sarpang	0.00	37.86	53.97	8.33	11.01	3.64	1.25	28.60	65.03
Lhuentse	6.75	29.16	0.06	31.43	19.20	16.21	12.40	1.38	11.57
Mongar	6.85	53.41	0.66	33.46	15.99	17.09	11.08	12.12	23.65
Trashigang	7.41	34.32	0.45	23.23	15.67	15.69	23.90	6.11	18.08
Trashiyangtse	5.73	44.31	0.20	36.21	8.39	10.20	24.64	3.06	15.65
Pemagatshel	2.82	72.32	5.23	25.06	5.92	12.87	7.49	13.20	32.64
S/Jongkhar	0.79	51.82	18.22	27.12	8.03	7.80	6.63	17.43	41.47
Bhutan	9.33	38.75	11.31	20.02	12.71	8.87	10.76	10.36	32.03



**Table 35: Fruits production (MT), 2008**

Dzongkhags	Fruits production (MT)								
	Apple	Mandarin	Arecanut	Peach	Pear	Plum	Walnut	Mango	Others
Thimphu	1,667	0	0	17	6	8	17	0	1
Paro	3,072	0	0	72	45	7	71	0	11
Ha	332	0	0	29	5	9	5	4	4
Chhukha	0	2,208	431	26	24	4	7	19	158
Samtse	0	1,893	1,552	20	42	2	9	35	579
Punakha	5	342	0	32	77	9	11	17	227
Gasa	3	0	0	12	13	0	0	0	5
Wangdue	36	207	0	45	43	13	6	4	120
Tsirang	4	6,059	0	46	240	66	1	66	295
Dagana	19	6,357	393	64	223	19	10	238	272
Bumthang	198	0	0	35	20	9	14	0	1
Trongsa	2	157	0	14	15	8	3	3	32
Zhemgang	0	1,690	0	25	4	6	16	11	165
Sarpang	0	6,162	1,288	20	244	11	8	77	468
Lhuentse	8	176	0	53	40	29	10	2	73
Mongar	25	1,058	0	120	46	47	13	68	165
Trashigang	14	462	0	97	66	66	67	18	83
Trashiyangtse	5	202	0	67	15	14	23	1	39
Pemagatshel	16	7,143	0	70	16	71	28	20	158
S/Jongkhar	5	4,048	372	100	21	16	20	27	232
<b>Bhutan</b>	<b>5,410</b>	<b>38,184</b>	<b>4,036</b>	<b>961</b>	<b>1,205</b>	<b>414</b>	<b>339</b>	<b>610</b>	<b>3,088</b>

**Table 36: Apple and mandarin production (MT), 2008**

Dzongkhags	Apple				Mandarin			
	Total Trees (000'Nos)	Bearing Trees (000'Nos)	Production (MT)	Yield (Kg/Tree)	Total Trees (000'Nos)	Bearing Trees (000'Nos)	Production (MT)	Yield (Kg/Tree)
Thimphu	101	81	1,667.0	20.5	0	0	0.0	0.0
Paro	161	130	3,071.7	23.6	0	0	0.0	0.0
Ha	27	15	332.1	22.3	0	0	0.0	0.0
Chhukha	8	5	0.0	0.0	259	141	2208.4	15.7
Samtse	0	0	0.0	0.0	170	99	1893.4	19.1
Punakha	0	0	5.4	29.0	30	21	341.5	16.1
Gasa	0	0	2.7	20.3	0	0	0.0	0.0
Wangdue	3	2	36.3	23.1	12	7	206.6	28.5
Tsirang	0	0	3.8	22.9	201	119	6059.3	51.0
Dagana	1	1	18.9	24.8	249	139	6356.5	45.6
Bumthang	10	9	197.9	23.0	0	0	0.0	0.0
Trongsa	0	0	2.1	22.6	7	3	156.7	49.5
Zhemgang	0	0	0.0	0.0	156	95	1690.3	17.8
Sarpang	0	0	0.0	0.0	238	153	6161.9	40.2
Lhuentse	1	0	8.3	31.7	8	4	176.2	45.7
Mongar	2	1	24.5	26.6	60	24	1058.1	44.3
Trashigang	3	0	13.8	28.6	29	12	462.2	37.7
Trashiyangtse	1	0	4.9	29.3	19	7	201.7	28.8
Pemagatshel	1	1	16.2	32.5	355	204	7143.0	35.0
S/Jongkhar	0	0	4.8	24.1	179	92	4047.7	44.1
<b>Bhutan</b>	<b>321</b>	<b>245</b>	<b>5,410.4</b>	<b>22.0</b>	<b>1975</b>	<b>1124</b>	<b>38183.8</b>	<b>34.0</b>

**Table 37: Arecanut and peach production (MT), 2008**

Dzongkhags	Arecanut				Peach			
	Total Trees (000'Nos)	Bearing Trees (000'Nos)	Production (MT)	Yield (Kg/Tree)	Total Trees (000'Nos)	Bearing Trees (000'Nos)	Production (MT)	Yield (Kg/Tree)
Thimphu	0	0	0.0	0.0	0.9	0.9	16.8	18.8
Paro	0	0	0.0	0.0	5.3	3.2	71.7	22.2
Ha	0	0	0.0	0.0	0.3	0.3	28.7	100.5
Chhukha	503	62	430.7	7.0	0.8	0.5	25.7	28.3
Samtse	532	219	1552.1	7.1	12.0	0.8	20.3	27.1
Punakha	0	0	0.0	0.0	1.2	6.0	31.6	5.3
Gasa	0	0	0.0	0.0	0.1	0.0	12.0	68.4
Wangdue	0	0	0.0	0.0	1.1	1.0	45.3	44.8
Tsirang	0	0	0.0	0.0	1.0	1.0	45.9	37.5
Dagana	92	36	392.5	11.0	1.1	1.0	63.5	42.7
Bumthang	0	0	0.0	0.0	0.3	0.2	34.7	145.1
Trongsa	0	0	0.0	0.0	0.3	0.3	13.6	41.9
Zhemgang	0	0	0.0	0.0	0.8	0.6	24.6	39.0
Sarpang	545	142	1288.3	9.1	0.5	0.4	19.5	32.7
Lhuentse	0	0	0.0	0.0	1.2	1.2	52.8	44.5
Mongar	0	0	0.0	0.0	3.4	3.1	120.2	32.6
Trashigang	0	0	0.0	0.0	2.8	2.5	97.1	38.7
Trashiyangtse	0	0	0.0	0.0	2.9	2.6	67.2	25.9
Pemagatshel	0	0	0.0	0.0	1.7	1.0	70.4	35.9
S/Jongkhar	64	25	372.2	14.6	2.2	2.1	99.7	47.3
<b>Bhutan</b>	<b>1751</b>	<b>488</b>	<b>4081.6</b>	<b>8.4</b>	<b>40.1</b>	<b>31.8</b>	<b>961.0</b>	<b>30.3</b>

**Table 38: Pear and plum production (MT), 2008**

Dzongkhags	Pear				Plum			
	Total Trees (000'Nos)	Bearing Trees (000'Nos)	Production (MT)	Yield (Kg/Tree)	Total Trees (000'Nos)	Bearing Trees (000'Nos)	Production (MT)	Yield (Kg/Tree)
Thimphu	1	0	6.0	21.1	0	0	7.9	26.4
Paro	4	3	44.5	16.5	0	0	6.8	46.6
Ha	0	0	5.3	71.3	0	0	8.7	125.8
Chhukha	0	0	24.4	69.2	0	0	4.0	44.9
Samtse	1	1	42.4	60.0	0	0	1.7	17.8
Punakha	2	1	77.0	71.1	0	0	9.4	24.5
Gasa	0	0	13.1	63.1	0	0	0.4	53.4
Wangdue	1	1	42.7	46.1	0	0	13.3	71.3
Tsirang	3	3	240.1	80.7	1	1	65.5	54.7
Dagana	2	4	223.0	61.8	0	0	19.2	49.0
Bumthang	0	0	20.4	121.4	0	0	9.2	59.5
Trongsa	0	0	14.7	35.1	0	0	8.0	49.0
Zhemgang	0	0	3.9	21.8	0	0	5.9	48.6
Sarpang	1	1	244.3	78.0	0	0	11.2	50.2
Lhuentse	1	1	39.9	56.9	1	0	29.3	61.9
Mongar	2	1	45.5	42.2	1	1	47.2	29.2
Trashigang	3	1	65.6	45.6	2	1	65.8	44.9
Trashiyangtse	0	0	15.1	69.3	0	0	13.7	49.8
Pemagatshel	1	0	16.3	53.6	1	1	70.6	86.4
S/Jongkhar	1	0	20.6	70.6	1	0	16.4	44.6
<b>Bhutan</b>	<b>22</b>	<b>19</b>	<b>1204.8</b>	<b>64.8</b>	<b>9</b>	<b>9</b>	<b>414.2</b>	<b>48.5</b>

**Table 39: Walnut and mango production (MT), 2008**

Dzongkhags	Walnut				Mango			
	Total Trees (000'Nos)	Bearing Trees (000'Nos)	Production (MT)	Yield (Kg/Tree)	Total Trees (000'Nos)	Bearing Trees (000'Nos)	Production (MT)	Yield (Kg/Tree)
Thimphu	2	1	16.6	15.6	0	0	0.1	26.2
Paro	6	3	70.5	23.5	0	0	0.0	0.0
Ha	1	0	4.7	16.2	0	0	4.2	111.3
Chhukha	2	1	7.4	9.1	3	1	18.5	25.1
Samtse	3	1	9.2	9.5	2	1	34.5	28.1
Punakha	1	0	11.3	39.0	2	1	16.9	21.2
Gasa	0	0	0.0	10.2	0	0	0.0	0.0
Wangdue	2	0	6.4	43.2	0	0	4.1	9.6
Tsirang	4	0	1.1	39.2	3	2	66.2	28.3
Dagana	5	0	9.5	24.3	5	3	238.0	69.4
Bumthang	1	0	13.8	52.8	0	0	0.0	0.0
Trongsa	0	0	2.6	31.0	0	0	3.3	48.6
Zhemgang	2	0	16.2	35.3	3	0	11.1	27.9
Sarpang	5	1	8.0	7.2	6	2	76.5	31.4
Lhuentse	1	0	9.8	34.3	0	0	2.3	23.7
Mongar	2	0	12.9	28.3	5	2	68.3	27.7
Trashigang	6	2	66.9	37.2	1	0	18.0	41.6
Trashiyangtse	1	1	23.1	31.0	0	0	1.3	29.7
Pemagatshel	1	0	28.0	117.3	2	1	20.2	19.9
S/Jongkhar	2	1	20.4	40.6	3	1	26.8	34.7
<b>Bhutan</b>	<b>45</b>	<b>13</b>	<b>338.5</b>	<b>26.2</b>	<b>35</b>	<b>17</b>	<b>610.3</b>	<b>36.5</b>

**Table 40: Other fruits production (MT), 2008**

Dzongkhags	Others Fruits			
	Total Trees (000'Nos)	Bearing Trees (000'Nos)	Production (MT)	Yield (Kg/Tree)
Thimphu	1	0	0.7	4.18
Paro	0	0	10.7	33.45
Ha	3	1	4.3	4.75
Chhukha	29	15	158.1	10.49
Samtse	82	29	579.0	19.63
Punakha	16	12	227.1	18.22
Gasa	0	0	4.5	44.57
Wangdue	11	5	120.2	22.09
Tsirang	49	28	295.0	10.59
Dagana	43	18	272.4	15.24
Bumthang	0	0	0.9	29.00
Trongsa	4	2	31.5	15.07
Zhemgang	10	6	165.2	28.14
Sarpang	70	27	467.9	17.16
Lhuentse	5	2	73.4	31.60
Mongar	27	12	165.4	13.57
Trashigang	27	6	83.3	14.67
Trashiyangtse	8	2	39.2	17.35
Pemagatshel	32	8	157.5	19.71
S/Jongkhar	33	13	231.7	17.95
<b>Bhutan</b>	<b>451</b>	<b>188</b>	<b>3,088.0</b>	<b>16.40</b>

## 2.5 Livestock

The livestock farming is an essential part of the farming systems across the country and is known as an economic activity distinct from growing crops. The country has a wide range of livestock production systems depending on the variations in environmental conditions.

The term “livestock” in this study refers to all animals and birds kept or reared in captivity mainly for agricultural purposes. This includes cattle, yaks, buffaloes, horses, mules, donkeys, sheep, goats, pigs and poultry. Dogs and cats regardless of whether they were kept for agricultural or other purposes have also been included under the livestock. The rearing and production of fishes has been also the part of the livestock programs supported by fisheries breeding centers in Sarpang and Samdrupjongkhar. Figure 21 depicts the proportion of households as percentage of the rural households in the dzonkhag owning livestock.

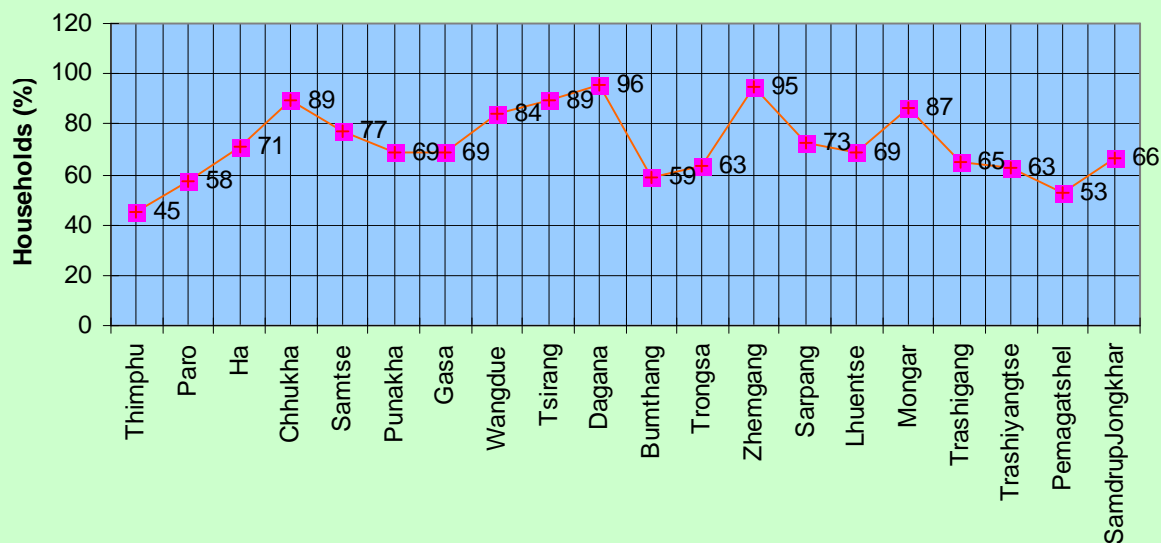
Livestock products include dairy products (milk, butter and cheese), meat, eggs and wool. Substantial amount of the livestock products were traded but mostly within the country. The GDP contribution of the livestock sector to the national GDP was 5.5 percent (SYB 2009) and

the RNR Census 2009 revealed that 15 percent of the total cash income of the rural households was generated through sale of livestock products in 2008.

Livestock population (nos), 2008	
Local cattle	252,899
Improve cattle	55,696
Other cattle	1,476
Yaks	40,482
Horses	22,301
Sheep	12,116
Goats	34,176
Pigs	18,963
Poultry	197,766
Other cattle includes Zo/Zom and Buffaloes and Horses include Horses, Mules and Donkeys	

Livestock productions (kgs), 2008	
Milk	24,940,286
Butter	1,648,139
Cheese	1,935,236
Beef	461,164
Pork	244,725
Mutton	34,065
Chicken	92,615
Wool	11,774
Eggs (Doz)	450,758

**Figure 21: Proportion of livestock owning households as percentage of the total rural households in the dzongkhags, 2008**



**Table 41: Proportion of households as percentage of the total livestock owning households, 2008**

Dzongkhags	Percent households by types of livestock						
	Mithun Cattle	Nublang Cattle	Jersey Cattle	Swiss Brown Cattle	Other Cattle	Yaks	Horses
Thimphu	3.20	21.53	11.38	0.60	0.18	5.58	9.52
Paro	4.53	22.78	13.75	0.33	0.01	0.70	6.87
Ha	3.53	25.64	11.57	0.24	0.03	2.69	9.34
Chhukha	2.65	28.04	6.21	0.00	0.00	0.00	1.92
Samtse	0.73	27.33	3.70	0.07	0.47	0.00	0.75
Punakha	8.79	28.79	10.16	0.21	0.00	0.00	4.19
Gasa	6.63	10.71	3.12	2.64	0.00	17.59	25.74
Wangdue	10.33	29.67	7.40	1.04	0.03	1.17	5.79
Tsirang	0.90	22.13	11.09	0.12	0.68	0.00	1.33
Dagana	3.12	25.62	7.32	0.00	0.12	0.00	1.98
Bumthang	7.70	15.88	8.57	13.52	0.51	2.36	10.48
Trongsa	12.65	23.70	11.67	2.86	0.00	0.17	4.91
Zhemgang	16.22	20.45	6.52	0.23	0.00	0.00	15.28
Sarpang	3.62	26.30	9.49	0.11	0.38	0.00	1.94
Lhuentse	17.43	20.92	7.30	1.57	0.02	0.11	12.76
Mongar	18.58	21.71	10.37	1.08	0.00	0.00	9.52
Trashigang	17.38	21.69	8.76	0.29	0.10	2.60	8.65
Trashiyangtse	14.52	26.09	10.64	0.43	0.08	0.08	12.08
Pemagatshel	14.68	20.28	17.63	0.34	0.00	0.00	12.18
S/Jongkhar	15.18	21.93	10.92	0.27	0.02	0.00	8.66
Bhutan	8.75	24.22	8.96	0.67	0.17	0.65	6.17



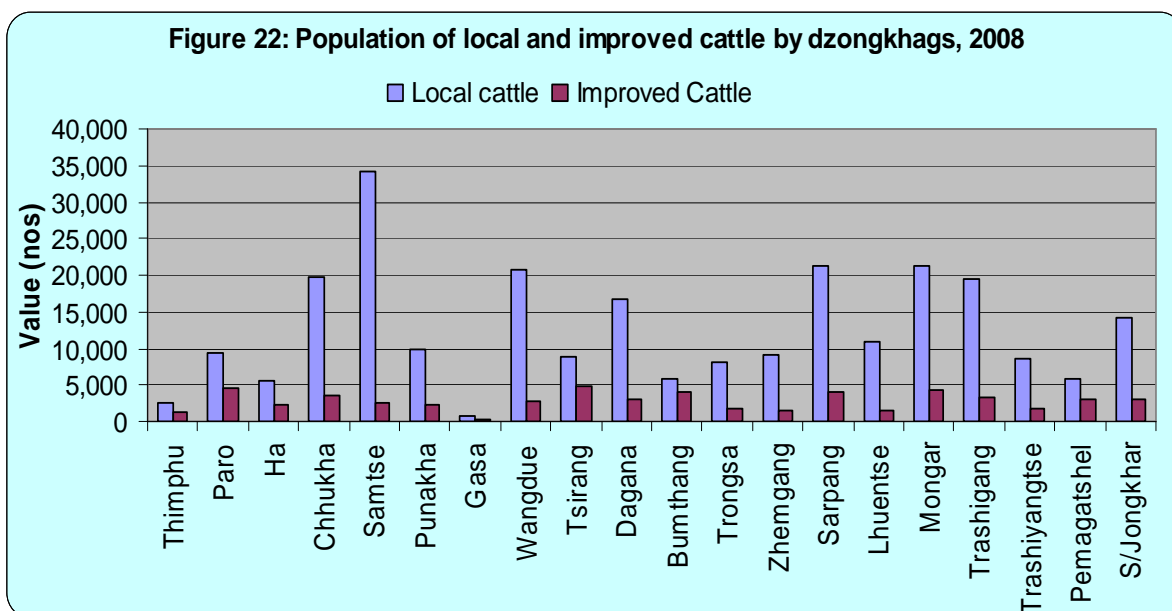
**Table 42: Proportion of households as percentage of the total livestock owning households, 2008**

Dzongkhags	Percent Households by types of livestock					
	Sheep	Goats	Pigs	Poultry	Dogs	Cats
Thimphu	0.04	0.14	2.32	6.95	19.53	19.04
Paro	0.20	0.73	5.72	8.20	17.56	18.60
Ha	0.19	0.62	8.23	14.18	10.05	13.69
Chhukha	1.42	8.52	9.48	18.81	9.93	13.02
Samtse	3.07	13.43	5.26	21.70	10.77	12.71
Punakha	0.08	0.38	7.52	13.55	9.78	16.55
Gasa	0.08	0.08	0.48	6.63	11.99	14.31
Wangdue	1.51	0.60	7.62	11.50	8.40	14.95
Tsirang	1.48	12.06	6.26	16.04	12.89	15.00
Dagana	0.84	9.49	8.93	18.18	10.46	13.94
Bumthang	1.31	0.15	0.00	6.66	18.27	14.60
Trongsa	1.07	0.03	1.09	14.95	8.75	18.15
Zhemgang	0.00	0.38	7.11	16.69	5.29	11.83
Sarpang	1.76	8.43	5.61	19.21	9.08	14.07
Lhuentse	0.13	0.21	2.30	19.18	7.26	10.80
Mongar	0.08	0.69	4.45	17.88	4.79	10.85
Trashigang	1.21	0.26	3.27	15.44	9.06	11.29
Trashiyangtse	0.20	0.85	6.34	7.21	8.91	12.56
Pemagatshel	0.04	0.27	4.04	12.69	6.29	11.57
S/Jongkhar	0.23	2.48	3.06	16.91	8.60	11.72
Bhutan	1.04	4.70	5.57	15.94	9.73	13.42

**Table 43a: Livestock population, 2008**

Dzongkhags	All Livestock Population (Nos)					
	Mithun Cattle	Nublang Cattle	Jersey Cattle	Brown Swiss Cattle	Other Cattle	Yaks
Thimphu	321	2,130	1,162	140	117	9,981
Paro	2,030	7,360	4,311	185	21	3,773
Ha	1,627	3,939	2,088	74	55	4,652
Chhukha	2,445	17,351	3,457	0	0	0
Samtse	749	33,504	2,394	39	427	0
Punakha	2,259	7,612	2,166	33	0	0
Gasa	288	426	113	158	0	5,694
Wangdue	4,644	16,004	2,317	505	4	2,753
Tsirang	399	8,487	4,727	44	236	0
Dagana	1,933	14,690	3,112	0	80	0
Bumthang	2,229	3,616	1,439	2,671	41	3,197
Trongsa	1,969	6,180	1,505	354	0	138
Zhemgang	6,167	2,945	1,400	42	0	0
Sarpang	2,488	18,664	4,023	54	167	0
Lhuentse	4,732	6,099	1,201	229	17	241
Mongar	12,526	8,818	3,972	332	0	0
Trashigang	9,594	9,779	3,272	112	165	8,780
Trashiyangtse	3,347	5,347	1,694	48	112	400
Pemagatshel	2,950	2,975	3,076	55	0	0
S/Jongkhar	6,403	7,699	2,922	73	26	0
<b>Bhutan</b>	<b>68,885</b>	<b>184,014</b>	<b>50,443</b>	<b>5,253</b>	<b>1,476</b>	<b>40,482</b>

Note: Local cattle includes “Mithun + Nublang cattle and improved includes Jersey + Brown Swiss cattle. Refer Table 43 to 46.



**Table 43b: Livestock population, 2008**

Dzongkhags	All Livestock Population (Nos)				
	Horses	Sheep	Goats	Pigs	Poultry
Thimphu	1,057	2	6	100	1,018
Paro	1,548	27	111	822	5,217
Ha	922	20	72	605	2,611
Chhukha	460	1,091	5,330	2,598	18,471
Samtse	433	3,556	12,266	1,840	35,925
Punakha	616	8	76	892	4,291
Gasa	994	4	4	23	339
Wangdue	1,143	2,393	156	1,347	4,982
Tsirang	243	749	5,588	1,530	23,225
Dagana	445	540	5,036	2,557	18,295
Bumthang	1,237	467	5	0	534
Trongsa	308	430	2	70	2,000
Zhemgang	1,754	0	46	864	6,074
Sarpang	358	954	3,920	1,264	28,306
Lhuentse	1,426	63	18	229	5,654
Mongar	2,449	40	153	1,231	14,530
Trashigang	2,927	1,528	192	1,019	10,444
Trashiyangtse	1,336	39	82	710	1,397
Pemagatshel	1,377	3	37	678	4,968
S/Jongkhar	1,268	70	942	565	9,849
<b>Bhutan</b>	<b>22,335</b>	<b>12,116</b>	<b>34,176</b>	<b>18,963</b>	<b>197,766</b>

**Table 44: Mithun cattle population (Nos), 2008**

Dzongkhags	Mithun Cattle (Mthun pure + Mithun Cross), Mithun Cross (Jatsa + Jatsam + Yangku + Yangkum)							
	Total	Young Females	Young Males	Heifers	Milch Cows	Dry Cows	Breeding Bulls	Bullocks
Thimphu	321	45	35	43	51	46	2	100
Paro	2,030	235	175	169	489	417	78	466
Ha	1,627	340	226	242	418	210	61	130
Chhukha	2,445	350	264	405	638	403	27	358
Samtse	749	103	106	108	146	89	5	192
Punakha	2,259	207	209	192	334	387	56	873
Gasa	288	36	27	30	59	53	4	79
Wangdue	4,644	503	482	534	1,047	695	165	1,218
Tsirang	399	50	33	64	71	45	4	132
Dagana	1,933	229	263	208	376	270	16	571
Bumthang	2,229	237	234	321	588	448	22	379
Trongsa	1,969	203	216	215	356	253	49	678
Zhemgang	6,167	947	706	676	1,288	1,184	81	1,285
Sarpang	2,488	335	328	400	649	321	40	415
Lhuentse	4,732	793	638	596	1,058	785	61	802
Mongar	12,526	1,386	1,426	1,808	2,926	2,537	145	2,299
Trashigang	9,594	1,009	973	1,130	2,065	1,728	96	2,593
Trashiyangtse	3,347	385	330	500	640	735	26	732
Pemagatshel	2,950	368	344	321	532	685	21	679
S/Jongkhar	6,403	810	743	979	1,515	1,026	61	1,269
<b>Bhutan</b>	<b>68,885</b>	<b>8,522</b>	<b>7,717</b>	<b>8,914</b>	<b>15,204</b>	<b>12,277</b>	<b>1,023</b>	<b>15,229</b>

**Table 45: Nublang cattle population (Nos), 2008**

Dzongkhags	Nublang Cattle							
	Total	Young Females	Young Males	Heifers	Milch Cows	Dry Cows	Breeding Bulls	Bullocks
Thimphu	2,130	338	331	223	345	400	29	464
Paro	7,360	814	724	762	1,155	1,668	279	1,959
Ha	3,939	537	540	687	860	686	86	544
Chhukha	17,351	2,124	1,914	2,935	3,092	2,797	163	4,327
Samtse	33,504	4,432	4,278	4,873	6,201	4,061	489	9,170
Punakha	7,612	804	941	874	1,040	1,396	242	2,314
Gasa	426	61	61	44	56	75	17	113
Wangdue	16,004	1,820	1,999	2,364	2,934	2,994	318	3,574
Tsirang	8,487	871	837	1,072	1,209	956	175	3,367
Dagana	14,690	1,875	1,863	1,838	2,268	2,020	68	4,757
Bumthang	3,616	394	359	517	714	696	33	903
Trongsa	6,180	745	733	722	1,181	1,288	78	1,435
Zhemgang	2,945	473	368	397	501	484	31	690
Sarpang	18,664	2,176	2,303	2,641	3,386	2,492	397	5,268
Lhuentse	6,099	963	918	870	1,132	1,495	93	630
Mongar	8,818	1,207	1,512	1,512	1,417	1,594	141	1,434
Trashigang	9,779	1,252	1,238	1,450	1,865	2,252	67	1,654
Trashiyangtse	5,347	788	719	738	881	1,385	18	818
Pemagatshel	2,975	426	503	432	448	625	30	511
S/Jongkhar	7,699	1,065	1,052	1,216	1,399	1,031	59	1,877
<b>Bhutan</b>	<b>184,014</b>	<b>23,190</b>	<b>23,205</b>	<b>26,224</b>	<b>32,148</b>	<b>30,452</b>	<b>2,828</b>	<b>45,967</b>

**Table 46: Jersey cattle population (Nos), 2008**

Dzongkhags	Jersey Cattle (Jersey Pure + Jersey Cross)							
	Total	Young Females	Young Males	Heifers	Milch Cows	Dry Cows	Breeding Bulls	Bullocks
Thimphu	1,162	190	168	161	371	170	19	82
Paro	4,311	742	520	521	1,223	756	150	398
Ha	2,088	405	265	319	666	288	24	120
Chhukha	3,457	673	504	597	931	342	72	336
Samtse	2,394	429	355	414	637	229	60	270
Punakha	2,166	282	340	258	448	380	66	392
Gasa	113	9	14	24	21	25	8	11
Wangdue	2,317	304	305	390	603	320	96	298
Tsirang	4,727	793	562	801	1,083	617	123	748
Dagana	3,112	553	447	433	830	357	20	471
Bumthang	1,439	180	172	258	394	185	28	223
Trongsa	1,505	316	222	173	459	202	13	120
Zhemgang	1,400	314	189	263	305	192	55	82
Sarpang	4,023	841	651	615	1,089	431	61	335
Lhuentse	1,201	230	138	208	360	214	21	31
Mongar	3,972	676	575	768	1,097	622	78	155
Trashigang	3,272	562	457	495	1,015	547	50	145
Trashiyangtse	1,694	291	254	334	417	269	24	106
Pemagatshel	3,076	613	531	391	808	557	20	156
S/Jongkhar	2,922	506	414	545	879	340	39	197
<b>Bhutan</b>	<b>50,443</b>	<b>8,907</b>	<b>7,085</b>	<b>7,988</b>	<b>13,657</b>	<b>7,056</b>	<b>1,039</b>	<b>4,710</b>

**Table 47: Brown Swiss cattle population (Nos), 2008**

Dzongkhags	Swiss Brown Cattle ( Swiss Brown Pure + Swiss Brown Cross)							
	Total	Young Females	Young Males	Heifers	Milch Cows	Dry Cows	Breeding Bulls	Bullocks
Thimphu	140	26	11	9	34	14	3	43
Paro	185	25	19	18	41	65	9	7
Ha	74	12	10	4	13	19	0	15
Chhukha	0	0	0	0	0	0	0	0
Samtse	39	5	6	5	6	10	3	3
Punakha	33	2	11	8	7	2	0	2
Gasa	158	19	25	19	27	29	8	32
Wangdue	505	69	69	75	135	76	12	67
Tsirang	44	9	4	6	8	4	3	8
Dagana	0	0	0	0	0	0	0	0
Bumthang	2,671	334	297	424	646	476	16	477
Trongsa	354	47	54	48	98	55	6	46
Zhemgang	42	9	10	6	10	2	1	4
Sarpang	54	19	13	7	7	1	0	7
Lhuentse	229	51	32	56	25	53	1	10
Mongar	332	91	65	75	51	31	10	9
Trashigang	112	23	17	16	35	15	5	1
Trashiyangtse	48	13	13	9	6	2	0	4
Pemagatshel	55	13	11	9	19	0	0	2
S/Jongkhar	73	8	13	15	20	15	1	1
<b>Bhutan</b>	<b>5,253</b>	<b>787</b>	<b>693</b>	<b>825</b>	<b>1,217</b>	<b>889</b>	<b>82</b>	<b>760</b>

**Table 48: Other cattle population (Nos), 2008**

Dzongkhags	Cattle Others (Zo + Zoms + Buffaloes)							
	Total	Young Females	Young Males	Heifers	Milch Cows	Dry Cows	Breeding Bulls	Bullocks
Thimphu	117	10	11	15	35	12	4	30
Paro	21	10	0	0	0	0	0	10
Ha	55	3	3	3	17	17	1	11
Chhukha	0	0	0	0	0	0	0	0
Samtse	427	47	54	61	77	80	10	97
Punakha	0	0	0	0	0	0	0	0
Gasa	0	0	0	0	0	0	0	0
Wangdue	4	0	0	0	0	0	0	4
Tsirang	236	62	43	15	70	39	0	8
Dagana	80	14	11	6	22	22	4	0
Bumthang	41	4	1	2	18	3	0	12
Trongsa	0	0	0	0	0	0	0	0
Zhemgang	0	0	0	0	0	0	0	0
Sarpang	167	37	28	9	46	30	1	16
Lhuentse	17	0	0	0	6	6	0	6
Mongar	0	0	0	0	0	0	0	0
Trashigang	165	4	4	10	65	14	8	61
Trashiyangtse	112	1	5	4	65	13	1	23
Pemagatshel	0	0	0	0	0	0	0	0
S/Jongkhar	26	1	4	6	5	8	1	0
<b>Bhutan</b>	<b>1,476</b>	<b>196</b>	<b>166</b>	<b>133</b>	<b>426</b>	<b>245</b>	<b>30</b>	<b>280</b>



**Table 49: Yak population (Nos), 2008**

Dzongkhags	Yaks							
	Total	Young Females	Young Males	Heifers	Milch Cows	Dry Cows	Breeding Bulls	Bullocks
Thimphu	9,981	1,257	1,065	828	2,358	1,408	372	2,693
Paro	3,773	429	420	335	876	954	144	616
Ha	4,652	645	502	546	1,356	679	155	770
Chhukha	0	0	0	0	0	0	0	0
Samtse	0	0	0	0	0	0	0	0
Punakha	0	0	0	0	0	0	0	0
Gasa	5,694	627	605	621	1,225	877	68	1,670
Wangdue	2,753	305	282	317	601	505	96	648
Tsirang	0	0	0	0	0	0	0	0
Dagana	0	0	0	0	0	0	0	0
Bumthang	3,335	443	344	346	842	639	41	681
Trongsa	0	0	0	0	0	0	0	0
Zhemgang	0	0	0	0	0	0	0	0
Sarpang	0	0	0	0	0	0	0	0
Lhuentse	241	9	14	17	147	34	0	20
Mongar	0	0	0	0	0	0	0	0
Trashigang	8,780	668	772	918	3,133	1,172	252	1,865
Trashiyangtse	400	40	49	45	91	85	9	81
Pemagatshel	0	0	0	0	0	0	0	0
S/Jongkhar	0	0	0	0	0	0	0	0
<b>Bhutan</b>	<b>40,482</b>	<b>4,529</b>	<b>4,147</b>	<b>4,053</b>	<b>10,808</b>	<b>6,504</b>	<b>1,162</b>	<b>9,280</b>

**Table 50: Horses population (Nos), 2008**

Dzongkhags	Horses (Horses + Mules + Donkeys)				
	Total	Local Males	Local Females	Improved Males	Improved Females
Thimphu	1,057	546	481	14	16
Paro	1,548	840	684	12	11
Ha	922	558	339	11	14
Chhukha	460	228	226	4	3
Samtse	433	229	195	3	6
Punakha	616	329	271	6	10
Gasa	994	645	340	8	1
Wangdue	1,143	607	501	20	15
Tsirang	243	117	124	1	1
Dagana	445	198	241	2	3
Bumthang	1,237	570	576	37	53
Trongsa	308	132	160	9	7
Zhemgang	1,754	949	787	13	5
Sarpang	358	193	162	3	0
Lhuentse	1,426	640	710	43	33
Mongar	2,449	1,219	1,179	32	18
Trashigang	2,927	1,481	1,417	17	12
Trashiyangtse	1,336	593	691	15	37
Pemagatshel	1,377	598	752	18	9
S/Jongkhar	1,268	674	564	19	11
<b>Bhutan</b>	<b>22,301</b>	<b>11,345</b>	<b>10,399</b>	<b>289</b>	<b>268</b>

**Table 51: Sheep population (Nos), 2008**

Dzongkhags	Sheep				
	Total	Local Males	Local Females	Improved Males	Improved Females
Thimphu	2	0	0	0	2
Paro	27	6	11	3	6
Ha	20	11	8	0	1
Chhukha	1,091	323	747	7	15
Samtse	3,556	1,347	2,199	5	5
Punakha	8	0	1	5	2
Gasa	4	2	2	0	0
Wangdue	2,393	797	1,565	6	25
Tsirang	749	289	422	7	30
Dagana	540	176	357	0	7
Bumthang	467	162	203	37	64
Trongsa	430	226	199	3	2
Zhemgang	0	0	0	0	0
Sarpang	954	348	601	4	1
Lhuentse	63	11	14	14	24
Mongar	40	17	20	1	1
Trashigang	1,528	649	842	34	3
Trashiyangtse	39	8	19	6	5
Pemagatshel	3	1	1	1	0
S/Jongkhar	70	29	41	0	0
<b>Bhutan</b>	<b>12,116</b>	<b>4,448</b>	<b>7,335</b>	<b>136</b>	<b>197</b>

**Table 52: Goats population (Nos), 2008**

Dzongkhags	Goats				
	Total	Local Males	Local Females	Improved Males	Improved Females
Thimphu	6	3	2	0	1
Paro	111	56	54	1	0
Ha	72	31	41	0	0
Chhukha	5,330	2,183	3,135	5	6
Samtse	12,266	5,152	7,094	17	2
Punakha	76	36	40	0	0
Gasa	4	2	2	0	0
Wangdue	156	65	91	0	0
Tsirang	5,588	2,460	3,094	23	10
Dagana	5,036	2,110	2,919	4	2
Bumthang	5	4	1	0	0
Trongsa	2	1	1	0	0
Zhemgang	46	20	23	1	2
Sarpang	3,920	1,827	2,081	6	7
Lhuentse	18	10	8	0	0
Mongar	153	82	70	1	0
Trashigang	192	63	125	0	4
Trashiyangtse	82	39	38	2	3
Pemagatshel	37	19	18	0	0
S/Jongkhar	942	418	524	0	0
<b>Bhutan</b>	<b>34,176</b>	<b>14,633</b>	<b>19,443</b>	<b>61</b>	<b>39</b>

**Table 53: Pigs population (Nos), 2008**

Dzongkhags	Pigs				
	Total	Local Males	Local Females	Improved Males	Improved Females
Thimphu	100	31	23	22	23
Paro	822	293	361	60	108
Ha	605	237	289	33	45
Chhukha	2,598	1,283	990	186	139
Samtse	1,840	1,046	684	55	55
Punakha	892	303	353	105	132
Gasa	23	2	19	1	1
Wangdue	1,347	496	556	137	158
Tsirang	1,530	680	589	121	141
Dagana	2,557	1,117	1,097	157	186
Bumthang	0	0	0	0	0
Trongsa	70	16	24	15	15
Zhemgang	864	317	327	100	120
Sarpang	1,264	737	356	134	38
Lhuentse	229	84	76	32	37
Mongar	1,231	378	426	184	242
Trashigang	1,019	434	333	83	169
Trashiyangtse	710	220	233	109	147
Pemagatshel	678	242	282	66	88
S/Jongkhar	565	244	299	12	11
<b>Bhutan</b>	<b>18,963</b>	<b>8,164</b>	<b>7,329</b>	<b>1,613</b>	<b>1,857</b>

**Table 54: Poultry, dog and cat population (Nos), 2008**

Dzongkhags	Poultry					Dogs and Cats	
	Total	Local Males	Local Females	Improved Males	Improved Females	Dogs	Cats
Thimphu	1,018	199	767	13	40	926	808
Paro	5,217	441	4,473	6	297	2,286	1,823
Ha	2,611	502	1,832	12	265	531	695
Chhukha	18,471	3,958	13,706	598	209	1,687	1,984
Samtse	35,925	13,071	22,778	49	26	3,099	3,249
Punakha	4,291	1,257	2,783	71	180	1,109	1,663
Gasa	339	47	212	3	76	216	129
Wangdue	4,982	1,466	3,318	28	170	1,227	1,942
Tsirang	23,225	4,498	11,702	531	6,494	2,425	2,321
Dagana	18,295	5,552	12,679	50	14	1,974	2,329
Bumthang	534	100	426	2	5	926	676
Trongsa	2,000	511	1,384	53	52	443	850
Zhemgang	6,074	1,202	4,354	81	437	480	1,048
Sarpang	28,306	4,468	15,193	355	8,290	1,535	2,202
Lhuentse	5,654	2,098	3,476	41	38	595	890
Mongar	14,530	4,971	8,674	157	727	1,023	2,510
Trashigang	10,444	3,365	6,505	99	475	2,007	2,436
Trashiyangtse	1,397	493	755	21	129	779	1,158
Pemagatshel	4,968	1,544	3,026	77	320	589	1,171
S/Jongkhar	9,849	3,227	6,502	47	74	1,152	1,450
<b>Bhutan</b>	<b>197,766</b>	<b>52,883</b>	<b>124,430</b>	<b>2,307</b>	<b>18,146</b>	<b>25,009</b>	<b>31,334</b>

**Table 55: Availability of Feed and fodder, 2008**

Dzongkhags	Improved Pasture		Planted Fodder Trees	
	Households (%)	Area (Hectares)	Households (%)	Trees (000' Nos)
Thimphu	10.30	63.38	3.77	0.61
Paro	8.57	40.27	7.71	2.10
Ha	43.12	127.38	19.71	9.68
Chhukha	9.79	730.34	64.74	107.70
Samtse	5.42	202.09	57.53	119.01
Punakha	3.96	13.45	28.49	2.84
Gasa	13.63	15.71	5.77	0.30
Wangdue	18.83	165.47	17.84	2.13
Tsirang	18.54	157.67	79.42	78.75
Dagana	5.37	68.91	62.82	34.89
Bumthang	51.06	504.00	4.08	0.20
Trongsa	14.31	91.59	21.04	2.19
Zhemgang	3.46	32.10	46.03	7.53
Sarpang	8.40	123.30	46.42	46.40
Lhuentse	8.97	55.00	34.98	4.11
Mongar	11.74	395.28	67.89	29.40
Trashigang	4.06	243.85	30.48	13.24
Trashiyangtse	2.78	20.77	20.89	2.11
Pemagatshel	15.04	71.89	45.66	15.36
S/Jongkhar	32.09	331.16	53.31	32.18
<b>Bhutan</b>	<b>12.07</b>	<b>3,453.64</b>	<b>43.13</b>	<b>510.70</b>

**Table 56a: Nos. Livestock died during 2008**

Dzongkhags	Nos. of livestock died					
	Mithun Cattle	Nublang Cattle	Jersey Cattle	Swiss Brown Cattle	Other Cattle	Yak
Thimphu	43	222	142	7	21	505
Paro	61	437	231	3	0	218
Ha	83	260	139	2	4	225
Chhukha	250	1,388	232	0	2	0
Samtse	25	1,574	136	1	28	0
Punakha	200	735	171	8	0	0
Gasa	21	39	3	3	0	805
Wangdue	444	1,465	203	76	3	149
Tsirang	38	344	181	2	5	0
Dagana	165	673	154	2	5	0
Bumthang	132	418	137	294	27	304
Trongsa	205	563	149	31	0	5
Zhemgang	885	325	109	1	0	0
Sarpang	170	1,005	199	5	5	0
Lhuentse	336	601	100	8	0	0
Mongar	1,244	885	482	46	0	0
Trashigang	759	1,068	309	4	133	147
Trashiyangtse	308	499	129	7	2	64
Pemagatshel	241	220	209	9	1	0
S/Jongkhar	751	682	230	3	0	0
<b>Bhutan</b>	<b>6,361</b>	<b>13,403</b>	<b>3,645</b>	<b>512</b>	<b>236</b>	<b>2,422</b>



**Table 56b: Nos. Livestock died during 2008**

Dzongkhags	Nos. of livestock died				
	Horses	Pigs	Poultry	Sheep	Goats
Thimphu	34	Pigs	145	1	4
Paro	52	21	477	1	0
Ha	39	62	389	1	6
Chhukha	35	175	1,477	59	274
Samtse	40	66	2,478	221	824
Punakha	44	38	208	1	1
Gasa	59	0	25	0	0
Wangdue	56	69	131	20	5
Tsirang	12	151	2,887	48	231
Dagana	20	135	4,317	45	250
Bumthang	73	0	10	109	19
Trongsa	35	6	164	3	0
Zhemgang	197	55	879	0	3
Sarpang	7	38	1,514	53	112
Lhuentse	46	6	146	27	0
Mongar	161	50	685	2	9
Trashigang	135	141	355	104	35
Trashiyangtse	52	25	87	1	3
Pemagatshel	67	41	120	0	1
S/Jongkhar	75	31	364	3	47
<b>Bhutan</b>	<b>1,239</b>	<b>1,110</b>	<b>16,858</b>	<b>699</b>	<b>1,824</b>

## **2.6 Forestry**

Forests have always played an important role in socio-economic development of the country. The forests form an integral part of farming systems and are linked to agriculture and livestock development. Forests provide food, medicines, energy, shelter, animal fodder, organic fertilizers etc., and thus substantially support the subsistence of the people. Free access to such natural resources, especially for rural people, has effectively helped avert situations of extreme poverty, destitution and homelessness. Forests are also vital to maintain water catchments which support agriculture, the main source of livelihood for the people and the hydropower sector, which is the largest source for the growth of national revenue. The forestry-subsector accounted for 4.4 percent of the national GDP in 2008 (NSB SYB 2009) and contributed 6.55 percent of the cash income of the rural households in 2008 (RNR Census 2009).

Bhutan is determined to maintain 60 percent of the country's geographical area under forest for all times to come and ensure maximum people's participation in sustainable forest and water resources management in order to improve protective and productive functions of forest ecosystems and to generate income and enhance rural livelihood from forest resources.

The RNR Census 2009 collected some qualitative data on the forests management aspects and issues related to forestry rules, royalty and utilization of forestry resources. The statistics for 2008 on the supply and utilization of timbers and non-timber products presented under section 2.6.2 has been derived from the administratively recorded data maintained by the Department of Forests & Park Services (DoFPS) and Natural Resource Development Corporation Limited (NRDCL).

### **2.6.1 Forests Management and Issues.**

According to the RNR census 2009, at the national level, atleast 98.35 percent of the rural households were aware of the forestry rules and 61.18 percent of the households were aware of the Forest Management Units (FMUs). The FMUs has been reported as having positive impacts for about 91.54 percent and negative impacts for 7.55 percent of the rural households. Over 85 percent of the rural households were of the opinion that the presence of electricity will reduce pressure on the forest resources. *See Table 56 for details.*

Obtaining of permits for collection of non-wood forests products (NWFPs) was reported to be easy by 26.90 percent and difficult by 18.89 percent. The majority (54.21%) of the rural households however, were not able to report anything on this.

Likewise, the royalty rates for NWFPs were “very high” and “very low” as reported by 11.17 percent and 9.38 percent respectively of the rural households. However, at least 79.48 percent of the households have reported that the royalty rates for the NWFPs were moderate in 2008.

**Table 57: Percent households having awareness of forestry rules, FMU system and its impacts; and opinions on electricity with regards to the pressure on the forest 2008**

Dzongkhags	Aware of Forestry Rules	FMU System			Presence of electricity will reduce pressure on forests
		Aware	Positive impact	Negative impact	
Thimphu	84.51	52.99	79.80	7.08	74.14
Paro	85.16	34.16	76.49	12.69	74.98
Ha	60.23	76.85	9.73	66.95	83.89
Chhukha	93.04	31.82	85.95	8.52	65.82
Samtse	88.83	28.94	82.26	8.54	78.25
Punakha	93.13	61.27	90.22	5.65	88.58
Gasa	62.12	15.47	33.49	33.49	61.89
Wangdue	94.14	40.35	89.64	5.49	83.75
Tsirang	90.90	36.68	82.46	10.07	76.78
Dagana	93.80	36.57	88.40	7.03	80.12
Bumthang	93.47	43.31	84.67	13.95	88.50
Trongsa	96.60	43.70	86.70	10.44	74.94
Zhemgang	98.35	61.18	91.54	7.55	85.64
Sarpang	94.67	35.36	90.09	5.62	84.93
Lhuentse	95.68	39.18	84.06	11.90	74.65
Mongar	96.19	46.85	86.95	10.11	79.25
Trashigang	93.86	24.20	83.62	12.32	70.11
Trashiyangtse	93.75	22.30	88.87	10.40	67.86
Pemagatshel	91.53	21.14	84.63	8.47	66.08
S/Jongkhar	91.63	22.80	82.87	10.64	73.10
Bhutan	89.58	38.76	79.12	13.35	76.66

**Table 58: Percent households with various opinions on obtaining permits and royalty rates for NWFP, 2008**

Dzongkhags	Percent households with various opinions on obtaining permits for NWFP collection			Percent households with various opinions on NWFP Royalty Rates		
	Easy	Difficult	Can't Say	Very Hight	Very Low	Moderate
Thimphu	49.18	21.20	29.62	9.40	3.20	87.40
Paro	28.70	25.53	45.77	11.06	18.90	70.04
Ha	6.51	15.32	78.18	13.49	21.23	65.28
Chhukha	33.28	11.71	55.01	6.46	6.64	86.91
Samtse	26.87	12.80	60.33	6.76	10.15	83.09
Punakha	34.15	17.86	47.99	14.30	4.28	81.41
Gasa	23.26	38.60	38.14	27.66	11.17	61.17
Wangdue	23.11	31.64	45.25	30.76	5.45	63.79
Tsirang	23.59	4.68	71.73	1.37	7.36	91.28
Dagana	30.64	15.71	53.65	9.15	12.14	78.71
Bumthang	49.29	22.38	28.33	21.72	11.24	67.04
Trongsa	11.67	26.37	61.96	15.54	13.84	70.63
Zhemgang	25.00	19.33	55.67	14.50	5.30	80.20
Sarpang	32.84	18.34	48.82	4.28	6.54	89.18
Lhuentse	22.64	17.49	59.87	19.91	4.34	75.75
Mongar	31.06	27.98	40.97	11.03	9.56	79.41
Trashigang	23.12	22.01	54.86	16.88	11.75	71.37
Trashiyangtse	13.91	9.89	76.20	9.38	8.09	82.53
Pemagatshel	26.22	23.93	49.85	7.38	11.13	81.49
S/Jongkhar	21.39	16.35	62.27	2.77	8.53	88.70
Bhutan	26.90	18.89	54.21	11.17	9.34	79.48

**Table 59: NWFP Cooperative member households and households having private forestry and reasons for not having the private forestry, 2008**

Dzongkhags	NWFP Cooperative Member households (%)	Households having private forestry (%)	Households with reasons for not having the private forestry (%)			
			Limited land holding	Not aware	Other reasons	No reason
Thimphu	51.89	3.98	43.64	19.04	6.50	9.61
Paro	58.57	4.66	36.89	17.41	5.02	13.45
Ha	60.23	3.20	35.04	16.22	6.01	27.33
Chhukha	60.68	4.04	36.27	21.13	12.71	16.63
Samtse	63.60	2.02	45.64	20.14	8.54	9.75
Punakha	64.35	3.60	48.79	16.14	4.65	12.04
Gasa	16.17	1.38	38.11	11.19	10.84	9.44
Wangdue	67.53	1.74	41.68	34.21	4.82	11.37
Tsirang	73.20	2.75	51.92	10.11	6.76	16.14
Dagana	66.53	3.32	53.71	25.16	8.11	7.10
Bumthang	69.74	8.35	32.31	15.07	10.56	17.33
Trongsa	74.63	14.33	36.62	17.01	13.48	15.99
Zhemgang	57.26	2.00	33.02	26.94	11.22	15.96
Sarpang	70.39	6.53	47.99	18.79	10.38	12.83
Lhuentse	53.74	2.88	34.92	15.68	6.18	13.84
Mongar	59.69	4.49	49.53	13.46	6.48	9.81
Trashigang	63.54	2.28	30.36	19.10	10.86	16.27
Trashiyangtse	61.85	2.80	17.51	31.34	12.66	19.22
Pemagatshel	48.31	3.13	29.00	34.11	4.48	19.02
S/Jongkhar	57.10	6.51	27.78	27.42	12.17	12.07
Bhutan	62.05	3.86	39.39	21.16	8.58	13.70

**Table 60: Percent households with community forestry and reasons for not being the member of community forestry, 2008**

Dzongkhags	Percent households with community forestry and reasons for not being the member to community forestry				
	Member to Community forestry	Not Member to Community forestry	Not Aware	No Area	No Interest
Thimphu	21.99	78.01	33.64	32.71	8.93
Paro	18.73	81.27	38.08	26.26	10.04
Ha	27.03	72.97	41.57	19.12	9.43
Chhukha	8.86	91.14	30.48	33.24	11.19
Samtse	8.73	91.27	27.49	32.15	10.59
Punakha	31.34	68.66	31.88	39.63	13.57
Gasa	24.14	75.86	50.00	10.00	2.73
Wangdue	13.22	86.78	50.44	23.74	9.10
Tsirang	32.99	67.01	20.04	41.60	6.98
Dagana	10.65	89.35	45.11	26.92	9.64
Bumthang	24.65	75.35	24.92	26.45	11.42
Trongsa	25.08	74.92	43.25	20.19	8.08
Zhemgang	15.41	84.59	34.46	20.72	9.14
Sarpang	21.42	78.58	23.01	35.78	9.10
Lhuentse	15.57	84.43	27.73	27.80	8.33
Mongar	19.48	80.52	20.87	31.64	10.28
Trashigang	15.65	84.35	23.34	33.38	7.65
Trashiyangtse	17.83	82.17	31.29	10.78	14.53
Pemagatshel	13.06	86.94	47.67	14.54	7.16
S/Jongkhar	14.95	85.05	33.96	20.79	18.43
Bhutan	16.61	83.39	31.18	29.15	10.09

**Table 61: Percent households willing to plant various trees / plants on their land, 2008**

Dzongkhags	Percent households willing to plant various types of trees and plants on their land					
	Fodder trees	Firewood spp.	Timber Spp.	Fruits	Bamboo	Others
Thimphu	11.86	7.33	23.89	45.52	2.26	6.24
Paro	6.91	4.78	15.59	41.40	0.92	2.81
Ha	30.04	7.66	37.50	32.17	13.28	6.98
Chhukha	50.33	19.35	40.22	37.11	8.34	1.80
Samtse	52.51	23.95	42.31	35.41	21.44	0.95
Punakha	25.67	7.16	20.26	60.92	7.74	2.64
Gasa	14.48	7.93	43.79	12.07	3.79	16.90
Wangdue	27.17	14.20	36.43	36.67	12.77	1.57
Tsirang	61.17	20.85	41.84	44.12	11.80	2.61
Dagana	55.68	24.79	50.92	41.17	12.90	0.94
Bumthang	13.65	16.54	44.33	13.65	1.49	4.30
Trongsa	23.73	4.70	48.09	27.95	1.91	3.03
Zhemgang	42.10	7.16	41.47	56.70	22.39	1.09
Sarpang	45.05	16.83	56.12	32.49	22.10	1.47
Lhuentse	32.06	7.38	14.24	58.65	2.65	3.11
Mongar	34.32	5.23	18.70	55.35	5.45	1.90
Trashigang	25.77	5.95	31.72	48.86	7.70	4.07
Trashiyangtse	10.60	6.01	27.74	64.05	2.03	2.27
Pemagatshel	21.46	8.49	35.92	43.65	5.36	1.50
S/Jongkhar	23.33	8.41	36.57	39.90	1.38	3.18
Bhutan	34.08	12.38	35.39	43.48	9.75	2.46

**Table 62: Percent households with walking distances to nearest firewood sources, 2008**

Dzongkhags	Percent households with walking distances to nearest firewood sources.				
	Less than 1 hour	1-3 hours	3-6 hours	6 hours - 1 day	More than 1 day
Thimphu	23.58	39.62	14.31	3.46	2.59
Paro	18.85	39.75	13.87	5.38	3.44
Ha	20.55	48.99	6.54	5.03	2.10
Chhukha	17.75	59.68	12.96	1.26	1.18
Samtse	31.47	50.10	4.48	0.68	1.86
Punakha	40.12	42.56	5.94	0.55	3.16
Gasa	17.09	15.01	0.92	0.00	0.00
Wangdue	36.05	44.65	7.78	3.38	0.46
Tsirang	52.81	31.94	1.98	0.38	2.48
Dagana	37.88	49.20	4.54	0.80	1.37
Bumthang	31.08	57.50	4.57	1.79	1.96
Trongsa	25.37	51.04	6.57	9.51	2.78
Zhemgang	33.09	59.70	2.21	0.91	1.36
Sarpang	37.00	48.66	4.29	0.26	1.28
Lhuentse	29.11	53.96	10.29	1.33	0.06
Mongar	22.86	62.63	7.21	2.07	1.10
Trashigang	22.86	59.28	10.47	1.16	1.20
Trashiyangtse	29.72	60.28	6.17	1.85	0.32
Pemagatshel	25.24	60.02	5.86	0.83	0.30
S/Jongkhar	18.25	69.43	3.09	0.48	0.28
Bhutan	29.00	52.69	6.83	1.65	1.42

## 2.6.2 Supply and Utilization of Forest Products

The statistics for this section has been generated from the administratively gathered data stored in a “Forestry Information Database” system. The data were originated from the field offices such as Parks and Territorial Divisions across the country submitted to the forest department headquarters in Thimphu on quarterly reporting basis. The information on the production and transaction of timber for rural and urban consumptions in the country was sourced in from the Natural Resource Development Corporation Limited.

A lot of limitations had been observed while processing the data contained in the Forestry Information Database. The limitation ranges from irregular spellings for product names and units to missing or strange figures for some of the parameters. The validation exercises therefore, involved standardizing the spellings for product names and units and those missing and strange figures



were filled up or replaced with figures resulted from using standard royalty rates. Through all these trials and errors, the following sets of statistics on supplies of forest products and royalties could be generated which have been approved by the Department of Forests and Park Services for inclusion in this publication.

**Table 63: Quantity of forest wood products supplied and revenue generated, 2008**

<b>Product Type</b>	<b>Unit</b>	<b>Quantity (in 1000)</b>	<b>Royalty Realized (Nu. Millions)</b>
Cham	Nos	44.39	1.35
Dangchung	Nos	13.26	0.06
Drashing	Nos	14.41	0.75
Firewood	Cubic Meter	1352.55	2.40
Logs	CFT	509.67	6.39
Lopsand Tops	CFT	17.02	0.19
Mushroom Billet	Nos	13.06	0.06
Other woods	Nos	1.00	0.01
Poles	Nos	63.48	0.41
Posts	Nos	51.81	0.35
Sawn timber	CFT	11.03	0.10
Shinglep	Nos	4.03	0.12
Tree	Nos	13.53	0.84
Tsim	Nos	29.62	0.36
Wood Burrs	Nos	0.11	0.00
Woodchips	Cubic Meter	5.42	0.33
<b>Total</b>			<b>13.72</b>

*Source: Generated by authour from Forestry Information Database maintained by DoFPS.*

**Table 64: Quantity of non-wood forest products supplied and revenue generated, 2008**

<b>Product Type</b>	<b>Unit</b>	<b>Quantity (in 1000)</b>	<b>Royalty Realized (Nu. Millions)</b>
Bamboo	Bundles	0.208	0.001
Bamboo	Nos	345.510	0.154
Cane	Headloads	1.129	0.003
Cane shoot	Headloads	0.256	0.001
Charcoal	Truckloads	1.314	0.021
Chirata	Kgs	0.550	0.013
Daphne bark	Kgs	8.800	0.006
Dyes	Kgs	1.550	0.025
Incense	Kgs	0.421	0.000
Leaf mould	Headloads	0.036	0.000
Leaf mould	Truckloads	0.218	0.012
Mushroom	Kgs	0.969	0.015
Resin	Kgs	60.422	0.210
Sand	Truckloads	18.027	0.727
Silajit	Kgs	0.040	0.000
Star Anis	Kgs	3.200	0.006
Stones/Boulders	Truckloads	52.503	1.778
Top Soil/mud	Truckloads	0.996	0.071
Zanthoxylum	Kgs	0.351	0.001
<b>Total</b>			<b>3.044</b>

*Source: Generated by authour from Forestry Information Database maintained by DoFPS.*

**Table 65: Revenue generated through realization of royalties for supply of timber and NWFPP by Parks and Territorial Divisions in 2008 (Nu. Millions)**

<b>Parks / Territorial Divisions</b>	<b>Wood products</b>	<b>NWFPPs</b>	<b>Total</b>
BWLS	0.10	0.01	0.11
JDNP	0.15	0.00	0.16
JSWNP	0.09	0.00	0.09
RMNP	0.03	0.02	0.04
SWLS	0.07	0.01	0.08
TNP	0.30	0.02	0.33
Bumthang	2.19	0.08	2.26
Gedu	0.23	0.65	0.88
Mongar	1.14	0.29	1.43
Paro	5.03	0.12	5.16
S/jongkhar	0.40	0.23	0.63
Samtse	1.15	0.40	1.54
Sarpang	0.09	0.08	0.17
Thimphu	0.60	0.66	1.26
Trashigang	0.46	0.13	0.59
Tsirang	0.50	0.11	0.61
Wangdue	0.55	0.09	0.64
Zhemgang	0.64	0.15	0.79
<b>Total</b>	<b>13.72</b>	<b>3.04</b>	<b>16.76</b>

*Source: Generated by authour from Forestry Information Database maintained by DoFPS.*

**Table 66: Revenue generated through realization of royalties for supply of wood products and NWFP by Dzongkhags in 2008 (Nu. Millions)**

<b>Dzongkhags</b>	<b>Wood products</b>	<b>NWFPs</b>	<b>Total</b>
Bumthang	2.34	0.09	2.43
Chhukha	0.23	0.65	0.88
Dagana	0.20	0.09	0.28
Gasa	0.08	0.00	0.08
Ha	3.13	0.06	3.19
Lhuentse	0.42	0.03	0.46
Mongar	0.91	0.27	1.18
Paro	1.93	0.07	2.00
Pemagatshel	0.08	0.08	0.15
Punakha	0.36	0.02	0.38
Samdrupjongkhar	0.32	0.15	0.48
Samtse	1.14	0.40	1.54
Sarpang	0.10	0.09	0.19
Thimphu	0.63	0.66	1.29
Trashigang	0.37	0.12	0.48
Trashiyangtse	0.22	0.03	0.25
Trongsa	0.13	0.13	0.26
Tsirang	0.31	0.02	0.33
Wangdue	0.28	0.06	0.34
Zhemgang	0.55	0.02	0.58
<b>Bhutan</b>	<b>13.72</b>	<b>3.04</b>	<b>16.76</b>

*Source: Generated by authour from Forestry Information Database maintained by DoFPS.*

**Table 67: Quantity (1000) of forest wood products supplied and revenue realized (Nu. Millions) by type of royalties, 2008.**

Product Type	Commercial		Concessional		Free	Total	
	Quantity	Revenue	Quantity	Revenue	Quantity	Quantity	Revenue
Cham (Nos)	0.177	0.009	42.853	1.343	1.357	44.387	1.352
Dangchung (Nos)	1.472	0.013	9.654	0.043	2.130	13.256	0.056
Drashing (Nos)	0.405	0.185	13.603	0.561	0.400	14.408	0.746
Firewood (M3)	910.746	1.775	390.460	0.628	51.341	1352.547	2.403
Logs (CFT)	493.164	6.378	16.197	0.013	0.310	509.672	6.391
Lops and Tops (CFT)	9.434	0.178	0.477	0.016	7.110	17.021	0.194
Mushroom Billet (Nos)	9.600	0.009	3.460	0.052	0.000	13.060	0.061
Other woods (Nos)	0.840	0.008	0.160	0.001	0.000	1.000	0.009
Poles (Nos)	17.613	0.210	45.367	0.200	0.500	63.480	0.410
Posts (Nos)	14.697	0.113	37.110	0.239	0.000	51.807	0.352
Sawn timber (CFT)	6.906	0.098	1.674	0.002	2.451	11.030	0.100
Shinglep (Nos)	0.329	0.021	3.520	0.099	0.178	4.027	0.120
Tree (Nos)	0.986	0.313	12.323	0.524	0.220	13.529	0.838
Tsim (Nos)	0.537	0.008	27.846	0.350	1.240	29.623	0.358
Wood Burrs (Nos)	0.113	0.002	0.000	0.000	0.000	0.113	0.002
Woodchips (M3)	5.422	0.325	0.000	0.000	0.000	5.422	0.325
<b>Total</b>		<b>9.645</b>		<b>4.071</b>			<b>13.716</b>

Source: Generated by authour from Forestry Information Database maintained by DoFPS.

**Table 68: Timber production and supplies by areas in 2008 (NRDCL)**

Regions	Urban				Rural			
	Qty. produced (Millions CFT)	Qty. sold (Millions CFT)	Royalty (Millions Nu)	Cash generated from sale of product (Millions Nu)	Qty. produced (Millions CFT)	Qty. sold (Millions CFT)	Royalty (Millions Nu)	Cash generated from sale of product (Millions Nu)
Wang	268.61	231.61	2.76	26.28	14.49	1.49	0.01	1.15
Rinpung	476.11	403.65	4.82	44.67	16.03	16.03	0.01	1.27
Zhonggar	224.04	141.66	2.45	15.32	7.05	7.05	0.01	0.57
Sha	255.22	226.74	2.69	25.77	54.79	54.79	0.04	4.38
Zhemgang	88.51	91.20	1.04	10.30	4.56	4.56	0.00	0.40
Phuntsholing	223.26	182.60	2.38	21.64	8.12	8.12	0.01	0.66
Jakar	369.63	282.21	4.02	29.30	47.50	47.50	0.04	3.85
<b>Total</b>	<b>1,905.39</b>	<b>1,559.66</b>	<b>20.16</b>	<b>173.28</b>	<b>152.53</b>	<b>139.53</b>	<b>0.12</b>	<b>12.27</b>

Source: Summary of the information from NRDCL by authour.

## **2.7 Marketing of agricultural and forest products**

The Agricultural Marketing Services in the Ministry of Agriculture & Forests has been recently upgraded to Department of Agricultural Marketing and Cooperatives and a Master Plan for agricultural marketing is being developed for improvement of market potential and developing the processing capacity to increase the monetary returns from agricultural products for the rural people.

The RNR Census 2009 incorporated a section to gather information from the rural households on “how much of the farm agricultural products was sold out and purchased including forest products and forest- byproducts” during 2008. The data on “sold to and purchased from whom and where” however was not collected. Generally, the motor-roads and markets access have greatly influenced on the productions and marketing of the agricultural products. The places at the vicinity of markets and motor-roads tended to produce more and sell more but at the sametime purchase more too. It has been observed that the rural households altogether have generated cash imcome of at least 2,027.95 millions ngultrum from sale of cereal grains and horticulture crops (78.55%), livestock products (14.90%) and forest products and byproducts (6.55%). On the other hand a total of 832.43 millions ngultrum has been spent on purchased of food commodities such as food grains (36.64%), dairy products (14.5%), eggs (0.85%), fish (4.76%), meats (17.79%), cooking oil (16.17%), sugar (0.78%) and vegetables and others (8.51%).

The livestock products in this context comprise of meats including chichen and dairy products such as milk, butter and cheese. The forest products and forest byproducts include edible non-wood products (bamboo shoots, cane shoots, damru, fern shoots, nuts, mushrooms, oilseeds, pan-leaves and orchids), medicinal plants (cordyceps, lemon grass oil, star anis, chirata, pipla, resin and other medicinal plants) and handicraft items made of forest products (bangchung, mats, baskets, daphne, dyes, incense, dhapa, cups and furnitures).

It has also been observed that the rural households have, altogether purchased 18,293 tonnes of food-grains, 922 tonnes of dairy products, 77,900 dozens of eggs and 1,708 tonnes of meats and 454 tonnes of fish in 2008. The following tables show the details on the sale and purchase of the agricultural commodities.

**Table 69: Percent households with corresponding cash income earned through sale of forest products and byproducts, 2008**

Dzongkhags	Edible Items		Medicinal Items		Handicraft Items		Total Income (Nu. Millions)
	Households (%)	Income (Nu. Millions)	Households (%)	Income (Nu. Millions)	Households (%)	Income (Nu. Millions)	
Thimphu	15.22	0.517	12.28	14.474	11.23	0.474	15.464
Paro	14.88	0.220	0.08	1.313	3.36	0.275	1.808
Ha	38.73	0.743	1.57	0.084	8.73	0.004	0.831
Chhukha	53.52	0.419	0.33	0.051	11.71	0.680	1.149
Samtse	48.24	0.168	0.61	0.015	17.84	1.008	1.184
Punakha	46.90	1.495	0.07	0.000	3.72	0.188	1.682
Gasa	51.21	0.022	4.24	14.505	7.88	0.000	14.527
Wangdue	39.09	0.815	5.46	49.371	10.26	4.157	54.342
Tsirang	42.68	0.074	0.42	0.000	15.63	0.203	0.277
Dagana	46.74	0.409	0.08	0.000	19.36	0.081	0.490
Bumthang	7.83	0.152	15.43	14.200	14.76	0.879	15.232
Trongsa	50.63	0.135	0.53	0.012	12.30	0.042	0.189
Zhemgang	61.42	0.199	0.00	0.000	12.35	2.868	3.049
Sarpang	52.29	0.026	0.16	0.000	13.24	0.276	0.302
Lhuentse	51.52	0.159	0.78	0.515	10.08	0.347	1.021
Mongar	45.04	0.074	3.37	3.603	10.88	2.395	6.072
Trashigang	46.39	0.106	1.88	1.164	12.87	0.447	1.717
Trashiyangtse	44.69	0.043	1.96	2.386	7.19	9.133	13.182
Pemagatshel	42.87	0.116	1.03	0.079	17.31	0.175	0.370
S/Jongkhar	50.46	0.265	1.76	0.486	21.25	0.347	1.098
<b>Bhutan</b>	<b>46.47</b>	<b>6.159</b>	<b>1.57</b>	<b>102.258</b>	<b>13.86</b>	<b>23.978</b>	<b>133.990</b>



**Table 70: Percent households selling cereals and pulses, 2008**

Dzongkhags	Cereals					Pulses				
	Paddy	Wheat	Barley	Bwheat	Millets	Beans	Dhal	Mung bean	Peas	Rajma bean
Thimphu	4.95	0.00	0.24	0.00	0.00	4.17	0.00	0.00	3.38	0.08
Paro	19.00	1.15	0.32	0.07	0.00	5.02	0.00	0.00	6.31	1.29
Ha	1.09	0.76	0.00	0.34	0.00	1.17	0.00	0.00	2.68	0.08
Chhukha	3.41	0.00	0.09	0.09	0.32	3.44	0.53	0.00	3.06	0.56
Samtse	8.58	0.00	0.03	0.02	0.50	0.80	0.33	0.02	0.03	0.12
Punakha	44.12	0.55	0.04	0.08	0.00	13.27	0.04	0.04	2.28	0.13
Gasa	6.24	1.15	0.46	0.23	0.00	1.15	0.00	0.00	0.23	0.00
Wangdue	17.91	0.40	0.00	0.07	0.00	3.14	0.00	0.00	0.30	0.00
Tsirang	15.00	0.00	0.00	0.06	1.22	2.57	1.54	0.35	1.13	1.88
Dagana	14.74	0.10	0.03	0.06	0.96	0.96	1.73	0.03	0.16	1.69
Bumthang	0.49	0.00	0.08	0.24	0.00	0.57	0.08	0.00	0.08	0.00
Trongsa	8.51	0.00	0.23	0.08	0.08	3.71	0.00	0.00	0.00	0.00
Zhemgang	2.44	0.00	0.06	0.00	0.00	0.85	0.00	0.11	0.00	0.06
Sarpang	16.13	0.00	0.00	0.05	2.52	0.99	0.68	0.05	0.18	0.21
Lhuentse	7.03	0.00	0.00	0.00	0.00	0.39	0.00	0.00	0.00	0.00
Mongar	2.01	0.27	0.19	0.08	0.00	2.81	0.04	0.15	0.59	1.31
Trashigang	2.96	0.17	0.39	0.13	0.00	0.81	0.02	0.00	0.29	1.08
Trashiyangtse	2.94	0.00	0.04	0.00	0.44	1.01	0.00	0.00	0.12	0.04
Pemagatshel	0.30	0.00	0.03	0.18	0.03	1.43	0.03	0.03	0.30	0.45
S/Jongkhar	11.88	0.00	0.03	0.28	0.11	1.32	0.53	0.06	0.51	0.67
Bhutan	9.49	0.23	0.11	0.10	0.31	2.30	0.34	0.05	0.95	0.62

**Table 71: Percent households selling vegetables, 2008**

Dzongkhags	Percent households selling various vegetables											
	Potato	Cabbage	Carrot	Cauliflower	Asparagus	Broccoli	Pumpkin	Radish	Spinach	Tomato	Turnip	Other vegetables
Thimphu	25.1	2.3	3.5	1.4	1.4	0.6	0.4	3.1	3.1	0.1	0.2	0.3
Paro	37.8	7.2	1.9	0.1	2.3	0.1	0.1	2.6	3.7	0.9	0.3	1.9
Ha	26.9	2.5	0.3	0.3	0.3	0.1	0.0	0.3	2.6	0.0	0.0	0.0
Chhukha	14.3	1.2	1.6	0.1	0.0	0.2	0.8	0.5	3.4	0.0	0.2	1.7
Samtse	0.8	0.1	0.0	0.0	0.0	0.2	0.2	0.0	1.5	0.1	0.0	0.8
Punakha	6.2	0.5	0.3	0.0	0.1	0.9	0.3	2.2	3.7	0.4	0.0	6.1
Gasa	14.1	0.9	0.0	0.0	0.5	0.2	0.0	0.0	1.4	0.0	0.0	0.7
Wangdue	36.0	0.6	0.0	0.1	0.3	0.4	0.0	0.5	2.5	0.2	0.0	1.7
Tsirang	7.8	1.1	0.2	0.6	0.0	1.1	1.7	0.4	6.8	0.0	0.0	2.8
Dagana	5.3	0.3	0.1	0.2	0.0	0.1	0.2	0.1	1.2	0.0	0.0	0.5
Bumthang	60.4	1.1	0.3	0.3	0.0	0.1	0.1	0.2	0.3	0.0	0.0	0.0
Trongsa	10.2	1.6	0.4	0.7	0.0	0.6	0.2	0.6	2.8	0.0	0.0	0.9
Zhemgang	11.2	0.6	0.0	0.2	0.2	0.3	1.3	0.4	1.0	0.0	0.0	0.4
Sarpang	1.9	0.3	0.1	0.1	0.0	0.3	0.2	0.1	1.5	0.0	0.0	0.7
Lhuentse	13.4	1.5	0.1	0.4	0.0	0.3	0.0	0.2	1.0	0.0	0.0	0.4
Mongar	21.0	2.0	0.3	0.7	0.1	0.6	0.5	0.8	3.2	0.0	0.0	1.5
Trashigang	25.3	1.2	0.1	0.3	0.1	0.2	0.1	0.4	1.0	0.0	0.0	0.4
Trashiyangtse	18.1	1.6	0.0	0.9	0.3	0.4	0.0	0.0	0.6	0.0	0.0	0.5
Pemagatshel	15.4	0.8	0.0	0.1	0.0	0.1	0.3	1.0	1.0	0.0	0.0	0.5
S/Jongkhar	8.0	1.7	0.1	0.2	0.0	0.2	1.1	0.4	2.8	0.0	0.0	0.9
Bhutan	15.8	1.3	0.4	0.3	0.2	0.3	0.4	0.6	2.3	0.1	0.0	1.2

**Table 72: Percent households selling oilseeds and spices, 2008**

Dzongkhags	Oilseeds					Spices			
	Mustard	Soyabean	Sesemu	Groundnut	Cardamom	Chili	Garlic	Ginger	Onion
Thimphu	0.16	0.00	0.00	0.00	0.00	11.87	0.31	0.00	0.39
Paro	0.14	0.00	0.00	0.04	0.00	26.09	0.36	0.04	0.39
Ha	0.08	0.00	0.00	0.00	10.99	0.42	0.00	0.59	0.00
Chhukha	0.82	0.06	0.03	0.00	13.96	5.26	0.44	11.31	0.15
Samtse	0.18	0.05	0.00	0.05	17.44	0.68	0.21	17.86	0.03
Punakha	0.08	0.04	0.00	0.08	0.00	19.13	0.88	0.00	2.95
Gasa	0.00	0.00	0.00	0.00	0.00	1.15	0.23	0.00	0.23
Wangdue	0.07	0.07	0.00	0.00	0.00	10.36	1.82	0.23	1.75
Tsirang	0.06	0.38	0.00	0.06	0.47	6.15	0.35	3.04	0.60
Dagana	3.07	0.16	0.00	0.00	9.40	1.89	0.45	0.48	0.54
Bumthang	0.00	0.00	0.00	0.00	0.00	0.90	0.41	0.00	0.16
Trongsa	0.08	0.00	0.00	0.00	0.85	12.61	0.62	0.62	0.23
Zhemgang	1.08	0.00	0.00	0.00	0.06	2.84	0.17	0.40	0.00
Sarpang	0.26	0.03	0.00	0.00	3.20	1.01	0.13	6.84	0.16
Lhuentse	0.00	0.28	0.00	0.00	0.00	6.97	0.55	0.06	0.17
Mongar	0.11	0.17	0.00	0.34	0.06	7.80	1.73	0.27	0.82
Trashigang	0.17	0.67	0.00	0.79	0.08	6.23	1.41	0.24	0.56
Trashiyangtse	0.04	0.73	0.00	1.25	0.00	8.83	1.09	0.12	0.16
Pemagatshel	0.09	0.06	0.00	0.59	0.48	2.35	0.83	0.59	0.06
S/Jongkhar	2.98	0.03	0.08	0.00	0.87	2.30	0.65	7.13	0.22
Bhutan	0.53	0.17	0.01	0.21	3.93	6.35	0.73	3.96	0.49

**Table 73: Quantity of cereals, pulses and oilseeds sold and cash amount earned, 2008**

Dzongkhags	Cereals		Pulses		Oil Seeds	
	Quantity (MT)	Nu (millions)	Quantity (MT)	Nu (millions)	Quantity (MT)	Nu (millions)
Thimphu	29.11	1.14	44.43	0.98	0.90	0.01
Paro	293.12	11.05	178.68	3.51	3.23	0.03
Ha	5.60	0.19	15.62	0.30	0.01	0.00
Chhukha	60.30	2.25	138.77	2.86	1.88	0.04
Samtse	307.47	11.20	23.62	0.57	3.04	0.07
Punakha	487.39	18.88	172.43	3.75	0.24	0.01
Gasa	14.36	0.54	1.70	0.03	0.00	0.00
Wangdue	271.69	10.82	45.37	0.96	0.25	0.01
Tsirang	233.17	8.69	70.21	1.72	0.46	0.01
Dagana	206.78	7.78	41.17	1.16	12.31	0.21
Bumthang	2.36	0.08	2.53	0.05	0.00	0.00
Trongsa	42.35	1.65	13.06	0.35	0.02	0.00
Zhemgang	19.70	0.68	5.45	0.11	2.81	0.04
Sarpang	291.86	10.46	22.16	0.53	1.08	0.02
Lhuentse	45.90	1.84	1.89	0.04	0.24	0.01
Mongar	43.34	1.63	79.59	1.87	2.63	0.14
Trashigang	64.84	2.39	62.28	1.32	11.05	0.35
Trashiyangtse	31.84	1.16	7.96	0.18	11.98	0.37
Pemagatshel	3.70	0.13	26.29	0.51	3.06	0.09
S/Jongkhar	195.08	7.46	36.50	0.69	14.84	0.23
<b>Bhutan</b>	<b>2,649.96</b>	<b>100.05</b>	<b>989.69</b>	<b>21.50</b>	<b>70.02</b>	<b>1.63</b>

**Table 74: Quantity of spices, vegetables sold and cash amount earned, 2008**

Dzongkhags	Spices		Vegetables	
	Quantity (MT)	Nu (millions)	Quantity (MT)	Nu (millions)
Thimphu	88.72	8.76	1,448.27	13.18
Paro	458.40	43.20	3,955.98	31.01
Ha	46.06	4.80	1,519.80	11.03
Chhukha	435.22	29.53	3,706.69	30.77
Samtse	1,286.19	68.29	220.51	2.22
Punakha	412.05	39.78	391.05	5.69
Gasa	1.90	0.17	87.91	0.72
Wangdue	184.11	16.95	7,660.17	62.80
Tsirang	87.91	5.97	628.03	7.08
Dagana	105.34	10.96	545.98	4.06
Bumthang	10.08	0.75	4,008.19	31.56
Trongsa	67.38	6.62	427.47	3.76
Zhemgang	19.66	1.77	553.89	4.38
Sarpang	140.91	6.55	266.90	2.22
Lhuentse	56.51	5.51	345.78	2.55
Mongar	192.44	17.69	2,668.10	21.87
Trashigang	162.34	14.74	3,996.05	31.24
Trashiyangtse	93.01	9.13	710.29	5.73
Pemagatshel	37.74	2.85	1,610.98	12.15
S/Jongkhar	231.18	8.89	690.99	6.52
<b>Bhutan</b>	<b>4,117.14</b>	<b>302.91</b>	<b>35,443.03</b>	<b>290.53</b>

**Table 75: Quantity of fruits and mushrooms sold and cash amount earned, 2008**

Dzongkhags	Fruits		Mushrooms	
	Quantity (MT)	Nu (millions)	Quantity (MT)	Nu (millions)
Thimphu	1,279.49	38.73	1.48	0.243
Paro	2,204.09	66.42	0.95	0.144
Ha	219.95	6.59	0.02	0.003
Chhukha	1,987.77	58.11	0.36	0.066
Samtse	2,084.34	74.64	0.34	0.058
Punakha	255.31	7.22	0.09	0.012
Gasa	3.31	0.09	0.06	0.010
Wangdue	141.88	3.79	0.40	0.049
Tsirang	4,278.12	108.46	0.21	0.025
Dagana	4,579.63	123.21	0.00	0.001
Bumthang	71.29	2.15	0.01	0.002
Trongsa	85.02	2.25	0.05	0.008
Zhemgang	1,096.53	29.32	0.39	0.044
Sarpang	4,761.05	141.51	0.07	0.010
Lhuentse	77.08	2.10	0.10	0.016
Mongar	535.53	14.14	0.09	0.015
Trashigang	236.54	6.14	0.01	0.001
Trashiyangtse	89.60	2.30	0.04	0.006
Pemagatshel	4,622.08	116.28	0.05	0.009
S/Jongkhar	3,157.33	86.08	0.01	0.001
<b>Bhutan</b>	<b>31,765.94</b>	<b>889.52</b>	<b>4.71</b>	<b>0.721</b>

**Table 76: Quantity of cereal grains sold, 2008**

Dzongkhags	Quantity of cereal grains sold (MT)					
	Paddy	Wheat	Barley	Buckwheat	Millet	All cereals
Thimphu	29.0	0.0	0.1	0.0	0.0	29.1
Paro	285.6	6.8	0.6	0.1	0.0	293.1
Ha	4.3	0.9	0.0	0.4	0.0	5.6
Chhukha	57.1	0.0	0.3	0.1	2.8	60.3
Samtse	298.7	0.0	0.1	0.0	8.6	307.5
Punakha	485.1	2.1	0.0	0.2	0.0	487.4
Gasa	13.6	0.7	0.1	0.0	0.0	14.4
Wangdue	271.0	0.7	0.0	0.0	0.0	271.7
Tsirang	227.3	0.0	0.0	0.0	5.9	233.2
Dagana	200.0	0.3	0.3	0.1	6.1	206.8
Bumthang	2.0	0.0	0.2	0.2	0.0	2.4
Trongsa	41.9	0.0	0.4	0.1	0.0	42.4
Zhemgang	19.6	0.0	0.1	0.0	0.0	19.7
Sarpang	261.9	0.0	0.0	0.2	29.8	291.9
Lhuentse	45.9	0.0	0.0	0.0	0.0	45.9
Mongar	40.1	1.9	0.9	0.4	0.0	43.3
Trashigang	59.1	2.7	2.3	0.7	0.0	64.8
Trashiyangtse	28.9	0.0	0.2	0.0	2.8	31.8
Pemagatshel	3.2	0.0	0.1	0.4	0.0	3.7
S/Jongkhar	193.8	0.0	0.0	1.0	0.3	195.1
<b>Bhutan</b>	<b>2568.1</b>	<b>16.2</b>	<b>5.6</b>	<b>3.7</b>	<b>56.3</b>	<b>2650.0</b>

**Table 77: Cash amount earned from sale of cereal grains, 2008**

Dzongkhags	Cash income generated from sale of cereal grains (Nu. Millions)					
	Rice	Wheat	Barley	Buckwheat	Millets	All cereals
Thimphu	1.142	0.000	0.002	0.000	0.000	1.144
Paro	10.927	0.115	0.009	0.001	0.000	11.052
Ha	0.172	0.013	0.000	0.007	0.000	0.192
Chhukha	2.209	0.000	0.003	0.001	0.034	2.248
Samtse	11.147	0.000	0.001	0.000	0.050	11.198
Punakha	18.844	0.031	0.000	0.002	0.000	18.877
Gasa	0.526	0.013	0.001	0.000	0.000	0.540
Wangdue	10.816	0.009	0.000	0.000	0.000	10.825
Tsirang	8.645	0.000	0.000	0.000	0.047	8.692
Dagana	7.733	0.004	0.003	0.001	0.042	7.783
Bumthang	0.080	0.000	0.002	0.003	0.000	0.085
Trongsa	1.640	0.000	0.008	0.001	0.000	1.648
Zhemgang	0.681	0.000	0.001	0.000	0.000	0.682
Sarpang	10.250	0.000	0.000	0.003	0.207	10.461
Lhuentse	1.844	0.000	0.000	0.000	0.000	1.844
Mongar	1.589	0.024	0.012	0.007	0.000	1.631
Trashigang	2.293	0.046	0.036	0.012	0.000	2.387
Trashiyangtse	1.141	0.000	0.002	0.000	0.020	1.162
Pemagatshel	0.128	0.000	0.001	0.006	0.000	0.135
S/Jongkhar	7.440	0.000	0.000	0.017	0.004	7.461
<b>Bhutan</b>	<b>99.246</b>	<b>0.255</b>	<b>0.080</b>	<b>0.062</b>	<b>0.405</b>	<b>100.048</b>



**Table 78: Quantity of vegetables sold (MT), 2008**

Dzongkhags	Quantity of various vegetables sold (MT)											
	Potato	Cabbage	Carrot	Cauliflower	Asparagus	Broccoli	Pumpkin	Radish	Spinach	Tomato	Turnip	Other vegetables
Thimphu	1,302	29	23	16	7	2	3	40	19	1	1	4
Paro	3,305	408	51	2	27	1	1	57	39	15	8	42
Ha	1,495	12	1	1	1	0	0	2	8	0	0	0
Chhukha	3,547	32	24	1	0	1	12	17	35	0	2	35
Samtse	150	1	1	0	0	4	10	1	29	1	4	20
Punakha	185	8	2	0	1	9	3	52	44	9	0	77
Gasa	83	1	0	0	1	0	0	0	2	0	0	1
Wangdue	7,556	9	0	1	3	4	1	21	39	4	1	21
Tsirang	458	11	2	6	0	10	30	6	69	1	0	36
Dagana	520	3	1	2	0	1	3	1	11	0	1	4
Bumthang	3,994	7	1	1	0	0	0	2	2	0	0	0
Trongsa	379	8	2	3	0	2	2	15	12	0	0	4
Zhemgang	509	8	0	2	1	1	17	9	5	0	0	3
Sarpang	227	4	1	1	0	3	2	3	16	0	0	10
Lhuentse	325	8	0	2	0	1	0	2	5	0	0	2
Mongar	2,482	35	4	10	2	8	12	27	50	0	0	38
Trashigang	3,896	32	1	6	1	4	7	20	20	1	0	8
Trashiyangtse	673	17	0	6	2	3	1	1	4	0	0	4
Pemagatshel	1,535	18	0	1	0	1	4	32	11	0	0	9
S/Jongkhar	580	18	1	2	0	2	24	11	33	0	0	19
<b>Bhutan</b>	<b>33,201</b>	<b>669</b>	<b>114</b>	<b>62</b>	<b>47</b>	<b>59</b>	<b>128</b>	<b>320</b>	<b>453</b>	<b>32</b>	<b>18</b>	<b>339</b>

**Table 79: Cash income earned from sale of vegetables (Nu. Millions), 2008**

Dzongkhags	Cash income generated from sale of various vegetables (Nu. Millions)											
	Potato	Cabbage	Carrot	Cauliflower	Asparagus	Broccoli	Pumpkin	Radish	Spinach	Tomato	Turnip	Other vegetables
Thimphu	10.5	0.4	0.7	0.3	0.2	0.1	0.1	0.4	0.4	0.0	0.0	0.1
Paro	23.9	2.6	1.3	0.0	0.5	0.0	0.0	0.5	0.8	0.4	0.0	1.0
Ha	10.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0
Chhukha	27.5	0.5	0.7	0.0	0.0	0.0	0.2	0.2	0.7	0.0	0.0	0.9
Samtse	1.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.6	0.0	0.0	0.3
Punakha	1.5	0.1	0.1	0.0	0.0	0.3	0.1	0.6	0.9	0.2	0.0	2.1
Gasa	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wangdue	60.8	0.1	0.0	0.0	0.1	0.1	0.0	0.3	0.8	0.1	0.0	0.5
Tsirang	3.5	0.2	0.1	0.1	0.0	0.3	0.6	0.1	1.3	0.0	0.0	1.0
Dagana	3.6	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.1
Bumthang	31.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trongsa	2.8	0.1	0.1	0.1	0.0	0.1	0.0	0.3	0.3	0.0	0.0	0.1
Zhemgang	3.6	0.1	0.0	0.0	0.0	0.0	0.3	0.1	0.1	0.0	0.0	0.1
Sarpang	1.5	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.3	0.0	0.0	0.2
Lhuentse	2.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Mongar	18.3	0.5	0.1	0.2	0.0	0.2	0.2	0.3	1.0	0.0	0.0	1.0
Trashigang	29.5	0.5	0.0	0.1	0.0	0.1	0.1	0.2	0.4	0.0	0.0	0.2
Trashiyangtse	5.1	0.3	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1
Pemagatshel	11.0	0.3	0.0	0.0	0.0	0.0	0.1	0.3	0.2	0.0	0.0	0.3
S/Jongkhar	4.4	0.3	0.0	0.0	0.0	0.1	0.5	0.1	0.7	0.0	0.0	0.5
<b>Bhutan</b>	<b>253.0</b>	<b>6.4</b>	<b>3.2</b>	<b>1.3</b>	<b>0.9</b>	<b>1.6</b>	<b>2.5</b>	<b>3.4</b>	<b>8.9</b>	<b>0.8</b>	<b>0.1</b>	<b>8.4</b>

**Table 80: Quantity of pulses, oilseeds and spices sold, 2008**

Dzongkhags	Pulses (MT)					Oilseeds (MT)					Spices (MT)			
	Beans	Dhal	Mung bean	Peas	Rajma bean	Mustard	Soyabean	Sesemu	Groundnut	Cardamom	Chili	Garlic	Ginger	Onion
Thimphu	26	0	0	18	0	1	0	0	0	0	86	1	0	1
Paro	65	0	0	98	16	0	0	0	3	0	451	3	1	4
Ha	4	0	0	12	0	0	0	0	0	40	0	0	6	0
Chhukha	64	5	0	64	6	2	0	0	0	134	69	6	225	1
Samtse	15	6	0	1	2	0	0	0	3	341	5	12	929	1
Punakha	146	0	0	23	3	0	0	0	0	0	387	7	0	19
Gasa	1	0	0	0	0	0	0	0	0	0	1	0	0	0
Wangdue	42	0	0	3	0	0	0	0	0	0	152	15	2	14
Tsirang	23	14	3	11	18	0	0	0	0	3	42	3	35	5
Dagana	9	15	0	1	15	12	1	0	0	81	12	4	4	5
Bumthang	2	0	0	0	0	0	0	0	0	0	5	2	0	3
Trongsa	13	0	0	0	0	0	0	0	0	6	56	2	2	1
Zhemgang	5	0	1	0	0	3	0	0	0	0	16	1	3	0
Sarpang	10	7	1	2	2	1	0	0	0	23	5	2	110	2
Lhuentse	2	0	0	0	0	0	0	0	0	0	53	3	0	1
Mongar	47	1	2	9	20	0	0	0	2	1	153	24	4	11
Trashigang	34	0	0	5	24	1	2	0	8	1	123	24	5	10
Trashiyangtse	7	0	0	1	0	0	1	0	11	0	82	9	1	1
Pemagatshel	16	3	0	3	4	0	0	0	3	2	17	8	10	1
S/Jongkhar	14	5	1	6	11	15	0	0	0	8	15	9	198	2
<b>Bhutan</b>	<b>545</b>	<b>58</b>	<b>8</b>	<b>256</b>	<b>122</b>	<b>35</b>	<b>5</b>	<b>0</b>	<b>30</b>	<b>638</b>	<b>1730</b>	<b>134</b>	<b>1533</b>	<b>82</b>

**Table 81: Cash income earned from sale of pulses and oilseeds, 2008**

Dzongkhags	Pulses (Nu. Millions)					Oilseeds (Nu. Millions)			
	Beans	Dhal	Mung bean	Peas	Rajma bean	Mustard	Soyabean	Sesemu	Groundnut
Thimphu	0.62	0.00	0.00	0.35	0.01	0.01	0.00	0.00	0.00
Paro	1.25	0.00	0.00	1.89	0.38	0.00	0.00	0.00	0.03
Ha	0.08	0.00	0.00	0.22	0.01	0.00	0.00	0.00	0.00
Chhukha	1.32	0.16	0.00	1.26	0.13	0.04	0.00	0.00	0.00
Samtse	0.30	0.22	0.00	0.01	0.04	0.00	0.00	0.00	0.07
Punakha	3.22	0.00	0.00	0.46	0.07	0.00	0.00	0.00	0.00
Gasa	0.03	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Wangdue	0.91	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00
Tsirang	0.52	0.50	0.08	0.23	0.38	0.00	0.01	0.00	0.00
Dagana	0.23	0.47	0.01	0.03	0.42	0.20	0.00	0.00	0.00
Bumthang	0.05	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Trongsa	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zhemgang	0.10	0.00	0.01	0.00	0.00	0.04	0.00	0.00	0.00
Sarpang	0.22	0.19	0.02	0.05	0.05	0.02	0.00	0.00	0.00
Lhuentse	0.04	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Mongar	1.09	0.01	0.05	0.21	0.52	0.00	0.01	0.00	0.13
Trashigang	0.72	0.01	0.00	0.10	0.49	0.01	0.07	0.00	0.27
Trashiyangtse	0.16	0.00	0.00	0.02	0.01	0.00	0.02	0.00	0.34
Pemagatshel	0.33	0.05	0.00	0.05	0.08	0.00	0.00	0.00	0.09
S/Jongkhar	0.31	0.09	0.01	0.11	0.17	0.23	0.00	0.00	0.00
<b>Bhutan</b>	<b>11.82</b>	<b>1.70</b>	<b>0.18</b>	<b>5.04</b>	<b>2.75</b>	<b>0.57</b>	<b>0.13</b>	<b>0.00</b>	<b>0.93</b>

**Table 82: Cash income earned from of spices, 2008**

Dzongkhags	Spices (Nu. Millions)				
	Cardamom	Chili	Garlic	Ginger	Onion
Thimphu	0.00	8.63	0.08	0.00	0.05
Paro	0.00	42.82	0.21	0.02	0.16
Ha	4.59	0.03	0.00	0.18	0.00
Chhukha	15.36	6.94	0.45	6.74	0.05
Samtse	39.20	0.45	0.91	27.71	0.02
Punakha	0.00	38.66	0.49	0.00	0.62
Gasa	0.00	0.14	0.02	0.00	0.01
Wangdue	0.00	15.24	1.17	0.05	0.49
Tsirang	0.30	4.21	0.22	1.05	0.18
Dagana	9.24	1.15	0.27	0.14	0.15
Bumthang	0.00	0.50	0.13	0.00	0.12
Trongsa	0.72	5.64	0.17	0.07	0.03
Zhemgang	0.01	1.62	0.06	0.08	0.00
Sarpang	2.63	0.50	0.13	3.22	0.06
Lhuentse	0.00	5.27	0.20	0.01	0.03
Mongar	0.06	15.31	1.86	0.12	0.34
Trashigang	0.10	12.41	1.81	0.14	0.29
Trashiyangtse	0.00	8.35	0.72	0.02	0.04
Pemagatshel	0.23	1.73	0.60	0.29	0.02
S/Jongkhar	0.88	1.49	0.68	5.76	0.08
<b>Bhutan</b>	<b>73.33</b>	<b>171.09</b>	<b>10.18</b>	<b>45.60</b>	<b>2.72</b>

**Table 83a: Quantity of fruits sold, 2008**

Dzongkhag	Quantity of fruits sold (MT)			
	Apple	Mandarin	Arecanut	Peach
Thimphu	1,268.27	0.00	0.00	4.03
Paro	2,121.18	0.00	0.00	27.10
Ha	196.23	11.59	0.46	7.07
Chhukha	72.89	1,592.92	287.62	1.31
Samtse	0.00	1,149.21	857.81	1.08
Punakha	0.00	171.35	0.00	1.56
Gasa	0.00	0.00	0.00	0.00
Wangdue	9.69	100.73	0.00	5.97
Tsirang	2.14	4,183.06	0.00	4.66
Dagana	11.35	4,188.46	226.63	1.39
Bumthang	68.52	0.00	0.00	0.00
Trongsa	0.00	78.52	0.00	0.39
Zhemgang	0.00	1,070.49	0.54	0.00
Sarpang	0.00	3,892.24	756.04	0.00
Lhuentse	0.46	57.00	0.00	0.77
Mongar	9.48	485.44	0.00	1.94
Trashigang	1.31	196.25	0.35	2.12
Trashiyangtse	1.54	79.95	0.00	0.00
Pemagatshel	7.24	4,168.08	6.99	1.66
S/Jongkhar	0.54	2,629.89	229.61	0.00
<b>Bhutan</b>	<b>3,770.83</b>	<b>24,055.16</b>	<b>2,366.04</b>	<b>61.03</b>

**Table 83b: Quantity of fruits sold, 2008**

Dzongkhag	Quantity of fruits sold (MT)				
	Pear	Plum	Walnut	Mango	Others
Thimphu	0.69	2.40	2.51	0.00	1.59
Paro	19.75	0.41	31.84	0.00	3.80
Ha	0.77	0.00	0.39	3.44	0.00
Chhukha	2.46	0.00	3.48	7.97	19.12
Samtse	0.46	0.00	3.87	9.12	62.79
Punakha	9.03	0.00	2.31	1.77	69.29
Gasa	1.93	0.00	0.00	0.00	1.39
Wangdue	4.20	4.75	0.54	0.00	16.00
Tsirang	17.76	5.20	0.00	31.45	33.86
Dagana	15.93	0.00	0.74	112.42	22.72
Bumthang	0.39	1.16	1.23	0.00	0.00
Trongsa	0.00	1.16	0.00	0.54	4.43
Zhemgang	0.35	0.46	0.00	1.81	22.88
Sarpang	4.37	1.20	4.33	27.13	75.74
Lhuentse	0.00	0.00	0.00	0.96	17.89
Mongar	1.32	2.35	0.79	21.21	13.00
Trashigang	8.16	1.31	16.03	1.93	9.09
Trashiyangtse	1.54	0.62	3.47	0.00	2.49
Pemagatshel	0.00	5.06	4.94	1.16	3.83
S/Jongkhar	0.74	2.23	4.54	4.37	9.52
<b>Bhutan</b>	<b>89.86</b>	<b>28.30</b>	<b>81.01</b>	<b>225.26</b>	<b>389.44</b>

**Table 84: Cash income earned from sale of fruits, 2008**

Dzongkhag	Cash income generated from sale of fruits (Nu in Millions)								
	Apple	Mandarin	Arecanut	Peach	Pear	Plum	Walnut	Mango	Others
Thimphu	38.46	0.00	0.00	0.11	0.02	0.04	0.06	0.00	0.04
Paro	64.72	0.00	0.00	0.48	0.45	0.00	0.67	0.00	0.10
Ha	5.92	0.33	0.02	0.14	0.02	0.00	0.01	0.14	0.00
Chhukha	2.28	40.44	14.42	0.03	0.06	0.00	0.08	0.32	0.03
Samtse	0.00	29.17	43.36	0.02	0.01	0.00	0.09	0.36	0.54
Punakha	0.00	4.59	0.00	0.03	0.23	0.00	0.08	0.07	2.18
Gasa	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.03
Wangdue	0.31	2.70	0.00	0.14	0.11	0.06	0.01	0.00	0.30
Tsirang	0.06	105.65	0.00	0.09	0.44	0.04	0.00	1.26	0.24
Dagana	0.34	106.00	11.33	0.04	0.40	0.00	0.02	4.51	0.13
Bumthang	2.11	0.00	0.00	0.00	0.01	0.01	0.03	0.00	0.00
Trongsa	0.00	2.04	0.00	0.01	0.00	0.03	0.00	0.02	0.14
Zhemgang	0.00	28.63	0.03	0.00	0.01	0.00	0.00	0.07	0.11
Sarpang	0.00	99.80	38.40	0.00	0.12	0.01	0.10	1.13	0.40
Lhuentse	0.01	1.43	0.00	0.02	0.00	0.00	0.00	0.04	0.56
Mongar	0.29	12.48	0.00	0.04	0.05	0.02	0.02	0.87	0.13
Trashigang	0.04	5.04	0.02	0.05	0.20	0.01	0.37	0.08	0.26
Trashiyangtse	0.05	2.04	0.00	0.00	0.04	0.01	0.10	0.00	0.00
Pemagatshel	0.22	104.74	0.35	0.03	0.00	0.03	0.11	0.05	0.05
S/Jongkhar	0.02	66.97	11.57	0.00	0.02	0.04	0.10	0.17	0.11
<b>Bhutan</b>	<b>114.83</b>	<b>612.06</b>	<b>119.50</b>	<b>1.23</b>	<b>2.24</b>	<b>0.31</b>	<b>1.86</b>	<b>9.09</b>	<b>5.37</b>



**Table 85: Pork production and marketing, 2008**

Dzongkhags	Pork Production		Pork Marketing		
	Percent households producing pork	Pork quantity produced (MT)	Percent households selling pork	Pork quantity sold (MT)	Amount earned (Nu.Millions)
Thimphu	2.123	2.558	1.179	0.985	0.071
Paro	1.505	5.168	0.538	0.848	0.067
Ha	6.795	8.168	1.762	0.922	0.068
Chhukha	11.196	37.148	5.319	19.690	1.464
Samtse	3.466	14.816	2.013	8.460	0.629
Punakha	1.896	5.077	1.306	2.250	0.166
Gasa	0.231	0.256	0.231	0.160	0.011
Wangdue	3.906	11.049	0.960	1.845	0.134
Tsirang	11.798	31.151	8.535	22.013	1.666
Dagana	9.495	37.241	6.106	23.117	1.741
Bumthang	0.000	0.000	0.000	0.000	0.000
Trongsa	0.155	1.200	0.155	1.050	0.090
Zhemgang	4.994	10.624	4.654	7.681	0.578
Sarpang	5.959	25.703	4.814	17.024	1.304
Lhuentse	0.996	2.808	0.941	1.674	0.125
Mongar	2.686	12.652	2.115	8.920	0.647
Trashigang	1.549	17.639	1.347	14.221	1.191
Trashiyangtse	1.411	4.977	1.210	3.352	0.248
Pemagatshel	2.289	9.028	1.576	5.903	0.460
S/Jongkhar	1.628	7.464	1.432	4.626	0.372
<b>Bhutan</b>	<b>4.046</b>	<b>244.7</b>	<b>2.594</b>	<b>144.7</b>	<b>11.030</b>

**Table 86: Beef production and marketing, 2008**

Dzongkhags	Beef Production		Beef Marketing		
	Percent households producing beef	Beef quantity produced (MT)	Percent households selling beef	Beef quantity sold (MT)	Amount earned (Nu.Millions)
Thimphu	2.044	5.406	1.336	2.211	0.158
Paro	3.728	27.936	2.294	12.015	0.916
Ha	2.013	3.107	1.510	1.492	0.125
Chhukha	2.997	22.176	1.734	7.855	0.622
Samtse	0.197	1.723	0.106	0.693	0.056
Punakha	3.751	21.460	2.528	10.128	0.743
Gasa	0.231	0.058	0.231	0.020	0.001
Wangdue	8.408	46.633	4.734	14.486	1.104
Tsirang	0.471	2.141	0.282	1.102	0.076
Dagana	1.055	5.585	0.703	2.128	0.157
Bumthang	5.791	17.328	1.387	2.250	0.162
Trongsa	4.099	12.773	3.171	5.580	0.383
Zhemgang	6.243	25.163	4.938	11.883	0.871
Sarpang	0.182	1.118	0.104	0.605	0.040
Lhuentse	7.692	30.695	5.313	11.046	0.836
Mongar	7.572	71.191	5.393	31.093	2.288
Trashigang	5.689	54.862	4.730	29.418	2.161
Trashiyangtse	3.911	16.614	2.581	6.536	0.488
Pemagatshel	2.824	19.203	2.348	8.893	0.669
S/Jongkhar	4.913	34.284	4.323	19.114	1.405
<b>Bhutan</b>	<b>3.665</b>	<b>419.5</b>	<b>2.574</b>	<b>178.5</b>	<b>13.260</b>

**Table 87: Yak meat production and marketing, 2008**

Dzongkhags	Yak Meat Production		Yak Meat Marketing		
	Percent households producing yak meat	Yak meat quantity produced (MT)	Percent households selling yak meat	Yak meat quantity sold (MT)	Amount earned (Nu.Millions)
Thimphu	2.044	12.565	2.044	9.251	1.350
Paro	0.430	2.270	0.430	1.828	0.268
Ha	3.775	10.855	3.775	7.983	1.217
Chhukha	0.029	0.058	0.029	0.018	0.002
Samtse	0.000	0.000	0.000	0.000	0.000
Punakha	0.000	0.000	0.000	0.000	0.000
Gasa	3.926	7.123	1.386	1.080	0.200
Wangdue	0.563	3.057	0.497	2.333	0.290
Tsirang	0.031	0.101	0.031	0.083	0.012
Dagana	0.000	0.000	0.000	0.000	0.000
Bumthang	0.653	0.667	0.489	0.439	0.053
Trongsa	0.077	0.156	0.077	0.120	0.012
Zhemgang	0.000	0.000	0.000	0.000	0.000
Sarpang	0.000	0.000	0.000	0.000	0.000
Lhuentse	0.055	0.085	0.055	0.066	0.007
Mongar	0.000	0.000	0.000	0.000	0.000
Trashigang	0.252	2.228	0.202	1.752	0.238
Trashiyangtse	0.121	2.545	0.121	2.156	0.311
Pemagatshel	0.000	0.000	0.000	0.000	0.000
S/Jongkhar	0.000	0.000	0.000	0.000	0.000
<b>Bhutan</b>	<b>0.256</b>	<b>41.7</b>	<b>0.225</b>	<b>27.1</b>	<b>3.960</b>

**Table 88: Mutton production and marketing, 2008**

Dzongkhags	Mutton Production		Mutton Marketing		
	Percent households producing mutton	Mutton quantity produced (MT)	Percent households selling mutton	Mutton quantity sold (MT)	Amount earned (Nu.Millions)
Thimphu	0.000	0.000	0.000	0.000	0.000
Paro	0.036	0.010	0.000	0.000	0.000
Ha	0.084	0.907	0.084	0.375	0.041
Chhukha	3.027	4.976	0.470	1.035	0.127
Samtse	5.297	10.249	0.545	1.448	0.166
Punakha	0.000	0.000	0.000	0.000	0.000
Gasa	0.000	0.000	0.000	0.000	0.000
Wangdue	0.099	0.090	0.033	0.020	0.002
Tsirang	7.123	7.169	1.130	1.661	0.243
Dagana	4.827	5.083	0.895	1.014	0.121
Bumthang	0.245	0.384	0.082	0.023	0.002
Trongsa	0.077	0.208	0.077	0.050	0.006
Zhemgang	0.170	0.164	0.057	0.060	0.007
Sarpang	2.576	2.976	0.338	0.534	0.073
Lhuentse	0.000	0.000	0.000	0.000	0.000
Mongar	0.085	0.130	0.000	0.000	0.000
Trashigang	0.050	0.214	0.017	0.080	0.009
Trashiyangtse	0.040	0.608	0.040	0.008	0.001
Pemagatshel	0.059	0.027	0.000	0.000	0.000
S/Jongkhar	1.067	0.870	0.084	0.050	0.008
<b>Bhutan</b>	<b>1.724</b>	<b>34.1</b>	<b>0.242</b>	<b>6.4</b>	<b>0.805</b>

**Table 89: Chicken production and marketing, 2008**

Dzongkhags	Chicken Production		Chicken Marketing		
	Percent households producing chicken	Chicken quantity produced (MT)	Percent households selling chicken	Chicken quantity sold (MT)	Amount earned (Nu.Millions)
Thimphu	0.079	0.463	0.079	0.300	0.045
Paro	0.143	0.062	0.000	0.000	0.000
Ha	0.252	0.579	0.000	0.000	0.000
Chhukha	7.758	24.650	0.235	20.515	2.194
Samtse	14.621	21.407	0.091	5.570	0.478
Punakha	0.084	0.017	0.000	0.000	0.000
Gasa	0.000	0.000	0.000	0.000	0.000
Wangdue	0.199	0.099	0.000	0.000	0.000
Tsirang	10.762	21.492	0.659	14.623	1.785
Dagana	11.541	7.315	0.192	0.288	0.028
Bumthang	0.000	0.000	0.000	0.000	0.000
Trongsa	0.000	0.000	0.000	0.000	0.000
Zhemgang	3.575	1.029	0.114	0.318	0.022
Sarpang	9.524	11.069	0.286	0.928	0.090
Lhuentse	0.055	0.009	0.000	0.000	0.000
Mongar	0.106	0.344	0.000	0.000	0.000
Trashigang	0.084	1.228	0.017	1.000	0.010
Trashiyangtse	0.000	0.000	0.000	0.000	0.000
Pemagatshel	0.416	0.834	0.030	0.400	0.040
S/Jongkhar	1.713	2.018	0.084	0.796	0.095
<b>Bhutan</b>	<b>4.294</b>	<b>92.6</b>	<b>0.105</b>	<b>44.7</b>	<b>4.788</b>

**Table 90: Fish production and marketing, 2008**

Dzongkhags	Fish Production		Fish Marketing		
	Percent households producing fish	Fish quantity produced (MT)	Percent households selling fish	Fish quantity sold (MT)	Amount earned (Nu.Millions)
Thimphu	0.000	0.000	0.000	0.000	0.000
Paro	0.000	0.000	0.000	0.000	0.000
Ha	0.000	0.000	0.000	0.000	0.000
Chhukha	0.705	1.765	0.176	0.152	0.015
Samtse	0.212	0.552	0.061	0.153	0.015
Punakha	0.000	0.000	0.000	0.000	0.000
Gasa	0.000	0.000	0.000	0.000	0.000
Wangdue	0.662	1.401	0.298	0.780	0.079
Tsirang	2.291	3.327	0.596	1.228	0.133
Dagana	1.343	1.235	0.256	0.291	0.032
Bumthang	0.000	0.000	0.000	0.000	0.000
Trongsa	0.000	0.000	0.000	0.000	0.000
Zhemgang	0.000	0.000	0.000	0.000	0.000
Sarpang	0.989	2.667	0.468	1.701	0.154
Lhuentse	0.000	0.000	0.000	0.000	0.000
Mongar	0.000	0.000	0.000	0.000	0.000
Trashigang	0.000	0.000	0.000	0.000	0.000
Trashiyangtse	0.000	0.000	0.000	0.000	0.000
Pemagatshel	0.000	0.000	0.000	0.000	0.000
S/Jongkhar	1.488	5.575	0.898	3.487	0.385
Bhutan	0.460	16.5	0.167	7.8	0.811

**Table 91: Milk production and marketing, 2008**

Dzongkhags	Milk Production		Milk Marketing		
	Percent households producing milk	Milk quantity produced (MT)	Percent households selling milk	Milk quantity sold (MT)	Amount earned (Nu.Millions)
Thimphu	42.610	840.098	12.186	129.030	2.106
Paro	45.950	1,443.506	6.022	98.287	2.327
Ha	61.493	1,182.898	14.430	41.200	0.827
Chhukha	52.865	1,530.748	15.751	196.810	4.057
Samtse	49.266	1,823.165	15.332	234.561	4.328
Punakha	45.217	772.581	9.524	44.178	0.945
Gasa	66.975	318.123	2.079	1.445	0.034
Wangdue	69.149	1,643.178	10.725	119.723	2.401
Tsirang	44.556	1,029.838	8.723	67.809	1.374
Dagana	53.740	1,144.634	13.971	88.149	1.660
Bumthang	64.356	1,135.118	9.299	131.077	2.175
Trongsa	58.237	1,018.818	6.574	71.170	1.251
Zhemgang	37.514	496.226	6.016	46.285	0.925
Sarpang	53.188	1,743.484	14.416	236.378	4.971
Lhuentse	49.696	788.446	8.578	28.236	0.579
Mongar	54.717	2,041.257	10.702	113.045	2.285
Trashigang	45.464	2,778.569	10.301	203.302	3.771
Trashiyangtse	42.419	853.028	3.992	36.328	0.873
Pemagatshel	34.453	763.610	6.243	55.122	1.019
S/Jongkhar	48.821	1,592.960	8.422	143.857	2.759
<b>Bhutan</b>	<b>49.723</b>	<b>24,940.3</b>	<b>10.554</b>	<b>2,086.0</b>	<b>40.668</b>

**Table 92: Butter production and marketing, 2008**

Dzongkhags	Butter Production		Butter Marketing		
	Percent households producing butter	Butter quantity produced (MT)	Percent households selling butter	Butter quantity sold (MT)	Amount earned (Nu.Millions)
Thimphu	40.252	62.541	23.349	41.182	5.169
Paro	41.685	117.414	19.534	69.965	9.092
Ha	52.768	51.243	25.923	29.435	4.068
Chhukha	47.341	95.124	18.983	54.705	7.269
Samtse	36.234	99.314	8.355	45.459	5.825
Punakha	44.079	57.828	18.542	31.872	4.009
Gasa	66.744	25.555	19.861	5.086	1.112
Wangdue	68.421	126.506	36.048	76.237	9.573
Tsirang	38.563	41.725	10.762	18.130	2.328
Dagana	47.634	59.636	13.427	27.350	3.697
Bumthang	59.543	52.243	32.545	32.828	4.124
Trongsa	56.458	76.286	36.504	48.550	6.131
Zhemgang	33.825	50.028	17.423	29.832	3.875
Sarpang	42.441	73.131	13.115	32.523	4.436
Lhuentse	48.146	63.786	22.357	34.692	4.700
Mongar	51.354	142.635	22.948	80.920	11.316
Trashigang	42.888	199.118	17.657	118.215	14.773
Trashiyangtse	41.008	51.345	18.347	26.839	3.726
Pemagatshel	32.283	57.992	13.407	30.530	4.290
S/Jongkhar	41.746	144.689	21.898	92.799	12.055
<b>Bhutan</b>	<b>44.508</b>	<b>1,648.1</b>	<b>18.521</b>	<b>927.2</b>	<b>121.567</b>



**Table 93: Cheese production and marketing, 2008**

Dzongkhags	Cheese Production		Cheese Marketing		
	Percent households producing cheese	Cheese quantity produced (MT)	Percent households selling cheese	Cheese quantity sold (MT)	Amount earned (Nu.Millions)
Thimphu	35.613	81.660	21.934	54.454	3.567
Paro	36.487	221.299	18.996	125.157	7.097
Ha	43.960	76.485	23.742	45.412	2.972
Chhukha	36.145	106.456	15.016	67.490	4.325
Samtse	18.662	92.554	6.962	51.960	3.304
Punakha	38.390	76.888	16.561	47.768	3.042
Gasa	63.972	33.958	26.097	8.092	1.626
Wangdue	65.177	153.880	35.518	100.233	6.264
Tsirang	24.945	35.672	9.602	19.946	1.217
Dagana	38.267	68.528	12.596	38.159	2.403
Bumthang	54.649	51.172	18.923	31.393	2.053
Trongsa	50.116	99.383	28.461	61.898	4.008
Zhemgang	29.739	44.071	10.726	26.394	1.698
Sarpang	31.720	77.919	13.427	42.282	2.625
Lhuentse	42.501	70.387	19.646	40.958	2.589
Mongar	43.570	167.516	18.761	106.521	6.718
Trashigang	37.216	240.555	15.704	151.583	9.836
Trashiyangtse	37.177	62.925	16.411	37.500	2.306
Pemagatshel	27.794	61.248	13.496	36.366	2.230
S/Jongkhar	35.065	112.680	18.108	70.859	4.467
<b>Bhutan</b>	<b>36.252</b>	<b>1,935.2</b>	<b>16.247</b>	<b>1,164.4</b>	<b>74.346</b>

**Table 94: Eggs production and marketing, 2008**

Dzongkhags	Eggs Production		Eggs Marketing		
	Percent households producing eggs	Eggs quantity produced (1000 dozs)	Percent households selling eggs	Eggs quantity sold (1000 dozs)	Amount earned (Nu.Millions)
Thimphu	10.692	6.554	5.896	5.105	0.637
Paro	12.151	32.888	7.348	24.667	3.524
Ha	27.852	7.061	15.940	4.085	0.514
Chhukha	44.226	22.569	23.891	11.967	1.441
Samtse	47.964	31.024	14.046	11.784	1.424
Punakha	23.093	16.384	18.247	9.065	1.102
Gasa	7.852	0.968	4.619	0.557	0.067
Wangdue	26.680	15.977	16.418	8.829	1.088
Tsirang	43.175	48.355	20.803	34.129	4.652
Dagana	48.913	29.661	22.730	15.325	1.989
Bumthang	4.241	1.172	2.039	0.692	0.083
Trongsa	20.727	5.008	11.756	2.393	0.287
Zhemgang	35.074	20.764	27.185	12.045	1.535
Sarpang	40.958	60.862	26.828	39.188	5.627
Lhuentse	30.825	12.742	18.594	5.419	0.664
Mongar	38.325	59.786	26.332	29.650	3.619
Trashigang	25.585	30.991	13.533	16.287	1.984
Trashiyangtse	5.847	2.777	3.508	1.317	0.158
Pemagatshel	17.539	15.442	11.653	7.941	0.977
S/Jongkhar	31.443	29.772	21.814	17.595	2.131
<b>Bhutan</b>	<b>31.406</b>	<b>450.758</b>	<b>17.178</b>	<b>258.038</b>	<b>33.502</b>

**Table 95: Wool production and marketing, 2008**

Dzongkhags	Wool Production		Wool Marketing		
	Percent households producing wool	Wool quantity produced (MT)	Percent households selling wool	Wool quantity sold (MT)	Amount earned (Nu.Millions)
Thimphu	0.236	0.405	0.157	0.125	0.011
Paro	0.538	0.160	0.000	0.000	0.000
Ha	0.084	0.020	0.000	0.000	0.000
Chhukha	2.909	0.661	0.000	0.000	0.000
Samtse	3.663	2.920	0.030	0.260	0.026
Punakha	0.084	0.408	0.084	0.130	0.012
Gasa	11.316	0.195	0.000	0.000	0.000
Wangdue	3.840	0.937	0.033	0.027	0.001
Tsirang	2.228	0.402	0.000	0.000	0.000
Dagana	0.735	0.153	0.000	0.000	0.000
Bumthang	0.897	0.532	0.082	0.300	0.030
Trongsa	0.851	0.183	0.077	0.010	0.001
Zhemgang	0.000	0.000	0.000	0.000	0.000
Sarpang	1.327	0.806	0.026	0.250	0.025
Lhuentse	0.609	0.260	0.000	0.000	0.000
Mongar	0.021	0.349	0.000	0.000	0.000
Trashigang	1.852	3.030	0.084	0.136	0.013
Trashiyangtse	0.282	0.090	0.040	0.030	0.002
Pemagatshel	0.089	0.223	0.030	0.030	0.002
S/Jongkhar	0.140	0.041	0.000	0.000	0.000
<b>Bhutan</b>	<b>1.447</b>	<b>11.8</b>	<b>0.030</b>	<b>1.3</b>	<b>0.123</b>

## 2.9 Food and Food-grain Security

The analysis on the sale and purchase of food commodities revealed that the rural households were self-sufficient by at least 86 percent in food-grains. However, only 43.9 percent of the rural households have reported as having sufficient food-grains all year round from their farm productions. The rest 54.5 percent have reported to have faced seasonal food-grain shortages of 3.5 months in average and the production of food-grains was not feasible for 1.6 percent of the rural households.

**Table 96: Cereal-grain production, purchased and self-sufficiency status, 2008**

Dzongkhags	Production (MT)	Purchased (MT)	Requirement (MT)	Self Sufficiency (%)	Shortages (%)
Thimphu	748.15	736.77	1,484.93	50.38	49.62
Paro	4,352.88	1,056.20	5,409.09	80.47	19.53
Ha	1,215.74	684.13	1,899.88	63.99	36.01
Chhukha	6,446.37	1,570.04	8,016.42	80.41	19.59
Samtse	13,850.78	2,290.03	16,140.81	85.81	14.19
Punakha	6,850.97	255.96	7,106.92	96.40	3.60
Gasa	311.32	408.87	720.20	43.23	56.77
Wangdue	5,206.94	1,252.64	6,459.57	80.61	19.39
Tsirang	8,430.64	903.07	9,333.71	90.32	9.68
Dagana	10,025.70	855.60	10,881.30	92.14	7.86
Bumthang	815.17	1,035.77	1,850.94	44.04	55.96
Trongsa	2,387.15	333.79	2,720.94	87.73	12.27
Zhemgang	4,557.38	334.96	4,892.34	93.15	6.85
Sarpang	10,645.34	1,253.42	11,898.76	89.47	10.53
Lhuentse	3,344.05	263.79	3,607.85	92.69	7.31
Mongar	9,304.14	1,112.71	10,416.85	89.32	10.68
Trashigang	7,905.98	1,474.75	9,380.74	84.28	15.72
Trashiyangtse	3,016.76	534.98	3,551.74	84.94	15.06
Pemagatshel	5,135.60	1,063.10	6,198.70	82.85	17.15
S/Jongkhar	7,106.69	872.41	7,979.10	89.07	10.93
<b>Bhutan</b>	<b>111,657.76</b>	<b>18,292.99</b>	<b>129,950.75</b>	<b>85.92</b>	<b>14.08</b>

The shortage was reported to have addressed by purchasing of food-grains with the money earned or received from sale of horticulture crops for 39.5 percent, 16.9 percent, 2.1 percent, 18.3 percent and 12.4 percent of the rural households respectively from sale of horticulture crops, livestock products, forest products, off-farm activities and remittances. At least 10.7 percent of the rural households have borrowed from neighbours to fill the shortage gaps. See the following tables for details.

**Table 97: Proportion of rural households by food-grain self-sufficiency status and shortage coping mechanism, 2008**

Dzongkhags	Percent households by sufficiency status of food grains grown on the farm			Number of food shortage months and percent households by coping mechanisms with the earnings from various sources						
	Sufficient	Insufficient	Food grain production not feasible	Horticulture crops	Livestock products	Forest products	Off-Farm activities	Remittances	Borrowed from Neighbor	Average nos. food shortage months
Thimphu	37.3	62.7	0.0	55.1	19.1	10.1	6.3	7.3	2.1	4.7
Paro	55.5	40.9	3.7	69.8	11.9	1.3	6.4	6.5	4.1	4.2
Ha	8.5	91.5	0.0	38.1	25.7	1.6	11.9	11.8	10.9	4.1
Chhukha	17.5	77.4	5.1	51.5	18.4	1.2	12.1	10.7	6.1	3.7
Samtse	19.1	80.7	0.2	44.0	15.5	0.4	17.8	12.8	9.5	3.1
Punakha	67.0	32.7	0.3	38.0	8.4	8.2	15.8	15.0	14.6	3.2
Gasa	20.4	24.4	55.2	80.3	14.7	0.0	2.0	1.6	1.4	6.9
Wangdue	47.6	49.9	2.5	37.9	23.3	9.9	10.4	7.2	11.4	2.9
Tsirang	30.7	68.8	0.5	44.7	14.5	0.4	22.1	14.0	4.2	2.9
Dagana	36.2	63.7	0.1	30.5	20.3	0.3	24.2	12.4	12.2	3.0
Bumthang	34.9	61.5	3.6	45.0	14.9	6.9	17.0	9.7	6.5	3.1
Trongsa	47.4	52.2	0.4	31.8	22.1	2.0	16.8	13.7	13.6	3.4
Zhemgang	46.4	52.8	0.9	30.0	20.2	2.7	15.9	17.4	13.8	3.0
Sarpang	31.9	68.1	0.0	35.4	19.8	0.8	22.0	18.9	3.0	3.6
Lhuentse	56.8	42.2	1.0	21.7	13.6	2.7	27.9	11.4	22.8	2.8
Mongar	66.3	33.5	0.3	27.9	14.4	1.4	24.0	9.8	22.4	2.8
Trashigang	62.9	34.4	2.7	26.3	20.5	0.4	25.4	13.0	14.3	3.6
Trashiyangtse	54.7	45.2	0.1	27.9	11.1	1.9	28.4	13.9	16.8	3.0
Pemagatshel	62.6	37.0	0.4	35.7	11.2	0.6	19.9	15.6	17.0	2.9
S/Jongkhar	39.2	60.8	0.0	36.7	17.0	2.9	18.9	12.3	12.3	2.8
Bhutan	43.9	54.5	1.6	39.5	16.9	2.1	18.3	12.4	10.7	3.5

**Table 98: Percent households purchasing various food commodities, 2008**

Dzongkhags	Proportion of households who purchased various food commodities (percent)								
	Cereal grains	Dairy products	Eggs	Fish	Meats	Oil	Sugur	Vetables	Others
Thimphu	18.58	24.59	4.44	6.42	23.80	12.50	0.60	6.33	2.74
Paro	13.01	23.58	5.65	6.73	24.64	13.03	1.91	7.24	4.20
Ha	23.52	16.52	3.08	4.22	23.05	15.06	0.05	8.10	6.39
Chhukha	23.61	13.43	1.17	5.68	19.12	16.83	1.84	8.33	9.99
Samtse	21.21	9.22	1.20	4.75	21.80	18.72	0.88	14.06	8.15
Punakha	5.99	22.36	3.94	10.86	27.65	13.82	3.39	7.54	4.46
Gasa	26.48	15.05	0.81	5.48	11.62	14.94	4.82	2.01	18.80
Wangdue	19.57	14.51	2.97	7.38	20.41	15.18	3.96	7.22	8.80
Tsirang	19.41	13.23	2.34	8.30	25.76	18.37	2.78	3.87	5.94
Dagana	16.96	13.00	1.11	8.08	25.24	17.18	3.24	7.99	7.21
Bumthang	29.96	20.18	3.09	7.05	15.70	13.85	2.73	3.87	3.57
Trongsa	24.30	13.79	3.07	10.57	14.03	20.39	3.38	1.62	8.85
Zhemgang	21.96	14.23	1.50	14.96	14.56	20.62	4.21	1.41	6.55
Sarpang	19.26	11.45	1.54	10.29	19.80	16.99	3.05	12.05	5.56
Lhuentse	13.95	16.95	1.11	15.36	11.23	18.44	10.19	1.01	11.76
Mongar	22.59	12.54	1.72	16.11	14.12	18.50	4.28	1.56	8.58
Trashigang	17.91	16.41	1.91	13.53	17.36	14.67	6.11	4.39	7.70
Trashiyangtse	17.84	18.95	2.51	15.86	15.06	17.58	4.42	1.44	6.34
Pemagatshel	20.11	13.85	0.96	13.18	19.89	15.96	4.24	6.06	5.76
S/Jongkhar	22.49	11.61	0.81	12.98	21.43	16.26	2.69	7.97	3.77
Bhutan	19.22	15.13	2.15	10.16	20.00	16.39	3.42	6.63	6.89

**Table 99: Money spent on purchased of food commodities, 2008**

Dzongkhags	Total expenditure on food commodities (Nu. Millions)	Expenditure on each type of food as percentage of the total expenditure on all food commodities							
		Food grains	Diary products	Eggs	Fish	Meats	Cooking oil	Sugar	Vegetables / Others
Thimphu	47.55	29.37	26.42	1.53	2.07	22.75	10.70	0.12	7.04
Paro	103.34	18.40	27.42	2.36	2.08	31.14	11.85	0.28	6.46
Ha	31.01	37.94	14.92	1.01	1.41	24.18	11.84	0.01	8.69
Chhukha	58.96	44.09	12.24	0.36	2.32	17.42	15.09	0.30	8.17
Samtse	87.02	45.73	6.70	0.22	1.58	11.63	16.75	0.16	17.22
Punakha	48.68	9.47	20.41	1.56	6.24	38.91	15.15	0.58	7.67
Gasa	14.71	65.63	6.62	0.10	1.59	6.22	10.17	0.37	9.29
Wangdue	48.11	37.15	13.46	0.85	2.45	21.88	16.13	0.43	7.65
Tsirang	39.16	40.37	9.73	0.92	2.80	19.01	21.25	0.69	5.23
Dagana	39.53	38.12	9.51	0.30	2.84	19.36	20.38	0.68	8.82
Bumthang	35.01	46.76	20.28	0.98	1.92	9.91	15.40	0.80	3.95
Trongsa	12.44	47.52	14.70	0.89	3.54	11.12	18.59	0.86	2.78
Zhemgang	13.67	47.60	10.60	0.43	9.82	8.47	19.79	1.18	2.12
Sarpang	58.99	35.77	9.35	0.49	4.01	12.93	16.76	0.74	19.96
Lhuentse	16.89	28.94	17.91	0.41	14.01	8.50	23.80	2.96	3.48
Mongar	43.06	47.77	9.35	0.43	11.04	6.58	19.34	1.28	4.20
Trashigang	64.13	39.26	12.34	0.61	11.07	11.73	16.53	2.46	6.00
Trashiyangtse	27.69	34.52	16.85	0.75	13.05	8.59	22.28	1.63	2.34
Pemagatshel	39.85	45.39	8.88	0.17	7.59	12.08	18.02	1.38	6.50
S/Jongkhar	36.34	43.06	8.23	0.33	6.96	14.14	16.34	1.00	9.95
Bhutan	866.13	36.64	14.50	0.85	4.76	17.79	16.17	0.78	8.51

**Table 100: Quantity of food commodities purchased, 2008**

Dzongkhags	Quantity of food commodities purchased (MT)						
	Food grains	Diary products	Eggs	Fish	Meats	Cooking oil	Sugar
Thimphu	677.06	81.77	75.00	8.82	116.25	81.08	1.85
Paro	1,017.09	190.31	227.97	23.83	371.53	193.26	9.59
Ha	658.74	33.99	26.41	5.34	77.44	55.77	0.10
Chhukha	1,494.07	62.97	25.17	15.46	112.29	130.53	5.99
Samtse	2,236.89	65.71	31.29	16.61	110.04	210.08	4.83
Punakha	254.35	77.41	78.58	27.64	204.09	110.43	9.19
Gasa	377.00	4.75	1.23	1.47	8.84	18.46	1.24
Wangdue	1,026.59	45.27	45.69	12.10	112.94	120.33	6.76
Tsirang	888.45	28.39	39.82	11.40	79.47	124.85	9.51
Dagana	846.90	30.55	14.92	11.92	93.85	122.60	9.09
Bumthang	874.10	42.79	38.49	7.08	36.50	84.62	8.86
Trongsa	323.66	13.36	12.06	4.03	15.14	35.30	3.21
Zhemgang	331.79	10.61	7.45	14.86	15.17	41.28	5.42
Sarpang	1,222.85	52.66	34.10	25.96	85.86	145.15	14.35
Lhuentse	261.53	24.34	7.99	25.24	16.98	63.53	15.81
Mongar	1,102.24	29.62	22.12	54.97	32.50	123.55	18.12
Trashigang	1,427.67	52.48	43.62	79.70	82.85	153.14	53.41
Trashiyangtse	522.87	27.84	21.68	40.07	27.27	83.49	15.19
Pemagatshel	1,054.64	24.71	8.49	35.60	52.03	103.30	19.09
S/Jongkhar	851.89	22.50	17.10	32.16	56.61	80.45	12.51
<b>Bhutan</b>	<b>17,450.37</b>	<b>922.02</b>	<b>779.17</b>	<b>454.24</b>	<b>1,707.66</b>	<b>2,081.21</b>	<b>224.09</b>



**Table 101: Expenditure incurred by type of food commodity purchased, 2008**

Dzongkhags	Expenditure incurred on the purchased of various food commodities (Nu in Millions)									
	Total	Cereal grains	Dairy products	Eggs	Fish	Meats	Cooking Oil	Sugar	Vegetables	Others
Thimphu	47.6	14.0	12.6	0.7	1.0	10.8	5.1	0.3	0.1	3.1
Paro	103.3	19.0	28.3	2.4	2.2	32.2	12.3	1.1	0.3	5.6
Ha	31.0	11.8	4.6	0.3	0.4	7.5	3.7	0.5	0.0	2.2
Chhukha	59.0	26.0	7.2	0.2	1.4	10.3	8.9	1.3	0.2	3.5
Samtse	87.0	39.8	5.8	0.2	1.4	10.1	14.6	1.7	0.1	13.3
Punakha	48.7	4.6	9.9	0.8	3.0	18.9	7.4	0.4	0.3	3.3
Gasa	14.7	9.7	1.0	0.0	0.2	0.9	1.5	1.2	0.1	0.2
Wangdue	48.1	17.9	6.5	0.4	1.2	10.5	7.8	0.8	0.2	2.9
Tsirang	39.2	15.8	3.8	0.4	1.1	7.5	8.3	0.7	0.3	1.4
Dagana	39.5	15.1	3.8	0.1	1.1	7.7	8.1	0.7	0.3	2.8
Bumthang	35.0	16.4	7.1	0.3	0.7	3.5	5.4	0.3	0.3	1.1
Trongsa	12.4	5.9	1.8	0.1	0.4	1.4	2.3	0.2	0.1	0.1
Zhemgang	13.7	6.5	1.5	0.1	1.3	1.2	2.7	0.2	0.2	0.1
Sarpang	59.0	21.1	5.5	0.3	2.4	7.6	9.9	0.9	0.4	10.8
Lhuentse	16.9	4.9	3.0	0.1	2.4	1.4	4.0	0.4	0.5	0.2
Mongar	43.1	20.6	4.0	0.2	4.8	2.8	8.3	1.4	0.6	0.4
Trashigang	64.1	25.2	7.9	0.4	7.1	7.5	10.6	1.7	1.6	2.1
Trashiyangtse	27.7	9.6	4.7	0.2	3.6	2.4	6.2	0.4	0.5	0.2
Pemagatshel	39.9	18.1	3.5	0.1	3.0	4.8	7.2	0.8	0.6	1.8
S/Jongkhar	36.3	15.7	3.0	0.1	2.5	5.1	5.9	0.3	0.4	3.4
<b>Bhutan</b>	<b>866.1</b>	<b>317.4</b>	<b>125.6</b>	<b>7.4</b>	<b>41.2</b>	<b>154.1</b>	<b>140.0</b>	<b>15.1</b>	<b>6.7</b>	<b>58.6</b>

**Table 102: Cash income and expenditure, 2008**

Dzongkhags	Cash income generated from sale of farm and forest products (Nu. Millions)				Expenditure on food commodities (Nu. Millions)	Cash balance (Nu. Millions)
	Crop products	Livestock products	Forest products	Total income		
Thimphu	63.1	13.11	15.46	91.68	48.79	42.88
Paro	155.37	23.29	1.81	180.47	103.93	76.54
Ha	22.92	9.83	0.83	33.59	31.58	2.01
Chhukha	123.63	21.51	1.15	146.54	60.43	86.11
Samtse	157.28	16.25	1.19	174.72	87.88	86.84
Punakha	75.51	10.02	1.68	87.21	1.68	83.85
Gasa	1.56	3.05	14.53	19.13	14.29	4.84
Wangdue	95.45	20.94	54.34	170.73	51.1	119.63
Tsirang	132.32	13.49	0.28	146.09	39.46	106.63
Dagana	147.45	11.83	0.49	159.77	39.72	120.05
Bumthang	34.64	8.68	15.23	58.55	37.59	20.96
Trongsa	14.66	12.17	0.19	27.02	12.62	14.4
Zhemgang	36.35	9.51	3.07	48.92	13.73	35.19
Sarpang	161.35	19.34	0.3	181	59.6	121.4
Lhuentse	12.06	9.5	1.02	22.58	16.95	5.64
Mongar	57.44	26.87	6.07	90.39	43.3	47.08
Trashigang	56.24	33.98	1.72	91.94	65.05	26.88
Trashiyangtse	18.92	8.11	11.56	38.6	27.94	10.65
Pemagatshel	121.35	9.69	0.37	131.41	40.05	91.36
S/Jongkhar	102.84	23.68	1.1	127.61	36.74	90.87
<b>Bhutan</b>	<b>1,590.44</b>	<b>304.85</b>	<b>132.39</b>	<b>2,621.95</b>	<b>832.43</b>	<b>1,193.81</b>

## 2.10 Topographical (altitudes and slopes) Information

**Table 103: Geographical areas as percentage of the total area of dzongkhag by ranges of altitudes.**

Dzongkhag	Ranges of altitudes (m.a.s.l)									
	0 - 600	600 -1200	1200 – 1800	1800 - 2400	2400 - 3000	3000 - 3600	3600 - 4200	4200 - 4800	4800 - 5400	>5400
Thimphu	4.0	27.2	42.4	20.6	5.6	0.3	0.0	0.0	0.0	0.0
Paro	6.3	25.3	24.9	18.6	21.3	3.5	0.1	0.0	0.0	0.0
Ha	2.6	8.7	17.7	30.7	27.2	11.2	2.0	0.0	0.0	0.0
Chhukha	9.0	22.1	25.2	21.5	15.3	5.9	1.0	0.0	0.0	0.0
Samtse	17.3	27.6	25.5	17.2	10.0	2.2	0.0	0.0	0.0	0.0
Punakha	17.4	26.0	22.1	15.8	12.9	5.8	0.1	0.0	0.0	0.0
Gasa	0.2	2.0	6.9	13.0	15.7	14.9	20.3	18.4	7.1	1.4
Wangdue	3.6	16.1	20.9	24.0	21.2	10.1	3.6	0.4	0.0	0.0
Tsirang	10.1	34.9	28.5	15.5	7.4	3.2	0.5	0.0	0.0	0.0
Dagana	4.1	17.9	29.6	30.9	12.5	4.1	1.0	0.0	0.0	0.0
Bumthang	6.2	14.9	22.2	29.6	24.1	2.8	0.2	0.0	0.0	0.0
Trongsa	1.7	11.6	24.5	29.0	20.1	9.8	3.1	0.1	0.0	0.0
Zhemgang	9.5	27.1	28.0	17.9	9.7	5.1	2.1	0.5	0.0	0.0
Sarpang	30.5	29.5	21.4	14.8	3.0	0.7	0.2	0.0	0.0	0.0
Lhuentse	1.4	8.3	16.0	21.0	19.4	18.8	11.2	3.6	0.2	0.0
Mongar	4.8	23.4	28.6	23.3	12.7	6.1	1.0	0.0	0.0	0.0
Trashigang	4.9	20.8	28.3	24.3	18.9	2.9	0.0	0.0	0.0	0.0
Yangtse	2.5	11.8	21.9	26.2	20.4	13.8	3.2	0.2	0.0	0.0
Pemagatshel	9.9	39.9	37.7	12.4	0.2	0.0	0.0	0.0	0.0	0.0
S/Jongkhar	25.4	30.3	25.4	12.6	4.6	1.5	0.1	0.0	0.0	0.0
Bhutan	7.7	18.5	22.9	21.1	15.2	7.3	4.0	2.3	0.8	0.2

Source: Calculated by authour using data from Atlas of Bhutan (LUPP), 1997.

**Table 104: Geographical areas as percentage of the total area of dzongkhag by ranges of slopes.**

Dzongkhag	Ranges of slopes (degrees)								
	< 5	5-13	13-19	19-25	25-30	30-35	35-40	40-47	> 47
Thimphu	10.0	22.3	23.0	19.5	12.8	6.4	3.5	1.6	0.8
Paro	9.9	22.6	23.3	19.8	12.6	6.4	3.4	1.4	0.5
Ha	8.5	20.6	24.0	21.3	13.5	6.6	3.4	1.6	0.5
Chhukha	5.6	18.9	24.0	21.9	14.5	8.0	4.5	1.9	0.7
Samtse	10.9	20.1	24.5	21.2	12.6	6.1	3.0	1.2	0.4
Punakha	7.4	19.5	22.9	21.5	14.3	7.9	4.1	1.7	0.7
Gasa	21.9	18.9	16.0	14.6	11.4	7.4	4.9	2.8	2.0
Wangdue	11.2	19.5	20.1	18.3	14.0	8.6	5.0	2.3	1.0
Tsirang	6.5	19.2	23.2	20.9	15.3	8.3	4.2	1.8	0.7
Dagana	5.9	21.6	25.1	21.3	13.3	7.0	3.6	1.6	0.6
Bumthang	15.5	28.6	21.9	15.8	9.5	4.7	2.4	1.1	0.5
Trongsa	5.0	16.6	20.7	21.3	17.0	9.9	5.6	2.7	1.1
Zhemgang	5.5	15.1	19.9	21.2	17.6	10.8	6.1	2.8	1.2
Sarpang	17.8	20.2	20.4	18.1	12.3	6.6	3.2	1.2	0.3
Lhuentse	6.1	14.5	18.9	20.5	17.1	11.0	6.7	3.4	1.7
Mongar	5.6	16.6	20.2	20.0	16.2	10.6	6.1	3.2	1.5
Trashigang	6.1	18.0	22.6	22.3	15.5	8.4	4.4	1.9	0.7
Trashiyangtse	6.1	17.9	23.4	21.2	14.8	8.4	4.8	2.2	1.2
Pemagatshel	5.5	14.6	20.4	21.2	17.1	10.4	6.4	3.2	1.2
S/Jongkhar	13.6	20.3	19.3	18.3	13.5	7.7	4.4	2.1	0.9
Bhutan	10.6	19.4	21.0	19.3	13.9	8.0	4.5	2.2	1.0

Source: Calculated by authour using data from Atlas of Bhutan (LUPP), 1997.

## Annexure

<b>Existing RNR Infrastructures as of April 2010</b>		
<b>RNR COMMON SERVICES (Nos)</b>		
RNR Extension Centers	138	(+) 7 under construction
RNR Research Centers	4	
RNR Research Sub-Centers	6	
Soil & Plant Analytical Laboratory	1	
Farm road (km)	2,273	
Power Tiller Track (km)	284	
Functional Irrigation channel (km)	2,774	
<b>AGRICULTURE (Nos)</b>		
Agriculture Extension Centers	40	
Agriculture Seed Production Farms	11	
National Plant Protection Centre	1	
National Soil Service Centre	1	
Farm Mechanization Centers	3	
Farm Mechanization Training Center	1	
National Mushroom Center	1	
National Post Harvest Center	1	
<b>LIVESTOCK (Nos)</b>		
Veterinary Hospital	20	
Livestock Extension Centers	42	
Regional Livestock Development center	4	
Satellite Veterinary Laboratories	3	
Livestock Farms	11	
Fodder Seed Production Center	1	
Vaccine Production Center	1	
National Artificial Insemination Center	1	
National Cold Water Fishery Center	1	
National Warm Water Fish Culture Center	1	
National Center for Animal Health	1	
<b>FORESTRY (Nos)</b>		
Territorial Divisions HQs	12	
National Parks	5	
Range Offices	55	
Beat Offices	80	
Nature Conservation Study Center	1	
Wildlife Sanctuaries	3	
Forest Management Units	17	
Nature Study Center	1	
Forest Cover (Total)	72%	
Protected Areas	51.25%	

<b>Fertilizers distribution to dzongkhags (MT), 2007-2008</b>								
<b>Dzongkhag</b>	<b>Bone Meal</b>	<b>Borax</b>	<b>Butachlor</b>	<b>DAP</b>	<b>MOP</b>	<b>SSP</b>	<b>Suphala</b>	<b>Urea</b>
Bumthang	0.00	0.00	0.00	0.00	0.00	386.55	42.40	177.60
Chhukha	0.00	0.00	0.00	0.00	0.00	0.00	181.95	20.10
Chukha	0.00	0.00	6.13	0.00	0.00	0.00	0.00	0.00
Dagana	1.85	0.00	4.00	0.00	0.50	1.95	2.55	7.75
HA	0.00	0.00	1.50	0.00	0.00	0.00	21.00	13.50
Lhuentse	0.00	0.00	11.60	0.00	0.00	0.00	0.00	52.60
Mongar	0.10	0.05	2.70	0.00	0.05	1.00	9.90	72.30
Paro	0.00	0.05	69.91	0.00	0.60	5.30	140.30	95.80
Pemagatshel	0.00	0.00	7.29	0.00	0.00	0.00	31.00	57.00
Punakha	0.75	0.00	35.03	0.00	0.00	1.00	3.80	67.75
S/Jingkhar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.00
S/Jongkhar	0.00	0.00	1.20	0.00	0.00	0.00	0.00	0.00
Samtse	1.10	0.00	0.92	0.00	1.10	1.15	3.73	3.87
Sarpang	0.00	0.00	6.47	0.00	0.00	0.50	14.00	16.50
Thimphu	2.85	0.53	17.05	0.50	14.60	45.05	78.15	72.25
Trashigang	0.00	0.00	12.27	0.00	10.10	89.50	124.50	494.55
Trashiyangtse	0.00	0.00	0.00	0.00	0.00	0.00	4.00	73.00
Trongsa	0.00	0.00	12.40	0.00	0.00	0.30	9.25	8.75
Tsirang	0.25	0.00	4.91	0.00	0.25	1.75	10.00	7.80
Wangdue	1.70	0.00	54.91	1.00	1.95	68.30	365.70	140.15
Yangtse	0.00	0.00	15.80	0.00	0.00	0.00	0.00	0.00
Zhemgang	0.00	0.00	1.93	0.00	0.00	0.00	0.00	0.00
Bhutan	8.60	0.63	266.02	1.50	29.15	602.35	1042.23	1399.27

Source: National Seed Center (Druk Seed Corporation), Department of Agriculture

Fertilizers distribution to dzongkhags (MT), 2008-2009									
Dzongkhag	Bone Meal	Borax	Butachlor	DAP	KG_MIX	MOP	SSP	Suphala	Urea
Bumthang	0.00	0.00	0.00	0.00	0.00	0.00	754.05	130.95	395.85
Chhukha	2.80	0.00	5.92	0.10	0.04	5.00	5.00	216.02	50.11
Chukha	0.00	0.00	5.92	0.00	0.00	0.00	0.00	0.00	0.00
Dagana	0.30	0.00	5.88	0.00	0.00	0.00	0.00	4.40	17.75
HA	0.00	0.00	2.20	0.00	0.00	0.00	0.00	44.25	21.75
Lhuentse	0.00	0.00	26.40	0.00	0.00	0.00	0.00	0.00	71.00
Mongar	0.75	0.00	6.14	0.00	0.00	0.75	2.55	20.50	194.75
Paro	2.11	2.15	186.44	0.00	0.20	1.20	12.00	289.78	311.31
Pemagatshel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	32.80	120.80
Punakha	1.25	0.00	78.20	0.00	0.00	0.00	7.50	90.80	129.95
S/Jingkhar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.40
Samtse	0.55	0.00	7.62	0.00	0.00	1.10	3.75	5.60	8.45
Sarpang	2.70	0.00	18.70	1.00	0.00	0.00	0.00	8.60	12.20
Thimphu	3.50	0.50	43.50	3.35	0.30	22.70	87.90	177.65	155.57
Trashigang	0.00	0.00	33.10	0.00	0.00	0.00	65.05	184.60	799.30
Trashiyangtse	0.00	0.00	33.72	0.00	0.00	0.00	0.00	6.85	195.00
Trongsa	0.60	0.00	26.60	0.00	0.00	0.00	0.00	20.00	14.60
Tsirang	0.75	0.00	10.70	0.00	0.00	0.00	0.75	13.00	17.20
Wangdue	0.65	0.00	129.00	0.00	0.39	4.00	169.55	705.86	321.04
Yangtse	0.00	0.00	33.72	0.00	0.00	0.00	0.00	0.00	0.00
Zhemgang	0.00	0.00	4.60	0.00	0.00	0.00	3.40	3.40	2.25
Bhutan	15.96	2.65	658.36	4.45	0.93	34.75	1111.50	1955.06	2856.28

Source: National Seed Center (Druk Seed Corporation), Department of Agriculture

Plant Protection Chemicals distribution (kgs/ltrs)								
2007-2008					2008-2009			
Dzongkhag	Herbicides	Insecticides	Non-Toxic	Rodenticides	Herbicides	Insecticides	Non-Toxic	Rodenticides
Bumthang	184.0	38.0	6.0	0.0	166.5	17.2	13.0	0.0
Chhukha	1.0	201.0	195.0	5.0	3.2	4.5	1.0	0.2
Dagana	27.0	84.5	0.0	0.3	2.0	59.7	23.0	3.4
Ha	2.0	55.0	98.0	0.8	0.5	99.5	200.0	1.4
Lhuentse	0.0	220.0	0.0	5.0	21.0	547.0	4.5	3.0
Mongar	0.0	133.0	6.0	9.0	43.2	649.9	2714.0	0.2
Paro	19.0	445.0	2934.0	1.0	0.0	95.4	13.0	0.4
Pemagatshel	0.0	84.0	0.0	0.0	5.0	138.1	2.0	5.3
Punakha	2.0	74.5	5.0	3.6	0.0	77.0	9.0	1.7
Samtse	0.0	90.5	0.0	0.0	0.0	5.5	0.0	0.0
Sarpang	0.0	28.0	1.0	0.0	20.0	81.0	11.0	0.7
Thimphu	27.0	2049.0	6750.0	10.0	111.3	1382.4	4961.5	5.9
Trashigang	0.0	275.0	0.0	2.0	0.0	159.1	15.0	10.2
Trashiyangtse	0.0	0.0	0.0	3.0	5.4	92.6	0.0	3.5
Trongsa	20.0	0.0	0.0	0.0	57.5	157.9	0.0	3.0
Tsirang	0.0	2.0	3.0	0.1	0.2	73.0	9.0	2.7
Wangdue	1571.0	54.5	15.0	5.0	2252.0	88.2	33.0	8.0
Zhemgang	0.0	292.0	30.0	3.3	2.0	139.0	0.0	2.0
Bhutan	1853.0	4126.0	10043.0	48.1	2689.8	3867.0	8009.0	51.4

Source: National Plant Protection Center (NPPC), Department of Agriculture



<b>Distribution of Seeds (kgs), 2007-2008</b>			
Dzongkhag	Cereals and Legumes	Potato	Vegetables
Chukha	4,250.00	21,050.00	320.00
Dagana	6,650.00	4,000.00	60.00
HA	230.00	6,550.00	40.00
Lhuentse	2,370.00	0.00	100.00
Mongar	4,470.00	3,200.00	200.00
Paro	2,690.00	10,050.00	720.00
Pemagatshel	7,290.00	2,500.00	30.00
Punakha	4,700.00	4,000.00	130.00
S/Jongkhar	11,670.00	0.00	100.00
Samtse	5,890.00	1,100.00	20.00
Sarpang	33,360.00	1,100.00	180.00
Thimphu	1,290.00	15,750.00	330.00
Trashigang	7,220.00	9,320.00	30.00
Trongsa	2,540.00	0.00	0.00
Tsirang	9,640.00	5,000.00	90.00
Wangdue	3,400.00	20,550.00	10.00
Yangtse	1,070.00	0.00	220.00
Zhemgang	2,310.00	16,450.00	280.00
Bhutan	111,040.00	120,620.00	2,860.00

Source: National Seed Center (Druk Seed Corporation), Department of Agriculture

Distrubution of farm machineries and equipments, 2007-2008 (Nos. or Sets)																
Dzongkhag	Attachaki	Plough	Corn flake machine	Diesel engine 7 & 10HP	Electric motor 10 & 7_5HP	Rice Mill	Oil Mill	Maize Sheller	PP Equipments	Pipe Hose Complete set	Power Sprayer	Power Tiller with rotary tiller	Rice huller	Rotary Paddy Weeder	Tools & Implements	Trailer
Bumthang	3	12		2	1							12	1		2	12
Chhukha	7	10		4	3				2			10	6		1	10
Dagana	6	7		10	1			1	1			7	9		1	7
Gasa		8		3								8	4			8
Ha		9										9			2	9
Lhuentse	23	1	6	25				3				1	22		2	1
Mongar	29	8	26	36				1				8	7			8
Paro	6	8		3	7	3	4		12			5	11	19	339	5
Pemagatshel	2	3	1	2								3	35		7	3
Punakha	2	8	1	33	4		1			1		8	3		106	8
S/jongkhar	6	2		5	2							2			2	2
Samtse	9	4	1	1	7		1			1	1	4	10		8	4
Sarpang	9	9		3	9				9	1	2	9	11		25	9
Thimphu	1	10		5	4	1	1		8	11	11	8	8		71	8
Trashigang	45	49	10	23	26			32		7		8	37	10	93	8
Trashiyangtse	23	2	2	20	3			2		2		2	22		1	2
Trongsa	7	7	3	7								7	7		1	7
Tsirang	1			1					3				1	2	3	
Wangdue	5	11		14	3		2		11			10	20		254	10
Zhemgang	3	6	2	2	1				6			6	3		27	6
Bhutan	171	128	52	180	66	4	9	38	49	23	14	81	197	31	939	81

Source: Agricultural Machinery Center (AMC), Department of Agriculture

Distrubution of farm machineries and equipments, 2008-2009 (Nos. or Sets)																
Dzongkhag	Attachaki	Plough	Corn flake machine	Diesel engine 7 & 10hp	Electric motor 10HP & 7_5HP	Rice Mill	Flour Mill	Oil Mill	Maize Sheller	P.P Equipments	Pipe hose	Power sprayer	Power Tiller with rotary tiller	Rice huller No_4 & 10	Tools & Implements	Trailer
Bumthang	3				6					2	1			8	13	
Chhukha	3				3					5	3			3	2	
Dagana	3	7									1		7	1	4	7
Gasa	1				1									1		
Ha	2				3					1	2				15	
Lhuentse	20	8	7	22	1			1					8	15	1	8
Mongar			3							8	3			1	150	
Paro	2	10			7	3			1	2	1		9	5	461	9
Pemagatshel		2								13			2			2
Punakha	1	8		2	8								8	13	95	8
Samdrupjongkhar	6	6	1	1	6								6	6		6
Samtse	1	5	1	1	5			1			1		5	1	7	5
Sarpang	7	2	1	1	6				24	23	4		2	8	25	2
Thimphu	4	1	1	3	4	2		2	20	20	4	8	1	6	75	1
Trashigang	46	17	7	2	44		3	2	16	3	2		1	38	1	1
Trashiyangtse	2	3	4	6	1			1					3	3		3
Trongsa	4	1	3	4	1					4	1		1	5		1
Tsirang	3	9		2					1	6	4		8	3	133	8
Wangdue	6	6		1	10			1		21	1		6	11	151	6
Zhemgang	8	8	6	8	2			3	16				8	6		8
Bhutan	122	93	34	53	108	5	3	11	78	108	28	8	75	134	1133	75

Source: Agricultural Machinery Center (AMC), Department of Agriculture

<b>Imports/Purchase and Distribution of food commodities (MT)</b>				
Commodities	2008		2009	
	Imports	Distribution	Imports	Distribution
Atta	183.8	177.78	166.99	141.91
Maida	294.5	274.43	280.18	283.03
Oil	818.9	266.06	666.54	708.22
Pulses	331.7	785.85	369.59	74
Rice	9417	359.43	6718.71	6373.01
Salt	309	8250	351.43	395.12
Sugar	1820	1914.29	3589	3646.31
Wheat	48.96	20.6	80.32	82.5
Dal	NR	NR	NR	278.11
Dalda	NR	NR	495.94	445.34
Kharang	NR	NR	103	188

Source: Food Corporation of Bhutan, Phuentsholing

<b>Average selling prices from FCB depots, 2008 and 2009 (Nu/kg or ltr.)</b>							
Month	Year	Kharang	Maize	Oil	Rice	Sugar	Wheat
January	2009	NR	NR	55.18	16.06	22.48	13.96
February	2009	NR	9.50	52.14	15.27	25.44	14.17
March	2009	NR	NR	51.94	15.22	26.45	14.17
April	2009	15.94	NR	49.46	15.24	25.64	14.17
May	2009	NR	NR	52.27	15.28	28.02	13.16
June	2009	NR	NR	52.30	15.42	28.38	12.15
July	2009	NR	NR	51.50	15.76	27.99	12.47
August	2009	14.40	14.40	32.01	NR	28.88	NR
September	2009	14.15	NR	53.04	18.31	33.90	12.34
October	2009	NR	NR	52.97	19.70	33.49	13.96
November	2008	NR	NR	54.10	21.12	15.93	14.18
November	2009	NR	NR	50.60	19.67	36.24	14.62
December	2008	NR	NR	58.14	21.42	15.65	14.18
December	2009	NR	NR	53.29	20.05	37.07	15.62

Source: Food Corporation of Bhutan, Phuentsholing

RENEWABLE NATURAL RESOURCES CENSUS 2009

Ministry of Agriculture  
Royal Government of Bhutan



**Dzongkhag** : .....

**Geog** : .....

**Town** : .....

**Chiwog** : .....

**Village** : .....

**Respondent No:**  
(For office use only)

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## 1. BACKGROUND INFORMATION

1.1: Respondent's Identity		
Name:.....	Relationship to household head: .....	1 = head
Age: .....		2 = spouse
Sex: (1 = Male, 2 = Female): .....		3 = daughter / son
Gung No. .... Thram No: .....		4 = in-laws
		5 = other

1.2: Distances of road points and amenities from the household (Ask the following questions if there is no road).				
How long do you have to walk to reach motor-road point? .....				Distance
				1 = < 1 hour
				2 = 1 - 3 hours
				3 = 3 - 6 hours
				4 = 6 hours - 1 day
				5 = > 1 day
How long do you have to walk to reach nearest extension centres?	Tick the nearest one			Distance
	RNRC	AEC	LEC	

## 2. SOURCES OF HOUSEHOLD CASH INCOME.

Q 2.1: Main sources of cash Income during 2008							
Code	Sources of Income	Tick	Rank in order of importance (1,2 and 3)	Code	Sources of Income	Tick	Rank in order of importance (1,2 and 3)
1	Horticulture crops (fruits, potato,			7	Salaries / wages		
2	Cereal grains			8	Remittences		
3	Livestock products (meat and dairy products)			9	Contract works		
4	Non-wood forest products (edible and non-edible products)			10	Bussiness		
5	Mules / horses transports			1	Other off-fram activities		
6	Motor transports			1			

### 3. AGRICULTURAL MACHINERY AND EQUIPMENT.

Q 3.1: Serviceable machinery and equipment on the farm (numbers) in 2008											
Item		Indv.	Com.	Item		Indv.	Com.	Item		Indv.	Com.
1	Tractor			8	Power Reaper			15.	Secature		
2	Power Tiller			9	Maize Sheller			16.	Water Pump		
3	Power			1	Paddy			17	Power Chain		
4	Paddle Thresher			1	Bullock Drawn Plow (Improved)			18	Hand Operated Winnower		
5	Diesel Engine for Thresher			1	Rotary Paddy Weeder			19	Cornflake (tengma) machine		
6	Rice Mill Set			1	Power Sprayer			20	Veg.& fruit driers		
7	Oil Mill Set			3	P.P. Equipment			21	Silo		
				4							

**Note:** Indv. = Individually owned or Comm. = Community owned.

Q 3. .2: What did you use for ploughing your land during 2008? Tick as responded.			
<input type="checkbox"/>	Bullocks	<input type="checkbox"/>	Power tillers / other machineries
<input type="checkbox"/>	Both bullocks and power tillers / other machineries		
<input type="checkbox"/>	Other (specify) .....		

## AGRICULTURE

### 3.1 HOUSEHOLD LAND HOLDINGS

Q 4.1.1: Land holdings: Thram records information, 2008 (Respondent should produced Lag-thram)			
Do you own land? YES <input type="checkbox"/> NO <input type="checkbox"/> . If the answer is NO then proceed to Table 4.1.2			
Land type	Area (acres)	Land type	Area (acres)
Wetland		Kitchen garden	
Dry land		Orchard	

Q 4.1.2: Land ownership and tenure status during 2008 (Need not fill up the shaded box)					
Land Use Status		Wet Land (acres)	Dry Land (acres)	Orchard (acres)	
1	Own land cultivated				
2	Leased out				
3	Leased in				
4	Left fallow				
Give reasons for leaving land fallow. (Tick as responded)		<input type="checkbox"/> Unproductive <input type="checkbox"/> Stony <input type="checkbox"/> Wildlife problems <input type="checkbox"/> Very steep <input type="checkbox"/> No irrigation <input type="checkbox"/> House construction purpose <input type="checkbox"/> Far from resident <input type="checkbox"/> Affected by landslides <input type="checkbox"/> Town planning			

#### 4.2. CROP PRODUCTIONS

Q 4.2.1: Cereals production for the year 2008					
Crops	Harvested Area (acres)	Qty. Prod. (kgs)	Qty. retained for seed (kgs)	Qty. Sold. (kgs)	Price/ kg (Nu)
Paddy (irrigated)					
Paddy (upland)					
Maize					
Wheat					
Barley					
Finger Millet					
Foxtail Millet					
Sweet Buckwheat					
Bitter Buckwheat					

Q 4.2.2: Cereals production (2nd cropping) for the year 2008					
Crops	Harvested Area (acres)	Qty. Prod. (kgs)	Qty. retained for seed (kgs)	Qty. Sold. (kgs)	Price/ kg (Nu)
Paddy (irrigated)					
Paddy (upland)					
Maize					



<b>Q 4.2.3: Oil seeds production for the year 2008</b>					
Crops	Harvested Area (acres)	Qty. Prod. (kgs)	Qty. retained for seed (kgs)	Qty. Sold. (kgs)	Price/ kg (Nu)
Mustard					
Sunflower					
Soya bean					
Till / Sesemu					
Ground nut					

<b>Q 4.2.4: Grain Legumes production for the year 2008</b>					
Crops	Harvested Area (acres)	Qty. Prod. (kgs)	Qty. retained for seed (kgs)	Qty. Sold. (kgs)	Price/ kg (Nu)
Rajma bean					
Mung bean					
Dhal					
Lentil					
Beans					
Peas					

<b>Q 4.2.5: Vegetables production for the year 2008</b>					
Crops	Harvested Area (acres)	Qty. Prod.	Qty. retained for seed (kgs)	Qty. Sold. (kgs)	Price/ kg (Nu)
Potato					
Sweet potato					
Topioca					
Collocacia					
Asparagus					
Chilli					
Cabbage					
Cauliflower					
Spinach					
Sag					
Egg plant					
Lady finger					
Green leaves					
Broccoli					
Tomato					
Mushroom (Shitake)	Nos. of billets				
Mushroom (Straw)	Nos. Packets				

<b>Q 4.2.6: Roots, tubers and rhizomes production for the year 2008</b>					
Crops	Harvested Area (acres)	Qty. Prod. (kgs)	Qty. retained for seed (kgs)	Qty. Sold. (kgs)	Price/ kg (Nu)
Carrot					
Radish					
Turnip					
Cassava					

<b>Q 4.2.7: Vegetable (cucurbits) production for the year 2008. (Need not fill up the grey columns)</b>					
Crops	Harvested Area (acres)	Qty. Prod. (kgs)	Qty. retained for seed (kgs)	Qty. Sold. (kgs)	Price/ kg (Nu)
Cucumber					
Pumpkin					
Squash					
Guards					

<b>Q 4.2.8: Spices production for the year 2008</b>					
Crops	Harvested Area (acres)	Qty. Prod. (kgs)	Qty. retained for seed (kgs)	Qty. Sold. (kgs)	Price/ kg (Nu)
Onion					
Ginger					
Garlic					
Cardamom					

<b>Q 4.2.9: Fruit crops production for the year 2008</b>					
Fruit crop	Total Trees	Total Bearing Trees	Production Qty.(kg)	Qty. Sold (kg)	Price/ kg (Nu)
Apple					
Mandarin					
Mango					
Pear					
Peach					
Plum					
Walnut					
Areca nut					
Jack fruit					
Guava					
Pomegranate					
Apricot					
Avocado					
Litchi					
Persimmon					
Sugarcane					
Banana					
Tree tomato					

<b>Q 4.2.10: Quantity and type of fertilizers used for crops during 2008. (MT )</b>							
Farm yard manure (FYM)		Phosphate (SSP)	Urea	Suphala (NPK)	Other chemical fertilizer	Leaf mould	Did not use fertilizer
H/prod.	Purchased						

**Note:** H/prod = Home produced

<b>Q 4.2.11: Quantity and type of plant protection chemicals used for crops during 2008. ( in kgs / litres)</b>				
Insecticides	Fungicides	Herbicides	Tree spray oil	Other PP chemicals

#### 4. LIVESTOCK

5.1 Livestock population for the year 2008								
Cattle, Yaks and Buffaloes		Young		Adult				
		Male	Female	Hiefer	Milch cow	Dry cow	Breeding bull	Bullock
1	Mithun Pure							
2	Mithun Cross (Jatsa/Jatsam/Yangku/Yangkum)							
3	Nublang breed (Local cattle)							
4	Jersey Pure							
5	Jersey Cross							
6	Brown Swiss Pure							
7	Brown Swiss Cross							
8	Yak							
9	Zo / Zom							
10	Buffaloes							
Other livestock		Local		Improved				
		Male	Female	Male	Female			
11	Horses							
13	Mules							
14	Donkeys							
15	Goats							
16	Sheep							
16	Pigs							
17	Poultry							
Ask total nos. for cats and dogs.		Total nos.						
18	Cats							
19	Dogs							

5.2 Livestock death population for the year 2008			
Cattle, Yaks and Buffaloes		Young	Adult
1	Mithun Pure		
2	Mithun Cross (Jatsa/Jatsam/Yangku/Yangkum)		
3	Nublang breed (Local cattle)		
4	Jersey Pure		
5	Jersey Cross		
6	Brown Swiss Pure		
7	Brown Swiss Cross		
8	Yak		
9	Zo / Zom		
10	Buffaloes		
Other livestock		Young	Adult
11	Horses		
12	Mules		
13	Donkeys		
14	Goats		
15	Sheep		
16	Pigs		
17	Poultry		

Q 5.3: Livestock productions and marketing during 2008. (Need not fill up the grey columns)								
Type of products	Qty. Produced (kg.)	Used for processing (kg.)	Qty. Sold (kg.)	Price / kg	Type of products	Qty. Produced (kg.)	Qty. Sold (kg.)	Price / kg
Milk					Pork (pig meat)			
Butter					Beef (cattle/buffalo meat)			
Cheese					Mutton ( goats / sheep meat)			
Eggs (Nos)					Yak meat			
Wool					Chicken			
Fish								

Q 5.4: Live animals sold during 2008. (Need not fill up the grey columns)							
Type of livestock	Sex	Nos. Sold	Price / No	Type of livestock	Sex	Nos. Sold	Price / No
Mithun Cross	Male			Zo / Zoms	Male		
	Female				Female		
Nublang	Male			Buffaloes	Male		
	Female				Female		
Jersey	Male			Horses			
	Female			Mules			
Brown Swiss	Male			Donkeys			
	Female			Sheep			
Yaks	Male			Goats			
	Female			Pigs			
				Poultry			

Q 5.5: Feed and fodder		
Improved pasture Area (acres)	Fodder trees (nos)	<p><b>Ask this question, in case there was no improved pasture.</b></p> <p>What do you feed to your cattle? <b>TICK</b> as responded.</p> <p><input type="checkbox"/> Feed from the planted fodder trees</p> <p><input type="checkbox"/> Collect fodder from forest</p> <p><input type="checkbox"/> Send to graze on the native pastures</p> <p><input type="checkbox"/> Buy feeds from the market</p> <p><input type="checkbox"/> Feed crop residues</p> <p><input type="checkbox"/> Feed some portion of food grains</p> <p><input type="checkbox"/> Feed turnip and other vegetables</p>

## 6. FORESTRY

Q 6.1: Non-wood forest products / by-products and firewood, 2008								
Code	Forest Products	Unit code		Unit code				
		1. Kg	2. Pieces / nos	3. Head load	4. Bundle	5. Litre	6. Truck Load	7. Tractor Load
		Qty. Collected or produced	Unit	Qty. Sold	Price Nu / Unit			
1	Bangchung (bamboo product)							
2	Baskets (bamboo & Cane products)							
3	Others products made of bamboo and							
4	Cups ( wood products)							
5	Dhapa (wood products)							
6	Others products made of wood							
7	Cordyceps							
8	Mushroom (Wild)							
9	Wild Orchid flowers							
10	Illicium fruits / Star anis (Domleeshee)							
11	Walnut (wild)							
12	Hezel nut / Chest nut							
13	Rubia cordifolia (Soe / Laneru /							
14	Medicinal plants (Chirata)							
15	Medicinal plants (Pipla)							
16	Medicinal plants (Others)							
17	Resin							
18	Lemon grass							
19	Cane shoots (Pa-chag)							
20	Bamboo shoots (Ba-chag)							
21	Fern shoots (Nagkey)							
22	Damru							
23	Pan leaves							
24	Incense (Tsang-zey)							
25	Oil seeds							
26	Daphne bark (Dheynap)							
27	Quantity of firewood used during 2008							

Q 6.2: Issues related to forests, 2008						
1	Do you have private forests? <input type="checkbox"/> Yes <input type="checkbox"/> No If No, what are the reasons? <input type="checkbox"/> Limited land holding <input type="checkbox"/> Not aware <input type="checkbox"/> Others reasons <input type="checkbox"/> No reasons					
2	What types of trees would you like to plant in your land? <input type="checkbox"/> Fodder species <input type="checkbox"/> Firewood species <input type="checkbox"/> Timber species <input type="checkbox"/> Fruit trees <input type="checkbox"/> Bamboo <input type="checkbox"/> Other (specify).....					
3	Is there any co-operatives in your village for the NWFP / forest products use? <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, are you a member? ? <input type="checkbox"/> Yes <input type="checkbox"/> No					
4	Are you a member of community forestry? <b>(Tick as responded)</b> <input type="checkbox"/>		If No, what are the reasons? <input type="checkbox"/> Not aware <input type="checkbox"/> Not interested <input type="checkbox"/> No area <input type="checkbox"/> Other			
5	Is there a forest office in your village? <b>(Tick as responded)</b>		<input type="checkbox"/> Dz. Forest Extension Office <input type="checkbox"/> Park Office <input type="checkbox"/> Range Office <input type="checkbox"/> FMU Office <input type="checkbox"/> Beat Office <input type="checkbox"/> There is no any forest office			
6	How far do you have to walk to reach the nearest forest office? <b>(Tick as responded)</b>	< 1 hour <input type="checkbox"/>	1 – 3 hours <input type="checkbox"/>	3 – 6 hours <input type="checkbox"/>	6 hours – 1 day <input type="checkbox"/>	> 1 day <input type="checkbox"/>
7	Are you aware of the forest management unit systems? <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, how does it affect your livelihood? <input type="checkbox"/> Positively <input type="checkbox"/> Negatively					
8	How far do you have to walk to get firewood? <b>(Tick as responded)</b>	< 1 hour <input type="checkbox"/>	1 – 3 hours <input type="checkbox"/>	3 – 6 hours <input type="checkbox"/>	6 hours – 1 day <input type="checkbox"/>	> 1 day <input type="checkbox"/>
9	Do you find it more difficult to get firewood now than 10 years ago? <b>(Tick as responded)</b>	Yes <input type="checkbox"/> No <input type="checkbox"/>	If Yes, what would be the reasons? <b>Tick as responded.</b> <input type="checkbox"/> Increasing population <input type="checkbox"/> Strict forest rules <input type="checkbox"/> Diminishing forest cover <input type="checkbox"/> Other (specify).....			
10	Do you find it more difficult to get timber now than 10 years ago? <b>(Tick as responded)</b>	Yes <input type="checkbox"/> No <input type="checkbox"/>	If Yes, what would be the reasons? <b>Tick as responded.</b> <input type="checkbox"/> Increasing population <input type="checkbox"/> Strict forest rules <input type="checkbox"/> Diminishing forest cover <input type="checkbox"/> Other (specify).....			
11	Getting the forestry permit to collect NWFPs is: <input type="checkbox"/> Easy <input type="checkbox"/> Difficult <input type="checkbox"/> Can't say					
12	What do you think of the present royalty rates on NWFPs? <input type="checkbox"/> Very high <input type="checkbox"/> Very low <input type="checkbox"/> Moderate					
13	Do you think that dependence on forests resources will decrease if there is electricity in the village? <input type="checkbox"/> Yes <input type="checkbox"/> No					
14	Are you aware about the forestry rules and acts? <input type="checkbox"/> Yes <input type="checkbox"/> No					



**7. CONSTRAINTS ON THE FARM.**

**Q 7.1: Constraints faced by household during the year 2008. Select 3 most important constraints and rank them 1, 2 and 3 in the order of importance. (1 being the most important constraint and 3 the least).**

Code	Constraints	Tick	Rank	Code	Constraints	Tick	Rank
1.	Insufficient irrigation supply			8	Hail storm / wind		
2.	Unproductive land			9	Landslides / soil erosion		
3.	Labour shortage			10	Wild animal attack on livestock		
4.	Crop damage by wild animals			11	Livestock diseases		
5.	Crop damage by insects / diseases			12	Lack of feed and fodder supply		
6.	Drought			13	Shortage of land		
7	Excessive rain			14	Limited access to Markets		

**Q 7.2: Crops damaged by wildlife and domestic animals during 2008?**

Code	Main crops	Wild pigs		Deer / Sambhar		Monkey		Elephant		Bear		Porcupine		Birds		Domestic animals	
		A	P	A	P	A	P	A	P	A	P	A	P	A	P		
1	Paddy																
2	Maize																
3	Wheat																
4	Barley																
5	Potato																
6	Apple																
7	Mandarin																
8	Other tree crop 1 (specify)																
10	Other tree crop 2 (specify)																

Note: A = Area in acres and P = Estimated production in kgs. For fruit crops, report in nos. of trees instead of area.

Q 7.3: Livestock killed by wildlife during 2008?																	
Code	Livestock	Tigers		Wolves		Snow Leopards		Common Leopard		Clouded Leopard		Jackals / Foxes		Bears		Wild dogs	
		AD	YG	AD	YG	AD	YG	AD	YG	AD	YG	AD	YG	AD	YG	AD	YG
1	Local																
2	Imp.																
3	Horses																
4	Mules																
5	Donkeys																
6	Yaks																
7	Buffaloes																
8	Sheep																
9	Goats																
10	Pigs																
11	Poultry																

Note: AD = Adult, YG = Young and Improved.

**8. FOOD SECURITY.**

Q 8.1: Household Food-Grain Self Sufficiency													
Did you produce enough food-grain for your household's consumption in 2008? Tick as responded on the right.							<input type="checkbox"/> Enough <input type="checkbox"/> Not enough <input type="checkbox"/> Food grain production not feasible here						
If No enough: Which months did you face food-grain shortages? (Tick months 1-12 as responded)													
Bhutanese calendar ➔	1	2	3	4	5	6	7	8	9	10	11	12	
English calendar ➔	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	
Tick as responded ➔	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8.2: How do you cope with the shortages?							
Code	Copping mechanisms	Tick as responded	Rank in order of importance (1,2 and 3)	Code	Copping mechanisms	Tick as responded	Rank in order of importance (1,2 and 3)
1	Purchase from Market	<input type="checkbox"/>		9	Barter with dairy products	<input type="checkbox"/>	
2	Sale of potato	<input type="checkbox"/>		10	Cash remittance from employed members	<input type="checkbox"/>	
3	Sale of vegetables	<input type="checkbox"/>		11	Off farm activities (contract works, weaving)	<input type="checkbox"/>	
4	Sale of fruits	<input type="checkbox"/>		12	Hire out of bullocks, horses and mules	<input type="checkbox"/>	
5	Sale of other cash crops (specify)..... .....	<input type="checkbox"/>		13	Exchange with labour	<input type="checkbox"/>	
6	Borrowed from neighbours	<input type="checkbox"/>		14	Others (specify) .....	<input type="checkbox"/>	
7	Sale of livestock dairy and meat	<input type="checkbox"/>		15	Others (specify) .....	<input type="checkbox"/>	
8	Sale of forest product and	<input type="checkbox"/>				<input type="checkbox"/>	

Q 8.3: How much of the following food commodities did you purchase during 2008 for household consumption?								
Commodities	Qty. (kgs)	Approx. expenditure (Nu)	Commodities	Qty. (kgs)	Approx. expenditure (Nu)	Commodities	Qty. (kgs)	Approx. expenditure (Nu)
Rice			Butter			Goat meat		
Wheat			Cheese			Eggs (nos)		
Flour			Beef			Other-1 (specify) ..... .....		
Cooking oil			Pork			Other-2 (specify) ..... .....		
Vegetables			Dry fish			Other-5 (specify) ..... .....		
Milk (liquid)			Chicken					
Milk (powder)			Mutton (sheep meat)					

9. **COMMENTS.**

Q 9.1: Comments and notes (by the enumerators and supervisors)

Enumerator's name: ..... Date: ..... Signature: .....

Designation: .....

Supervisor's name: ..... Date: ..... Signature: .....

Designation: .....

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**THANK YOU AND TRASHI DELEK**

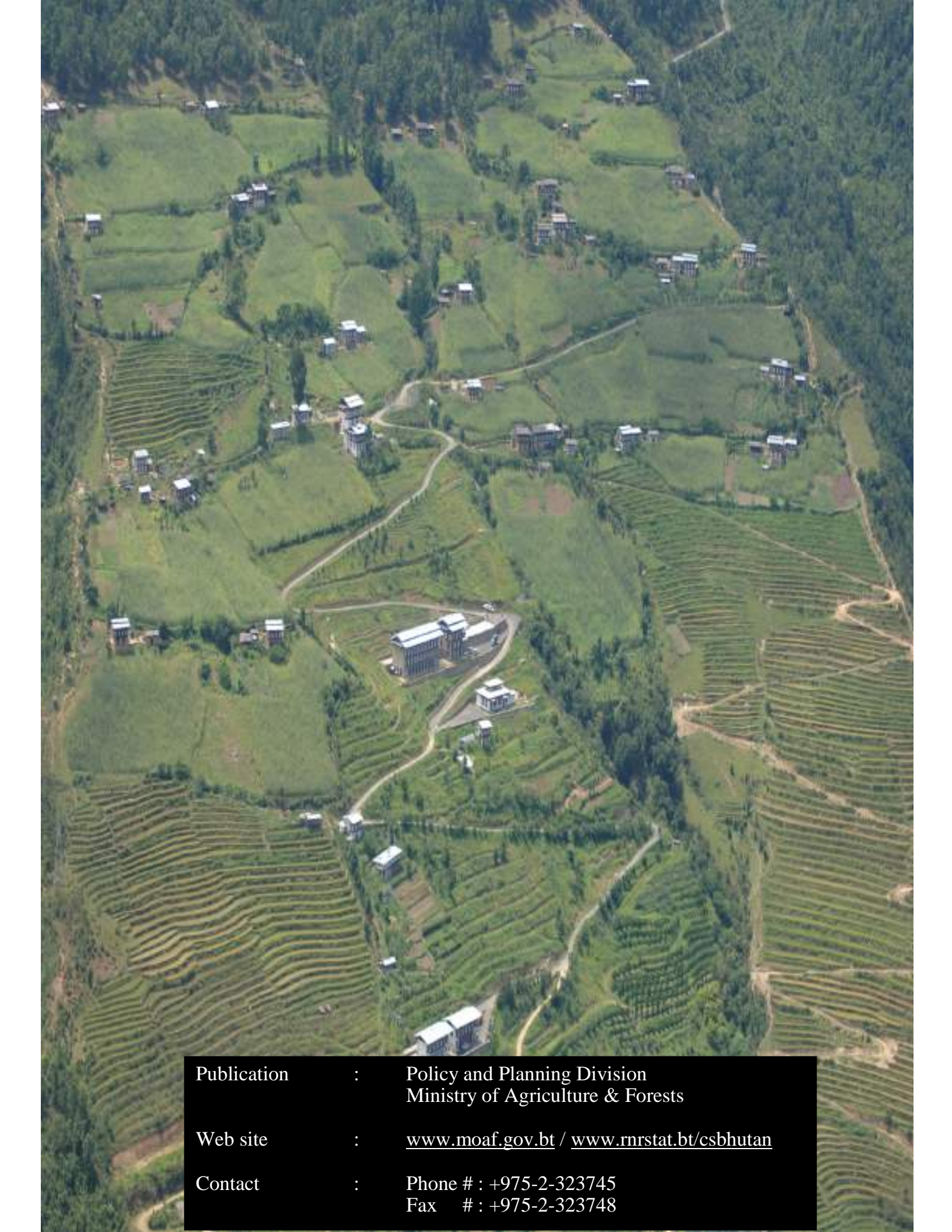
## UNITS CONVERSION TABLES

<b>Land use categories</b>			
Local Term	English	Local Term	English
Chhuzhing	Wetland	Tsoesa / Tsoezhi	Kitchen garden
Kamzhing	Dry land	Khimsa	Residential area
Ngulthog Dumra	Orchard	Tsamdrog	Pasture

<b>Measures of surface</b>			
Name	Area	Name	Area
1 hectare	2.471 acres	1 Acre	100 decimals
<b>Dry land</b>		<b>Wetland</b>	
1 langdo (1day plow)	34 dec = 0.34 acre	1 langdo (1 day plow)	25 dec = 0.25 acre
3 langdo	1 acre	4 langdo	1 acre
1 Dromo (1 morning plow)	17 dec = 0.17 acre	1 Dromo (1 morning plow)	13 dec = 0.13 acre
1 haal	34 dec = 0.34 acre	1 haal	25 dec = 0.25 acre

<b>Measures of grain volume: From local measurement units to kilograms</b>				
Commodities	Drey / Bray / Khaw	Ba-drey / Tho-drey / Wong-drey	Pathi	Phita / Lamshu / Mana
Paddy	1.210	1.890	2.870	0.320
Rice	1.660	2.240	3.740	0.430
Maize	1.660	2.130	3.520	0.390
Wheat	1.470	2.280	3.110	0.390
Barley	1.360	2.520	3.250	0.390
Buckwheat	1.270	1.820	3.010	0.330
Millet	1.380	1.920	2.810	0.330
Mustard	1.290	1.450	3.140	0.320
Sesame	1.080	1.170	3.120	0.260
Soya bean	1.420	1.750	3.670	0.350
Beans	1.470	1.770	3.400	0.390
White Dal	1.730	2.260	3.300	0.410
Black Dal	1.690	2.150	3.420	0.420
Peas	1.400	2.230	3.450	0.360

Conversion various commodities volume from different units to kilograms					
Items	Local units	In kgs	Items	Local units	In kgs
<b>Vegetables</b>			<b>Fruits</b>		
Spinach	Bundle	0.410	Apple	Number	0.24 kg ( 1 box = 18 kgs)
Mushroom	Drey	0.140	Mandarin	Number	0.15 kg ( 1 box = 15 kgs)
Onion shoot	Bundle	0.210	Areca nut	Number	0.05 kg ( 1 pon = 4 kgs)
Garlic shoot	Bundle	0.260	Walnut	Number	0.030
Coriander	Bundle	0.090	Lemon	Number	0.100
Broccoli	Bundle	0.290	Guava	Number	0.210
Asparagus	Bundle	0.280	Pomegranate	Number	0.820
Garlic (bulb)	Phita / Lamshu / Mana	0.140	Banana	Number	0.180
Fresh chilli	Drey	0.280	Mango	Number	0.180
Dry chilli	Drey	0.180	Pear	Number	0.080
<b>Forest products</b>			Groundnut	Phita / Lamshu / Mana	0.300
Cane shoot	Number	0.440	<b>Livestock products</b>		
Fern	Bundle	0.280	Butter	Tsang	0.390
Damru	Bundle	0.240	Butter	Sher	1.000
Pan leaves	Bundle	0.140	Butter	Phog	1.333
			Cheese	Number	0.090
			Hard cheese (chugo)	Chugo-shey	0.180



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