Agriculture Diversification in Bhutan

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INTRODUCTION

The Physical Setting of Bhutan

The Kingdom of Bhutan is a small land-locked country in the Himalayas surrounded by two giant neighbors with the Tibetan region of China to the north and India largely to the south. It covers an area of 38,394 square kilometers. The land rises from an elevation of about 200 meters above sea level in the south to over 7,550 meters in the north resulting in extreme variation in climate, agro-ecology, and bio-diversity.

Land Use

According to RNR statistics 2000, only about 7.8 percent of the land is arable. Actual operated agricultural area is 261,776 acres out of which 21 percent is wetland, 27 percent devoted to shifting cultivation, 8 percent orchards and one percent under kitchen garden. While about 59 percent of the rural households own and operate wet land in almost all the districts, 87 percent operate 113,000 acres of dry land.

Absolute landlessness among rural households is not significant. Only about 2.6 percent rural households do not have agricultural land and they mostly tenant on others farmland or work as agricultural laborers.

The very steep slopes, a predominant feature of the country, impose severe constraints on land available for agriculture. Crop cultivation is therefore concentrated on the lower valleys although less steep areas on the mountains are also used with the aid of terraces.

Population

According to the National Statistic Bureau, the population of the country is estimated at 752,700 in 2004 with the population density of 19.6 percent per sq. km. The annual rate of population growth is estimated at 2.5 percent. To curtail further rise in the growth rate, the Royal Government has already introduced a family planning program as part of its overall development strategy, and at the same time finalized the population policy.

Although unemployment figures are negligible at the moment because majority of the people residing in rural areas (79 percent), has become a serious concern for the government due to the rural-urban migration and as more people are churned out into the job market. However in the rural areas, studies have indicated a shortage of farm labor because of which most of the land remains fallow.

The Bhutanese Economy

Bhutan is largely an agrarian economy with 79 percent of its population engaged in agriculture and livestock farming. As such agriculture is an important source of employment and part of daily life for the Bhutanese people.

Bhutan remained closed to the outside world till the 1960s and its economy was largely self sufficient purely on agricultural production. Its economy was not monetized by then and taxation was mainly imposed in the form of labor, farm products and other products such as textiles.

With the start of the five year plans in 1961, infrastructural development took place with main emphasis on the construction of roads which had a string of effects gradually leading to the monetization of the economy. By 1980, assessment of the Gross Domestic Product was introduced and the Bhutanese economy was assessed in terms of monetary value.

AGRICULTURE IN BHUTAN

Over the past decade, the country has maintained a steady growth rate of 6-7 percent. The agricultural sector as a whole performed well, exceeding the projected target of 1.3 percent over the plan period. The main impetus of the growth in the sector came from forestry and cash crop production[1]. The construction sector, with an estimated growth rate of 17.3 percent, had a major influence on GDP growth rate brought about by the on-going construction of large hydropower projects.

Table 1: Sector composition of the economy to real GDP of Bhutan

Sectors	Percentage share of real GDP at 1980 prices				
	1980	1990	1999	2000	2003
Agriculture[2]	56.4	45.0	35.1	33.9	32.7
Agriculture	27.8	23.6	16.8	16.2	16.1
Forestry and logging	15.5	11.1	9.6	9.2	6.2
Livestock and fishing	12.5	9.4	7.3	7.1	10.5
Mining and quarrying	0.6	0.9	1.4	1.4	1.9
Manufacturing	3.2	7.0	9.6	9.4	7.6
Electricity	0.2	9.1	10.4	10.6	9.6
Construction	7.9	6.1	9.7	10.9	19.9
Wholesale and retail trade, restaurants and hotels	10.9	6.0	6.1	6.0	5.5
Transport and Communication	4.3	7.6	10.0	16.6	8.6
Financing, insurance, real estate and business services	6.3	9.4	8.7	8.4	6.5
Community, social and personal services	10.8	9.9	10.4	10.1	7.9

Source: National Statistical Bureau, Royal Monetary Authority of Bhutan

[1] Nine Five Year Plan document, Department of Planning.
[2]Agriculture encompasses all three sectors namely agriculture, forestry and livestock.

In 2003, the share of the agriculture sector had declined to 32.7 percent from 35.1 percent in 1999. On the other hand, the share of construction has risen from less than 10 percent in 1999 to almost 20 percent in 2003, resulting from the construction activities brought about by hydropower projects. The growth in the electricity sector has brought about expansion in the other sectors like manufacturing, transport and communications.

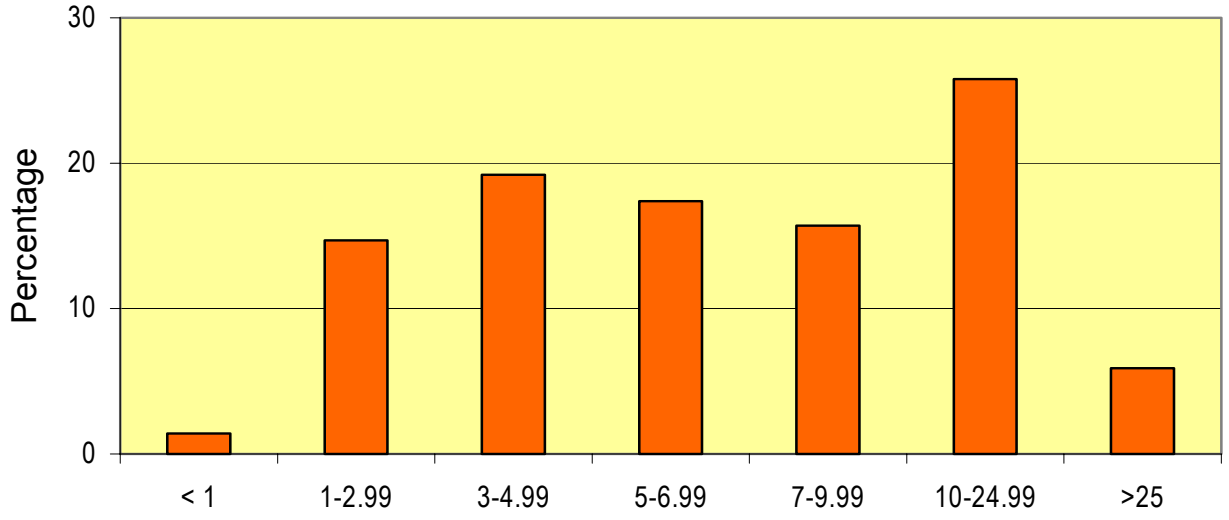
The end of 2004 marks in Bhutanese history 44 years of planned economic development. While the share of agriculture contribution to GDP declined from roughly 55 percent in 1985 to 33 percent in 2003, the Bhutanese economy is still governed by the agricultural sector as the main source of livelihood and income to the majority of the population. Agricultural practices in Bhutan are labor intensive with relatively low intensity of farm inputs. The economy one of the worlds smallest and least developed is dominated by small-scale subsistence farming based on traditional technology and with relatively little economic interaction outside local communities (Tobgay, 2005).

Majority of Bhutanese farmers are small and marginal. A small farmer in Bhutan subsists on farming by growing crops ranging from rice, wheat, maize, buckwheat, potatoes and barley depending on the climatic conditions. A sub-sector of the farmers dwells on animal husbandry by rearing cattle. Farming in Bhutan is a challenge because of small land size holding and rugged topography with steep slopes of most agricultural land, making farm labor intensive and mechanization difficult. Further, majority of the farms are located at a distance of roughly five to six hours walk from the nearest road head.

Given this scenario, of the rural people depending wholly on the agriculture sector, it is important to enhance farm productivity in order to encourage people to pursue profitable farm related enterprises and diversify their source of livelihood. Farm productivity is determined largely by scale and technology. Technological backwardness persists, as much of the farming is non-commercial subsistence agriculture. With a total arable land area of 7%, the average farm size is estimated at 3.4 acres per household. Therefore, Bhutanese farmers cannot benefit from economies of scale. In addition, total arable land is declining steadily. It is estimated that almost 1000 acres of paddy land has been lost per annum since 2000 due to urbanization and natural disasters.

As shown in Figure 1 agricultural land is characterized with small plots of land and cultivate it mostly with family labor, while others cultivate land wholly or partly leased. And a few large landholders cultivate through tenants or with hired labor. The role of farm size is one of the limiting factors to large-scale production. The viability of a small farmer and the agricultural sector is threatened because of the progressive decline in average farm size holdings and the rapid proliferation due to increase in demographic pressure.

Figure 1: Percentage of agricultural area by land holdings.



Source: RNR Census, 2000

About 72 percent of the land area in Bhutan is covered by forest, 28 percent is under shifting cultivation and only 7.8 percent is available for cultivation. Some 4 percent is classified as pasture land with the remaining consisting of glaciers, marshland and rocky outcrops.

The monsoon season begins in June and continues through into October. Temperature starts rising in April and begins falling rapidly in October. Therefore the growing seasons are clearly defined. Six main agro-ecological zones are distinguished on the basis of temperature and rainfall which are affected by altitude as shown in Table 2.

Table 2: Agriculture in the agro-ecological zones of Bhutan

Agro-ecological Zone	Altitude (m.a.sl.)	Rainfall (mm/annum)	Farming Systems, major crops and agricultural produce.
Alpine	3,600-4,600	<650	Semi-nomadic people, yak herding, dairy products, barley, buckwheat, mustard and vegetables.
Cool Temperate	2,600-3,600	650-850	Yaks, cattle, sheep & horses, dairy products, barley, wheat & potatoes on dryland, buckwheat & mustard under shifting cultivation.
Warm Temperate	1,800-2,600	650-850	Rice on irrigated land, double cropped with wheat and mustard, barley and potatoes on dryland, temperate fruit trees, vegetables, cattle for draft and manure, some machinery and fertilizers used.
Dry Sub-tropical	1,200-1,800	850-1,200	Maize, rice, millet, pulses, fruit trees and vegetables, wild lemon grass, cattle, pigs and poultry.
Humid Sub-tropical	600-1,200	1,200-2,500	Irrigated rice rotated with mustard, wheat, pulses and vegetables, tropical fruit trees.
Wet Sub-tropical	150-600	2,500-5,500	As for the humid zones - irrigated rice rotated with mustard, wheat, pulses and vegetables, tropical fruit trees.

Source: Nine plan, Renewable Natural Resources Sector, Ministry of Agriculture, Bhutan

The breakdown of land use in the agricultural areas is as follows:

Table 3: Land Use in the Cultivated Areas

Classification	Percent	Area (ha)
Wetland (irrigated)	21	22,539
Dryland (rainfed)	43	46,151
Shifting cultivation	27	28,979
Orchards	8	8,568
Kitchen gardens	1	1,073
Total	**100**	**107,328**

Source: RNR Statistics 2000, Volume 1, MoA, Thimphu.

Land is fairly distributed in the country. About 14 percent of the farm households each hold an acre or less, account for 1.4 percent of the agricultural land. At least 56 percent of the households have land holdings ranging from 1 to 5 acre each. Census results in 2000 show a maximum of 2.6 percent without land, although many of these still make a living from farming, either renting land or share-cropping with absentee land owners. Sharecropping is normally on the basis of a 50:50 share of the harvest with the owner, or on an earlier fixed rate based on estimated yield in the past.

The majority of the farm households in Bhutan are owner operated. Of the 54,019 acres of wetland, 84 percent are owner operated. About 8 percent are leased out mainly due to shortage of farm labor and another 8 percent left fallow primarily due to acute water scarcity or damage from wild animals[3]. About 76 percent of the dry land cultivated is owner operated. About 3 percent are leased out while 21 percent left fallow.

Policy Process

The policy and strategy formulation process is described as follows:

Agriculture Development Policy

Within the broad framework of the national development strategy, the specific policy objectives are:

- The sustainable development of arable agriculture, animal husbandry and forestry.
- Improvement of income, living and nutritional standards of the rural population.
- Environmental conservation, emphasizing an integrated crop/livestock/forestry system's development.
- To intensify the integrated approach towards achieving at least 70% self-sufficiency in food grains.
- To maintain at least 60% of the country's area under forest cover.
- To develop and promote high value low volume cash crops that offer comparative advantages over other crops.

Bhutan has witnessed a steady growth rate of 6 percent per annum since the mid 1980s, resulting in the enhancement of the per capita income. Nevertheless, Bhutan remains a Least Developed Country with a large number of people living on less than a dollar a day. The government has also formulated a policy to modernize the agriculture sector including implementation of various donor supported projects and programs in different regions of the country. Research on crop varieties, extension and manpower development programs in various fields such as horticulture, potatoes and market infrastructure development are making a positive impact on the farming systems.

The government is promoting the production of cash crops that has seasonal advantage over other crops in the neighboring countries. The RNR policy is geared towards transforming the agriculture sector from subsistence farming to a market oriented commercial farming.

[3] Ministry of Agriculture, web site, www.moa.gov.bt

National Development Policy Environment

The ultimate goal of Bhutan's development policy is towards achieving Gross National Happiness (GNH). This unique development philosophy has several aspects to it, including the four main pillars:

- Socio-economic development
- Good Governance
- Environmental Conservation
- Preservation of culture and tradition

Present broad policy objectives outlined in the Nine Five Year Plan will aim at increasing self-reliance, poverty reduction, strengthening decentralization, private sector development and employment generation, and improving the quality of life and delivery of social services.

Bhutan has cautiously followed the "middle path" balancing economic development with environmental conservation. Bhutan continues to pursue a holistic development approach placing people at the center of development to ensure all plans; programs and economic reforms create an enabling environment to the people to achieve economic prosperity and happiness.

BRIEF BACKGROUND TO AGRICULTURE DIVERSIFICATION

Proponents strongly argue that growing alternative food crops or fruit trees to diversify a traditional farm practices increases profits. Yet, most Bhutanese farmers depend on just one or two field crops as their main source of food. Close to 80 percent of the roughly 261,776 acres of annual crops grown in Bhutan produces mainly corn, rice, potatoes and wheat. Diversifying can spread economic risk and offer profitable niche markets, lessen impact on environmental resources strained by monoculture and, sometimes, offer new opportunities to strengthen communities.

AGRICULTURE COMMERCIALIZATION AND DIVERSIFICATION

Agricultural diversification in the Bhutanese context could be defined as a shift in cultivation of variety of crops for commercial purpose brought about by accessibility to markets and availability of support facilities, in terms of infrastructure, education, technical know-how, etc.

Table 4. Production of fruit crops

PRODUCE	QUANTITY (MT)
APPLE	5,113
ORANGE	29,616
WALNUT	235
PLUM	282
PEAR	718
PEACH	1,091
ARECANUT	1,330
GUAVA	665

Source: Adapted from RNR Census, MoA

Table 5. Major cash crops being exported

Produce	Quantity (MT)	Quantity (MT)
India (Exports)	**2000**	**2001**
Vegetables	15,585	23,364
Fruits & Nuts	2,076	4,628
Spices	1,089	1,094
Cereals	132	27
Oilseeds & med plants	89	169
Bangladesh		
Apples	1,137	1,373
Oranges	9,745	15,889

Source: Adapted from RNR Census, MoA

Apples, oranges, cardamom, areca nut, have had a major impact on income generation of farmers. These crops now dominate the export market. Apple is an important cash

crop in the western part of Bhutan, while oranges are produced mainly in the south and central regions. Other fruits like pears, plums, guava etc. are sold in the domestic markets because of the small harvest volumes.

Table 6. Production of vegetables

Produce	Production (MT)	% of Households
Potato	35,436	20
Chilli	2,849	4.5
Radish	3,384	17.1
Turnip	2,647	8.2
Ginger	1,270	1.9
Beans	1,151	6.2
Sag	521	8.2
Garlic	430	4.6
Onion	285	3.3
Cardamom	510	3.3
Tomato	334	na
Brinjal	197	na
Carrot	151	na
Cassava	827	na
Peas	627	na
Rajma beans	355	na

Source: RNR Statistics 2000.

Until 1970, vegetable production was limited to kitchen gardening. However in the early 1980s, release of 30 different crop varieties and diversification of vegetable cultivation of new crops like cabbage, cauliflower, peas, beans, asparagus, broccoli, onion and carrots significantly contributed to cash income and nutrition of the rural population.

In the early 1980s, with the commencement of the Bhutan National Potato Program, three high yielding blight resistance potato seeds were released. The farmers adopted the new production technologies and from a mere 3,796 metric tons in 1982, exports of potato increased to more than 24,000 metric tons in 2001 earning an income of 149 million ngultrums. The exports of potatoes have seen tremendous increase in the last few years. The production of potatoes in 2001 was estimated at 35,436 metric tons.

Bhutan is also the source of summer vegetables in the neighboring states of India. Cabbage, cauliflower, radish, peas, beans, carrot, potatoes, broccoli, and fresh chilies, etc. increasingly find markets in India. This is because Bhutan has a seasonal advantage in terms of vegetable production over its neighbors. Bhutan produces vegetables in summer, which are exported to India.

The farmers have the option to sell their produce directly to the traders or through the auction yards operated by the Food Corporation of Bhutan, a state governed trading company. In the auction yard, it is mostly the Indian buyers who purchase for onward sale for distribution to various parts of India.

Bhutanese vegetables are being increasingly demanded because of its taste and freshness and the conditions under which they are grown. Red potatoes from Bhutan are used predominantly in the manufacture of potato snacks and other potato products.

Although vegetables find ready market in India, there is little premium attached as the products are unsorted and lack grading aspects. It is the Indian middleman who makes large profits due to higher marketing margins brought about by sorting, grading and packaging.

High value products

Mushrooms

Bhutan exports fresh mushrooms to Japan and Thailand. Shitake and Masutake mushrooms are highly priced in Japan. Markets are also opening up in Malaysia and Singapore. According to sources from the National Mushroom Center, Masutake production picked up in 1992 reaching 11 metric tons in 1997 as compared to 7 tons in 1996. Despite high transport costs, the highly priced value of the product encourages further entrepreneurs to engage in the business.

Bhutan started exporting Masutake mushrooms to Japan, Thailand, Singapore, Malaysia and India since 1990 with the bulk of exports going to the Japanese market. This was due to greater demand from outside the country leading to exploration of more mushroom growing forest areas.

Lemon Grass oil

Lemon grass oil is mainly exported to India and Europe. It has been able to capture niche markets in Europe where it is used as a fragrance by the perfumery and cosmetic industry. The lemon grass oil is mainly produced in the east part of the country by the farmers on a contractual basis with the technical backstopping from governmental agencies.

Distillation of lemon grass oil has become the major source of income for the people in the eastern Bhutan. About 26 metric tons of lemon grass oil is produced annually worth about Nu. 10 million. In order to encourage farmers to take up such activities, the government in the past had distributed about 433 distillation units. The role of farmers has seen a shift from a laborer to that of a producer.

FACTORS CONTRIBUTING TO DIVERSIFICATION

Bhutan's comparative advantages

- Bhutan has seasonal advantage over India and as such summer vegetables can easily be absorbed in the neighboring states of India.

- The country's various altitudinal zones make it possible for the country to produce a wide range of produce.

- Bhutanese produce are in demand due to the growing conditions and best practices. Situated in the high land Himalayan region with no or little pollution has brought about customer preferences.

- The huge market across the border absorbs whatever Bhutan can produce.

Although due to the limited arable land, and huge variety of microclimates, the country may not be able to produce large quantities of any product. "So the best prospects for its agriculture lie in the exploitation of a wide variety of niche markets" (UNCTAD, Bhutan's Export Strategy). Therefore production of high value crops are being encouraged and the shift in the production towards organic crops are under process.

Farm Roads

Agricultural diversification in Bhutan is a recent trend and has come about mainly due to improved access to market brought about by construction of feeder/farm roads. There is a direct correlation between access to markets brought about by roads and the income of the farmers despite other constraints faced by the farmers because of which profits may not be maximized. It has been observed that households near the roads are generally much better off than those situated far away that are mainly depicted by the type of houses they live in and the standard of living.

Access to market, induces farmers to shift their cultivation of variety of crops especially those that yield higher income. Road facilitates and reduces transport costs of inputs and outputs, thereby increasing the profit margin of the farmers. Roads have been seen as the main determinant factor leading to agricultural diversification, though there are other factors like availability of resources, support facilities, markets etc. which play an active role only after access facilities to market are in place.

A wide range of food crops and vegetables are grown in small quantities are produced to be sold in the local markets. With the cash proceeds farmers are able to meet the expenditure on buying other household essentials like basic grocery items, procuring farm tools, etc.

However it has to be mentioned that there is little intra-regional trade within the country, although there is a lateral highway connecting the East, Central and Western regions of the country. This is because of the long distance and limited domestic market, while in the south bordering India; the markets can absorb whatever quantities are consigned. It is not economically feasible for a farmer to market small surpluses in other parts of country due to various limitations. As such, the direction of trade is mainly towards the South–East-South, West-South and Central-South.

Research & extension services

Improved research and extension services of a variety of crops suitable to the agro-climatic conditions have led to diversification and increased production. In 1999 new varieties of rice developed using local Bhutanese cultivars were released for general cultivation. An increase in yield by 20 percent has significantly contributed to increase in total rice production, although 2 percent of rice area has been lost to other uses.

Although Bhutan is a net importer of rice, it exports small quantities of red rice to USA and the possibilities of exporting to Japan are being assessed.

Maize productivity has also increased from 548 kilogram per acre in 1990 to 631 kilogram per acre in 2000 through introduction of improved varieties. There is a surplus production of maize in eastern part of the country.

Production of oilseeds increased from 1,371 MT in 1997 to 1,696 in 2000 mainly due to improved varieties and promotion of oil expellers. These oilseeds are mainly exported to India.

However, diversification has mainly been in favor of horticultural products like fruits and vegetables which are in demand in the neighboring country of India and Bangladesh, two of the most populous country in the world. Many off season vegetable cultivars have been tested and recommended by the research centers.

Apart from the release of improved varieties, integrated pest management practices have also been developed for the control of major pests and diseases of important crops - late blight in potatoes, citrus fruit fly, rice blast, chili wilt, apple rust, apple scab and cardamom wilt. These practices have contributed towards increasing production by 10-20 %. Pest and disease surveillance have helped timely control of localized pests and disease epidemics.

Soil and soil fertility improvement are also being conducted and recommendations are made based on the soil and plant analytical data generated from the laboratory.

Farmers Capacity Development Program

The capacity development programs undertaken by the government of Bhutan has been instrumental in raising crop productivity and in planning various enterprise

developments. Through training, demonstrations and study tours, farmers are making attempts to adopt better farming practices like the use of high yielding varieties (HYV), timely weeding, proper irrigation, crop rotation and the like. Leaflets are being distributed to educate the farmers and various programs initiated to make farmers aware in matters related to production of various agricultural crops.

Improved organized marketing system

The main driving force behind the commercial production of vegetables is the improvement in marketing system, though much needs to be done for effective and efficient marketing of the agricultural produce.

Before 1992, most of the vegetables were sold through the auction yard operated by the Food Corporation of Bhutan. The middlemen travel from house to house collecting surplus products and selling it to Indian traders through the auction yard which has encouraged the farmers and led to the increase in production. The farmers gradually started taking their produce to the auction yard which has set a trend for most of the farmers in rural areas. While small surpluses are sold in the weekend markets all over the country, the large surpluses are sold in the auction yard. However in 1992, due to the demonopolization policy, the middlemen/farmers can either sell directly to the traders or through the auction yards.

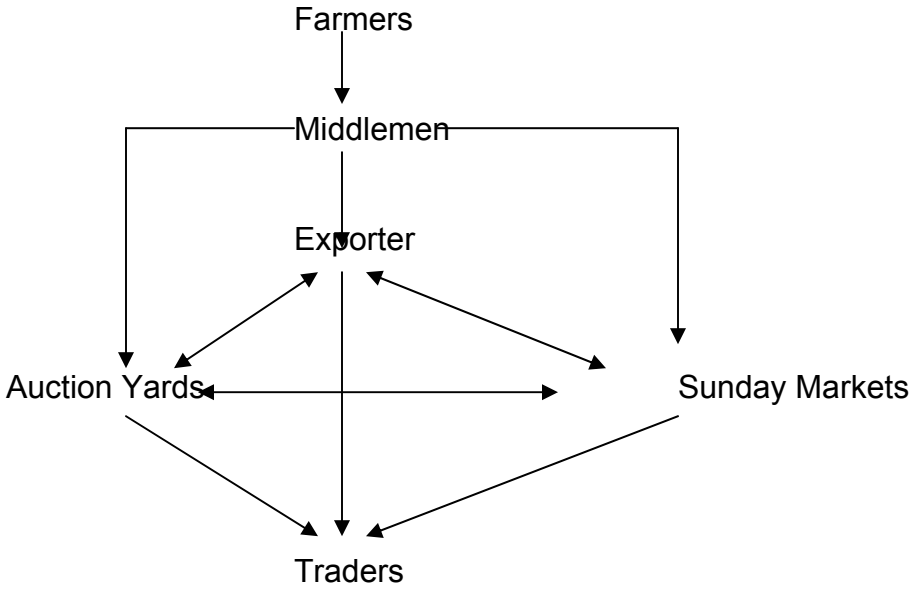


Figure 2. Prevailing marketing system

Research Studies

Studies have been carried out in various parts of country to ascertain their potentials and accordingly find markets for the produce. Trial marketing has been carried out with the involvement of the private sector after identifying the importers. After accessing the success of trial marketing and thereafter addressing the constraints in terms of quality, packaging, grading, etc, the farmers are encouraged to take up production.

A farmer oriented and market led approach has been found very crucial for the development of the farmers. Linkages between different institutions have been found very crucial for effective marketing. Marketing research and studies need to be conveyed to the technical divisions for implementations at the field level. Moreover the feed back received from the traders and consumers would have to be conveyed to the extension agents for improvement of the products.

Agriculture Marketing in Bhutan

The mountainous terrain of the country presents a major obstacle for marketing of agricultural products. Travel in the rural areas is difficult with many of the households located in far off places taking days of walk. Though farm roads now connect many villages, the majority of villages still remain isolated without access to markets. The little surplus produced in these areas is bartered locally. However in the hinter area of urban centers and in area development project districts, the subsistence orientation is gradually diminishing. Developmental activities and overall growth have sparked off greater monetization of the economy with greater number of farmers marketing their crops.

Barter trade is still prevalent in many parts of the country. This form of trade takes place usually in the rural areas where access to market is limited and supply of money or cash income is low. Food grains are usually bartered for livestock products especially in the northern part of the country where it is too cold to grow rice. However this trend is changing with products entering the urban markets especially during weekend markets. As a result of the income level of the general population and better travel conditions brought about by developmental activities, the barter trade is gradually being replaced by monetary system.

Marketing Support Program

The marketing sub-program is responsible for identification of markets and conducting trial shipments in liaison with the private sector. During the 8th five year plan, trial shipments have been undertaken in Sri Lanka and in southern India for fruits and Bangladesh for vegetables. The marketing support program is also responsible for construction of infrastructures and putting in a place appropriate institutions to facilitate effective and efficient marketing of agricultural produce.

The Food Corporation of Bhutan continues to function as the marketing arm of the Ministry of Agriculture. During the eight plan period, the value of agricultural commodities auctioned had risen from Nu. 89 million in 1997 to 181 million in 2001. The aggregate auction value has been increasing over the years.

Input supplies

The Druk Seed Corporation (DSC) functions as the main supplier of seeds and fertilizer to the farmers, through its regional branches and commission agents. The transportation cost of inputs is born by the Ministry of Agriculture so that all farmers have access to the inputs at a uniform price.

In the rural areas where there are no seed suppliers, the extension agents facilitates the collection of orders from the farmers in terms of their demand and accordingly intimates the regional branches or the commission agents.

Weekend Markets

The local weekend market was established to facilitate the marketing of agricultural produce, and the government had directed all the districts to operate weekend markets. Due to increase in demand from the growing population, the vegetable market in Thimphu now operates almost three days week.

The weekend market offers the farmers to sell their small surplus products to meet their daily necessities like salt, sugar, oil etc.

Auction Yard

The commencement of sale through auction yard has been very instrumental in inducing production on a larger scale as well in producing a variety of crops. As mentioned earlier, if the farmers fail to get a satisfactory price for their produce, they sell it through the auction yard.

Auction yards have been set up in all the central regions bordering India. Mobile temporary auction yards are also set up in the main production areas during the harvest seasons. These facilities are run under government supervision.

Markets

The enormous absorption capacity of Indian and Bangladesh market particularly during off seasons provides Bhutan with great opportunity to venture into export oriented vegetable and other cash crop production program.

During summer and autumn, vegetables are in short supply in the lowlands of India and Bangladesh whereas most areas in Bhutan are in highland areas where environmental conditions are favorable for vegetable cultivation. For sustained trade with India, trade and transportation links have to be maintained.

Export

The emergence of cash crop marketing is a recent trend which came about as a result of improved transport facilities, access to markets in India and Bangladesh and also because of domestic demand from food processing industries like Druk Fruit Products and Bhutan Agro Industries Limited. In fact due to the profitable earnings of the cash crops, many of the landowners especially near the roads have started converting their paddy fields into orchards to the extent that the government had to pass a law prohibiting such practices. Cash crops are mainly produced for export. Some sell directly to the traders while others through the auction yard.

Rural Credit

The Bhutan Development Finance Corporation (BDFC) extends credit facilities to the farmers. During the 8th plan period, the credit extended to the farmers was about Nu. 278 million in agricultural loan out of which Nu. 46 million was given through its headquarters in Thimphu.

To suit the financial needs of the clients and to provide appropriate financing schemes, the BDFC has formulated three different loan systems which are provided to its customers.

Table 7. Type of credits provided by Bhutan Development Finance Corporation

Sl no.	Loan Products	Loan Amount ceiling	Interest
1	Group Guarantee Lending & Savings schemes (GCLS)	50,000	13 % per annum
	Scheme (GGLS)		
2	Small Individual Loan Scheme(SIL)	50,000	14 % per annum
3	Commercial Agriculture loan scheme (CAL)	50,000 and above	15 % per annum

Source: BDFC

The GGLS scheme is directed to those individuals who are willing to form and work in groups. Collateral is not required for such schemes. SIL is given to the rural people who have some property to mortgage against the proposed loan and the repayment period is five years. CAL is provided for land development for orchards, repayable within seven years.

Availability of seasonal loans

The banks in Bhutan provide both pre-shipment and post shipment credits to the exporters. The pre-shipment finance is provided for procurement of materials, packing, transportation and transit insurance while post-shipment insurance is provided against the value of export. The interest rate charged by bank is 13 percent for the first 60 days and 15 percent thereafter.

FACTORS LIMITING DIVERSIFICATION OF AGRICULTURE

Traditional practices

Agriculture in Bhutan is still traditional and subsistence. Majority of farmers are illiterate and own small land holdings. Crop diversification would mean taking risks into cultivating new crops that would fetch additional cash income as compared to the growing traditional crop types. Thus the response towards diversification in present conditions is slow in many products.

Low farm productivity

In Bhutan, productivity is constrained by the rough and rugged terrain, primitive technologies, poor management, limited physical and human capital and fragmented and disconnected land parcels. In addition, rising education and military enrolment has also impacted negatively on farm productivity. Rural to urban migration has left village homes to the ageing population resulting to similar impacts. The total land holding per household, which is already low, is expected to decline further with land fragmentation due to inheritance. The overall performance of the agriculture sector is evident in the fact that 79% of the population contributes to only 25% of the GDP.

Infrastructure

The lack of infrastructures limits the farmers from producing more than that is actually required for their own consumption. Essential farm infrastructure like adequate irrigation facilities, farm roads, rural electrification, market information systems, research and extension are some of the key success factors towards a prosperous agricultural sector. Bhutanese agriculture needs to adequately develop such important components.

Storage facilities and other post harvest infrastructures needs to be set up initially at strategic locations so as to enable more farmers to use the facilities. Refrigerated vehicles for vegetable transportation are also required to maintain quality and freshness. Availability of such basic infrastructures would greatly boost and diversify production.

Weak institutional base for farmers groups/associations

Institutions need to be strengthened towards educating the farmers to form groups and associations (tshokpa) so that benefits of scale are tapped. Currently, each farmer is involved in producing small quantities over a limited production area. In order to consolidate small holdings into bigger size cultivation, government should make extra efforts. The concept of land pooling is an attempt to address the concern.

Lack of information

Lack of market information on the price, demand and supply situation, market outlets are the adverse factors constraining farmers from producing large quantities. Since farmers are not aware of the price and demand trends, they tend to sell at a price offered by the middlemen or traders.

Buyer syndicates at the auction yards

The traders who come to bid in the auction yards are rumored to form syndicates in order to keep the price low. This has been the main problem for which a solution has yet to be devised to break up such collusion.

The general trend during the start of the season shoots off by the traders offering a high price inducing all farmers to bring the harvest to the auction yard thereby creating a temporary glut, thus resulting in a downward spiral of prices due to excess supply at that point in time.

Transport constraints

The Bhutan Trade Development Project has carried out a comprehensive review of the country's transport system and its impact on exports. The following transport constraints were noted:

- Distance from the nearest seaport is 950 Kms through Indian towns.
- Poor road conditions
- Closure of roads during monsoons
- High transport costs
- Lack of competition in air services

Bhutan being a landlocked country has to use the nearest Indian seaport, Kolkatta for its trade with third countries. For export of agricultural produce containers have to be brought from Kolkatta which is not cost effective. Air-lifting is not found to be economically feasible because of the high costs.

Summer in Bhutan coincides with the monsoon season during which most parts of country remain isolated due to landslides resulting in goods getting stranded either on the road side or in the production areas.

Inadequate linkages between producers and markets

Linkages between the farmers and large consumers like the big hotels, schools, the army, and the monastic body is weak or non existent. Except for a few commodities like rice, most of the other procurement is imported from India. Correct measures in terms of developing a supplier-consumer relationship needs to be established and continued.

PROSPECTS FOR DIVERSIFICATION

The prospects of agricultural diversification in Bhutan are bright. Bhutan has a wide range of climatic conditions and has potentials to produce many varieties of agricultural produce. The marketing constraints mentioned above have to be addressed in order to make agriculture a viable economic enterprise generating employment opportunities and income for the rural populace. In order to address the supply constraints, the policy of the government in the ninth five year plan is to expand the vegetable growing areas. The marketing channels also need to be well establishment in order to provide an effective marketing system.

Vegetable crops gaining commercial importance both in domestic and international markets would be promoted through:

- Identification of crop varieties suitable for specific potential areas
- Provide technical information and guidelines for production of crops
- Provide appropriate post harvest technologies
- Assured supply quality planting materials and other production inputs

Given the multitude of agro-ecological conditions, off-season vegetable production needs to be expanded to exploit the vast markets of India and Bangladesh. This would also help in decreasing the dependency on vegetable imports. Many off-season vegetables have been tested and have been found to yield good results.

Improvement of marketing systems and market information

The domestic vegetable marketing is mostly done by individual farmers though in some instances middlemen do operate. It has been felt important to encourage farmers to form groups to make vegetable production more efficient and cost effective. The strategies could be strengthened by:

Regular dissemination of information
Increased competitions by involving export agencies

Ensuring greater transparency in the auction system
Provision of grading and sorting facilities
Provisions for credit

Distance from the market cannot be shortened but transport facilities could be improved with refrigerated trucks and possible airfreights. If the roads are not feasible, foot bridges, ropeways, animal breed to help the people with their transport and marketing needs should be considered.

Organic Production

With the world increasingly becoming conscious about health aspects, production of organic products in the diverse agro climatic conditions has been seen as a key to the success in the agriculture sector: thereby agriculture diversification. The Royal government at the moment is in the process of setting up the standards in conformity with international standards for organic products and the relevant institutions would be in place soon so as to facilitate marketing of organic products.

The limited arable land in Bhutan also necessitates the need for production of high value products for export to niche markets. Cultivation of mushrooms, medicinal and aromatic plants etc. are possible in Bhutan.

Establishing a Floriculture Industry

Encouraging farmers to grow flowers is another area, which remains unexplored. Bhutan has the potential to grow a variety of flowers because of diverse agro-climatic conditions but the floriculture industry is yet to take up. Market research has to be conducted in order to determine the markets and ascertain the profitability of setting up a floriculture industry in Bhutan.

More vegetables could be added on to the export basket

It has been found that Bangladesh in the same tropical region as India faces a scarcity of vegetables in summer. Only few vegetables are found in Bangladesh markets limiting consumers to few choices. Tomatoes are brought all the way from India. Spices are in great demand in Bangladesh. This offers for further diversification of products. The trail marketing carried out in Bangladesh proved very successful. However, the quality needs to be improved and a better co-ordination between the various agencies of the Ministry unit as well as with the farmers has been found to be very crucial.

Value Addition

Value addition of high value products would fetch better prices in the market. Production of herbal teas, medicinal soaps, canned vegetables & fruits etc. is another option which can be explored in order to enable farmers to diversify their production base.

CONCLUSION AND RECOMMENDATIONS

While the developments in the agricultural sector have created diversification opportunities, there are constraints that can hamper the ability of farmers; especially that majority of Bhutanese farmers are poor and marginal farmers. Lack of adequate infrastructure, limited access to information, credit, and other assets (land, water, and technological know-how), can severely constrain the scope of diversification initiatives. These barriers, information gaps, and capacity limitations present not only an opportunity, but also a need for authorities' concerned (Ministries, agencies, donors) to provide support and assistance to build the capacity for pro-poor diversification activities.

Diversification initiatives require a multi-component approach involving many specific investment areas. Policy and institutional environment, irrigation and drainage, science and technology, and rural infrastructure are just a few examples. All these investments will not come from the public sector. For long term planning, government has to create the enabling environments for the private sector to provide inputs and services to farmers necessary for diversification; (FDIs), however, the government needs to invest to widen the scope of research institutes to cover emerging issues of diversification, improve the analytical capabilities of farmers to synthesize the diversification opportunity, and develop the efficient knowledge and information systems.

Aside from income generation, diversification will, in most instances, increase employment for the rural poor. For example, von Braun (1995) quantifies that as a result of diversification to export vegetable production in Guatemala, employment increased by 45 percent on participants' farms. It is expected that the benefits of increased employment opportunities are not only substantial but are distributed across a broad spectrum of the economy and thus are to a large extent "pro-poor." Ali and Abedullah (2002) demonstrated the potential for rural employment generation arising from diversification out of cereals to high-value commodities, such as vegetables, by comparing the labor intensity in both systems. Substantial employment opportunities are generated in seed and seedling production, precision land preparation, and the irrigation, harvesting, cleaning, grading, and packaging of high-value crops. It was estimated that a one-hectare shift of cereal to vegetables in one season generates more than one year round full-time employment (that is, the difference between cereals and vegetables was more than 220 working days per hectare). The off-farm employment effect of similar magnitude was predicted through the expansion in the agricultural business activities. Joshi & Gulati et al. (2002) also reported similar results.

As a result of growing consumer demand for highly packaged and processed agricultural products, diversification typically involves the movement away from traditional commodities (requiring minimal secondary processing) toward higher value commodities (requiring significant processing and handling). Additionally, the new production systems are often more intensive and generate demand for a greater quantity and a variety of farm inputs. Because high-value crops, compared to cereals, are more strongly interlinked with other sectors of the economy in terms of providing their outputs and receiving inputs from these sectors, there is a stronger multiplier effect

of the initial increase in income. For example, it was estimated that a unit increase in initial income in cereals has a multiplier effect of two, while similar increase in vegetables will generate a multiplier effect of three (Ali and Abedullah 2002).

With the transition away from subsistence crops to more profitable cash crops like vegetables, returns to land, labor, fertilizer, and water are significantly higher. The degree of improvement in farm income in the long and medium term will depend on the nature of relative changes in income and expenditure, as well as the extent of home consumption. Rural households in Bhutan earning the bulk of their income from the production of exportable goods will experience a net welfare gain regardless of their consumption basket, while the impact for those households that are net consumers may be ambiguous, depending on the effect on local food prices. In any case, diversification will result in greater food security at the household level.

Given the above scenario, the Royal Government should take an active role in inducing sustainable growth by encouraging sustainable production systems in line with the available resources of farmers and microenvironments of soil and land, capturing on the seasonal advantages Bhutan has over its neighbors like India and Bangladesh. To promote the pro-poor diversification with high-value crops, investment should be directed to reduce yield fluctuation by developing stress-tolerant technologies and resistant cultivars of these crops and to improve farm to market linkages. Moreover, policy innovations should stimulate market mechanisms to develop small farmers' organization for the purpose of overcoming the economies of scale problem and improving their access to markets and information. Training on small-scale agricultural business development can also enable smallholder farmers and landless poor people to adjust. With appropriate policies, some of these investments may come from the private sector, while investment related to the establishment of producers' organization to improve their ability in analyzing diversification opportunities and meeting the research needs related to these opportunities should come from the public-private sector collaboration.

Delgado (1995) recognized that there are three requirements for policy level encouragement of diversification. First, diversification strategies need to target staple food production and marketing issues such that policies providing for greater food security are designed and implemented. Increases in high-value production are not likely to occur unless food security risks are considerably lowered, particularly in the context of Bhutan where currently a high share of resources is devoted to subsistence food production. Second, the transaction costs associated with the flow of resources and products between districts and regions need to be reduced. This is so that gains from the production of surplus can flow to areas producing non-surplus, which in turn are required to support the production of surpluses. Third, there is a need to promote non-traditional exports as a source of foreign exchange to overseas markets. For instance similar export items along the lines of mushrooms, cordyceps, apples and oranges needs to be further diversified. This can be achieved by investing in research, extension, training and information systems of high-value crops, organic production, medicinal and aromatic plants, and by developing quality infrastructure. It requires

sustained efforts to overcome institutional and infrastructural constraints. A further important role of the government is ensuring that farmers have the capacity to capitalize on the technological and market opportunities present in the external environment. This form of producer empowerment requires sound education and extension systems at all levels, as well as intervention when necessary to overcome any barriers to the flow of market and technical information and knowledge. Decentralization (DYTs,GYTs) has created a mechanism to facilitate the process but further strengthening of such bodies in terms of upgrading know-how, and awareness is deemed necessary. The importance of giving the farmers a selection of options for their production should be recognized within the programs and sub-programs of central planning.

The upcoming national food security policies document need to address both the country-wide production and the local availability of foods in areas with low productivity and/or areas more suited for the production of tradable goods, for example. Health and sanitation must be promoted to fully exploit the welfare effects of commercialization and diversification, and policy should focus on training and labor mobility programs because "after all, the least diversifiable endowment is probably uneducated labor" (Quiroz and Valdés 1995, p. 254).

And lastly, appropriate trade policy is critical, especially given that the country has initiated membership to joining the World Trade Organization (WTO), opportunities are increasingly tied to the exploitation of emerging markets in foreign countries.

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