

CHAPTER I

INTRODUCTION

1.1 Background

The Kingdom of Bhutan is located on the southern slopes of the eastern Himalayas between China (Tibet) to the north and India to the east, south and west. The country stretches 150 Km from north to south and 300 km from west to east, covering approximately 46,500 square kilometers. The country is entirely mountainous with elevation ranging from 160 meters above sea level in the South to more than 7,550 meters above sea level in the North. This rugged topography imposes enormous restrictions on the scope for agricultural development in Bhutan. As a result of the rugged terrain and high altitude only about 7.7 percent of the country's total land is considered suitable for arable agriculture. About 72 percent of the country's land area is under forest cover. It is one of the least developed countries in the world and ranked 134 of a total of 177 countries as per the Human Development Index (HDI) of the United Nations Development Programme (UNDP). Until 1961 Bhutan was largely a self-sufficient economy with little external linkages and poor internal communications. Modern planned development was introduced in 1961 through the First Five Year Development Plan and with its introduction, development works and growth in imports and exports and monetization had increased commensurately.

In 2000, the Bhutanese population was estimated to be 658,000 growing at an annual rate of 2.5 percent. The population density of the country is considered to be lowest in Asia. About 80 percent of the population resides in the rural areas and farming is primarily subsistence with the farmers making a part of their living from the natural resources, which are currently not as pressurized as in the neighbouring countries.

Agriculture remains the largest and single most important sector of the Bhutanese economy, although its share in gross domestic product (GDP) is estimated to have decreased from 55.7 per cent in 1980 to 36 percent in 2000 (Table 1.1). The reason is that the share of electricity sector increased to 11.6 percent from 0.2 percent in 1980. Moreover, like any other developing economy, the share of construction sector in the country has increased from 7.9 percent to 12.5 percent over the same period. The major export crops of the country are apples, mandarin, potatoes and cardamom while the major import crops are cereals (rice and wheat). Almost about 90 percent of the imports take place with India and are not subject to import duties because of free trade agreement between the two countries. Moreover, the national currency, the Ngultrum (Nu) since its introduction in 1974 has been pegged at par with the Indian rupee, which circulates freely within Bhutan. Cross rates vis-à-vis other currencies are based on the rates prevailing for the Indian rupee.

Table 1.1. Sectoral percentage share to Gross Domestic Product (GDP) in current prices

Sectors and subsector	1980	1991	1993	1995	1997	1999	2000
1. Agriculture, livestock, Forestry and Fishing	55.7	42.7	39.6	39.6	37.0	35.0	35.9
1.1 Agriculture proper	27.8	21.9	21.6	20.8	17.3	16.8	17.9
1.2. Livestock production	12.5	9.8	7.7	8.2	8.5	7.9	7.6
1.3. Forestry and logging	15.5	11	10.3	10.7	11.2	10.4	10.4
Non-agriculture							
2. Mining and Quarrying	0.6	1.7	1.4	2.0	2.1	1.7	1.6
3. Manufacturing	3.2	9.3	10.6	11.0	10.5	9.3	8.0
4. Electricity and gas	0.2	7.1	7.9	10.8	11.7	12.2	11.6
5. Construction	7.9	6.7	8.7	9.5	10.1	11.1	12.5
6. Wholesale and retail trade							
Restaurants and hotels	10.9	7.1	7.8	7.4	7.0	6.8	6.8
7. Transport, storage and communication	4.3	7.4	8.3	7.0	7.0	8.6	8.6
8. Financing, insurance and real estate	6.3	7.6	6.5	5.1	5.0	5.5	6.1
9. Community, social & services (Government)	10.8	10.5	9.1	7.6	9.4	8.7	8.9
Total	100	100	100	100	100	100	100

Source: Central Statistical Organisation, National Accounts Statistics, 1980-2000

In the arable areas, virtually all-accessible and moderately sloped land is being utilized (MoA, 2002). The dry land agriculture (32.6 percent) which is rain fed is the most dominant land use with maize predominating as the main crop among a much wider variety of annual crops. It is followed by 28.6 per cent slash and burn (*tseri*) and is used much the same way as dry land except that after a crop or two the land is then left fallow for a period ranging from four to 12 years. As this category of land use is mainly on steep and marginal lands, the government has a policy objective to eventually phase out this type of land use. Any land that is terraced and supplied by an irrigation canal is referred to as wetland and this category of land use is relatively small (12.6 percent). Paddy is the major crop grown in this category of land use system.

Bhutan's mountainous environment produces a wide range of agro-climatic conditions, reflecting differences in soil, rainfall, temperature, and slope. This allows a considerable variety of different crops to be grown. Major food crops include rice, maize, wheat, minor cereals (barley, buckwheat, millet), mustard and legumes (soybeans and other pulses). Crop production is generally based on a low level of purchased inputs. Soil fertility maintenance depends mainly on organic manures.

Around 18 percent of farm households own less than 1 hectare (MoA, 2002). Households with insufficient land of their own enter into tenancy contracts and sharecropping arrangements to get additional land for food production. Crop production, livestock and forestry activities are closely interrelated and interdependent. Agriculture derives organic material, fuel, fodder, timber, feed, bedding materials and other basic resources from the forest. Livestock provides the draught power and organic nutrients required for food production and in turn utilize feed and fodder from crops. The forests besides providing domestic fuel wood requirement are also a source of supplementary food supplies in the form of edible roots, tubers, fungi and leaves of certain plants.

It is said that Bhutan has been historically self-sufficient in food grains, and at one time exported rice to Tibet. However, increased population, urbanization and

increased consumption have led to deficits in food grains. Traditionally, the Bhutanese diet relied mainly on rice, maize and buckwheat, but in the past decade or so, staple food consumption patterns have gradually changed in the non-rice growing areas. There has been an increasing trend in the per capita consumption of rice and a decreasing trend in per capita consumption of other grains. While the preference of rice above other grains has always been there, economic growth, leading to increased incomes, as well as urbanization have allowed many consumers to change their food expenditure and increase the role of rice in their diet (Lhamo and Swinkels, 2002).

Rice as a principal food crop now is grown from tropical lowlands (200 m) in the south up to elevations as high as 2600 m in the north (Ghimiray, 2003). Based on the Renewable Natural Resources (RNR) census conducted by the Policy and Planning Division (PPD) of the MoA in 2000, the present total land devoted to paddy cultivation is about 21,756 hectares only and out of which 29 percent falls in the western region. The production of paddy at the national level based on the Census showed 68753 metric tons (Mt) from an area of 18923 ha. For the western region the total paddy production was 18,438 Mt from a harvested area of 5537 ha with an average yield of 3.3 Mt/ha. With a low national average yield of paddy and also other crops the Poverty Assessment and Analysis report of 2000 reported grain deficit in 63 *geogs* (blocks) indicating economic marginality of people living in those places. Grain deficiency is also reflected at the national level and in 1998 alone a total of 34,813 MT of rice were imported (Planning Commission, 2000).

From the productivity point of view, Warm Temperate zone (WT) is the most productive with the highest average yield of 3.08 t/ha and the least productive AEZ is the Wet Sub-tropical zone (WST) with 1.94 t/ha owing to poor soils, high pest incidence and unreliable irrigation supply (Ghimiray, 2002).

Both irrigated and non-irrigated lands are presently not optimally used for production. Most farmers still cultivate one crop, especially rice, per year although two crops are possible in the mid and the low altitude zones (DoA, 2003). Varieties and techniques for double cropping of rice are available but the rate of adoption is

very low (Ghimiray, 2000). Ever since the establishment of research system in the country several improved crop varieties and cultivation practices have been developed. So far a total of 12 improved varieties of rice have been released for different agro-ecological zones. Of these, two varieties are for low altitude areas, two for high altitudes and the rest primarily for mid altitudes. Concomitant with the high yielding varieties, several improved production packages have been developed both for improved and traditional crop varieties. These packages include appropriate establishment times and methods; nutrient management methods; weed and pest control etc. for specific rice agro-ecological zones (MoA, 2001). At the same time, traditional Bhutanese rice varieties are also grown under diverse agro-climatic conditions and show high level of diversity. More than 80 percent of the total land area is still planted to traditional varieties, reflecting the high adaptability and suitability of these cultivars in the traditional farming systems (Ghimiray, 2002).

The Royal Government of Bhutan (RGoB) ever since its 5th Five Year Plan (FYP) from 1981 to 1987 has been consistently pursuing the food self-sufficiency policy. The goal of the government is that Bhutan at least achieves 60 per cent self-sufficiency in rice and 70 percent self-sufficiency in cereals (MoA, 2000). However, Bhutan has not been able to achieve the above goals as yet and the country is still dependent on rice imports from India. The reasons for the continuous import of rice are the increase in its population, decreasing area under paddy cultivation and limited use of fertilizers. Paddy cultivation in Bhutan is also characterized by a number of problems like low temperature at high altitude, low soil fertility level, limited irrigated land, insects and diseases, inadequate infrastructures, credit and input supply and poor transport and distribution system.

Therefore, to address the needs and to achieve the self-sufficiency policy, the Ministry of Agriculture (MoA) has initiated a number of technical and policy research programs. A Bhutan-IRRI project to develop national rice research capabilities began in 1984 with funding from the International Development Research Centre (IDRC) of Canada. Bhutanese scientists and technicians were trained at IRRI and in-country to provide the basis of a national research system that has since made considerable

progress in demonstrating the potential for rice yield increases through varietal improvement, improved soil fertility, and better weed control. Greatest success has been achieved in the mid altitudes. Modern varieties (mainly IR64) have spread to over 30 percent in one important rice-growing area, the Wangdiphodrang-Punakha Valley.

1.2 Rationale

The rice system in Bhutan is characterized by high labour requirement, low chemical fertilizer input, low yield and is subsistence oriented. However, in recent years Bhutan has been observing a change in the dietary patterns shifting more towards rice. With the growing share in the diets of the Bhutanese people, rice is of crucial importance to the Bhutanese food policy. The national policy is to increase self-sufficiency in food grains from 65 percent in 1996 to 70 percent in the near future and to increase the self-sufficiency in rice to 60 percent. In the ongoing debate about rice policy, some proponents of increased rice protection assert that Bhutanese farmers cannot compete with cheap imported rice and in order to safeguard the income of rice farmers and prevent over dependence on the world market, Bhutan should increase tariff on rice. On the other hand, the Planning Commission in its Vision 2020 accords no priority to cereals program but has accorded top priority for the development of horticulture. It is said that Bhutan does not have comparative advantage in the production of rice because of its terrain, high labour requirement and the climatic factors and that future policies for economic growth should take full account of the country's comparative advantage. But then rice is not only a staple crop for most Bhutanese households, it is also of strong social importance to the farmers. Farmers are more concerned about meeting the household rice requirement or the social efficiency. There is therefore a need to really understand the situation of the rice system in the country and the effect of the present policies on it. Moreover if the present population growth of 2.5 percent (Planning Commission, 2002) continues in the years to come, and vast tract of fertile agricultural land being lost to non-agricultural developmental activities and urban development it is more likely that the self-sufficiency rate will decline rather than increase. Kuensel, the National

newspaper on 2nd March 2005 reported that Bhutan for the past six years had been losing about 405 acres of paddy growing land annually to development activities, natural disasters and regeneration of forests. With very limited scope for expansion of agricultural land, and high population growth rate, the population to land ratio is likely to expand resulting into domestic food shortages.

1.3 Objectives

The objectives of the study are as follows:

1. To understand the production and technological options of growing rice in the different agro-ecological zones of the western region;
2. To measure the profitability of rice production in the western region of Bhutan;
3. To assess the impact of policy changes affecting the economic viability of rice and its associated technologies; and
4. To determine critical policy options and changes on rice production.

A review of the present situation of rice production system in Bhutan and the policies and programmes geared at increasing its production was carried out. The review was done to get a better understanding of the present situation. The details of this are given in the following chapter. Policy Analysis Matrix (PAM) framework has been used as the tool for analysis in this study. A chapter on PAM has been devoted in this study solely to get a better understanding on its construction and interpretation of the results.