

Chapter 2 Country Profile

2.1 Socioeconomic Overview

Bhutan is a small landlocked country. It is situated in the eastern Himalayas. It covers about 40,077 sq. km. It is bordered on the west, south and east by the Indian states of Sikkim, West Bengal, Assam and Arunachal Pradesh, and on the north by the Tibetan Autonomous Region of China (Figure 1). The total population of this Buddhist country is estimated to be 600,000. About 85 per cent live in rural areas. According to the 1994 National Health Survey of the Ministry of Health and Education (MoHE), the population growth rate is 3.1 per cent per year. At this rate, the population is projected to double by 2015 A.D. The country is mountainous and elevation ranges from about 200 to 7,600 masl. The extreme variation in elevation and climate means that the country is divided into three broad agro-ecological zones: alpine, temperate, and subtropical.

Through successive five-year development plans, Bhutan has established a network of basic infrastructure, and economic and social services. The country today has a

fairly good motorable road-network connecting every district. Bhutan also has an excellent telecommunication network that connects all major settlements. The RGoB is already in the process of extending it deeper into the rural areas. The introduction of the Royal Bhutan Airlines has provided the country with direct access to some neighbouring countries.

Most of the country, including rural areas, has access to electricity and safe drinking water. Today, according to the Ministry of Finance (MoF), Bhutan spends more than 30 per cent of its budget on social sectors. The results have been encouraging. According to the MoHE, 72 per cent of the school-going age group has access to education, the literacy rate has surpassed 54 per cent, health coverage is now 90 per cent, and average life expectancy is 66 years. Furthermore, the renewable natural resources' (RNR) sector has regional research centres and an extension network reaching rural areas for the direct benefit of farmers.

Agriculture is the mainstay of the economy. Almost all the rural population is engaged

in agriculture and agriculture-related livelihoods. The Central Statistical Organization (CSO) estimated that farming, animal husbandry, and forestry accounted for about 38.6 per cent of the gross domestic product (GDP) in 1997. The per capita income in 1996 was US\$ 551 (CSO 1997), which is one of the highest in the Asian region. Also, there is little abject poverty and no significant income gap.

Livestock continue to be a vital part of the rural economy providing milk, meat, manure, and draught power. However, the cattle population presents serious localised problems of overgrazing.

RGoB has generally pursued economic policies characterised by prudent macroeconomic management and emphasis upon protection of the environment and the country's cultural heritage. Bhutan has, however, been dependent upon foreign aid to finance most of its development efforts. The country also faces formidable development constraints associated with its remoteness and rugged topography, limited capacity to plan and implement programmes, and a shortage of trained manpower. However, the RGoB is able to meet the cost of recurrent expenditure from its own domestic revenue.

2.2 Land-Use Patterns

2.2.1 Agriculture

The entire country is mountainous except for the foothills in the south. According to

the Land-Use Planning Project (LUPP 1994), agricultural land is limited to about 7.8 per cent of the total area of the country. However, agriculture is still the most important sector and contributed 19.2 per cent to GDP in 1996 (CSO 1997). The predominant agricultural land uses are *chhuzhing* (irrigated paddy fields), *kamzhing* (dryland), *tseri* (slash and burn agriculture), and orchard cultivation. Details of land uses are given in Table 2.1.

Chhuzhing

Chhuzhing is irrigated, bench-terraced paddy land. A rice-based cropping system is practised on this type of agricultural land. While paddy is the main crop, other crops, such as wheat, potatoes, and vegetables, as second crops in winter, are not unknown. In some areas, particularly in the southern subtropical zone, paddy is grown twice. It is estimated that approximately 12 per cent of the total cultivated area is *chhuzhing* (LUPP 1995).

Chhuzhing is mostly found in the broad valleys of Punakha, Wangdue, and Paro districts. In other parts of the country, such as Trashigang, Mongar, Lhuentse, and Trongsa, *chhuzhing* is found scattered on steep slopes. In the southern subtropical zone, there is a long and extensive stretch of *chhuzhing* in the foothills along the border area.

Kamzhing

Kamzhing is either terraced or unterraced rainfed agricultural land. It is found

Table 2.1: Agricultural Land by Type (in '000 ha)

Type of Land Use	Total Area	Percentage
<i>Chhuzhing</i>	388	12
<i>Kamzhing</i>	977	31
<i>Tseri</i>	883	28
Orchard	58	2
Others	840	27
Total	3146	100

Source: LUPP 1994

throughout the country, mainly on mountain slopes. Bunds help to mitigate soil erosion problems. *Kamzhing* constitutes about 31 per cent of the total agricultural land. Maize- or potato-based farming systems are practised. Besides these crops, other annual crops, such as mustard, buckwheat, turnips, and vegetables, are grown in the temperate northern zone. In the subtropical zones, millet is grown as the second crop.

Tseri

Tseri is a conventional slash and burn system of agriculture, except that *tseri* farmers do not shift their homes like their counterparts elsewhere. *Tseri* areas are cultivated on a rotational basis with an average fallow period of five to six years. The land is left fallow for regeneration of its vegetative cover and soil nutrients. *Tseri* is important as it comprises 28 per cent of the cultivated area (Table 2.1). Common crops are maize, millet, wheat, barley, and buckwheat. Other crops, such as chilli, beans, and leafy vegetables, are grown as intercrops. Since *tseri* areas are inside or near forests, crop losses from wildlife are high.

Orchard

Fruit-growing has long been part of Bhutanese life, but commercial orchards are a recent practice, introduced in order to improve the living conditions of the rural population by increasing their cash income. Orange, apple, cardamom, ginger, nuts and mango are some of the major crops planted. The estimated area under orchards is two per cent of the total cultivated land (Table 2.1). The orchard area is underestimated since the satellite images used failed to account for areas of less than five acres (2 ha) and some orchards could not be differentiated from forest cover.

The area under apple plantation is expanding, particularly in Thimphu and Paro

Dzongkhags. Most of these new plantations are being developed on dryland and, to some extent, on *tseri* land. There is pressure on *chhuzhing* as it is relatively more accessible than other land types. Most orchard crops are exported to India; however, efforts are being made to diversify. Markets in Bangladesh, Thailand, and Singapore are being explored for selected crops. Poor quality and lack of standardisation are the major problems that Bhutanese crops face in these markets.

Others

This is agricultural land that could not be identified with the mapping technique deployed. It is a 'club' land category that can be classified into one of the above categories with finer mapping techniques.

2.2.2 Forests

Forest is defined in the Forest and Nature Conservation Act 1995 as 'any land and water body, whether or not under vegetative cover, in which no person has acquired a permanent and transferable right of use and occupancy, whether such land is located inside or outside the forest boundary pillars, and it includes land registered in a person's name as *tsamdog* (grazing land) or *sokshing* (woodlot for collecting leaf litter)'. Bhutan has extensive and rich forest resources. Wide variations in altitude and climate mean that forest resources are habitats for some of the world's endangered species of animals and plants. Bhutan is one of the ten 'hot spots' in the world. Currently, forests occupy 72.5 per cent of the total area of the country. They are managed as government-reserved forests. Table 2.2 provides forest cover composition (LUPP 1994).

The species' composition of the country's forests can be placed into three broad ecological zones. Forests that occur in the range of 200 to 1,000m among the southern foot-

Table 2.2: Composition of Forest Cover by Type and Area

Forest Type	Area (sq. km.)	Percentage
Fir	3453	11
Mixed conifer	4868	17
Blue pine	1286	4
Chir pine	1009	3
Broadleaved with conifer	1358	5
Broadleaved	13749	47
Plantations	64	1
Shrub	3258	12
Total	29,045	100

(LUPP 1994)

hills are known as subtropical. These forests are composed of broadleaved species that have high economic value. Most plantations are also found in these forests. The Black Mountain region, which is considered to be the richest subtropical forest in the world, is part of this forest zone. These forests are also habitat for most of the endangered wildlife, such as the rhinoceros, tiger, elephant, pigmy hog, and so on.

The temperate zone forest lies between altitudes of 1,000 and 4,000m. It contains important inhabited areas. Forests between 1,000 and 2,000m in humid areas are classified as warm broadleaved forest and contain a mixture of evergreen and deciduous broadleaved species. In the drier areas at this altitude, chir pine is common. Cool broadleaved forest is found on moist exposed slopes above the warm broadleaved forest. Evergreen oak forest occurs at the same elevation as cool broadleaved forest but on drier sites. The forest above 2,500m consists mainly of temperate conifers with some hardwoods. The conifer forest, especially blue pine and spruce, is the main forest type of commercial significance.

The alpine zone occurs at 4,000m and above. This zone is an important natural conservatory of glaciers, alpine meadows and scrublands, and subalpine and cool temperate conifer forest. It harbours spe-

cies of wildlife, many of which are endangered or extinct elsewhere in the world. Takin, snow leopard, blue sheep, musk deer, Himalayan black bear, marmots, red panda, tiger, and species of pheasant are some important species. Jigme Dorji National Park, which is the largest park in the country, is mostly in this zone. There are also several species of plants that have commercial, medicinal, traditional, and religious significance. More than 300 species are currently being used to make indigenous medicine. The area also has great potential for trekking tourism, and this is being gradually exploited; the number of tourists is increasing every year.

Forest resources play an important role in conservation of the environment and in the national economy. While attempting to keep the environment intact, the forestry sector contributed 11.7 per cent to the GDP in 1996 (CSO 1997). Forestry is of strategic importance because the young and expanding industrial sector is largely dependent on forest resources. It also provides food and other important products to rural communities. Furthermore, in the absence of improved pasture, cattle are allowed into government-reserved forest for free grazing. In addition, forests are a tourist attraction as unspoilt natural beauty, exotic excursion spots, wildlife habitat and a peaceful resort to rest. Given all these

features, the RGoB recognises the important role and functions of the forest in the sustainable development of the country's economy.

In order to preserve the rich flora and fauna, 26.5 per cent of the country's total area is under a protected area system. The objective is to protect and preserve biodiversity and genetic resources. Currently, there are four national parks, four wildlife sanctuaries, and one strict nature reserve occupying a total of 11,078 sq. km.

2.2.3 Livestock

The Bhutanese economy is traditionally centred on subsistence and migratory patterns of livestock farming. As more than 95 per cent of households own cattle, this is a strong indicator of the importance of livestock in the country's rural economy. However, livestock cannot be looked at in isolation from crops and forestry – it is an integral part of the Bhutanese farming sys-

tem. For instance, livestock provide draught power and manure for crop production, which is 'reciprocated' with feed, fodder, and fallow grazing; the forest is a source of litter for animal bedding, and also a place for grazing. Wild grazing is common practice.

In the last decade or so, the traditionally harmonised practice of livestock farming has been increasingly put under pressure by implementation of a successful livestock programme. The irony of its success is the threat of imbalance in the crop-livestock-forest relationship. With improved veterinary facilities, the animal population has increased but this has not resulted in an increase in livestock products. Livestock production now competes with crops for arable land and causes overgrazing of forests. There is no currently appropriate means of balancing livestock population and pasture availability or of reducing the number of economically unproductive animals.