Chapter 3

BACKGROUND OF THE STUDY AREA

Palpa District

General Features

Palpa, a mid-hill district in western Nepal, is a rectangular piece of land covering 1,36,600ha in area (Figure 3). The Siddhartha Rajmarg (SRM) passes through the district and the major town of Tansen is accessible by a branch road. Several district points are well connected by fair weather roads as well.

Biophysical Description

The topography is characterised by steep southern Himalayan ranges running east to west. Several valleys of considerable size are also found. To the north, two-thirds of the district fall within the Mahabharat Range and the southern one-third is within the Siwaliks. The monsoon, as elsewhere, is erratic in Palpa. The annual rainfall varies from 1,000-2,000mm with mean rainfall at Tansen recording 1,870.3mm during 1979-84. The normal maximum summer temperature exceeds 30°C and in winter it is 7°C.

The geology is characterised by a very complex mixture of phyllites, schists, quartzites, granites, and limestones of varying ages and weathering stages in the Mahabharat Range. The Siwaliks is comprised of sandstones, sandy limestones, clays, and conglomerates. The soil is generally poor with a low fertility index, medium P^H, and low organic matter content.

Demography

The estimated population of Palpa is around 250,000. The majority consists of *Magar* followed numerically by *Brahmin* and

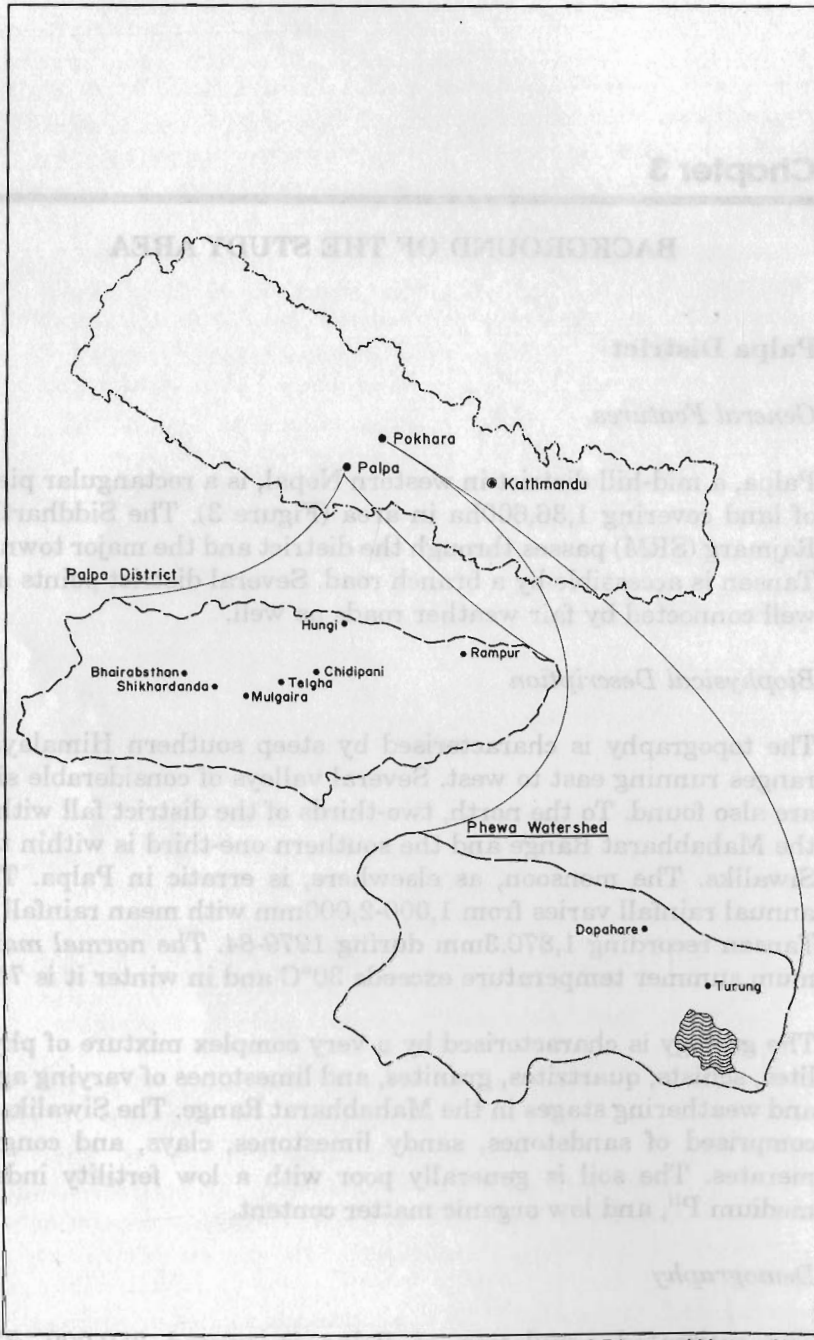

Figure 3: Location Map of Palpa District and Phewa Watershed in Western Nepal

Chhetri. There are small groups of *Newar* and occupational castes (*Sarki*, *Damai*, *Majhi*, and *Kami*).

Forestry

Forests cover 52 per cent of the total area of Palpa (71,172ha). This, however, includes all areas that have 10 per cent or more land covered by trees, shrubs, and grasses. The potential community forest area is estimated at 32,000ha. The shrubland amounts to 17,000ha (Fonzen 1986). In the Siwaliks, the forest cover, estimated to be around 20,000ha, is not as bad as in the mid-hills. On an average, the total volume per hectare is between 50-100 cubic metres. Regeneration is regularly affected by human activities, livestock grazing, and fires. In the northern two-thirds of the district, within the Mahabharat Range, the forests are scattered patches intermixed with human settlements or are on almost inaccessible slopes. In the southern (one-third) area, although the tropical/subtropical, mixed deciduous forests are of good density and quality, because of the illicit cutting of trees for firewood, the forest cover is decreasing rapidly. The main types of forest vegetation, as described by Stainton (1972), are as follows.

1. Sal forest. The dominant tree species is *sal* (*Shorea robusta*), normally found at elevations below 1,100m and, with some exceptions, up to 1,500m. It is more common in the Siwaliks and river valleys, mainly on the southern slopes.

2. *Katus/Chilaune* Forest. *Katus* (*Castanopsis indica*) and *chilaune* (*Schima wallichii*) are the main tree species; *laligurans* (*Rhododendron arboretum*) is predominant in some parts, and it is normally found from 750 to 1,800m on moist slopes in the mid-hills.

3. *Salla* Forest. *Khote salla* (*Pinus roxburghii*) is the characteristic tree species found from between 900 to 2,000m in arid conditions (southern slopes and rounded hills).

4. Mixed Forest. No dominant tree species can be identified. Vegetation is partly deciduous during the dry period at elevations of up to 1,200m in the Siwaliks and river valleys.

5. Shrubland. The vegetation is dominated by heavily degraded forests, mainly shrubs and young saplings. Some areas are almost devoid of tree species. Systematic forestry development in Palpa began in the late 1960s. Pine forests were planted in and around Tansen town (Shrinagar afforestation site). Tinau Watershed Project (TWP), a joint HMG/SATA/GTZ venture, which started in 1981, helped to introduce community forestry (*Panchayat* Forest) in Palpa. Some 660ha. of forest plantations were established during the next five years (Fonzen 1986). After 1985, the Project inputs were continued; however, more tasks were handled by the District Forest Office. Due to the gravity of the problem, most of the community forestry plantations and related activities have been concentrated in the mid-hills. In these areas, people are very much aware of the deteriorating state of the forests. Through their contacts with various outside agencies and experts, many villagers have improved the community-managed forests. The recent changes in forest legislation and rapid handing over of the forests to forest user groups have greatly increased the interest and participation of the people in carrying out successful forest development and management activities.

Agriculture

Around 47 per cent of the total land area is under agriculture in Palpa, and the bulk of it is characterised by sloping terraces. The average landholding is around 1.0ha, 35 per cent of which is estimated to be *khet* land. Paddy, maize, and wheat are the major food crops. Ginger, vegetables, and fruits are cash crops also. Livestock is an important and integral part of the agricultural and forestry sectors. Agricultural production is inadequate, and the district has a net food deficit. The over-exploitation of natural resources has had a negative impact on agricultural production.

Other Development Activities

Since 1981, the Tinau Watershed Project (later renamed the Palpa Development Project [PDP] to cover the entire district) has been carrying out major development activities in the district. In

addition, several other donor-assisted projects as well as regular government-funded development works are being carried out in the district. Helvetas is coordinating the funding on behalf of GTZ and the District Development Secretariat is the coordinating agency for HMG/N. The communication and education infrastructures of the district are fairly well developed, partly due to inputs from the PDP. In recent years, the relationship between the Project officials and the DFO staff has deteriorated to the extent that it has started to affect forestry activities. The basic problem is a lack of understanding of each other's approach and absence of functional coordination. The impact of the PDP on people's lives, however, is positive, mainly due to the establishment of road networks.

Phewa Tal Watershed

General Description

The Phewa Tal Watershed is located in Kaski district in western Nepal. It covers an area of about 123 square kilometres. Six village development committees (VDCs) fall fully or partially within the watershed. They are Sarangkot, Kaskikot, Dhikur Pokhari, Bhadaure Tamagi, Chapakot, and Pumdi Bhumdi. A part of the Pokhara municipality is also included in the watershed area (Figure 3).

Population

The current population is estimated at 34,050, consisting of about 5,570 households (HH). The majority of households are engaged in farming about 3,462ha of agricultural land. Upper caste *Brahmin* are predominant (47%) in the population, followed by occupational castes (*Damai*, *Kami*, and *Sarki* - 27%) and *Gurung* (14%). The average family size is 5.6 members with almost an equal male-female ratio.

Socioeconomics

The average landholding by household is estimated at 0.65ha and six per cent of the households are reported to be landless. The population density is 260/km^2 and the number of persons per ha of agricultural and forest land is nine and six respectively. The majority of the farmers practise subsistence agriculture. About

47.7 per cent are literate, out of which 17.3 per cent are female. The watershed is deficient in foodgrain production for more than six months a year. Over 79 per cent of the households suffer from food deficit (HMG/FINNIDA 1992).

Livestock farming is a major source of cash income. The livestock population is estimated at 22,670 head or 13,400 livestock units. At the current supply rate, only 59 per cent of the total digestive nutrients (TDN) are available for consumption by livestock.

Fuelwood and Fodder Situation

At the present level of fodder and fuelwood consumption and continuing forest degradation, it is estimated that all accessible forests will be depleted by the year 2006. This projection is based on the assumptions that the forests are not under scientific management and that the level of fuelwood and fodder consumption will remain at one cubic metre/person/year and 2.8kg of total digestive nutrients (TDN) per livestock unit/year respectively. However, under appropriate management (including improved user group-based management), the current forest area is expected to sustain the demand for a much longer period. It is believed that it is possible to manage the forests under sustained yield conditions (Karki 1982).

Soil Conservation Work

The siltation survey carried out during 1990 and 1991 indicated that the estimated annual sediment yield in the watershed was about 147,000 tonnes or an average hectare of the watershed land yields over 12 tonnes of silt annually. The main reasons for siltation in the watershed are - a) cultivation of marginal and sloping lands; b) illicit cutting down of trees for fodder, fuelwood, and timber; c) general degradation of the land resources; d) severe soil erosion and drying up of the water sources; e) low agricultural productivity; and f) poor animal health. Overgrazed lands are estimated to yield up to 36 tonnes of sediment, followed by dry terraces (12 to 20 tonnes/ha). The recent Baglung Road construction activities increased the siltation yield also.

People, especially women, are reported to be spending an increasing amount of time fetching water and collecting fuelwood

and fodder as well as leaf litter for animal bedding and farmyard manure. The subsistence economy of the majority of farmers is barely being maintained against the usual ups and downs, mainly due to the fluctuating production and environmental disturbances.

Various watershed protection and management programmes have been launched since the late seventies to reverse the trend of ecological deterioration. The emphasis has been on prescribing a land use practice for sustained economic productivity. Due to the importance of the area as a national tourism site, its protection is a national priority. The central and local governments also accord high priority to the protection and management of the watershed. However, the supply of basic commodities, such as food, fodder, and fuelwood, for the growing population and generating employment opportunities are issues which have to be addressed first.

Biophysical Description

The Phewa Lake is situated at 793masl. The highest point of the watershed is the Panchase Ridge at 2,589m. The terrain, in general, is rugged and is comprised of several folds of steeply sloping hills. A number of streams and rivers criss-cross the watershed, the major ones being the Harpan and Andheri *Khola.*

The climate is monsoonal. More than two-thirds of the estimated annual rainfall (4,000mm) occurs during the June to September period. Hailstorms are quite common during summer and they damage agricultural, forest, and fruit crops.

Forestry. The forestry situation in the watershed is vital for both the sustenance of Phewa Lake and the subsistence farming of the population. At present, the forest cover is estimated to be 44 per cent of the total land use. There has been an overall improvement in forest quality, largely due to the gradual popularity of the community-based management system. Since 1990, user group forestry (UGF) has been implemented in the Phewa Watershed and various forest user groups (FUGs) are currently operating with varying degrees of success. Still, the Phewa Watershed suffers from a net deficit in terms of fuelwood, fodder, and timber products. The current deficit is estimated at 9,000 cubic metres per year. It is estimated that only 70 per cent of the total fodder needs are met from all the sources. Great disparities also exist in the percentage of forest area in each VDC. While Chapakot is 50

per cent forested, Sarangkot and Kaskikot are only seven per cent forested.

The Phewa Tal Watershed (PTW) occupies a special place on the national tourism map in that the survival of the lake and the quality of the lake's water are closely related, not only to the economy of Pokhara but also to the development of nature tourism in the country. National attention is being focussed on the socioeconomic factors affecting the watershed, as a result of the threat posed to the lake's environment.

Geology and Landform

Geology. The main parent material throughout the watershed is grey phyllitic schist. The rock dip in the watershed is mainly south-facing, except for the lower parts of the northern mountain slopes which have a north-facing rock dip.

Landform. The watershed represents the landform found in the Mahabharat Range. Alluvial plains and fans constitute about eight per cent of the watershed and river terraces constitute another three per cent.

Nine per cent of the watershed area is too steep (slopes above 60%) for intensive cultivation and should be used for perennial vegetation cover, e.g., forests. About 55 per cent of the watershed area is in the slope class, 30-60 per cent is under cultivation, and the forestry sector needs intensive attention for sustainable human use. Only 13 per cent of the area is on slopes of less than 15 per cent where rice terraces are found.

Agriculture

The agricultural sector includes crop farming, horticulture, and livestock-raising. The average landholding per household is 0.65ha. Half of the land is *khet*[1] (51%), a quarter is *bari*[2], and 13.3 per cent is under *kharbari*, or thatch grasses. The remainder is fallow land. *Brahmin* families own the largest landholdings (0.91ha), followed by the *Newar* and *Chhetri*. The *Tamang* are the

[1] irrigated rice land

[2] rainfed cultivated land

smallest landholders. Paddy and maize are the predominant crops. The yields of major crops are lower than national yield levels.

Livestock

Every household in the watershed keeps livestock. The average per household (HH) holding of cattle, buffalo, sheep/goats, pigs, and poultry is 0.68, 1.92, 1.41, 0.17, and 2.39 respectively. Improved breeds are negligible. More than 80 per cent of the households face a fodder deficit.

Horticulture

More than half (57%) of the farmers cultivate some kind of fruit tree. The average holding of fruit plants is seven trees per household. People in the watershed are generally more interested in planting fruit trees along with other multipurpose tree species, grasses, and food crops.

History of Watershed Development

Phewa Tal is one of the important lakes of Nepal. The catchment area of this lake is known as Phewa Tal Watershed (PTW). Historically, the Phewa Watershed has been used intensively for agriculture. Out of the six major watersheds in Nepal, Phewa Tal has the highest percentage of agricultural land (48.3%), the highest population density, the lowest amount of arable land per capita, and the highest grazing pressure. Prior to malaria eradication, the valley bottom and the lakeside areas were not settled, although rice cultivation was practised in these areas. The ridge tops were used for settlements, the hill slopes for maize/millet cultivation, and the valley bottom was forested. However, until about 50 years ago, more than 50 per cent of the watershed was forested. As a result of the rapid population growth after 1950, as well as the rapid urbanisation of Pokhara nearby, the deciduous forests of the watershed were destroyed rapidly. The need for more food forced the people to cultivate higher and more fragile slopes. The livestock population growth was also commensurate to that of the human population and, due to uncontrolled grazing, the rangelands also deteriorated. It was not until the late 1970s that the Government intervened and launched preventive and rehabilitative measures, primarily to protect the Phewa Lake from increasing sedimentation.

Planned development and management of the watershed began in 1974 with initial funding from His Majesty's Government (HMG) of Nepal. It was a pilot project of the newly-established Department of Soil and Water Conservation. Later, assistance from the UNDP/FAO was obtained, and this continued until 1986. Since 1986, the soil conservation and watershed management programme activities in the PTW have been supported by the Finnish International Development Agency (FINNIDA).

Community Participation in Resource Management

Forests in the PTW have been managed traditionally by the local communi-ties. Even under changing government rules and socioeconomic pressure, forests continued to be managed by the local communities under indigenous management systems. *Adhikari Ban*, *Paudyal Ban*, and *Kunwar Ban* are among the examples of traditionally-managed communal forests. Forests in Sarangkot, Chapakot, and Bhadaure Tamangi are under well-documented, endogenously-managed forest systems (Messerschmidt 1990a and 1990b).

The Government introduced community-based, forest management systems in the PTW in 1974/75 when the Phewa Tal Watershed Development Project (PTWDP) commenced its activities. However, community involvement was mainly sought in the afforestation and protection of degraded forests and rangelands. Later, these new forests were handed over to the concerned communities under the *Panchayat* Protected Forests. In 1988, when the erstwhile *Panchayat* Forests were converted into community forests, user group-based ownership and management of forests were legalised. Since then, forests are being handed over to the local communities at a rapid pace. Evaluation of forest conditions, management and sustainability of resources, and user group-based management of two types of representative forest (one natural and one plantation) will be discussed in the next chapter.