

## Chapter 4 Spatial Profile of Kirtipur Municipality

The spatial profile of Kirtipur Municipality was extracted in the form of thematic maps from the GIS database described above. The maps are presented at the end of this chapter. The maps provide a general overview of the spatial distribution of population and physical infrastructure within the municipality. Maps 1 and 2 show the 1992 orthophoto and the 2001 satellite image, and give an overall picture of the change in settlement structure within the municipality. Map 3 shows the location of Kirtipur Municipality in the national context and Map 4 the administrative boundaries within the municipality. These are followed by maps of population distribution, settlements, road network, industry, electricity and telephone networks, public utilities, educational institutions, public services, public institutions, general markets, vegetable markets, heritage sites, land-use and land cover 1992 and 1998, land-use change, and urban growth. Each of the themes is discussed briefly below with reference to the respective map.

### Demography

The 2001 census gave a total population of 40,835 individuals with 21,686 males and 19,149 females in 9487 households, i.e., an average household size of 4.3 persons; and a male-to-female ratio of 1.13. Map 5 and Figure 9 show the population density by ward, Figure 10 the population distribution by age and sex, and Figure 11 the male-to-female ratio in different age

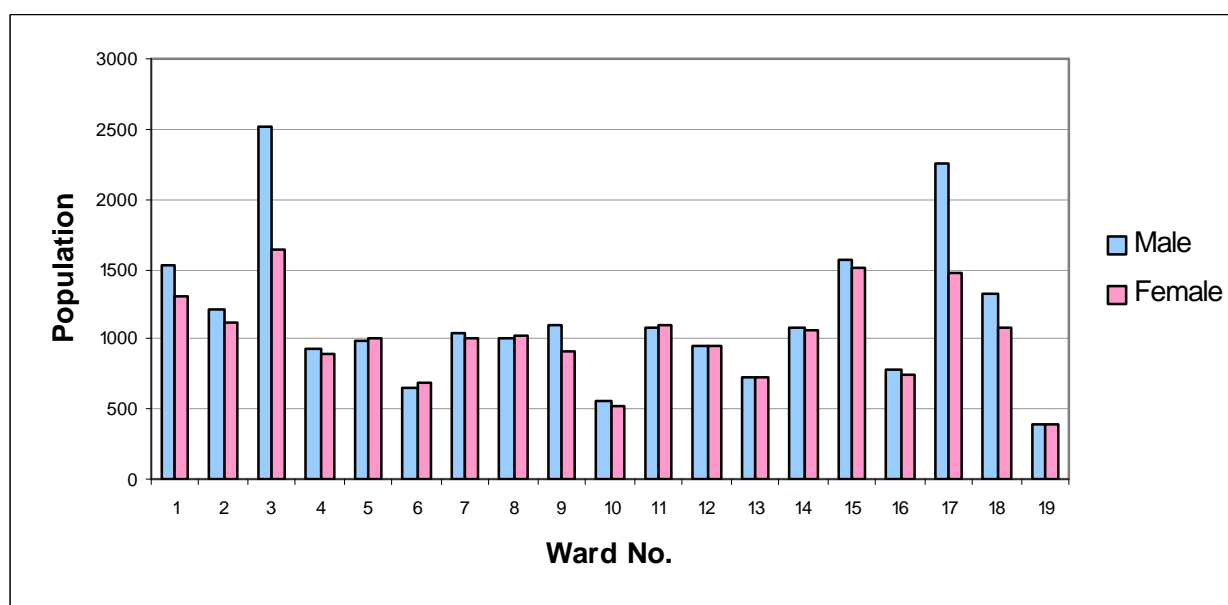


Figure 9: Male and female population by ward

groups. In the 1991 census, the population of the VDCs that now form Kirtipur Municipality was 31,338 with 16,080 males and 15,258 females in 5666 households; i.e., an average household size of 5.53 persons and a male-to-female ratio of 1.05. Thus in the intervening 10 years the population increased by about 30% while the average family size decreased and the male-to-female ratio slightly increased.

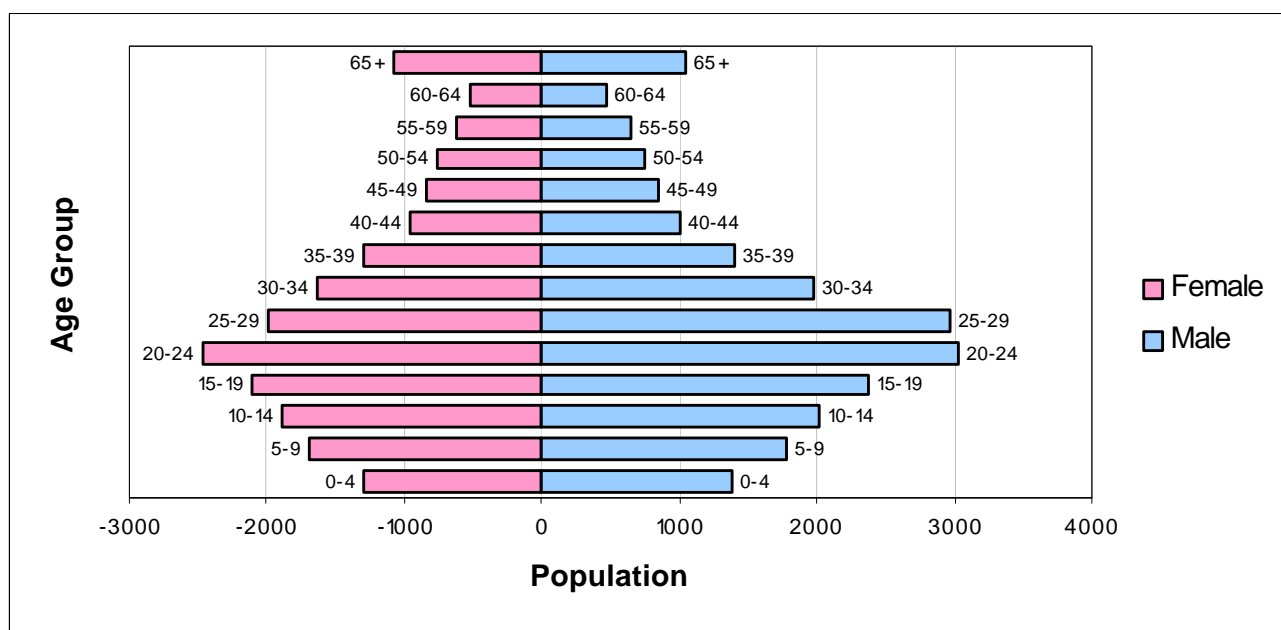


Figure 10: Male and female population by age, 2001 census

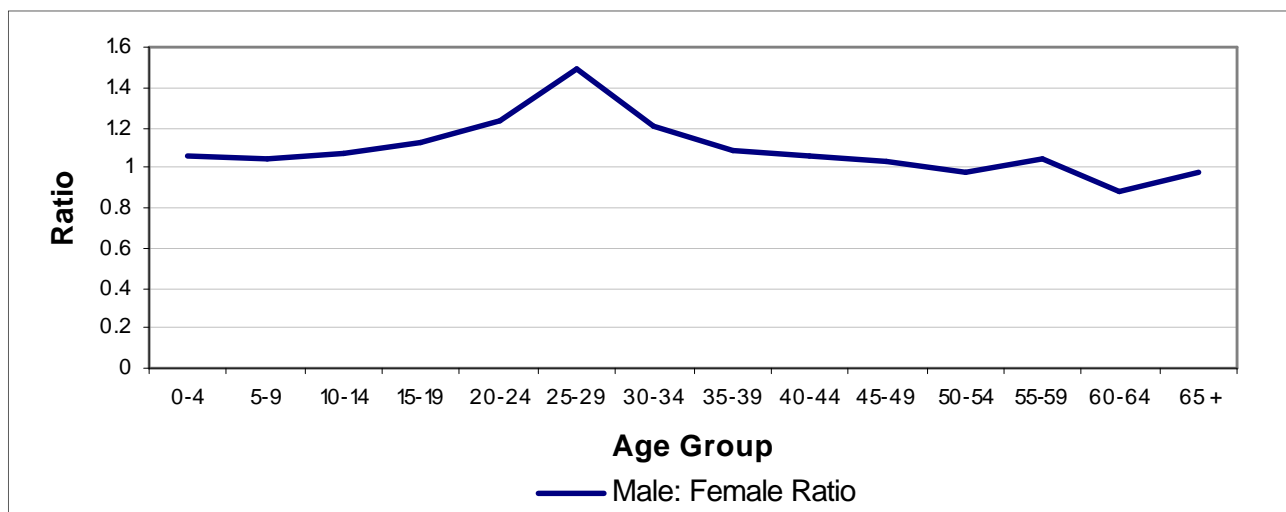


Figure 11: Male-to-female ratio by age group, 2001 census

## Physical infrastructure

### Road network

The road network in the municipality is shown in Map 7. The roads are based on the KUDP database (1998), and were updated using the IKONOS image of 2001 and verified in the field. The roads are classified as surfaced, gravel, and trails. The width and quality of roads are not uniform throughout their lengths. The average width of surfaced road is 5.3m and of gravel roads 3.7m. The total length of surfaced roads is 23.7 km, of gravel roads 52.6 km, and of trails 149.0 km. The field verification in 2003 showed that some 5 km of gravel road had been surfaced since the data were first compiled in 1998, and trails had increased by about 2 km.



Figure 12: Pedestrian street in the core area

The major road in the municipality runs along its eastern border parallel to the Bagmati river. This road connects the municipality to Kathmandu Metropolitan City in the northeast and Dakshinkali in the southeast. The remaining surfaced roads are limited to the area around the base of the old settlement, the Tribhuvan University compound, Panga, and roads to the settlements of Bhatkepati and Tyanglaphant. More than 60 % of the municipal area is only served by gravel roads or trails.

The traditional streets and courtyards of the old core area are built mainly for pedestrians (Figure 12). They are constructed with stone and brick or mixed paving, and are deteriorating rapidly. The lack of a proper surface drainage system causes fast deterioration of the road infrastructure. The core area is densely populated, but many parts of the area are not accessible to vehicles. This raises serious concerns as ambulances and fire brigades cannot reach the area in times of emergency.

### Factories/industries

The sites of factories and industries identified during the field survey and incorporated in the GIS database are shown in Map 8. Kirtipur is known for its traditional handloom industry and many households possess a handloom to supplement their income (Shrestha 1995). People in Kirtipur also engage in economic activities such as carpet-weaving, paper-making, and craft work (Figure 13). Although the collective contribution of these industries at the household level may be significant to the local economy, it was not possible to incorporate them into this study. Table 3 shows the number of households according to the 2001 census engaged in different non-agricultural economic activities in the municipality.



Figure 13: Women weaving a carpet

Table 3: Number of households engaged in non-agricultural economic activities

Type of activity	No. of households
Manufacturing	123
Trade/business	651
Transport	36
Services	289
Other	167
Total economically active households	1266
Total households in municipality	9487



Figure 14: A textile mill

Kirtipur has some national industries such as the Himal Cement Factory (not in operation since December 2001) and Krishi Chun Industry (a limestone factory), and a few big factories like the Sitaram Gokul Mill and Pashmina Factory in Nagaun (Figure 14). Carpet factories are a major industry. However, the number of carpet factories declined from 33 in 1998 to 24 in 2003, and those remaining have downsized as business has weakened. Wards 3 and 17 have the greatest number of industries. There is one brick factory in Ward 19. A brick factory visible in 1992 aerial photographs that occupied a large area in Ward 2 has now disappeared.

## Electricity

Information on the electricity network was obtained from the local Nepal Electricity Authority (NEA) office in the form of a sketch map and integrated into the GIS database. The electricity transmission and distribution network including locations of transformers is shown in Map 9. There are 58 transformers with varying capacities from a minimum of 15 KVA to a maximum of 1000 KVA. The Siuchatar ropeway substation is the main source of electricity. It covers the Kirtipur, Salyanstan, Khasibazar, Nagaun, Bhatkepati, Machhengaun, and Dudh Pokhari areas. The substation at Teku covers the Tribhuvan University area, Chobhar, Bhajangal, Nayabazar, Chilancha, Panga, and Charghare. Kirtipur Municipality also receives electricity from the Lalitpur substation. Industries and educational institutions consume around 70% of the available capacity. According to the local NEA office, electricity could be made available to 100% of the population, but only 75% of households are on the list of consumers.

## Telephone network

Information on the telephone network was obtained from the Nepal Telecommunications office in Kirtipur. The Telephone Exchange Office is located in Nayabazar. The main telephone line and location of cabinets are shown in Map 9. There are 14 telephone cabinets with 420 distribution boxes (DB); each DB has a capacity of 10 telephone line connections. At present, there are 2224 subscribers connected. According to the Telephone Exchange Office, the present infrastructure could provide an additional 300 telephone lines.



Figure 15: Daily chores at a public water tap

## Water supply

Information on water supply lines was collected from the Nepal Water Supply Corporation and details of other public water sources collected during the field survey; their location is shown in Map 10.

The municipality's two main sources of drinking water are the springs at Dudh Pokhari and Sim Jhowahiti located in Ward 7. They each have a centralised piped water supply system with a capacity of 2200 m<sup>3</sup> per day for Dudh Pokhari and 1000 m<sup>3</sup> per day for Sim Jhowahiti. An additional source at Lwangkot, which lies outside the municipal boundary in Machhengaun VDC, has a capacity of 1200 m<sup>3</sup> per day and serves the old core area of the municipality. A large number of households in the municipality still depend upon traditional water sources such as wells, stone spouts, springs, and ponds. A field survey done in 1999 showed that only about 25% of households had a house connection. A number of public taps have been constructed by the Nepal Water Supply Corporation (NWSC) but there are still many areas that lack a drinking-water supply (Figure 15). Available sources are not fully utilised because the small reservoir capacity limits storage (Figure 16). Water quality is poor because of surface water infiltration into supply pipelines; there are no treatment facilities for drinking water.



Figure 16: A reservoir under construction



Figure 17: New building on the TU campus



Figure 18: A high school (combined secondary/primary)

## Social infrastructure

### Educational institutions

Information on educational institutions was collected during the field survey. Their locations are shown in Map 11.

The location of Tribhuvan University (TU) in the municipality makes Kirtipur a centre for higher education (Figure 17). Students from all over the country come here to study. There are three colleges, 26 combined secondary/primary schools (usually referred to simply as 'secondary schools'), 12 primary only schools, and 2 childcare centres within the municipality area (Figure 18). Ward 17 has the highest number of educational institutions with one college, seven secondary/primary schools, and one primary only school. Wards 4, 6, and 13 have no schools at all and large parts of Wards 7, 8, 16, and 19 are far from any educational facilities. The standard and the physical infrastructure of schools vary greatly with some schools such as the Laboratory High School and Modern Indian School catering to students from Kathmandu and Lalitpur municipalities. Besides the schools and colleges, there are five public reading rooms in the municipality which are included in the category of educational institutions. (Generally referred to as 'libraries', these reading rooms are often located in

local clubs and provide access to newspapers and similar, and occasionally books). Figure 19 shows the population of school age children (5-19 years) and the total number of schools in each ward.

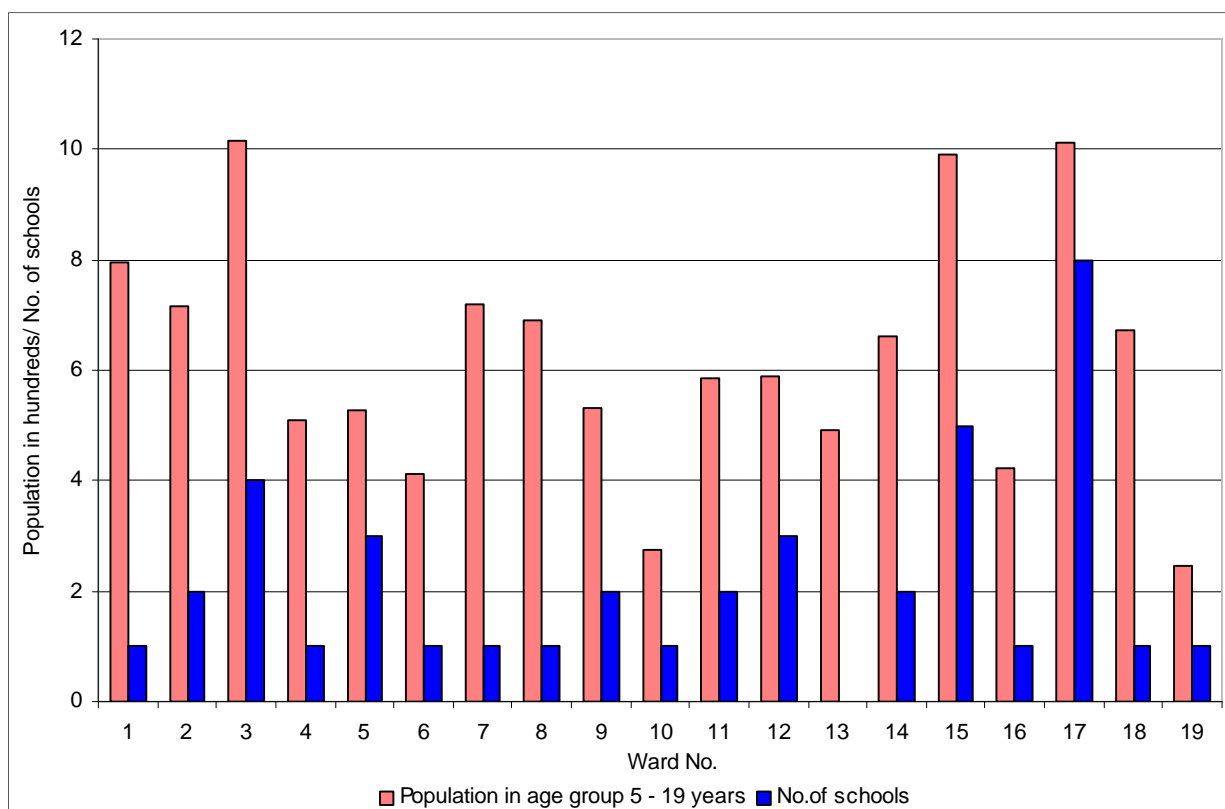


Figure 19: Population of school age children and number of schools by ward





Figure 20: Health services at PHECT-NEPAL



Figure 21: Kirtipur Municipality's office building



Figure 22: A meat shop in the main town



Figure 23: Shop area in Nayabazar

## Health facilities

Information on health (and veterinary) facilities was collected during the field survey (Map 12).

The population is poorly served by health facilities. There is no hospital in the municipality; in an emergency, local people must go to Kathmandu or Lalitpur. There are two health centres, four health posts, five sub health posts and three health clinics. In addition there is one yoga centre, one veterinary and agricultural service centre, and one centre for the disabled. A community-based reproductive health service centre and a community dental centre (included in the above) established in 2000 by the Public Health Concern Trust (PHECT-NEPAL) cater to the needs of people from surrounding villages as well as local people (Figure 20).

## Public institutions

Banks, post offices, ward offices, and government and semi-government organisations were categorised as public institutions (Figure 21). Information on these was collected during the field survey and is presented in Map 13. Apart from ward offices and a few post offices, virtually all public institutions are located at the base of the hill surrounding the core area in Wards 5 and 17.

## Shops and markets

The locations of shops and markets (taken to mean any retail outlets including shops, stalls, tea and food stands, and similar, see Table 4) were identified during the field survey and incorporated together with data from the FAO survey on vegetable (food) markets (FAO 2000) into the GIS database. The locations of these retail outlets are shown in Maps 14 (general) and 15 (food only). About 45% of Kirtipur Municipality is agricultural land and agricultural products occupy a major portion of market trade. Markets and shopping areas are concentrated in the core district and its peripheries (Figures 22 and 23).

Table 4: Market types

General	Food
General store	Mixed
Electrical/electronics	Fixed
Restaurants	Fruits and vegetables
Repairs/workshops	Meat
Media/communications	
Rental	
Entertainment	
Hardware	
Beauty parlour	
Ready-made garments	
Medical	
Cloth and tailoring	
Books and stationery	
Other	



Figure 24: Bagh Bhairab temple



Figure 25: Chilanco Vihar complex



Figure 26: Taudaha lake



Figure 27: Theravada temple at Nayabazar

## Heritage Sites

The locations of heritage sites in the municipality was verified during the field survey; they are shown in Map 16.

Kirtipur is one of the oldest settlements in the Kathmandu valley and thus has many cultural heritage sites (Figures 24 - 29). The majority of these structures are concentrated in the old core area, Panga, and Chobhar area, with some scattered around Salyanstan, Kauniachaur, and Godamchaur.

The most significant cultural sites are the Bagh Bhairab complex (Figure 24), Chilanco Vihar complex (Figure 25), Uma Maheswor temple (Figure 28), and Adinath temple (Figure 29). Details of these are given in Annex 2.

Besides these, there are a number of Buddhist monasteries, bahals (courtyards), sattals (pilgrim's houses), and more than fifty patis (raised platform for pilgrims) and small chaityas (small stupas) scattered around the old core area. The heritage sites of the municipality have great cultural and historic value and provide one of the potentials for tourism development, but many are in serious need of conservation.

Taudaha lake is another site of cultural significance (Figure 26). Legend has it that the lake was created by Manjushri to provide a home for the *nags* (snakes) that lived in the lake that covered Kathmandu before it was drained through the Chobhar gorge. People living near to the lake use it as a source of water.

In addition to the old heritage sites, a number of new monasteries have been built in the municipality. The Nagara Mandapa Kirti Vihar in Nayabazar, completed in 1989, includes a Thai-style Theravada temple (Figure 27).



Figure 28: Uma Maheswor temple



Figure 29: Adinath temple

## Land use and land cover

Land-use maps were prepared for 1992 (Map 17) and 1998 (Map 18) from aerial photographs taken at scales of 1:10,000 and 1:15,000, respectively. The urban areas were divided into three classes: high density residential areas with more than 90% houses within the built-up area; medium density residential areas with 50 to 90% houses; and low density residential areas with less than 50% houses. Agricultural land was also classified into three types: steep cultivated land with more than 15 degrees slope; medium slope cultivated land with 7-15 degrees slope; and flat cultivated land with less than 7 degrees slope.

The proportional distribution of land use and land cover in 1998 is shown in Figure 30 and Table 5 (next chapter). Agricultural land, mainly flat cultivated land and steep slope cultivated

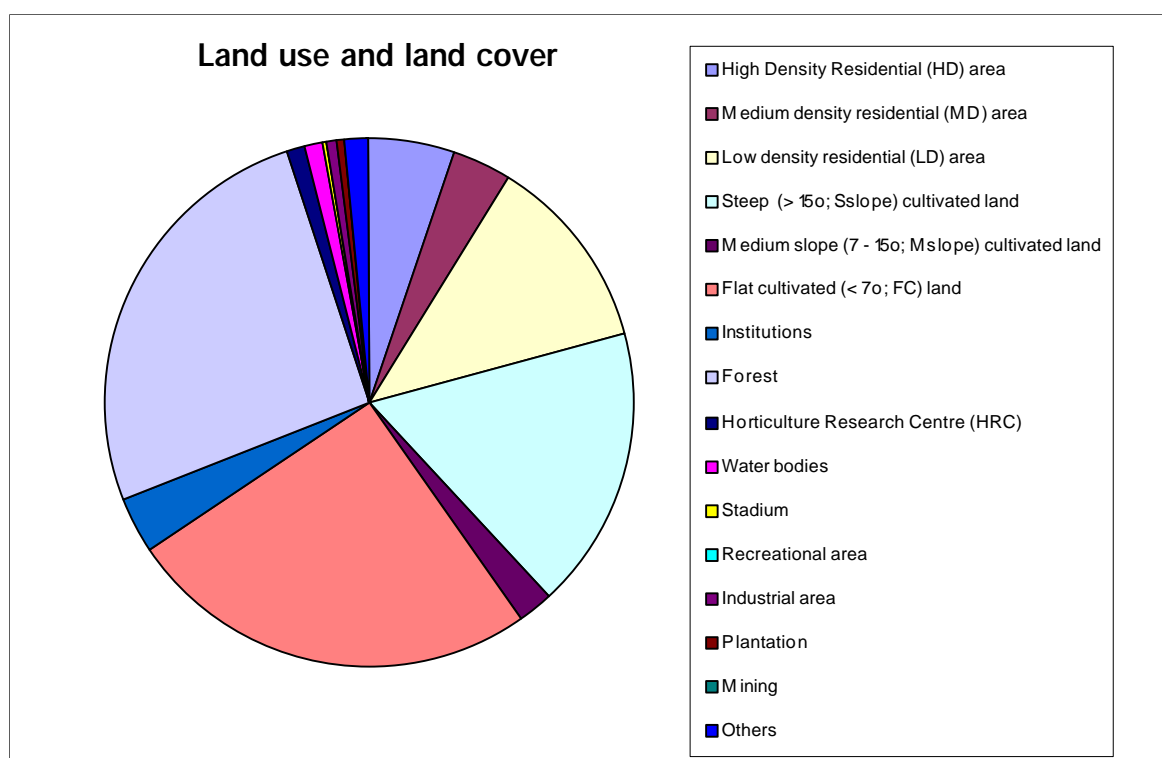
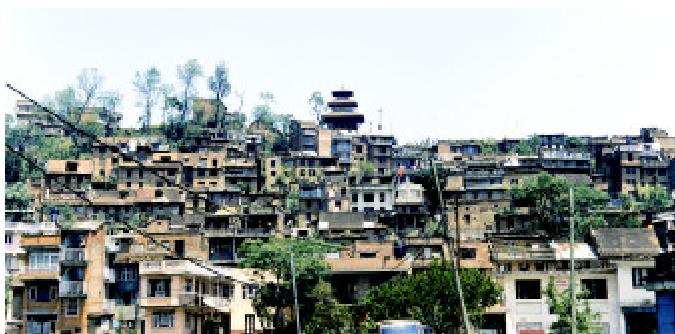


Figure 30: Distribution of land use and land cover, 1998





**Figure 31: Agriculture is the predominant land-use type**



**Figure 32: High density residential area**

land (Figure 31) is the dominant land-use type, with forest second and urban areas third (Figure 32).

Actual and potential changes in land use and land cover are shown in Maps 19 to 23 and discussed in the next chapter.

## Ward profiles

The spatial profile of each of the 19 wards is presented in Maps 24 to 42 to show in more detail the location of infrastructure, facilities and services. The educational institutions, factories and industries, public utilities, and heritage sites are shown on the maps and major characteristics such as area, number of households, and male and female population are given in a box for easy reference. The wards are of varied size and shape and the maps are presented at different scales to fit the page. The orthophoto is used as a background to the maps to show physical features that are not incorporated in the database and provide a sense of the surrounding features. Hill-shaded DEM and settlements are used for the maps of Wards 7, 8, 12, 16 and 19 as these are not covered by the orthophoto.

