

# 4

## Settlement Pattern

**K**athmandu Valley is a natural sub-region in the mid hills of Nepal. The whole population of the valley shares the same natural resources, such as watershed, drainage channels, forests, soil, and air. The surface runoff of the entire area of 665 sq.km drains out of a single outlet at Katuwaldaha located on the southern tip of the valley. Air and water pollution occurring in one location easily gets spread to the entire area.

A study carried out by Kathmandu Valley Town Development Committee in 2001 revealed that 32% of the valley was covered with forest, 40% with agriculture, 17% with rural settlements, and 11% with municipal areas. This shows that Kathmandu Valley, in spite of rapid urbanisation and population growth, is still rural and green. However, the same study revealed that, between 1984 and 2000, land covered by urban settlements had increased from 3,096 to 9,193 ha. Similarly, agricultural land had decreased from 40,950 to 27,570 ha. An analysis of settlement patterns using the DPSIR framework is presented below.

### Drivers

The population of the valley in 2020 will reach 2.5 million compared to 1.6 million in 2001 (KVTDC 2002). This growth in population includes both natural growth and emigration. Although an additional 300 thousand people can be accommodated by densification of areas within the existing Ring Road, farmland will have to be encroached upon to settle an additional 600 thousand people. Due to the insurgency, there has been a huge influx of internally displaced people in the valley, and this may lead to a much higher population growth than projected by the study.

At present the population growth for the valley has been estimated at more than four per cent per year. The low-density urban sprawl and uncontrolled settlement

development in rural areas are the two key issues in urban development. The low density of the existing municipal areas, which is around 120 persons/ha, poses a challenge for urban managers because of the high cost of providing and maintaining municipal services. The optimum density for a medium-sized city like Kathmandu should be at least 200-250 persons/ha. On one hand, huge parcels of land are being underused within the existing Ring Road, and on the other ribbon development as well as leap-frog development are taking place in rural areas.

### Pressure

#### Change in the settlement pattern

The earlier settlements of Kathmandu which date back to the Lichhivi period were normally located on the drier, less fertile elevated land, locally referred to as 'tars'. Kathmandu being the transit point for trade between India and Tibet had a comparative advantage due to the high Himalayas in the north and the malaria-prone tropical forest in the south. The traders had to stay in Kathmandu for three to four months to cross the Himalayas in summer and tropical forests in winter. Agriculture and cottage industries flourished due to the trade and Nepal had substantial influence in Tibet. The surplus revenue earned by the state was used to build civic amenities as well as temples, palaces, and shrines. Until the Malla period, Kathmandu remained a compact settlement surrounded by agricultural land. After the Gorkha conquest, Kathmandu was declared the capital of a unified Nepal. The physical development of the valley was greatly influenced by the construction of new palaces outside the city core. This practice was most prominent during the Rana period when palaces were built to the north, northeast, and east of Kathmandu City. A road network system was developed linking these palaces to the city core and to each other. Over time small settlements grew around these palaces, and

the land made accessible by interconnecting roads became the areas to be first developed following the political changes in the country after 1951 (DHPP 1969).



Source: Kishore Thapa

Historic Core Area of Kathmandu built in 13<sup>th</sup> century A.D.

### Modern development due to expansion of the industry and service sectors

Growth of Kathmandu city outside the historic city core area occurred in the 50s and 60s mainly to the east and northeast in Bagbazar, Dilli Bazar, and Putali Sadak in the east and towards Lazimpat and Maharajgunj in the northeast. This development was triggered by the construction of roads to connect Rana palaces. These were generally lower density linear developments along the existing road networks, but without adequate infrastructure. At the time the Physical Development Plan for the Kathmandu Valley was being prepared in 1969, Kathmandu City was confined to the highlands between the Bishnumati River and the Dhobi Khola in the east-west and between Bagmati River and Maharajgunj in the north-south. Low intensity urbanisation had occurred on the periphery, leaving large areas of undeveloped land within the city areas.

In the decade from 1970-80, there was expansion of government machinery, expansion of trade and tourism, and establishment of carpet industries. This led to an increase in employment opportunities in Kathmandu. Urbanisation gained further momentum during this period and low-density urban expansion spread to outlying well-drained 'tars' with easy road access such as Bansbari, Teku-Kalimati, Baneshwore-Battisputali, and so on. These new developments were occurring beyond the Bishnumati River in the west and Dhobi Khola in the east. The Ring Road, which was constructed in the mid 70s, gave further impetus to urban expansion, as more areas were made accessible. Development accelerated at the intersections of the

Ring Road and the arterial roads, especially in Balaju, Maharajgunj, and Jawalakhel.

### Expansion of the city due to concentration of political and economic power

By the 80s and 90s, the urban growth of greater Kathmandu was taking place generally in a north-south direction. This was mainly due to the fact that much of the easily accessible land had already been consumed and the land bordering on the west was undulating and difficult to develop, whereas the international airport impeded expansion to the east. Although pockets of inaccessible land still remained undeveloped within municipal areas, unregulated ribbon development along the principal arterial roads had extended beyond its borders in the surrounding villages. A major thrust in urban expansion had also been occurring in the east along the Kathmandu-Bhaktapur transport corridor. Bhaktapur had remained a neglected and relatively stagnant city in the past. After the successful completion of the Bhaktapur Development Project, the migration of people from Bhaktapur was checked and the city experienced an increase in tourism activities. The trolley bus service and the Arniko Highway made Bhaktapur easily accessible to Kathmandu. Since the 80s, the space between Kathmandu and Bhaktapur has been filling up with low-density ribbon development. This process has continued unabated until today.

Rapid urbanisation in the valley has been guided by the following factors.

- Concentration of political and economic power resulting in employment opportunities and multiple activities
- Availability of urban basic services such as water, roads, electricity, and telephones
- Proximity to work areas such as administrative centres and industries
- Location of an international airport and tourist centres
- Push factors in rural areas such as natural calamities, unemployment, and social stigma

### State

The rural areas of Kathmandu have experienced unprecedented land subdivision and building construction over the past six years. An influx of internally displaced people has suddenly created a demand for housing plots and basic services. Those who cannot afford land in municipal areas prefer to stay on the fringe areas of the cities and in villages.

Difficulties in cultivation of land due to shortage of manpower and a huge demand for housing plots in the land market have motivated rural landowners to sell agricultural land at lucrative prices and search for alternative employment. Besides getting cheaper housing plots, another motivating factor for new migrants to settle in rural areas is that there is no need to get a building permit from the local authorities. People can build anywhere and build anything they like, and there is no government intervention.

One of the vivid manifestations of unplanned settlement in Kathmandu is the emergence of squatter settlements in different parts of the city. A study carried out by Lumanti, a local NGO, in 2000 revealed that there are 64 settlements in Kathmandu and the total population of squatters has been estimated at 14,500 (Lumanti 2003). Most of the settlements are located along river banks and on steep slopes. Squatters have occupied not only public land but also private land, and there have been conflicts between squatters and owners. Although the proportion of squatters in Kathmandu is much less than in other Asian cities, it is increasing at an alarming rate and may create environmental hazards in future (Table 4.1).

**Table 4.1: Growth of squatter settlements in Kathmandu Valley**

Year	No. of settlements	Population
1985	17	2,134
1988	24	3,665
1990	29	4,295
1992	33	6,355
1996	47	8,927
1998	49	10,323
2000	61	11,862
2003	64	14,500

Source: Lumanti 2003

The political power structure in the valley is still dominated by village development committees (VDCs) and the members of parliament raise rural development issues during their election campaigns. All the twelve members of Parliament, irrespective of their political affiliation, get elected on the basis of their influence in rural areas. Even at the local level, whenever a meeting is organised to discuss the development issues of the Kathmandu Valley, ninety-eight persons (chairmen of DDC and VDCs) talk about rural development issues and only five persons (mayors of municipalities) raise urban development issues. Since the existing planning

system does not recognise Kathmandu Valley as a single entity, it is virtually impossible to enforce development control tools that can address both rural and urban areas. The development priorities of urban and rural areas are different and in many cases conflict with each other. The issue of landfill sites in the valley is one example of such conflicts.

The growth of settlements in the valley is generally spontaneous, and there is very little planning intervention on the part of the government. Unlike in neighbouring countries, the government does not have financial resources to acquire huge parcels of land where planned urban development can be promoted. The current constitutional provision does not allow the government to impose any kind of restriction on the use of private property. Hence the government has only one legal tool to regulate and use, e.g., provision of infrastructure. However, this tool has been grossly misused in Kathmandu, mainly because of political patronage. As a result of political pressure, basic services such as roads, electricity, and telephones are provided in those areas in which the land-use plan has declared the area unfit for development. This tendency has made all kinds of planning norms redundant or irrelevant and promoted adoption of illegal and irrational practices, rather than following standard practices of urban development.

Whereas the government is unable to acquire land because of financial constraints, private developers face difficulties in assembling land parcels due to land ceiling provisions laid down by the Land Reform Act of 1964. Developers also face difficulties in procuring land parcels from speculative landowners who either demand exorbitant prices or simply refuse to sell the land. There is no legal tool that can be used to acquire isolated land parcels from uncompromising landowners. Notwithstanding, developers cannot buy sufficient land in Kathmandu and other major cities due to the land ceiling.

Kathmandu Valley Town Development Committee (KVTDC), which is responsible for overall planning and regulation of urban development, is operating with a land-use plan adopted in 1976. Several efforts to revise the land-use plan after that were not successful. KVTDC is involved in several land pooling projects and guided land development programmes. It also looks after court cases involved in violation of building byelaws and other issues related to planning. Local bodies like municipalities and village development committees that

are authorised by the Local Self Governance Act (LSGA) 1998 are issuing building permits mainly for revenue generation rather than regulating urban development. The technical capability of local authorities to deliver basic urban services is relatively low and people look upon central government agencies for such services. Figures 16 and 17 depict the housing process in unplanned and planned settlements respectively.



Figure 16: Housing process in unplanned settlements (typical case of Nepal)



Figure 17: Housing process in planned settlements

There are some positive trends in the development of Kathmandu Valley. The growth of economic activities in the trade and tourism sectors has created jobs and improved the living standards of valley residents. The pouring in of foreign remittances has also played a key role in the expansion of trade and commerce. The establishment of large shopping malls in the downtown area has boosted commercial activities. Similarly, the boom in academic institutions has attracted students from every nook and corner of the country. The towns of the valley are full of culture and vitality, which is visible in social and political events. The traditional agricultural system is undergoing significant transformation and farmers are increasingly interested in commercial farming, such as floriculture and horticulture, rather than subsistence farming. In urban areas, people have become more sensitive towards conservation of heritage and traditional architecture. The traditional craftsmanship of the valley, which was threatened with extinction a few decades ago, is booming now. The expansion of air transport in the domestic and international sectors is gradually developing Kathmandu as a regional air transport hub. Public transport has improved significantly over the last five years.

## Impact

The informal process of settlement development in the last 30 years has created several physical, social, and environmental problems in Kathmandu. The fragile ecosystem is affected severely by ever-expanding built-up areas and incompatible economic activities. Some of the most visible consequences are described below.

## River pollution

Lack of proper sanitation and drainage in urban and rural areas has resulted in dumping of sewage and garbage into the rivers. In most cases, the drainage system, which was designed for storm water only, is being used as a sewer; and the sewage directly flows into the river without any treatment. The problem has been aggravated by the growth of settlements along the river banks. Shortage of water in the river, especially during winter, leads to rivers virtually being used as sewers. Illegal mining of sand is causing environmental hazards along the river banks and severely affecting the structural safety of bridges at major arterial roads.

## Air pollution

In unplanned settlements, poor road networks and conflicting land uses lead to air pollution caused by emissions from vehicles plying along narrow and winding streets. After the closure of Himal Cement Factory at Chobhar and the banning of Vikram tempos, Kathmandu's air quality has improved.

## Dumping of solid waste

Illegal dumping of solid waste is a common sight in unplanned settlements. Those areas are either not served by the municipal solid waste collection system or the community is not well organised to handle the problem.

## Loss of agricultural land

Loss of agricultural land in Kathmandu Valley is posing a serious problem in the context of recharging groundwater; and it is also contributing to air pollution and loss of greenery. Kathmandu residents are becoming more reliant on outside supplies of cereals and vegetables.

## Traffic congestion

Conflicting land uses and an inadequate road network are creating traffic congestion and transportation facilities are inefficient. Public transport cannot operate in most settlements. Small public vehicles such as tempos and micro-buses have their own limitations in terms of handling passengers at affordable rates. Inefficient networks consume more land for less benefit all round. Table 4.2 shows the increase in vehicle registration in Nepal as a whole from 2004 to 2006.

**Table 4.2: Vehicle registration in Nepal**

Type	No. of vehicles in 2004/05	Increase in no. of vehicles in 2005/06 (Mar)	Total	Percentage increase
Bus	13,331	693	14,024	5.19
Minibus	4,256	261	4,517	6.13
Car/jeep/van	78,255	4,854	83,109	6.2
Tractor	33,230	1,106	34,336	3.3
Motorcycle	302,042	20,125	322,167	6.7
Tempo	7,263	35	7,298	0.5
Microbus	1,700	493	2,193	29.0
Truck/tanker/ dozer/crane/tipper	27,659	1,498	29,157	5.4
Pickup	1,059	352	1,411	33.2
Others	4,000	13	4,013	0.3
<b>Total</b>	<b>472,795</b>	<b>29,430</b>	<b>502,225</b>	<b>100.0</b>
Density per km	27		29	

Source: DoTM 2006

### Land speculation

Land speculation is a characteristic of urban development in Nepal, particularly in Kathmandu. This trend is detrimental to the organic growth of the city and proper expansion of basic services to the people. There are several areas within the existing Ring Road where developed plots are lying vacant, whereas there is tremendous pressure on housing in suburban areas. Under utilisation of land in the downtown area is a hurdle to planned growth of Kathmandu city. Land speculation is prevalent at both individual and institutional levels. Land brokers and housing development companies hold huge parcels of land in urban fringe areas for speculative purposes.

### Loss of cultural heritage

The rich cultural heritage of Kathmandu Valley is gradually eroding because of the excessive pressure of commercial activities. Historic ponds, courtyards, public rest houses, and grazing grounds and playing fields are being converted into private property. Similarly, public lands are being registered as private land for profit and speculation: traditional 'guthis' (trusts), which looked after the management of public lands, have either ceased to exist or are inactive.

### Substandard housing conditions

Substandard housing conditions are the most visible effect of unplanned settlements. Lack of natural light and ventilation, overcrowding, inadequate water supplies and sanitation, and air and noise pollution are indicators of substandard housing conditions. This situation causes stress and other deadly diseases.

### Gaps in supply of and demand for basic services.

Due to the huge influx of people into Kathmandu Valley, there are gaps in the demand for and supply of housing, water, electricity, drainage, and other utilities. Developed plots are not available at affordable prices and people are forced to buy raw agricultural land cheaply and struggle to acquire appropriate infrastructure afterwards. Ultimately the cost of infrastructure in such cases renders the housing on agricultural land more expensive than on developed land in the long run. Central government agencies are responsible for provision of basic services and these agencies are not in a position to expand their networks due to shortage of funds and lack of proper planning. Local authorities do not have the capacity to provide trunk infrastructure and services and their roles are limited to local-level infrastructure only.

### Domination of informal land brokers in the land market

The present supply of housing plots from land pooling projects is insufficient to have a significant influence on demand. The average number of annual building permits issued by Kathmandu City is 3,619 (1999-2001) whereas the total number of developed plots available from the government sector totlled 7,685 over the period from 1977-2002. Since the formal land market is limited to a few land-pooling project areas and developed housing plots are not readily available for prospective buyers, people rely on informal land brokers who operate at local level without license. The relationship between land brokers and employees in the land revenue and survey offices is crucial in land subdivision. There is no restriction on land subdivision except that the minimum size of a plot should be 80 sq.m. Land brokers designate a particular area for land subdivision and advertise it in the newspaper. People are often cheated when the plans shown in the advertisement and the actual on-site situation vary drastically.

### Response

Although a historical trading entrepôt between Tibet and British India, Kathmandu Valley was isolated from the influences of modernisation and democratisation until Rana rule ended in 1950. At that time the Kathmandu Valley opened up to international influence after centuries of limited contact. During the coronation of King Mahendra in 1955 and the state visit of Queen Elizabeth in 1962, many beautification activities were

undertaken, although these were limited to improvement of aesthetic beauty of some streets and building façades rather than improvement in basic urban services.

### Planning initiatives

The government of Nepal with the assistance of the United Nations reviewed the overall situation of Kathmandu Valley and prepared a 'Physical Development Plan for Kathmandu Valley' in 1969. The main objective of this plan was the preservation of historical and cultural heritage, guided urban development through land-use planning, and densification of fringe areas. The plan was a guiding principle for ordered urban development in the valley and the then government promulgated a Town Development Implementation Act in 1972 to implement it. Kathmandu Valley Town Development Committee (KVTDC) was established under this Act and was entrusted with the overall responsibility of planning and regulating urban growth in Kathmandu Valley. However, between 1970 and 1990, Kathmandu Valley experienced a huge increase in population and in economic activities and KVTDC was unable to cope with the challenges of such rapid urbanisation. Despite deficiencies, the overall planning framework prepared by KVTDC led to the development of a Ring Road and housing schemes at Kuleshwor, Galfutar, Dallu, and in the Sainbu-Bhaisepati area. It also facilitated the introduction of building permits in the municipalities. Later KVTDC launched two programmes, viz., the guided land development and land-pooling schemes; and these were effective in guiding urban development on the fringe areas of Kathmandu and Lalitpur.



Source: Civil Homes (P) Ltd, 2006

A typical housing colony developed by private developers in Kathmandu

In 1984, a Kathmandu Valley Physical Development Concept was prepared by the KVTDC with the objective of enforcing land-use and zoning regulations: the government failed to adopt it.

In 1987, the government, with the assistance of UNDP and the World Bank, prepared a Structural Plan of Kathmandu Valley. The objective of this was to provide guidelines for the physical development of metropolitan Kathmandu for the year 2010 A.D. Zoning was proposed to preserve agricultural lands and environmentally-sensitive areas. Building byelaws for Kathmandu Valley were also drafted, but, because the political situation changed in 1990, this plan was not given recognition by the new government.

In 1988, Kathmandu Valley Development Committee prepared an 'Urban Development and Conservation Scheme' for greater Kathmandu. The scheme emphasised the need for densification of old urban areas from 108 persons/ha to 123 persons/ha and for increasing the built-up area from 3,743 to 4,540 ha. Similarly, it was proposed that fringe areas should also be densified. Strategic re-densification and the role of Kathmandu Valley as a capital were envisaged in the Plan, and it opposed the establishment of major industries or other sources of pollution in the valley. Overlooking the trends and trying to control growth were the main shortcomings of this plan.

In 1991, after the general election, the government launched another study to guide and regulate urban development activities. This study was funded by Asian Development Bank and it examined issues related to land use, financial investment, environmental protection, and institutional re-organisation. Several policy options were recommended, including establishment of a valley-wide development authority and a 10-year infrastructural investment programme.

In 1995, another study carried out by the government with the help of The World Conservation Union (IUCN) examined the possibilities of limiting the growth of Kathmandu and arresting the flow of population coming to Kathmandu through secondary towns adjoining the Kathmandu Valley. The study clearly showed that planning intervention within Kathmandu Valley would not be sufficient unless the issue of secondary towns was addressed.

In 2002, the government approved a Long Term Development Concept for Kathmandu Valley prepared by Kathmandu Valley Town Development Committee.

The concept evolved through extensive consultations with politicians, the private sector, and local authorities. A new legislation was also proposed for establishing a Kathmandu Valley Development Council to replace the Kathmandu Valley Town Development Committee. Although this legislation was widely acclaimed, it has not yet been enacted by parliament because of political instability.

### Existing institutional and legal frameworks

The institutions involved in developing settlements and their roles are presented in Table 4.3 and the organisational structure is given in Figure 18. The figure clearly reveals the lack of cooperation and coordination between them.

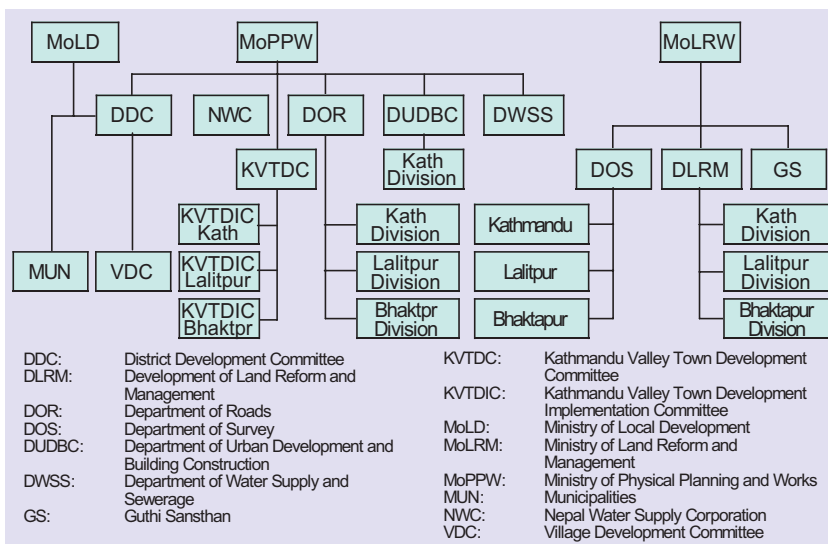
In 1976, the government adopted a Land-use Plan for Kathmandu Valley and established Town Development Implementation Committees in each of the three districts of Kathmandu Valley. These committees were given the legal authority to enforce land-use regulations and to promote and regulate urban development activities. As a first step towards implementation of the Town Development Plan, KVTDC launched 'sites and services schemes' in Kuleshor, Galfutar, Dallu, and Sainbu Bhaishapati. When the town development plan was launched, the population growth rate was less than three per cent, and most of the land around urban areas was used for agriculture. Between 1981 and 1991, the population grew by more than five per cent, and the government's urban development efforts were inadequate and services could not be delivered to new migrants. The housing projects launched by KVTDC were not completed on time and no new projects could be launched. The huge demand for housing plots was met by the private sector, in particular individual land brokers and real estate agents. Unplanned subdivision and assembly of land posed a serious threat to the planning initiatives of KVTDC. Urban expansion occurred on the fringe areas without any development control and building byelaws were completely ignored.

After promulgation of the Town Development Act 1988, Town Development Committees throughout the country were reorganised and given adequate authority to regulate urban development through enforcement of

building byelaws as well as through land development schemes. The efforts of the Kathmandu Valley Town Development Committee to introduce a Guided Land Development (GLD) programme and land-pooling schemes are commendable in the sense that they generated the public interest crucial for the success of the programme. Although, in the initial phases, these programmes did not go head smoothly because of public protests, the obstacles were overcome after extensive consultations with beneficiaries and people's representatives. Under the GLD programme, 475 km of roads were to be developed and the progress to date is

**Table 4.3: Institutions involved in settlement development**

Name	Responsibilities
Department of Land Reform and Management	Land registration, sub-division and transaction
Survey Department	Land survey, production of maps and maintenance of cadastral maps
Department of Urban Development and Building Construction	Regulation of apartments, construction of government buildings, conservation of religious and cultural sites
Kathmandu Valley Town Development Committee	Formulation of building byelaws, implementation of guided and land-pooling programmes
Municipalities	Solid waste management, building permits, revenue collection
Department of Roads	Construction and maintenance of strategic roads
Nepal Water Supply Corporation	Production of water, distribution, and maintenance of the water supply system
Guthi Sansthan	Maintenance and repair of temples and shrines
Village Development Committees	Building permits, construction of rural roads
District Development Committees	Construction of district roads
Nepal Electricity Authority	Generation, transmission and distribution of electricity, provision of street lights



**Figure 18: Organisational structure of institutions involved in settlement development**

300 km. The beneficiaries have donated 170 ha of land valued at Rs. 2,800 million. The government has invested only Rs.70 million in the scheme (KVTDC 2005): this scheme was limited to a few wards in Kathmandu and Lalitpur, and it could not meet the growing demand for developed plots in the valley. Hence the private sector and individual land brokers benefited from the land market. The conventional role of KVTDC was curtailed after promulgation of the LSGA in 1998. The municipalities have more authority to guide and regulate urban development under the Act and, in certain cases, the functions of the Town Development Committees and municipalities overlap.

The building byelaws enacted in 1976 under the Kathmandu Valley Town Development Plan became obsolete and impractical over time. In order to address the issues emerging in urban planning, in the context of LSGA, KVTDC drafted new planning and building byelaws, and these were approved by the government in 1993. The KVTDC and the municipalities are still operating building and planning permit activities on the basis of these byelaws which rule that planning permits from KVDTC are mandatory for launching land subdivisions or housing development schemes. Furthermore, to regulate land subdivisions, a minimum plot size of 80 sq.m. and a frontage of six metres have been established for the Kathmandu Valley.

At present, KVTDC is concentrating on the implementation of land-pooling schemes, as they have proved to be a promising tool for urban development in Nepal. Considering the holding of land by individuals and problems in land acquisition, the land-pooling concept has been widely supported by members of the public and law-makers. Land pooling is based on the concept of readjusting existing irregular plots into regular and square plots and creating road and drainage networks and open space. The project compensates landowners by providing them with developed plots of higher value but reduced land area. The cost of constructing infrastructure (roads and drainage) is financed by auctioning reserve plots. To date 11 projects have been

completed, three projects are nearing completion, and seven projects are being implemented. The land-pooling project in Kathmandu has inspired people in other towns, and several projects are being launched in Pokhara, Dang, Nepalgunj, and Dharan. Despite deficiencies in planning and implementation, land pooling has proved a pragmatic tool for urban development in a country like Nepal where land belongs to the people not the government. Table 4.4 gives information about land development projects completed in Kathmandu Valley and Figure 19 depicts land pooling at Naya Bazar. Figures 20 and 21 also depict different aspects of land pooling in Kathmandu Valley.

Table 4.4: Land development projects completed in Kathmandu Valley

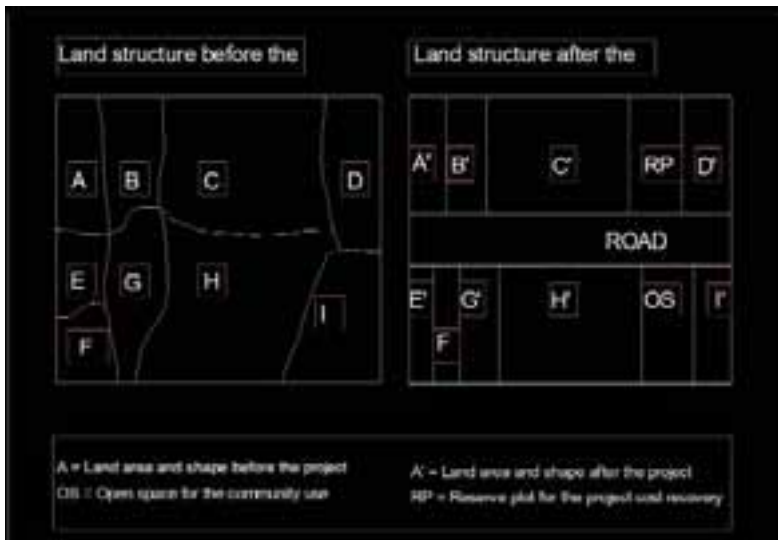
Project name	Area (ha)	Road (km)	Drainage (km)	Open space (ha)	No. of plots	Cost (million Rs.)
Gongabu	14.33	5.94	10.30	0.72	406	69.82
Lubhu	13.50	3.71	6.00	0.58	243	18.16
Kamal Binayak	7.32	3.20	4.90	0.30	205	8.64
Bagmati Phant	9.80	9.41	2.50	-	560	9.59
Liwali	33.45	8.85	9.41	1.17	770	62.32
Sintitar	27.50	8.73	8.85	0.94	920	87.49
Sainbu	24.58	10.25	17.40	3.18	800	296.25
Dallu	20.00	7.00	6.95	1.40	750	107.49
Naya Bazar	44.25	17.20	23.00	1.60	1312	277.79
Gopikrishna	10.88	4.14	4.14	0.42	292	72.46
Sinamangal -I	35.97	11.72	11.72	1.98	1074	109.13
Kirtipur- I	5.18	2.20	2.20	-	300	-
<b>Total</b>	<b>246.76</b>	<b>92.35</b>	<b>107.37</b>	<b>12.28</b>	<b>7632</b>	<b>1119.14</b>

Source: Joshi and Sangachhen 2001



Figure 19: Land pooling at Nayabazar

Source: DUDBC 1999



Source: Kathmandu Urban Development Project, DUDBC 1999

Figure 20: Physical improvements in land-pooling project after implementation



Source: KVTCDC 2006

Figure 21: Land-pooling project completed in Kathmandu Valley

In 1998, an Apartment Ownership Act was promulgated by the government as a means of promoting apartment living. This act enabled the private sector to construct and sell apartments at affordable prices. The Act was only finalised in 2003 because of legal and administrative hurdles. Although public response to apartment purchasing is quite overwhelming,

developers are still finding it difficult to acquire land and provide basic services and access roads.

At the end of the 1990s, the government launched a Kathmandu Urban Development Project. Although Kathmandu Metropolitan City (KMC) was the main beneficiary of the project, other municipalities were included in the institutional development programme. The project's main objective was to redevelop the core city area of Kathmandu. It was also meant to strengthen KMC by undertaking the urban development and management functions outlined in the Local Self Governance Act. The project prepared a digital base map of Kathmandu, and this is used for most of the planning, programming, development, and management activities carried out by government, semi-government, and non-government agencies. Similarly, Kathmandu Metropolitan City carried out a Kathmandu Valley Mapping Programme to improve the management functions of KMC. The most important output of this was the introduction of a Metric Addressing System which not only improved the revenue generation of KMC but also helped service providers such as the post office, police, kennel clubs, newspaper vendors, and garbage collectors to improve their services and collect fees and taxes with greater efficiency.

The government's planning strategy, particularly that of Kathmandu Valley Town Development Committee, is the Land Use Plan (LUP) for greater Kathmandu. Other than that there is no comprehensive land-use plan, no zoning regulations, and no plan for infrastructural expansion. Hence, the municipalities in the valley are also without proper regulatory tools to enforce standards.

Lack of political commitment and unwillingness to approve plans and policies are bottlenecks to proper land-use planning. There are no accepted goals and objectives, and, since rural voters dominate the politics of Kathmandu Valley, senior politicians are not concerned about urban issues.

## The future outlook of Kathmandu Valley

Kathmandu will continue to grow in future and, if rational planning and development strategies are not formulated, its growth will become a nightmare in the environmental sense. Policies are required for sustainable development of the Kathmandu Valley at both valley and local levels. Valley-level strategies should address trunk infrastructure such as major arterial roads (ring roads, highways), sewage systems, water supply systems (e.g., the Melamchi Project), and conservation of watershed and management of solid waste. Local-level strategies should address development of city or ward infrastructure such as drainage, open spaces, street lighting, primary collection of solid waste, and maintenance of local roads. Building byelaws and administration of building permit systems should be the functions of local authorities. Furthermore, community development work in which local people can actively participate in developing their neighbourhoods should be among the local-level strategies.

Kathmandu being the national capital means that the roles of central and local bodies are equally important, but their specific roles, responsibilities, authority, and accountability should be clearly defined.

An appropriate land-use and management policy will be required to guide development at both valley and local levels. The traditional land-management system is too obsolete to guide the future physical growth of Kathmandu Valley. No city plan can materialise without a corresponding land-use policy judicious enough to create a healthy living environment. Although local authorities have the authority to exercise self-governance, they need to coordinate with other local authorities through a valley-wide apex body for development endeavours. Such a body is yet to be established.

One of the principal causes of the deteriorating environment is the overlapping functions of different agencies and lack of coordination among them. Without a valley-wide apex body, it is difficult to coordinate three DDCs, 98 VDCs, and five municipalities. Better coordination is also needed among the government and semi-government line agencies.

Major projects to address the deficiency of trunk infrastructure in the Kathmandu Valley are in the pipeline. Table 4.5 lists the issues and interventions proposed for development of the Kathmandu Valley. Box 4 contains policies for the long-term development of the valley.

**Table 4.5: Major issues and interventions proposed for the planned development of Kathmandu Valley**

Major issues	Current Trend	Impact	Proposed intervention
1. Uncontrolled urban Sprawl	People are building houses without planning guidelines	Provision and maintenance of urban infrastructure becomes difficult and costly.	Enforce land-use plan to clearly demarcate the areas suitable for development and those unsuitable for development and provide infrastructure accordingly.
2. Deficiency of water supplies, drainage and sewerage	Existing infrastructure cannot support the population pressure	Quality of life is decreasing and public health is threatened.	More investment in upgrading municipal infrastructure; and increase the involvement of the private sector.
3. Traffic congestion	Inadequate road density and road network	Air pollution and increased travel time	Improvement of the existing road network and expansion to fringe areas
4. Unplanned land subdivision	The land management policy does not comply with urban planning standards and land brokers are more active than planners	Inefficient use of land, overcrowding and increased cost of infrastructure	Introduction of urban land management policy and procedures and regulation of the activities of land brokers through legislation
5. Environmental pollution	Incompatible land use, discharge of solid waste and liquid waste into the rivers.	Loss of eco-system and loss of cultural heritage	Construction of sewage treatment plants and strict enforcement of EIA and IEE in medium- and large-scale projects
6. Loss of agricultural and forest land	Agricultural land converted into built-up areas and forests encroached upon to establish security bases	Less groundwater recharge, loss of recreational area	Delineation of agricultural areas in the land-use plan and restriction on the use of forests for non-compatible activities
7. Poor management of cities	Weak capacity of municipalities and local authorities	The public is not receiving basic services at optimum level.	Improvement in the capacity and efficiency of local authorities to undertake urban management functions

## Box 4: Policies for long-term development of the valley

The long-term development concept for the valley approved by the government in 2002 has adopted the following policies. These policies can be taken as the guiding principle for ensuring planned growth.

- A valley-wide apex body to be formed with proportionate representation of local bodies.
- Job opportunities shall be decentralised so that people can settle in any location of the valley.
- Delineation of rural and urban boundaries so that separate planning standards can be enforced in rural and urban areas.
- Investments should be channelled to certain sectors only so that densification, development of new towns, and allocation of future land can be delineated.
- A system of planning permits and environmental impact assessment shall be introduced.
- Tourism-related activities shall be promoted and polluting industries shall be relocated to other towns outside Kathmandu Valley.
- Bhaktapur and other traditional settlements to be declared cultural towns.
- Kathmandu to be declared a single administrative entity.
- Protection of public parks and watershed areas
- Development of cottage industries
- Relocation of security establishments to fringe areas

### Proposed outer ring road

The government has approved an ambitious plan for constructing an Outer Ring Road. It is envisaged as a major arterial road to cater to the needs of the Kathmandu Valley for the next 20 years. The Outer Ring Road will pass through the traditional compact settlements of Kathmandu such as Harisiddhi, Bungamati, Khokana, Bhaktapur, Gokarna, Tokha, and Kirtipur. The 72-km long road will serve not only as the major arterial road but also as the backbone for future urban growth. Considering the mistakes made in planning the existing Ring Road, Nepalese planners have been careful to ensure that the plan encompasses integrated infrastructure, road access, and planned neighbourhoods adjacent to the road. Chinese assistance is expected for construction and the government of Nepal will acquire the land and plan and develop the neighbourhood. The preliminary estimate shows a cost of NRs. eight billion, excluding the cost of land. Land acquisition is to be carried out through a land-pooling concept by which landowners will contribute part of their land for road, drainage, and open space as well as construction of infrastructure. The average contribution of land to the proposed Outer Ring Road will be 40%. In return the people will receive developed plots of much higher value and with better

infrastructure than their original landholding. Construction will take about seven years from commencement. Environmentalists and development planners have raised concerns about the negative impacts of the Outer Ring Road. Environmental issues will have to be addressed through an Environmental Management Plan developed based on the Environmental Impact Assessment. Transportation experts are suggesting improvement of the existing radial road between the existing Ring Road and the proposed Outer Ring Road (Figures 22 and 23).

The Outer Ring Road Project will deliver the following benefits.

- Rural settlements in the valley will have improved access.
- Existing urban areas will grow towards the Outer Ring Road area.
- Land will be available for the utilities and services required for a metropolitan city, e.g., administrative sub centres, commercial sub-centres, intercity bus terminus, and so on.
- Planned neighbourhood and radial roads will be developed.
- The southern and eastern part of the valley will have improved access.



Figure 22: A view of the outer ring road

Source: Outer Ring Road Development Project, DUDBC 2006

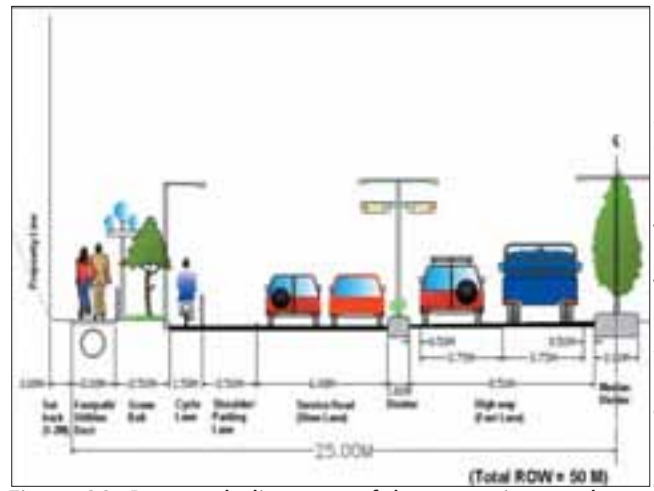


Figure 23: Proposed alignment of the outer ring road

Source: Outer Ring Road Development Project, DUDBC 2006