URBAN MANAGEMENT PROGRAMME
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Urban Growth and Its Impact on the Livelihoods of Kathmandu Valley, Nepal

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and
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Abstract

This study attempts to analyze and describe the trends and patterns of urban growth, and their impact on the peri-urban agricultural landuse and urban poverty level of the Kathmandu Valley. The landuse changes inside the watershed boundary of the Kathmandu Valley from 1955 to 2000 have been analyzed using GIS. Socio-economic data from the year 1971 to 2001 has also been analyzed. The analysis reveals that urban growth in the Valley has been unsystematic and has resulted in the conversion of a large portion of prime agricultural land. This type of urban growth is diluting the traditional compact settlement practice in the Valley. The compact settlement practice is the indigenous practice of staying together in a cluster to protect the prime agricultural land as well as the socio-cultural harmony in the community. On the other hand, urbanization increases the living standard of people, and drives the growth in the national economy. The employment opportunities in urban areas also attract the rural poor. The study also tries to highlight how urban poverty arises out of the process of urbanization. The study offers several policy options and recommendations to curb the haphazard urban growth and to preserve the prime agricultural land to feed the citizens of the Valley. It also suggests a balanced development between rural and urban sectors, which helps stop uncontrolled migration to the city area.

Keywords: Urbanization, agricultural land use, peri-urban, poverty, planning, policy, stakeholder, public, private, consultation

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List of Abbreviation

ADB	Asian Development Bank
CBS	Central Bureau of Statistics
DHPP	Department of Housing and Physical Planning
DUDBC	Department of Urban Development and Building Construction
EAP-AP	Environment Assessment Program-Asia Pacific
EIA	Environmental Impact Assessment
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
GIS	Geographical Information System
HDI	Human Development Index
HH	Household
HMG	His Majesty's Government of Nepal
IDP	Internally Displaced Person
IUCN	International Union for Conservation of Nature and Natural Resources
ICIMOD	International Center of Integrated Mountain Development
KMC	Kathmandu Metropolitan City
KVTDC	Kathmandu Valley Town Development Committee
MOPE	Ministry of Population and Environment
MPPW	Ministry of Physical Planning and Works
NPC	Nepal Planning Commission
PDR	People Democratic Republic
PPPUE	Public Private Partnerships for Urban Environment
RUPP	Rural Urban Partnership Program
SEAM	Strengthening of Environmental Administration and Management
UDLE	Urban Development through Local Effort
UN	United Nations
UNEP	United Nations Environment Program
UNDP	United Nations Development Program
UN-Habitat	United Nations Human Settlements Program
UNCHS	United Nations Center for Human Settlements
VDC	Village Development Committee
WB	World Bank

1. Introduction

The urban centers* of a country are important to national economic development, because they are the engines of economic growth. They are the central points for trade, commerce, industry, and government administration, where people can improve their earning opportunities. Cities are also centers of excellence for education, healthcare, technological innovation, entrepreneurship, and governance. They provide access to large markets for goods and services, and communication with the rest of the world. Urban centers create opportunities for jobs, employment, and livelihood (ADB, 2004).

The UN Population Division (2004) estimates that 48.3 per cent of the world's population lives in urban areas. It has estimated that 394.2 million people live in the big cities, 246.4 million of them in developing countries, more than 214.5 million in Asia. Most of the world's population growth is occurring in the cities of developing countries. The current level of urbanization ranges from a low 7.6 per cent in the Democratic Republic of Timor-Leste to 100 per cent in Singapore. A large proportion of internal migrants live in or around metropolitan or large city areas in developing countries. Hardoy, *et al* (2001) indicates that Asia alone has close to half the world's urban population, although more than half of this population lives in just two countries, China and India. In 2015, there will be 604.4 million people living in cities[1]. UN-Habitat and UNDP (2004) estimate that 1.7 billion people would be in slums by 2020 in developing countries, if current trends continue.

The rapid growth of the urban population is due both to natural increase and internal migration from rural to urban areas. In many less-developed countries, where there is limited population control, natural growth is a key factor. In addition, agricultural land is continuously converted to urban uses in the process of urbanization all over the world. Cities are moving beyond the suburbs and adding rural poor into the urban area. Nevertheless, the process of rural-urban migration may slow the reduction of urban poverty and may contribute to increased urban disparity (Brook and Davila, 2000).

The 21st century will witness rapid urbanization, with 2 billion new residents being added to the cities of the developing world in the next 25 years. This urban growth, although stimulated by economic development, has also led to a sharp division in growth between cities and among social groups. The next decade will also witness increasing urban poverty. In practice, most of the urban poor live in poor environments in slums and peri-urban areas. The number of urban dwellers living in slums and squatter settlements is also expected to rise in these rapidly urbanizing countries (UN-HABITAT and UNDP, 2004).

In the case of Asia, the urbanization processes and patterns have dramatically changed since the late 1960s. At the same time, urbanization has derived from industrial growth and the rapid economic development in most Asian countries (Douglass, 1995). In developing countries, the relationship between urbanization and industrialization is fragile in the periphery of the metropolitan area and has an adverse impact on the agricultural activities of the rural poor. The metropolitan decentralization processes, wherever present, are only at an initial stage in most cities of developing countries (Burgess, 2000). However, Pernia (1994) states that the smaller Asian countries have generally urbanized faster than larger ones such as the People's Republic of China, India and Indonesia, which will remain more rural than urban in 2010. It implies that growth in non-agricultural sectors will not have a major adverse impact on non-agricultural sectors in large countries, but it will in the case of small countries such as Nepal, Bhutan, Sri Lanka, and Lao PDR.

*Hardoy, *et al* (2001) mentions that there is no general agreement among governments as to how to define 'a town', and 'urban center' and 'a city'. In virtually all nations, urban centers include all settlements with 20,000 or more inhabitants but governments differ on what smaller settlements they include as urban centers - from those that include all settlements with a few hundred inhabitants as urban to those that only include settlements with 20,000 or more inhabitants.

[1] http://www.megacities.uni-koeln.de/_frame.htm?http://www.megacities.uni-koeln.de/documentation/megacity/start.htm (Sept. 9, 2004)

1.1 Agricultural Land and Poverty Situation during Urban Growth in Some Asian Cities

Agricultural land provides a flow of both market and non-market benefits to society (e.g. crop production and open space). However, the same land is required by developers for creating profitable building sites and establishing industries. As a result, prime agricultural lands are being converted to non-agricultural use, and affecting the urban environment as well as the livelihood of the poor villagers (Carver and Yahner, 1996). In the process of urbanization, agricultural land has been reduced by 52 per cent in Japan and 42 per cent in the Republic of Korea (Guangwei and Shishun, 1999). Since 1952, more than 13 million hectares of agricultural land have been converted to non-agricultural uses, due to urban development in China. During 1952-1997, the area under agricultural land declined by 12 per cent, from 108 million hectares to 95 million hectares (Zhang *et al*, 2000).

There were 668 cities in 1997 in China, 3.67 times the number in 1982 (182) and 2.06 times the number in 1985 (324). Similarly, the urban population grew from 106 million in 1957 to 370 million in 1997. However, in comparison to rural poverty, urban poverty is small in China. Using a poverty line of $1.0 income per capita per day, measured by 1985 purchasing power parity (or 1985 PPP dollar), the incidence of rural poverty was 11.5 per cent in 1998, and the number of rural poor was 103 million. In contrast, the incidence of urban poverty was only 2.06 per cent and the number of urban poor was 6.32 million or about 5 per cent of the nation's total poor (Fan *et al*, 2001; Yisheng[2]).

In India, area under non-agricultural use increased from 9.4 million hectares in 1950-51 to 22 million hectares in 1993-94[3]. The country has a total population of 1,027 million, of which 285 million (28 per cent) live in urban areas, as per the 2001 census. The number of towns and cities had touched 4,378 by 2001. Among these cities, 33 have a population of over a million. The number of urban poor in India is estimated at 80 million (40 per cent of the total urban population); 65 per cent of these are women and children[4]. Although the proportion of the population living below the poverty line fell from 50 per cent in the 1970s to about 36 per cent by 1995, in absolute terms the number of India's poor doubled from 164 million in 1951 to 320 million by 1993-1994. Present estimates are that 40 per cent of the rural population and 33 per cent of the urban population live below the poverty line (ADB, 2004).

Indonesia is also one of the more rapidly urbanizing countries in Asia. It had a total population of 134.4 million, of which 19.3 per cent were living in cities in 1975. This increased to 217.1 million total population, of which 44.2 per cent were living in the city areas by 2002[5]. These figures show the rapid population growth in Indonesian cities. But in contrast to other Asian countries, the number of urban poor decreased from 10 million to 9.4 million from 1979 to 1990. Indonesia's experience shows that rapid economic growth, increased efficiency of resource use and policy intervention in favor of the poor help to reduce poverty in the city area (Mills and Pernia, 1994).

Nepal is the least urbanized not only among the developing countries in Asia, but also among the SAARC countries. However, urban centers are growing rapidly at the rate of up to 7 per cent per annum, which is one of the highest urban growth rates in the world[6]. In 1961, 3.6 per cent of the total population lived in 16 urban areas. This figure increased to 6.4 per cent living in 23 urban areas in 1981, and 14.2 per cent living in 58 urban areas in 2001 (MOPE, 2002). Also, 23 per cent of the total urban population were poor in Nepal in 1995-96 (WB, 2004).

In recent years, the rate of urban population growth as well as number of

[2] http://www.adb.org/Documents/Conference/Making_Cities_Work/7_Urban_envl.pdf, (Sept 20, 2004)

[3] http://www.icar.org.in/ncap/publications/workshopprocedd/wsp5/chapter1.pdf, (Sept. 13, 2004)

[4] Urban Scenario, Urban growth (Sept. 12 2004) http://www.urbanindia.nic.in/mud-final-site/urbscene/index.htm and http://www.healthinitiative.org/html/tbpoverty/dots-urban-poor.swf

[5] UNDP. Human development Report, Indonesia, http://hdr.undp.org/statistics/data/cty/cty_f_IDN.html (Sept. 15, 2004)

[6] http://www.gtz.de/nepal/projects/udle.html

urban areas have increased substantially, because several small city areas have been declared municipalities, and because cities have been incorporating adjoining villages into their area. Although declared urban, many areas still have rural characteristics, especially in the periphery of cities.

Nepal is predominantly an agricultural country, but agricultural land has been changing rapidly due to urbanization in the areas near cities. At the same time, land for non-agricultural use increased by 45,200 hectares to 95,700 hectares and then to 119,160 hectares from 1961-62 to 1991-92 and then to 2001-02 respectively[7] (CBS, 1994; 2002). Population growth and industrial development have put pressure on land use in the major city areas. In addition, problems relating to traffic congestion; water shortage; solid waste disposal; and air, water and noise pollution have noticeably worsened during the last few years. Thus the government has implemented various policies and plans to improve the environment in city areas.

1.2 General Background and Urban Growth in Nepal

Nepal is located between the latitudes 26° 22' N and 30° 27' N, and longitudes 80° 4' E to 88° 12' E, with elevation ranging from 90 meters to 8,848 meters. It is roughly rectangular in shape, stretching 885 km east to west, with average breadth about 193 km north to south. The country borders the two most populous countries of the world, India in the east, south, and west, and China in the north (see Map 1.1).

Nepal covers an area of 147,181 sq km and has a population of 23.15 million (CBS, 2002). It has been divided into 5 development regions, 14 zones and 75 administrative districts. Districts are further divided into smaller units, called Village Development Committees (VDC) and municipalities. Currently, there are 3,914 VDCs and 58 municipalities. Each VDC is composed of 9 wards; municipality wards range from 9 to 35. Nature has divided the country into three geographical regions: mountain, hill and Terai, accommodating 7 per cent, 44 per cent and 49 per cent of the population respectively. Based on area of districts, these regions constitute 35 per cent, 42 per cent and 23 per cent of the total land area respectively.

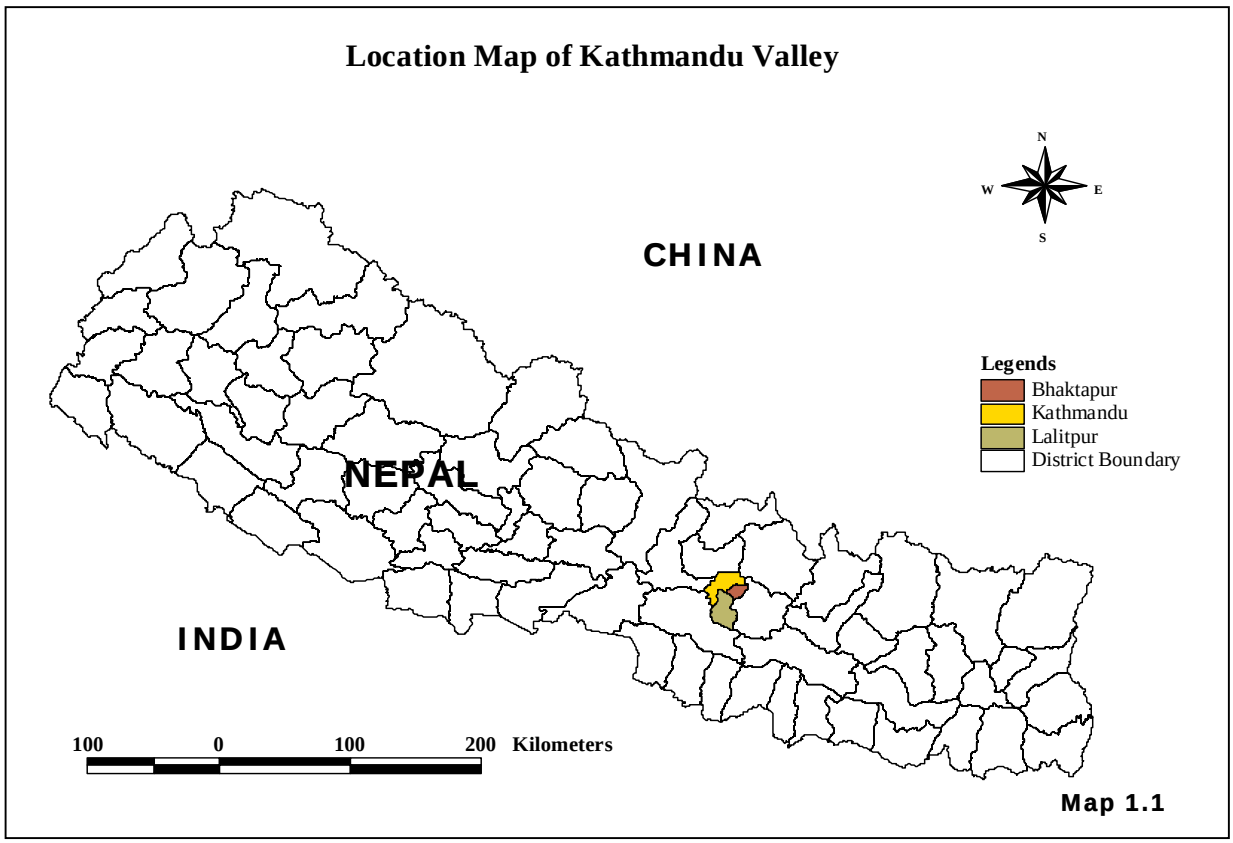
Nepal has a long history of urban life, but the level of urbanization in the country is nascent. Till 1961, there was no official definition of an urban center. However, urban development in the past was constrained due to rugged topography, inaccessibility, poor resource base and a low level of economic development. As a result, urban development was limited to the Kathmandu Valley and peripheral areas. Because of the Kathmandu Valley's strategic importance as centrally located between Tibet and India, its urban settlements of Kathmandu, Lalitpur and Bhaktapur became early trade centers. These settlements continued as important towns, economically and politically, for hundreds of years.

Most of the Himalayas and the Hills remained inaccessible and the Terai plains of the south did not allow much human activity because of malaria and dense forest (Shrestha and Malla, 1991). Urban expansion has been occurring outside the Kathmandu Valley after eradication of malaria and construction of highways in the country. Nepal had only 10 urban centers with a population of 5,000 and more: five in the Kathmandu Valley and five in the Terai during the 1952-54 census (see Table 1.1).

In 1961, for the first time, the government defined "urban" as settlements having 5,000 or more population, with urban facilities such as markets, industrial establishments, school, offices, etc. In that year, there were 16 towns with a population of 5,000 and more. This figure increased to 23, covering 6.4 per cent of the total population in 1981. In 1991, the number increased to 58 urban areas with a population of 10,000 and more, covering 9.2 per cent of the total population, which rose to 13.9 per cent in 2001 (MOPE, 2003).

In the census years of 1961 and 1971, the urban population grew from 38 per cent to 41 per cent. The figure increased again by 107 per cent between 1971 and 1981, and by 76 per cent between 1981 and 1991. The growth was 41 per cent between 1991 and 2001 (CBS, 2002).

[7] Source of data is 'National Sample Census of Agriculture 2001/02'. It has not included woodland and forest land as non-agriculture for the study.



The major urban areas that have crossed 50,000 population are shown in Annex A Table A8. A recent study by the UNDP states that the population of 12 municipalities, including Kathmandu, grew by 5.2 per cent in the last two years, compared to 3.6 per cent in 1991-2001[8].

Sharma (1990) mentions six types of urban centers in Nepal, which are illustrated as below:

1. Trading towns (land port and primary gateway to India) characterized by India-Nepal trade functions.
2. Growth towns located in the foothills or at the cross-roads. These towns help link the hill economy with that of the Terai, and serve as potential sites for industrial development.
3. Central places and Regional Development Centers such as Pokhara, performing administrative and distribution and agro-processing functions. These centers act as the first line of defense to absorb the Hills-Terai migration.

Table 1.1: Percentage of Urban Population Distribution by Geographical Region

Regions	1952/54	1961	1971	1981	1991	2001
Mountain	-	4.8 (3)	7.4(3)	8.7(4)	11.4(8)	17.8(20)
Kathmandu Valley	82.6(5)	64.9(5)	54.0(3)	38.0(3)	35.3(3)	30.9(5)
Bhitri Madhesh	-	-	3.5(1)	10.1(4)	9.5(4)	12.1(8)
Terai	17.4(5)	30.3(8)	35.0(9)	43.2(12)	43.9(18)	39.2(25)
Total	100(10)	100(16)	100(16)	100(23)	100(33)	100(58)

Source: CBS, 2003
Note: Bhitri Madesh: Shindhuli, Udhayapur, Makawanpur, Dang and Surkhet
In bracket number of city

8 Global IDP (2004). Exodus to the Urban Areas Places Pressure on the Infrastructure and Basic Services http://www.db.idpproject.org/Sites/idpSurvey.nsf/wViewCountries/5FF2C49F2FDC1975C1256CFB004EC8DC

4. Market Centers including small towns providing local market, sub-regional and, possibly selective regional service functions. Often these centers provide a forum for occupational mobility from rural to low-order to high-order non-farm jobs.
5. Service Centers: Judiciously located service centers provide a range of low-order services to its hinterland.
6. Capital Town of the Kathmandu Valley: A unique town by itself because of inherent historical, location, economic, administrative and political qualities.

Currently, the major urban areas in the country are Kathmandu, Biratnagar, Lalitpur, Pokhara, Birganj, Dharan, Mahendra Nagar and Bhaktapur. Among these urban areas, three major areas -- Kathmandu, Lalitpur and Bhaktapur -- were selected for research study. Apart from these three cities, the study also included two other cities, Kirtipur and Madhyapur Thimi. All these five urban areas are situated in the Kathmandu Valley, and located in the hill geographical region of Nepal. The study area of the Kathmandu Valley is based on a watershed boundary covering 81 per cent of Kathmandu district, 32 per cent of Lalitpur district, and the whole of Bhaktapur district.

1.3 Statement of Problems

Unsystematic and uncontrolled urban growth has a direct and indirect impact on agricultural land as well as on the urban poor. Some important problems related to urban growth and land use change in the Kathmandu Valley are explained below:

Kathmandu Valley, which comprises of five municipalities, is the main attraction for the rural poor as well as urban rich for betterment of livelihood. There has been a dramatic change in its land use composition during the periods 1984-1994 and 1994-2000. During these periods, agricultural land shrank from 64 per cent to 52 per cent, and further to less than 42 per cent respectively. Agricultural land has been decreasing annually by 7.4 per cent. Meanwhile, non-agricultural land has increased from 5.6 per cent to 14.5 per cent to 28 per cent in the Valley during the same periods. (CBS, 1998; KVTDC, 2002; APO, 2002).

Assuming that the present trend of urbanization continues, *ceteris paribus,* the total urban area will reach 34.3 per cent of the Valley by the end of 2020, as a result of urban encroachment on agricultural land. Agricultural area will shrink from 42.2 per cent (2000) to just 14.5 per cent during the same period. This shift will be more pronounced in the Valley than in other city areas. Similarly, the total population of the five municipalities, which constituted about 61 per cent of the total Valley population in 1991, is expected to reach 71 per cent in 2011 (Shrestha, 2002; HMG/IUCN, 1995; Spotlight, 2000)[9].

1.4 Rationale of the Study

Improper urban development can cause an adverse impact not only on agricultural land use but also on the environmental conditions as well as the livelihoods of poor inhabitants of the area. Unplanned urban growth in the Valley may worsen the quality and quantity of agricultural land in the long run. It may also have an adverse impact on agriculture-dependent disadvantaged groups in the Valley. It may attract the rural poor, who will then become urban poor. So, there is a need to study the impact of urban development on agricultural land use as well as urban poverty.

The research outcomes will benefit the urban planners and policy makers and agricultural sector in the following ways:

- The study will identify the role of the government in managing the urban environment as well as agricultural land in the Valley.
- The study will facilitate the conceptualization and formulation of sustainable urban policies to protect agricultural land and rehabilitate urban poor in the Valley.

1.5 Objectives of the Study

The purpose of this study is to determine the pattern of urbanization in the Kathmandu Valley and its impact on

[9] http://www.nepalnews.com.np/contents/englishweekly/spotlight/2000/sep/sep22/coverstory.htm (Sept. 12, 2004)

agricultural land use and urban poverty. Most of the land was earlier used for agriculture purposes. Urban areas are rapidly increasing in the Valley with in-migration from different parts of the country. Uncontrolled urban growth is having an adverse effect on agricultural land and livelihoods of people in the Valley.

The specific objectives are:

1. To analyze the transformation pattern of agricultural land to non-agricultural uses in the Kathmandu Valley.

2. To analyze the trend and pattern of urbanization and its effect on agricultural land and agricultural activities in the Valley, such as loss of agricultural land, loss of urban and peri-urban practices, growth of urban poverty and change in socio-economic conditions.

3. To suggest the policy guidelines that could effectively maintain sustainable balance between agriculture and non-agricultural sectors and reduce urban poverty in the Valley.

1.6 Approach and Methodology

Kathmandu Valley represents a region of major urban growth in Nepal. It consists of five major urban cities (mentioned in section 1.2). These cities have unique urban and rural attributes. The Valley had a careful assimilation of urban and rural activities in the past. Now it is necessary to invent solutions to maintain the urban and rural harmony in the Valley. The study of urban growth was carried out with comparison base on timeline frame (1950-1978-1991-2000).

1.6.1 Nature and Sources of Data

This study was based on both primary and secondary data. Primary data were collected by observation method (field visits) and secondary data were collected from Kathmandu Valley Town Development Committee (KVTDC), Kathmandu. Additional data were collected from published and unpublished reports, research studies and articles by different researchers, line agencies, non-governmental organizations and individuals.

Spatial Data Sources: The most important source for timeline (1950-1978-1991-2000) spatial data were collected from the Nation Planning Commission, ICIMOD and KVTDC.

Non-spatial Data Sources: In most cases, the district level data as mentioned in Table 1.2 was collected from Central Bureau Statistics, ICIMOD, and National Planning Commission Offices in Kathmandu district. Some relevant previous researches into the area under study were identified in the AIT library and website. Most of the city planning information on the area studied was collected from the KVTDC.

1.6.2 Research Design and Methods of Analysis

The ARCVIEW GIS and MS Excel software were used for database automation and analysis of the results. In this study, district-level data were considered as the spatial entity of urban development and agricultural activity, because there is a scarcity of attribute data at the micro-level of spatial units smaller than a district.

Land-use data (spatial data) and socio-economic data (non-spatial data) were selected as major indicators. The sub-parameters were assumed on the basis of their effectiveness at each district level. Some parameters are given in Table 1.2.

- Data referring to the timeline of 1955-1978-1991-2000 was collected. In terms of evaluation, assuming that the year 1955 is not yet affected by urbanization, it is then reasonable to compare the effects of urbanization on agricultural land uses in the study area after 23-, 14-, and 8-year intervals. Analysis was carried out in this manner:

Table 1.2: Major Parameters Considered for Analysis

Land use Parameters (Spatial Data)	Socio-economic Parameters (Non-spatial Data)
Agriculture land	Population and Slum
Built-up land	Household
Forest	Income and expenditure of people
Water body	Agriculture production
Recreation Area	Development Indicators

- All types of urban area in polygon form, agriculture land in polygon

form and motorable roads in line form were collected from different departments in Kathmandu. Different time frame spatial data collected from different organizations were readjusted into a standard format to meet the objectives of the study.

- The existing road network was used to measure the accessibility to the built-up and agricultural land.

- Paddy, fruits, vegetables and fishery were considered major agriculture activities to identify the agriculture land.

- The urban impact on agricultural land use was analyzed by comparing outcome maps at different dates during these periods: 1955-1978, 1978-1991 and 1991-2000.

After putting the data into GIS, all land use maps (1955, 1978, 1991 and 2000) fit into the same size and same spatial resolution and are ready for the comparison process. The process is illustrated in Figure 1.1.

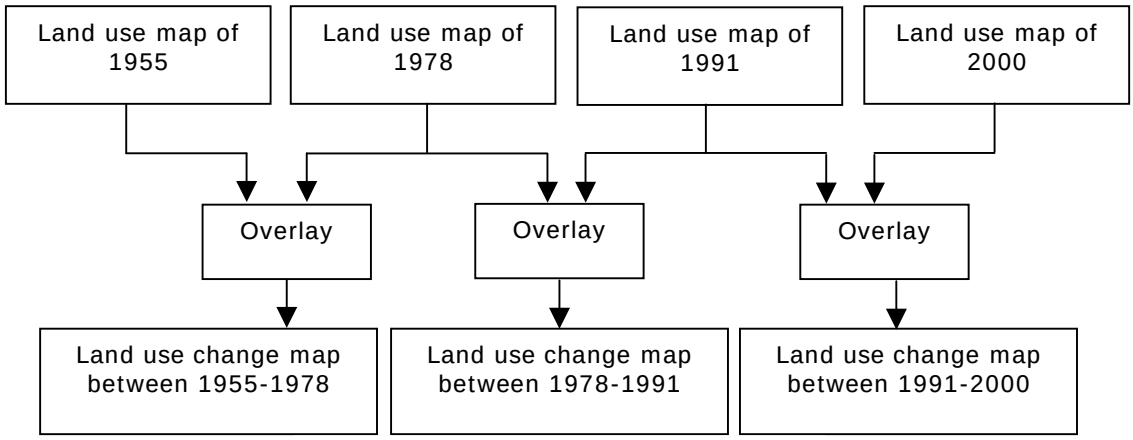


Fig. 1.1: Maps Comparison Process

- The poverty level of the Valley was analyzed by using socio-economic data (population, in-migration, slum settlement and GDP level), per capita income and expenditure of people. A comparative development analysis of three districts was also carried out to identify the level of poverty in the Valley.

2. Development of Urban Planning and Policies

National development is only possible if there is a strong development plan and policies in favor of the country and people, with extensive participation by all stakeholders. Similarly, a strong urban development plan and policy are needed to systematize urban growth. Several plans and policies have been prepared for the development of the Kathmandu Valley, but most have not been implemented properly at the city level.

Recently, KVTDC prepared the Development Plan 2020 of Kathmandu Valley, which is now in the final stage of the approval process. The plan envisages promoting the Kathmandu Valley as the historical, cultural, tourism, and capital region of the country. It has three goals: First, pursue the Valley-wide regional planning approach to minimize haphazard growth; Second, de-concentrate investment to other regions of the country to minimize the pressure of industries inside the Valley; and Third, promote balanced development between three districts of the Valley in a planned way. The implementation of this program could improve the existing urban situation.

2.1 National Development Planning and Policy

The effective national development plan was implemented only after 1956 in Nepal. In general, the main objective of the plan was to increase agricultural production and improve the economy. Poverty has been the underlying theme of all Nepal's development plans since the beginning. Nine periodic plans have been implemented till now, and the tenth plan is under implementation.

These planning practices have been mainly based on a top-down planning process, since the bureaucracy has been the key player in national development. There has been no basic involvement of local governments, beneficiaries, civil society or development partners. While the plans contained overall development and broad sectoral strategies, they were not often well integrated. They had no practice of monitoring or evaluation mechanisms to cross-check their effectiveness at the local level.

The **First Four Plans** (1956-1975) laid stress on development of infrastructure, especially roads and electricity. However, the Third Plan (1965-1970) incorporated environment-related policies and plans. It implemented a resettlement program in Terai to reduce the population pressure in the Hills. It declared temple and historical places as heritage sites and prepared a plan to protect these sites in the Kathmandu Valley.

Under the **Fifth and Sixth Plans** (1975-1985), the emphasis shifted towards the agricultural and industry sectors. The Sixth Plan (1980-1985) explicitly brought in poverty reduction as a development objective. The plan also laid emphasis on maintaining the balance in the use of land and environment. During this plan, the government introduced mandatory environmental impact assessment for development projects. It also reviewed the rules and regulations concerning the environment in the urban areas.

In the **Seventh Development Plan** (1985-1990), the issue of urbanization and housing policy was placed within the framework of social welfare, through the introduction of a basic needs program with six elements – food, shelter, clothing, health and security. However, political upheavals interrupted its implementation. With the restoration of democracy in 1990, poverty has again become a major objective of development planning.

The **Eighth Plan** (1992-1997) stressed infrastructure improvement and environment management on a sectoral basis. It also included the promotion of planned urban development and the management of urban areas by making the process of urbanization complementary to the growth of the local economy. The EIA guidelines have been officially gazetted; the Ministry of Population and Environment was established in 1995 to work as a separate line agency in environmental management.

The **Ninth Plan** (1997-2002) singled out poverty as the sole development objective. Its sole objective is to reduce (income) poverty from 42 per cent to 32 per cent of the population by the end of the Plan period. Several other indicators of human poverty -- such as illiteracy rate, infant mortality rate, maternal morality rate, and average life expectancy at birth -- were also identified and targets set for them. However, it also gave priority to urban development. It proposed to develop an integrated physical and social infrastructure in urban areas. It tried to use urban areas as economic growth centers, so they could generate employment for poor people and assist poverty alleviation. It also gave priority to the private sector in housing development in urban areas.

As in the previous plans, the core goal of the **Tenth Plan** is poverty alleviation. It has four main goals to achieve poverty alleviation:

a) Broad-based economic growth,
b) Social sector development,
c) Targeted programs, and
d) Good governance.

The Plan emphasizes effective implementation to ensure better delivery of outputs and services to rural communities. Efforts are made to ensure private sector participation in poverty alleviation programs. More efficient monitoring mechanisms were incorporated in the logical framework method to ensure greater accountability in the Tenth Plan. Economic reforms in a broad range of areas and sectors were formulated, together with a time-bound plan of critical immediate and medium-term actions for their implementation. The Tenth Plan has been prepared through a highly participatory and consultative process.

For infrastructural development, the key features of the Tenth Plan are listed below:

- The appropriate methodology should be used for mobilization, allocation and utilization of resources to achieve sustainable economic growth.

- Generation of employment through development programs.
- Development of strategic road networks (for access to district headquarters and regional balance) and areas with significant socio-economic importance e.g. hydropower, tourism etc.
- Encouragement of private sector participation in the development of infrastructure activities.
- Promotion of a decentralized management system to sustain infrastructure development.
- Provision of basic water supply to 85 per cent of rural and 95 per cent of urban population.
- Preparation of physical development plans for small towns and marker centers to ensure better provision of infrastructure.

2.2 Development of Urban Policies

In Nepal, the scope of development and management of urban environment can be facilitated through the urban Acts. The government, for the first time, promulgated a planning Act called the Town Development Committee Act, 1963, which provided for a committee to undertake some kind of zoning to manage the urban growth and implement projects, thus reinforcing the idea of planning as a set of development projects rather than a process. However, the committees did not materialize, due to lack of political commitment.

This act was amended in 1973 and became the Town Plan Implementation Act, 1973. For the first time, local institutions called town plan implementation committees were formed to develop urban sectors at four regional centers in the country. This act was also amended in 1988 and renamed the Town Development Committee Act, (TDCA), 1988. During this year, The Kathmandu Valley Development Authority Act 1988 was also formulated, but it never came into practice. However, the TDCA provided legal authority to the government to implement town development plans. It had the provision to acquire land for urban land development under the Land Acquisition Act, 1977.

This Act was again amended in 1996 to become the Town Development Act, 1996. It provides essential financial, technical and institutional support to the institutions doing the construction, development and expansion of towns. It also has provisions for acquiring land on behalf of private land development companies. These are some positive steps towards promoting the private and public sector participation in land development activity (Gyawali, 1997).

Notwithstanding this, a new version of the Kathmandu Valley Urban Development Authority ACT (Draft) has been billed in Parliament to regulate the rapid urbanization in the Kathmandu Valley in a more holistic manner. The lack of coordinated planning between the municipalities and the VDCs in the urban fringes has been detrimental to the overall development of the Valley (HMGN, 2002).

The Municipality Act, 1992 has categorized municipalities into three categories, *Mahanagarpalika* (metropolis), *Upa-mahanagarpalika* (sub-metropolis) and *Nagarpalika* (municipality), based on population size and income. A metropolis is defined as a municipality where the population count is 300,000 or more, which has a minimum annual revenue of Rs 70 million and relevant infrastructural facilities. Sub-metropolitan areas are defined as areas with annual revenue of at least Rs 20 million, a population of 100,000 or more, and other urban facilities. A municipality is defined as an area with a population of 20,000 or more and revenue of at least Rs 10 million, with basic urban amenities. The capital city of Kathmandu is the only Metropolis in the country. There are 4 sub-metropolises. The remaining 53 urban areas are municipalities.

Similarly, the Land Reform Act, 1964 regulates all kinds of land deals, including for urban land. The basic purpose of land reform was to protect the tenancy rights of farmers who have been cultivating land in the capacity of tenant. This right cannot be separated from the tenant even when the land is sold. So, after buying land, the new owners are understandably reluctant to place their land under cultivation while waiting for the construction of a house on it. Thus vacant plots in the middle of built-up areas have become a typical scene in all

municipal areas. The main motive of the Land Reform Act is to increase agricultural productivity, divert unproductive investment on land to other economic activities, achieve equitable distribution of agricultural land, upgrade the living standards of farmers and provide incentives for agricultural production. This Act does not mention urban land use management for housing. Instead, it has actually made it difficult to acquire or assemble land for development due to its provision of dual ownership between landowner and tenants. Thus, there is a need of an urban land act that tries to ensure adequate serviced land for housing for all sections of the people in a planned manner.

The Local Self-governance Act, 1999 (LSGA) gives the government the authority to make provisions to enable participation of people at the grassroots in the process of governance by decentralization. It tries to enhance the participation of all strata of people, including ethnic minorities, indigenous people and the down-trodden as well as socially and economically backward groups in mobilizing and allocating resources for the development of their regions and in the balanced and equitable distribution of the fruits of development. They have institutionalised the development of local bodies capable of bearing responsibility, by providing such responsibility and power at the local level as is necessary to formulate and carry out plans. They have constituted local bodies that can make decisions on matters affecting the day-to-day needs and lives of the people, by developing local leadership. The act also gives the authority to develop an institutional mechanism, functional structure and an administrative cadre that can focus on the needs and aspirations of the local people. It encourages the involvement of the private sector in local development for sustainability.

2.3 Organization Involvement in Urban Development

There are a number of governmental and non-governmental organizations that are directly or indirectly involved in the urban development activities in the country. The principal organizations are:

The *Ministry of Physical Planning and Works* (MPPW) is the main government agency responsible for physical planning of urban areas at the national level. Under this ministry, the *Department of Urban Development and Building Construction* (DUBDC) implements various urban development plans and programs through its 23 division offices located in different parts of the country. The *Ministry of Local Development* (MLD) is responsible for administering the programs of local governments such as municipalities and Village Development Committees (VDCs). The *Town Development Fund Board* (TDFB) was established in 1989. TDFB is an autonomous body under the MPPW. It has two main functions: to provide financial support to municipalities for the implementation of social infrastructure and revenue-generating projects, and to strengthen the technical and managerial capability of municipalities to implement the projects.

The Kathmandu Valley Town Development Committee (KVTDC) was established as the main regional planning body in order to enforce the plan in 1976. District-level units of the KVTDC were also established in Kathmandu, Lalitpur and Bhaktapur. KVTDC is responsible for planning and implementing urban development in the Valley. Kathmandu Metropolitan City (KMC), Lalitpur Sub-metropolitan, Bhaktapur Metropolitan, Kirtipur Metropolitan and Mahayapur Thimi Metropolitan are also involved in planning and implementing urban development at the local level. Apart from other municipalities, KMC is currently formulating a city development strategy, with key stakeholders participating, to provide a broad framework for the city's development and to coordinate stakeholder efforts. KMC is also implementing the *Kathmandu Valley Mapping Program*, with assistance from the European Union. The program aims at increasing the effectiveness of urban planning for the delivery of municipal services. ADB is also providing technical assistance for the institutional development of KMC and a national urban development strategy.

Urban Development Through Local Efforts (UDLE) is a program of His Majesty's Government of Nepal (HMG/Nepal) and the Government of the Federal Republic of Germany. The main objective of UDLE is to assist municipalities by building up

their ability to initiate and manage their own urban development.[10]

The *Public-Private Partnerships for Urban Environment* (PPPUE) program is supported by HMG/Nepal and UNDP. Its main objectives are to increase the access of the urban poor to basic services, to contribute to the creation of a healthy environment, and to improve living conditions in the urban and peri-urban areas of Nepal by promoting partnerships between public and private sectors for the sustainable provision of urban services. Now it is working with five partner municipalities: Biratnagar, Hetauda, Bharatpur, Pokhara and Butwal. It has implemented a number of development activities in collaboration with KMC in Kathmandu, such as the development of basic infrastructure in Gongabu bus terminal and the construction and maintenance of overhead bridges in the city area[11].

HMG/Nepal and Government of Finland started the development co-operation project "*Strengthening of Environmental Administration and Management* at the Local Level in Nepal" (SEAM-N) in 2001. The project area is the Morang and Sunsari districts in Eastern Nepal. The main objective of the project is to assist local authorities and industries of the area in environmental planning and management, for improving their environment. This project covers both urban and rural areas between the municipalities of Biratnagar to Dharan corridor, some of the most polluted and industrialized areas in the country[12].

The *Rural Urban Partnership Program* (RUPP) came into operation in 1997 as a joint effort between HMG/Nepal - National Planning Commission (NPC), Ministry of Physical Planning and Works (MPPW) and Ministry of Local Development (MLD), UNDP and UNCHS. RUPP intends to focus on enhancing management capabilities at the municipality, VDC and community level in 12 municipalities and 31 rural market centers (VDCs) for institutionalizing strong socio-economic linkages amongst the urban centers, rural market centers and villages. The goal of RUPP is to improve the livelihood of poor and disadvantaged people by creating an enabling environment for them to take advantage of the social and economic development opportunities that can be obtained through strengthened rural-urban linkages[13].

The *Lumanti Support Group for Shelter* is a non-government organization dedicated to the alleviation of urban poverty in Nepal by improving shelter conditions. It is working in 68 slum and squatter communities throughout Kathmandu, Lalitpur and Thimi via three programs; the Urban Community Empowerment Program, Water and Sanitation Program and Support for Displaced Poor Urban Communities[14].

Planners' Alliance for the Himalayan and Allied Regions (PAHAR-Nepal) is trying to implement an urban agricultural support program in close coordination with local leaders in Madhayapur Municipality in the center of the Kathmandu Valley. The municipality's planning advisor prepared the "Development Guidelines & Building Regulations 2001" in close cooperation with several ward chairmen, the legal advisor and other technical staff. It also created an Agricultural Reserve Zone in the plan, which is a first planning approach in urban areas to protect agricultural land in Nepal. Most non-urban and fertile agricultural land has been placed in this reserve zone, while existing urban areas are designated as development zones. The preservation of agricultural land is vital for the sustainability of urban development in the Kathmandu Valley[15].

With support from the United Nations Environment Program (UNEP/EAP-AP), ICIMOD facilitated the establishment of an Environment, Information and Assessment Unit at the Ministry of Population and Environment, HMG/Nepal. This project has carried out a Kathmandu Valley GIS study with the aim of preparing a core GIS Database and published CD-ROM on it. It is useful for research and development activities in planning and management of the Valley. Recently, ICIMOD has also published two books: *'Districts of Nepal Indicators of Development Update 2003'* and *'Mapping Nepal Census indicators 2001 and Trends',* which are useful for National Development work.

[10] (http://www.gtz.de/nepal/projects/udle.html)
[11] (http://www.pppue.org.np/index.php)
[12] (http://www.seam-n.com/)
[13] (www.undp.org.np/projects/nep96003.htm)
[14] www.lumanti.com.np/nav.php3?view=newsArt1
[15] http://www.ruaf.org/no4/28_29.html

UNESCO has acknowledged seven Monumental Zones with three historical palaces within their essential urban settings (Kathmandu, Lalitpur and Bhaktapur), two Hindu centers (Pashupatinath and Changu Narayan) and two Buddhist centers (Swayambunath and Boudhanath) in the World Heritage List. UNESCO is safeguarding the heritage, raising funds and providing expertise for the preservation of these sites.

PADCO Inc has supported HMG/Nepal, MPPW in formulating Management Support for Urban Development, Rapti Zone Integrated Rural Development, Urban Development Policy Study and Urban Development Assessment Methodology in the country.

However, the above-mentioned government, non-government and international non-government organizations are working toward the implementation of the urban development plan and policy at a national level. These organizations are assisting the government agencies financially and technically to strengthen their existing urban polices and manage the unsystematic urban growth in the country. These organizations are also trying to implement urban development activities at a local level.

3. Urban Growth and its Consequences in the Kathmandu Valley

The reasons for uncontrolled urban growth are the massive in-migration and natural growth in the Kathmandu Valley. There are urban plan and policy guidelines to manage the urban growth in the country but these are not implemented properly at the city level. The haphazard growth results in slum settlements in the city area. Slum settlements usually come up along the banks of rivers. These unsystematic settlements have an adverse impact on the city's environment, and on its aesthetics as well. In the past, the people of the Valley lived in compact settlements in a system of multi-habitation[16]. They shared their socio-cultural activities, which helped preserve their traditional practices. Now, these practices are slowly disappearing from the Valley. Massive in-migration and new individual settlement patterns are diluting the traditional compact settlements and practices. Local people as well as migrants have started to construct individual houses in the "scatter" manner, which has converted large areas of prime agricultural land in the Valley.

3.1 Population Growth and Emergence of Slum

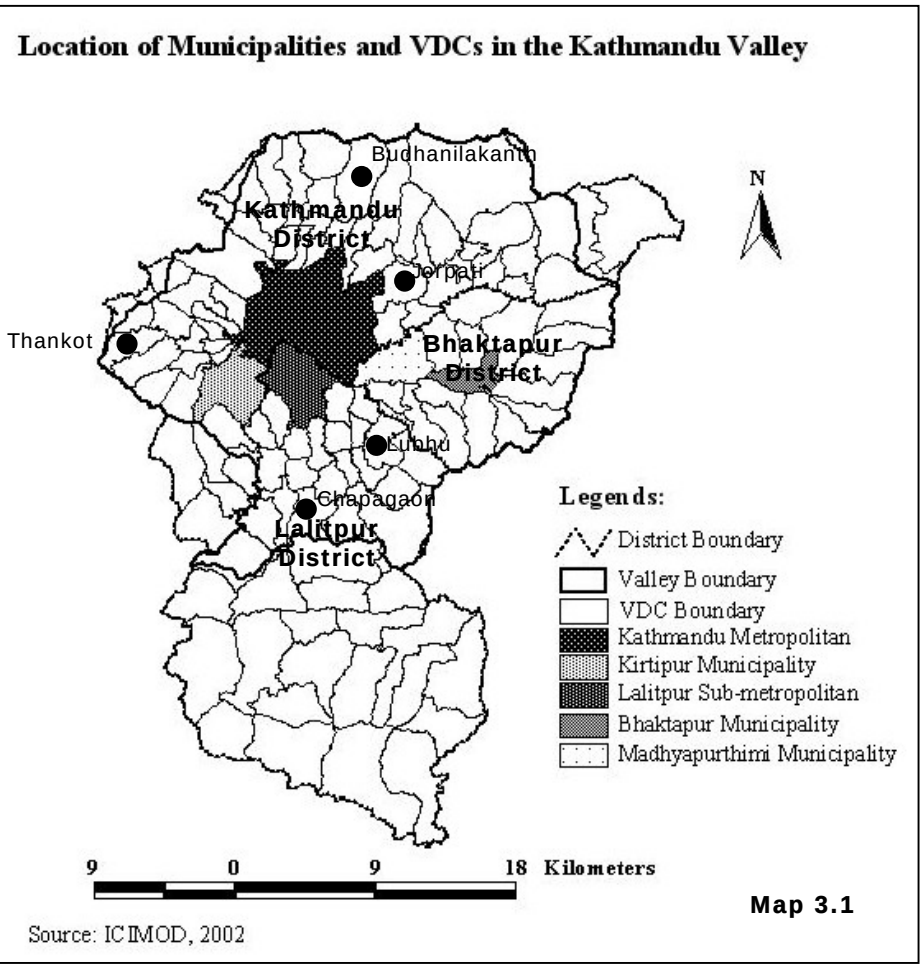
Kathmandu Valley is at a mean elevation of 1,350 metres above sea level. It comprises three districts: Kathmandu (395 sq. km), Lalitpur (385 sq. km) and Bhaktapur (119 sq. km). There are 115 VDCs and five municipalities in these three districts. Of these, 25 VDCs are situated outside the watershed boundary of the Kathmandu Valley. These five municipalities are the main growing urban areas of Nepal: Kathmandu Metropolitan, Lalitpur sub-metropolitan, Bhaktapur Municipality, Kirtipur Municipality and Madhyapur Thimi Municipality, covering an urban area of about 97 sq. km, as shown in Map 3.1. The Valley is the political, cultural, touristic, educational, administrative, commercial, industrial, security, hospital and financial center of Nepal. Hence, it has become the favorite destination for migration of rural people.

Population growth is the crucial factor influencing the Valley's socio-economic, socio-cultural and environmental condition. The average density of population per sq. km was 1,837 in 2001. However, the average population density per sq. km of the country was only 157 in the same year. The corresponding figures were 1,277 against 126 in 1991, 963 against 102 in 1981 and 623 against 79 in 1971. This shows that population density in the Kathmandu Valley is growing rapidly compared to the national population density. Annex Table A1 shows the population distribution figures from 1971 to 2001. It illustrates that the population of the Valley has increased by 23.8 per cent from 1971 to 1981, 44.2 per cent from 1981 to 1991 and 48.8 per cent from 1991 to 2001.

[16] Fuji (2004) mentions about multi-habitation, where people are provided safety and security supported by built-in systems of diversified cultural back grounds, to establish well integrated life styles of multi tribal/racial communities.

The population distribution at district level in 2001 is shown in Map 3.2.

Similarly, the Valley's settlements have tripled from 104,993 houses in 1979 to 345,562 houses in 2001. This can be seen in Figure 3.1.



Map 3.1

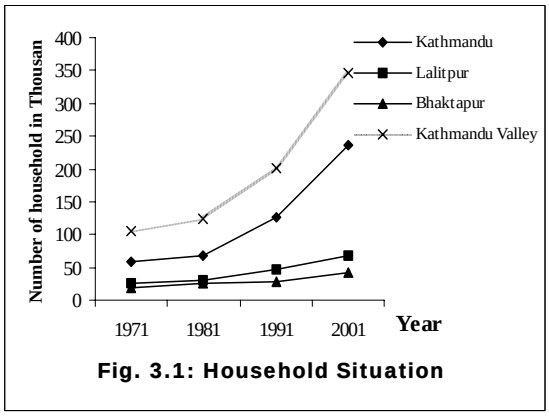


Fig. 3.1: Household Situation

In 1952-54, only about 3 per cent of the total 8.2 million population was in designated urban areas; 83 per cent of this was in Kathmandu Valley. Table 3.1 shows that the urban population of the Kathmandu Valley has increased by 46 per cent between 1971 and 1981, by 82 per cent between 1981 and 1991, and by 58 per cent between 1991 and 2001. According to the data, the largest population growth took place from 1981 to 1991. The table includes projections, indicating that the population will increase by 38 per cent between 2001 and 2011.

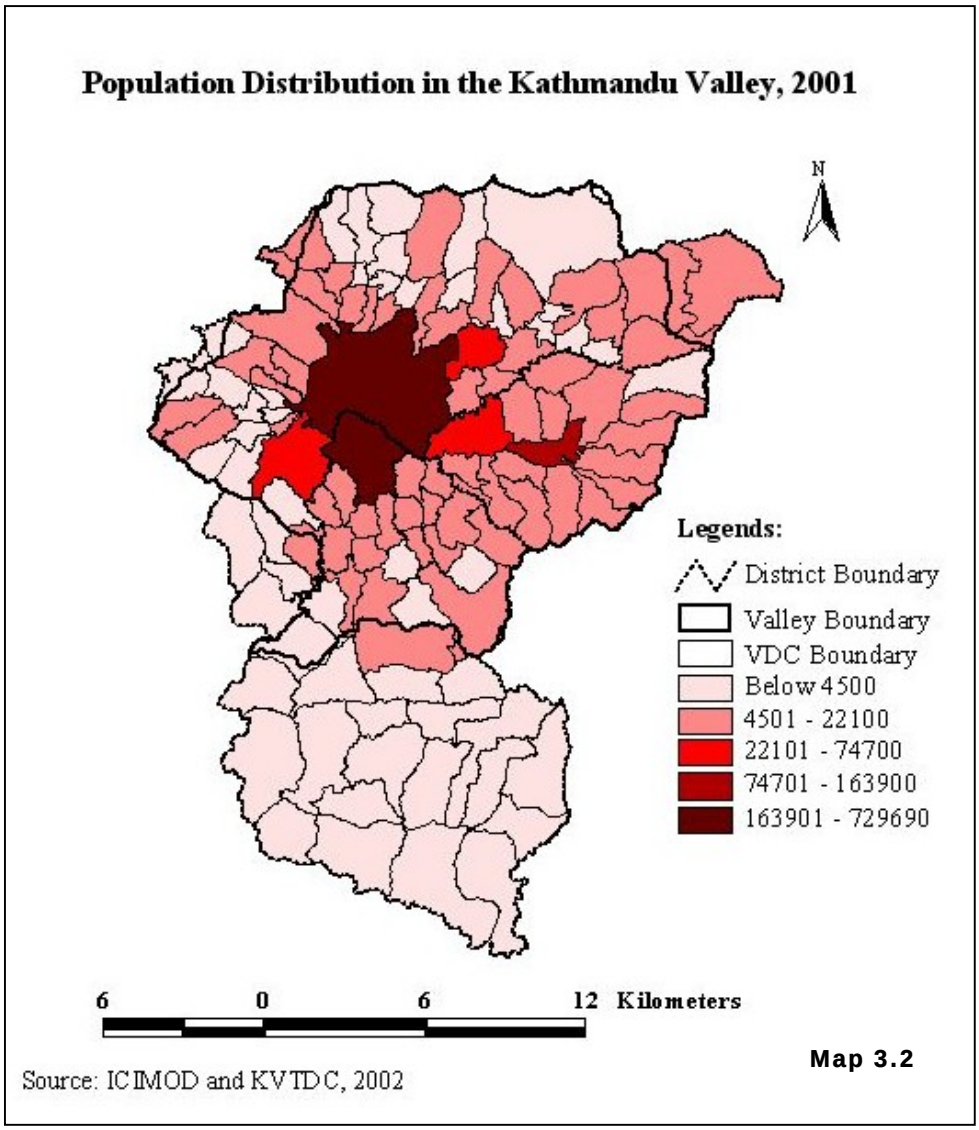
The population density in the core city area is very high compared to the Valley as a whole (see Table 3.2). In 2001, Kathmandu city had 11,099, Lalitpur city had 10,758 and Bhaktapur had 6,808 persons per sq. km. This is happening because of traditional compact settlement in the core city areas.

Table 3.2: Population Density (per sq km) in 2001

District	Urban	District
Kathmandu	11,099	2,739
Lalitpur	10,758	877
Bhaktapur	6,808	1,895
Kathmandu Valley	9,555	1,837

Source: ICIMOD *et al*, 2003b

Migration from Terai, hill and rural areas was a major cause of population growth



Map 3.2

Table 3.1: Urban Population and Area in Kathmandu Valley from 1981 to 2011 Projection

Municipality	1971	1981	1991	2001	2011	Urban Area sq. km in 2001
Kathmandu	150,402	235,160	421,258	729,690	1,011,105	50
Kirtipur	-	-	31,970	37,877	46,477	15
Lalitpur	59,049	79,875	115,865	163,923	229,852	15
Bhaktapur	40,112	48,472	61,405	74,707	105,561	6
Madhyapur Thimi	-	-	31,338	39,988	49,767	11
Total	**249,563**	**363,507**	**661,836**	**1,046,185**	**1,442,762**	**97**

Source: CBS 1983, 1993, 2002; KVTDC, 2002; ICIMOD *et al*, 2003b
www.mope.gov.np/population/chapter9.php, www.kathmandu.gov.np/cds/cdsreport/background.htm

in the Valley. This is because there is a huge disparity of income levels (see detail in section 4.1), physical facilities and employment opportunities between the above-mentioned areas and the Valley. Migration has received a further impetus from the Maoist insurgency and a tottering ceasefire, which has led to an exodus from rural hinterlands to the city areas. These migrants mostly prefer to stay in cheap rented houses in the suburban area. This is putting pressure on the limited resources and facilities in these areas (see Table 3.3).

Another phenomenon is that of relatively affluent rural people buying up land in the Valley, which has led to a sudden

boom in the real estate business. The number of land deals transacted daily has been rising compared to the previous year.

Table 3.3: Migration in the Valley

Municipality	1981	%	1991	%
Kathmandu	29,127	78.4	83,511	83.7
Lalitpur	6,397	17.2	14,787	14.8
Bhaktapur	1,610	4.4	1,439	1.5
Total	37,134	100	99,737	100

Source: KMC and WB, 2001

Almost a dozen private housing complexes have come up. This, however, has affected the poor village farmers who were totally dependent on that agricultural land for their daily subsistence. Some other populations, who have been similarly displaced, have started encroaching on public land. The areas around the riverbanks in Kathmandu have been their favorite targets, as shown in Table 3.4. Small to medium-sized shanties have sprouted along the banks of rivers like Bagmati, Bishnumati and Dhobikhola. (*Nepalnews*, 18 September 2003). This has been putting tremendous pressure on the limited infrastructure, and causing environmental degradation in the Valley.

Table 3.4: Growth in Squatter Settlements in Kathmandu

Year	No. of Settlements	No. of HH	Population
1985	17	-	2,134
1988	24	348	3,665
1990	19	859	4,295
1992	33	1,271	6,355
1996	47	1,783	8,927
1998	49	2,021	10,323
2000	61	2,031	11,862
Source: http://www.kathmandu.gov.np			

3.2 Multi-habitat and Land Use Practice

There were three regimes before the Shaha dynasty. They were the Kirati (7th Century B. C. –2nd Century A.D.), Licchivi (3rd-12th Century A.D.), and Malla (13th–18th Century). During these periods, settlements were established near the river belts i.e. Ikshumati (Tukucha), Bagmati and Vishnumati rivers, of the Valley. They were in compact form, closely and uniformly built with narrow streets and small courtyards, and congested. The settlements were neither rural nor urban. Different professional people lived together in a multi-habitation and shared their skills/talents to maintain a sustainable livelihood.

> "….in the *Malla* period, castes were grouped in concentric patterns in the town; the lowest castes, such as scavengers and sweepers, had their dwelling on the periphery of the town. The cultivators, to be near their fields, lived in the next ring, while artisans and craftsmen settled in the next inner ring. The traders and government officials were nearer to the palaces, which were right at the center (DHPP, 1969)".

They had formed a number of *guthis* (charities/trusts) to run and maintain their socio-cultural practices. Temples and open spaces were made into public spaces where people could enjoy socio-cultural activities. These practices maintained the social harmony in the community. Many of these settlements were established on higher land to protect the prime agriculture land in river belt areas, which practice can be observed even now in certain areas of the Valley. During the *Malla* period, most of the prime agricultural lands lying in the river belts were used for farming. The Valley of the *Manohara* River, the upper *Vishnumati* basin and the whole of the *Tukucha* areas were especially cultivated as urban agriculture (DHPP, 1969).

The practice of multi-habitation began to fade by the end of the 18th century when British-European influence brought in the new concept of palatial Renaissance architecture. A series of palaces with large compounds were built on agricultural land, with high boundary walls for protection. This design was copied by affluent Valley people, who started constructing bungalows with compounds in several places. As a result, the Valley people lost both their indigenous settlement practice as well as their socio-cultural harmony. People now prefer to stay in scatter form (see Map 3.3).

The growth of unplanned urbanization began in the Kathmandu Valley in the late 1950s. However, the pace of growth picked up only after the 1970s (HMG/IUCN, 1995). Even in 1975, approximately 90 per cent of the entire population lived in rural areas. The economy was dominated by the agricultural sector, which accounted for 71 per cent of the gross national product. Rural agricultural land was vigorously converted into built-up area after the

Malla Period (1300-1768) Rana Period (1846-1951) Haphazard Development (1951-Now)

Map 3.3: Built Form of Greater Kathmandu in Different Periods (Source: Shrestha, 2002)

construction of the Ring Road (27.8 km) around Kathmandu and Lalitpur municipalities in 1979. KVTDC (2002) predicts that if the unplanned urban growth continues at this pace, no agricultural land may remain in 2025. Figure 3.2 also shows agricultural land use change for urban use, which forecasts the land use situation in 2020 in the Kathmandu Valley.

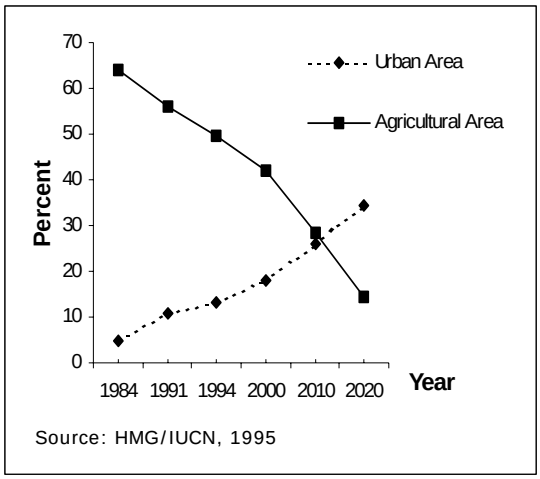


Fig. 3.2: Urban and Agricultural Landuse in the Kathmandu Valley

In addition, the traditional land/house division practice within a family also aids the unplanned urban growth and dilutes the traditional compact settlement in the Valley. Assume father / mother have a land/house that is divided among all children (especially sons) when they are grown up or want to separate from their family. In this case the land will be divided into small plots, which do not produce a large enough crop to feed the family. The children then have two options: either they leave farming and take up industrial or governmental work in cities for additional income, or they sell their lands and migrate to other villages where they can buy a large enough plot of land to continue farming.

However, a marginal population in the Kathmandu Valley still engages in agricultural work, and support a large number of persons in non-agricultural activities (production, commerce, institutes and services). The ratio of the adult economically active population engaged in non-agricultural activities to those in agricultural activities in 2001 was 2.34 (ICIMOD *et al*, 2003b). The non-agricultural population in the Valley has been much larger than in other areas. This ability of the agricultural sector to support a relatively large number of persons in non-agricultural activities has been one important attribute of an urban environment in the Valley. Kathmandu Valley has exhibited a highly evolved urbanized civilization for many centuries.

3.3 Urban and Peri-urban Agriculture

Kathmandu Valley was predominantly an agricultural area until the 1960s, and grew surplus crops and vegetables to feed people, but prime agricultural land has changed rapidly due to unplanned urbanization in the peri-urban area as well as the lowland area near the river belt. Now, it is difficult to support the people through production of crops and vegetables within the Valley. However, urban and peri-urban agriculture still plays a critical role in sustaining livelihoods in Kathmandu Valley. Close to 23 per cent of the vegetables consumed in Kathmandu are produced by poor farmers in urban and peri-urban agricultures. This figure can be improved to 76 per cent by improving farming practices and constructing a road networking system from the peri-urban to urban area.[17] This also contributes toward self-reliance in food and

[17] http://www.cityfarmer.org/NepalTrain.html

maintains the environmental condition of the Valley. Table 3.5 shows the demand for fresh food in the valley. Currently, the supply of vegetables in the Valley is mainly from three sources:

The peri-urban area of the Valley;

a) The more distant areas such as Birganj, Simaraoungarh, Lal Bandi, Bhalkewar and Janakpurdham; and

b) India, which mainly supplies potatoes, tomatoes, onions, *parawar* and chillies.

Table 3.5: Demand for Fresh Food in the Valley

Category	1996 Consumption (kg/capita/year)	Total Demand in 2000/01 (kg) in '000	Projected Demand in 2015/16 (kg) in '000
Vegetable	66.2	10,664	174,755
Fruit	11.3	18,814	43,587
Spices	3.0	3,912	7,368

Source: APO, 2002

The amount of land available for urban and peri-urban agriculture is continuing to shrink, while the demand for food in the cities is rising, due to large-scale migration from rural areas. This is not only creating environmental problems, but also threatening the ecological balance. About 20 to 30 years ago, rivers maintained at least a minimal flow of clean water all the year round. People could at least irrigate the agricultural land for fresh vegetable production. Now the rivers are almost dry during winter due to haphazard use of surface and ground water by industries and the built-up area. These are just a few of the many factors that are contributing to the decline of agricultural production in the Valley.

Urban and peri-urban agriculture is totally dependent on monsoon rain. The main crops are rice, wheat, and corn. In the peri-urban area, old settlements still practice their traditional style of farming, the *perma*[18] system (internal community labour sharing system). In this system, they do not have to hire labour from outside. But the system is slowly deteriorating. New settlements do not prefer to practice agriculture, and even when they do, they prefer to hire labour, which is more expensive and difficult to get, because of the growth of industries and construction agencies that pay higher wages. This trend is particularly seen in the younger generation, who consider agriculture as a livelihood backward. As a response to this problem, agricultural practice has been slowly shifting towards crops that require less labour, such as fruit plantations. However, some *Newar*[*] families still practice urban agriculture in the core city area (see Photo 3.2). Some individual households also practice urban agriculture to meet their daily food needs.

Photo 3.2: Urban Agricultural Practice

In recent years, farming families have been finding it difficult to maintain their living standard through agriculture alone. Many farmers have started joining secondary occupations for extra income, which has been affecting farming in the Valley. In addition, uncertain rainfall and poor irrigation facilities have also reduced agricultural production. School dropouts are increasing, due to the demand for family and child labour both in agriculture and factories because the family income is not sufficient to meet basic needs. Major urban and peri-urban agricultural areas in Kathmandu Valley are shown in Annex A Table A11.

In general, peri-urban agriculture areas in the Valley vary by type and form of production, land size, and access to irrigation and marketing. Farming in the eastern part of the Valley is more urban-

[18] *perma* system is an old practice that incorporates agriculture as well as community development activities in the village. In one community there may be several groups who can share labour only with certain groups. The name '*perma*' may be different in different villages.

[*] *Newar* is an old inhabitant of the Kathmandu Valley. Within the *Newar* ethnic group, the *Japu* caste have been practicing agriculture in the Valley from ancient times.

oriented (eg. Thimi), where farmers grow commercial crops for urban markets in the Valley as well as neighbouring districts. In the western and northern parts, farming is rural-oriented, following traditional subsistence crop production. In the southern part of the Valley, farming is of mixed type; some farmers produce commercial crops to sell in the city area, while some follow traditional crop production.

3.4 Agricultural Landuse Change

Agricultural land dominated the Kathmandu Valley over 35 years ago. However, it has been converted to various uses like building construction, industrial establishment, governmental premises etc. GIS analysis shows that 7 per cent (2,848 ha), 6 per cent (1,962 ha) and 26 per cent (8,765 ha) of agricultural land has been converted for non-agricultural purposes from 1955 to 1978, 1978 to 1991 and 1991 to 2000 respectively in the Kathmandu Valley (see Annex B Table B2). The largest conversion occurred between 1991 and 2000.

The agricultural landuse of three districts in Kathmandu Valley was also studied to pinpoint the location of change. The agricultural landuse change of three districts is shown in Figure 3.3. It shows

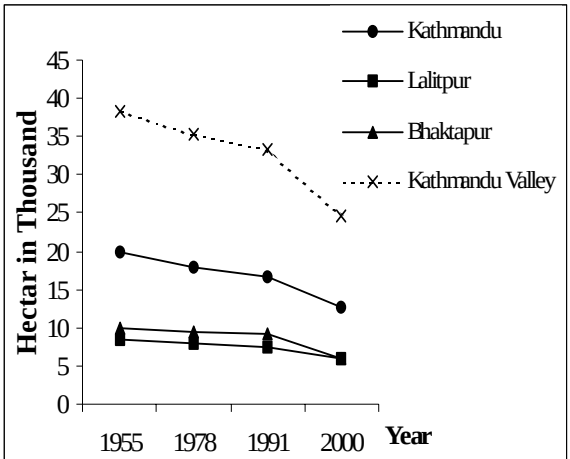


Fig. 3.3: Agricultural Landuse Change

that 10 per cent, 8 per cent and 24 per cent of agricultural land has been converted from 1955 to 1978, 1978 to 1991 and 1991 to 2000 respectively in Kathmandu district. In Lalitpur District, 5 per cent, 6 per cent and 20 per cent of agricultural land has been converted from 1955 to 1978, 1978 to 1991 and 1991 to 2000, respectively. Similarly, 5 per cent, 1 per cent and 36 per cent of agricultural land has been converted from 1955 to 1978, 1978 to 1991 and 1991 to 2000 respectively in Bhaktapur district. This shows that while the lowest rate of conversion happened in Bhaktapur district from 1778 to 1991, the highest rate of conversion also happened in the same district from 1991 to 2000. This phenomenon can be attributed to the value of land, which is cheaper in Bhaktapur district compared to the other two districts.

The real estate business was booming in the beginning of 1990 in the Kathmandu Valley. Land developers bought large tracts of agricultural land in the peri-urban area, and divided them into different sizes and shapes for building construction. Farmers could not compete with these developers to buy the agricultural land. Therefore, the price of land in the Valley has been rising sharply from 1970 onwards. Farmers also sell their land without hesitation when they receive a good price. The cash they receive by selling the land is several times higher than they get from farming. In addition, they have to work to get a good income from the farm. Thus, the main reason of conversion of agricultural land to non-agricultural land is the rising market prices for land. Many young people have abandoned their agricultural land (left it fallow) to work in factories and construction because of the lower risk as compared to paddy farming.

3.5 Expansion of Built-up Area

It has been noticed that the conversion of agricultural land into built-up area has been happening since 1950. However, it picked up pace in 1970. GIS analysis shows that the built-up area has expanded from 3,330 ha in 1955 to 6,152 ha in 1778, to 8,917 ha in 1991 and further to 16,472 ha in 2000 (see Annex B Table B3). Thus the built-up area has expanded five-fold from 1955 to 2000 in the Valley. A district-wise analysis has also been carried out (see Figure 3.4), which shows that the built-up area was much larger in Kathmandu district compared to other districts from 1955 to 2000. However, the growth in built-up area was high in Bhaktapur district from 1955 to 1978 and from 1991 to 2000. Lalitpur district has gradually expanded its built-up area from 1955 to 2000.

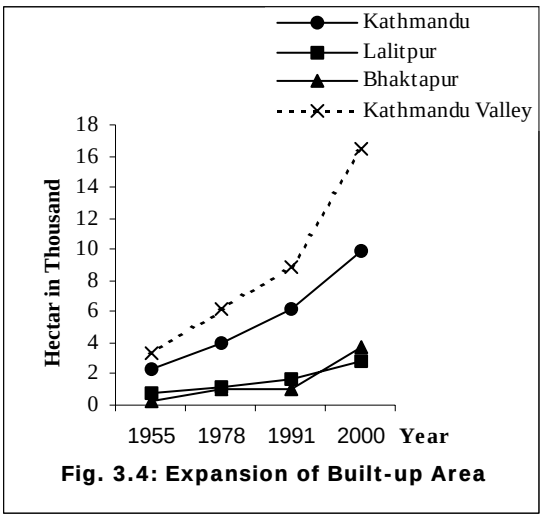
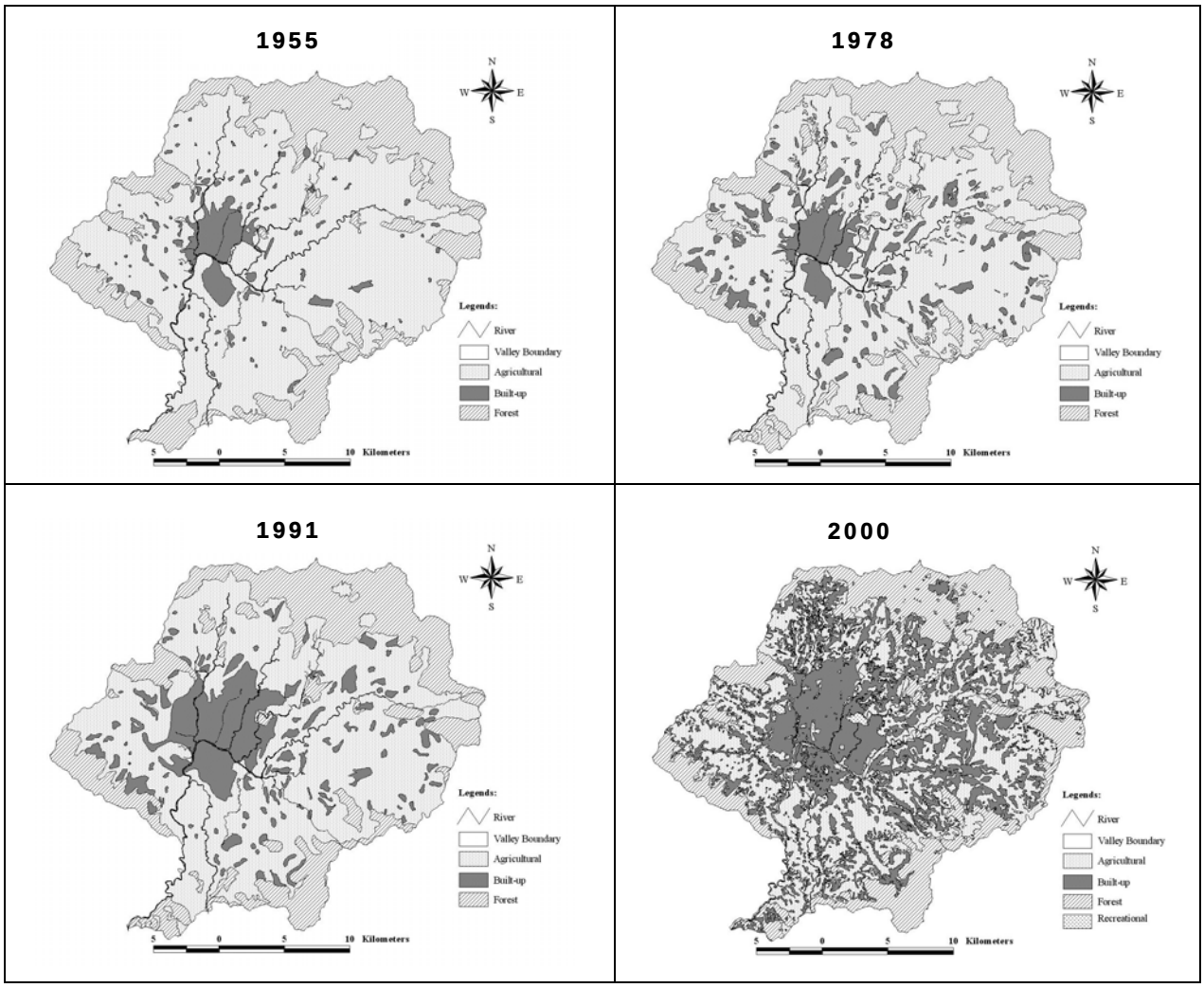


Fig. 3.4: Expansion of Built-up Area

the west (see map 3.1 and 3.4). These areas have expanded on both sides of major road networks. Apart from this, Hardoy *et al* (2001) mention "car-dependent patterns of urban expansion", which are also visible in the Valley. A majority of the affluent migrants from the countryside have started to settle in the peri-urban area of the Valley for its healthy environment. Usually these migrants develop unpaved road networks in their areas on their own. This may not be a good practice for future development.

In general, GIS analysis shows that agriculture land is shrinking, forestland is stable and built-up area is increasing in the Kathmandu Valley (see Figure 3.5).



Map 3.4: Landuse Map of the Kathmandu Valley

Maps of the year 1955 and 2000 show that built-up areas have extended upto Budhanilkantha in the north, Jorpati in the north-east, Bhaktapur in the east, Lubhu and Godavari in the south-east, Chapagaon in the south and Thankot in

However, uncontrolled and unplanned growth has had a negative impact on the whole community, especially in agricultural land use, such as deterioration of quality of agricultural land, shortage of labour and water, solid

waste disposal problem and air, water and noise pollution.

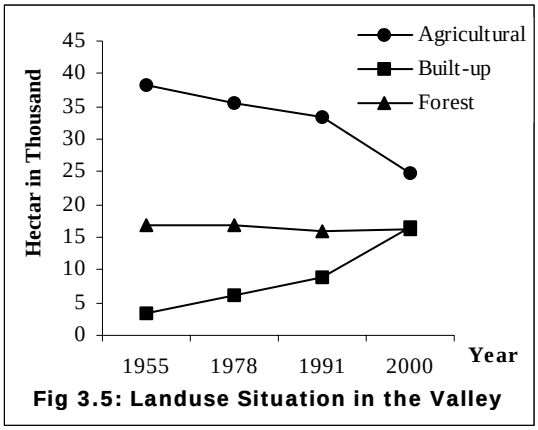


Fig 3.5: Landuse Situation in the Valley

Hence, it is high time Kathmandu Valley realized the necessity of planned development and management of the existing development to minimize the adverse impact on the environment as well as on human beings. The government has initiated the management of unplanned settlements in the Kathmandu Valley. They have introduced Sites and Services, Land Pooling/Readjustment and Guided Land Development (GLD) as a management tool to readjust the unplanned urban growth.

The first Sites and Service program was implemented at Kuleswor area in Kathmandu district. It tried to serve a planned housing settlement in the city center. Similarly, the GLD program was launched in several places to readjust the unplanned urban growth in the Kathmandu Valley. The main aim of this program is to correct the shortcomings in existing informal land development by bringing land owners/tenants and service delivery agencies within the fold of ward-level planning. Recently, Kathmandu and Lalitpur Municipalities have effectively implemented the GLD program, and expanded the narrow roadways in the city areas and created open spaces in the city center with public participation.

The first official land-pooling project in the country was the Gongabu Land Pooling Project (14.4 ha), which was launched in 1988 as a pilot project. Till 2003, a total of 11 land pooling projects have been completed and 14 other projects are under implementation. The new projects aim to cover 1,485 ha of land for readjustment. The total area of the 11 completed projects is 240 ha. The size of the projects varies from 7.3 ha in Kamal Binayak, Bhaktapur Municipality to 44.25 ha in Khusibu Pahiko Kathmandu Metropolitan. In future projects, it covers minimum 5 ha in Chikhu Hanuman Ghaat, Kirtipur Municipality to maximum 827 ha in Harishidi Satelite Town, Lalitpur District. This shows that the government has also started to take initiatives toward the urban management system.

4. Poverty and Urban Growth Inter-relationship

Kathmandu Valley consists of five major growing cities of Nepal. Among these cities, Kathmandu Metropolitan city is the capital city of Nepal. These cities have political, cultural, touristic, educational, administrative, commercial, industrial, security, hospital and financial facilities. Thus these cities are the favorite destination for the rural poor, especially because of the high disparity in income levels and physical facilities between rural and urban areas. Some major causes of poverty generation in the urban areas are explained below:

4.1 Socio-economic Condition

The UNDP Human Development Report 2004 indicates that the per capita income of Nepal was about US $ 230 in 2002. Nepal is ranked 140th in Human Development Index (HDI). Nepal belongs to the category of low human development countries. However, HDI has been steadily increasing since 1975[19] (see Figure 3.6).

The Nepal Living Standard Survey (1996♣) has estimated average US $ 110 per capita income at the National Level. For the Kathmandu Valley, average per capita income is US $ 344, which is three times the national average per capita income. It is four times that of the least per capita income groups. This income gap spurs migration into the Kathmandu Valley, thus increasing the number of urban poor in the Valley. This survey has also identified that 44 per cent of the

[19] http://hdr.undp.org/statistics/data/cty/cty_f_NPL.html, (Date: December 8, 2004) http://hdr.undp.org/statistics/data/country_fact_sheets/cty_fs_NPL.html, http://www.undp.org.np/publications/hdr2003/hdr03_Factsheet_Nepal.pdf

♣ 1 US $ equivalent to NRs 70 in 1996

poor live in rural areas, compared to 23 per cent in the urban area.

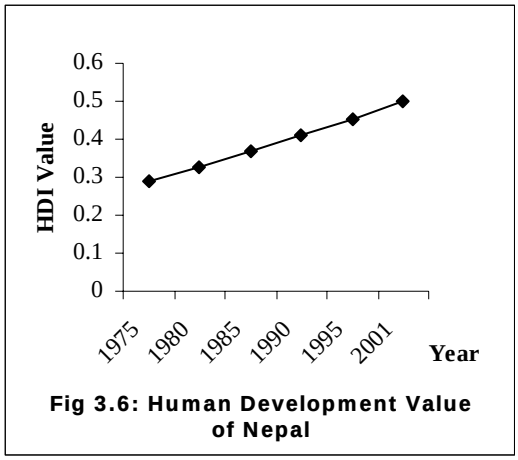


Fig 3.6: Human Development Value of Nepal

Nepal's economy was predominantly agricultural 25 years ago. Farming has been gradually overtaken by non-agricultural sectors (see Annex A Table A10). Still, the agricultural sector has more than 36 per cent in the GDP, while the non-agricultural sector has 63 per cent at the national level. There is no GDP estimation at the regional and sub-regional levels, thus the GDP of the Kathmandu Valley is not known.

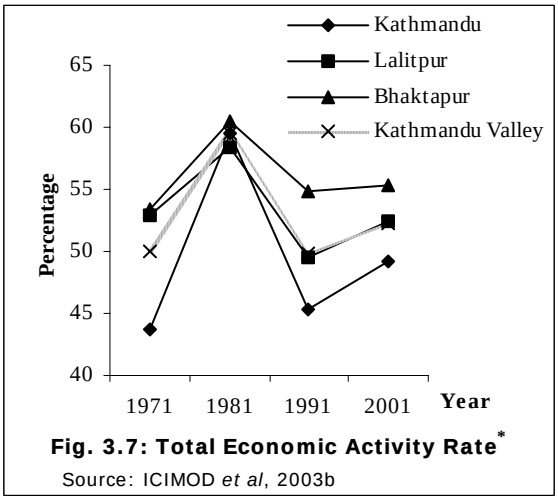


Fig. 3.7: Total Economic Activity Rate*

Source: ICIMOD *et al*, 2003b

Figure 3.7 shows that economically active population rate* was higher in 1981 in the Valley, implying that income-generation opportunities grow during urban expansion (Figure 3.4 shows the expansion trend of built-up area in the Valley. The built-up area has expanded five times from 1955 to 2000). But the economically active population suddenly decreased in 1991, probably due to the disturbance in the political situation, which had a stronger effect on economic activity in Kathmandu Valley compared to other parts of the country. After the introduction of democracy, economic activity took off again. In addition, population migration also had a major effect on the economically active population rate in the Valley. In 1991, almost 15 per cent of the total urban population was a migrant in the Valley (see Table 3.1 and 3.3). Among them, 83 per cent of migrants lived in Kathmandu Metropolitan city, which might be one of the many causes of economic fluctuation and poverty generation (see Table 3.4).

4.1.1 Employment Opportunities

Most of the economic activity in the country is centred in Kathmandu Valley. The growth of construction activity, establishment of new financial institutes, new airlines, etc. are all clustered in the Kathmandu Valley. The reason for this centric nature of economic activity is the centralized decision-making process.

Nepal Rastra Bank (1999) reports (see Table 3.6) that 58 per cent of employees work in government, semi-government and private sectors. Among them, 43 per cent work in the private sector. A little more than 23 per cent of the economically active population is self-employed. Almost 50 per cent of employees are female. Among them 32 per cent female workers fall within the unpaid employment category.

Table 3.6: Distribution of Population by Employment Status in 1995-96 (in per cent)

Employment Status	Male	Female	Total
Employer	1.2	-	0.8
Self-employed	25.7	18.5	23.2
Employee	62.0	49.5	57.7
Government	(8.5)	(6.9)	(7.9)
Semi-government	(8.2)	(5.1)	(7.1)
Private	(45.3)	(37.5)	(42.7)
Unpaid Family workers	11.1	32.0	18.3

Source: Nepal Rastra Bank, 1999

Table 3.7 shows that more than 26 per cent of the economically active population is engaged in the services sector. Only about 15 per cent is engaged in agriculture as against 80 per

* The ratio of the economically active population (aged 10 years and above) to the total population in the same age group; economically active persons were defined as those persons who had worked, and /or had actively sought work, at a single stretch or at intervals, for at least six months. Work included for pay, profit, or remuneration in cash or kind, employed and self-employed, and including extended economic activity.

cent at the national level. About 22 per cent are engaged in manufacturing and processing, followed by 21 per cent in the trade/commerce and related sectors. General labour constitutes little more than 4 per cent.

Table 3.7: Distribution of Population by Industry in 1995-96

Industry	% of Population
Agriculture	14.8
Mining	0.1
Manufacturing and Processing	21.9
Electricity, water and sanitation	1.2
Trade/commerce and related services	20.8
Construction	4.4
Transport and communication	5.5
General Labours (not specified)	4.4
Services (other than commercial)	26.9

Source: Nepal Rastra Bank, 1999

There are various types of employment opportunities available in the Kathmandu Valley, which is shown in Table 3.8. It shows that production workers are more than 20 per cent of the Valley's population and their household number is more than 14 per cent in the Valley. Now, more people are shifting their profession from agriculture to non-agriculture activities.

Table 3.8: Percentage Distribution of Household and Employed Population by Occupational Group in 1995-96

Occupational Group	% of HH	% of Employed People
Professional and Technical	9.57	11.5
Administrative and Managerial	5.71	4.5
Clerical	6.86	7.7
Sales	21.14	15.3
Service		11.8
Agricultural and Fishery	9.86	15
Production	14.86	20.7
Transport and Communication	5.29	4.5
Construction	5.29	4.5
General Labourers	2.86	4.5
Other	18.57	-

Source: Nepal Rastra Bank, 1999

4.1.2 Income and Expenditure

Nepal Rastra Bank (1999) reports that the average per capita income of the urban area of the Kathmandu Valley is more than NRs 24,000 (US $ 343) per annum. Table 3.9 shows that about 24 per cent of the average annual per capita income is generated from kind and more than 17 per cent from the rental value of a self-owned home.

Table 3.9: Annual Average Per Capita Income by Source in 1995-96

Total Annual income = 24,561

Sources of Income	Income in NRs.	In %
A. Current cash income	**18,632**	**75.9**
Wages and salaries	8,667	35.3
Enterprise income • Agricultural • Non-agricultural	5,183 (317) (4,866)	21.1 (1.3) (19.8)
Properly rental income	2,828	11.5
Pension and assistance	1,586	6.5
Other cash income	367	1.5
B. Income in kind	**5,926**	**24.1**
Home produced	71	0.3
Free of cost	689	2.8
Received as part of pay/wages	5	
Enterprise income • Agricultural • Non-agricultural	940 (911) (28)	3.8 (3.7) (0.1)
Rental Value of a self-owned home	4,225	17.2

Source: Nepal Rastra Bank, 1999

Table 3.10: Annual Average Per Capita Income by Occupation in 1995-96

Occupational Group	Average HH size	Income in NRs	Expense NRs.
Administrative and Managerial	5.18	46,534	41,365
Professional and Technical	4.54	35,715	46,056
Sales and Service	5.18	25,179	27,949
Production	4.92	22,832	24,265
Clerical	3.81	24,882	28,012
Transport and Communication	4.51	18,362	21,457
Construction	4.89	15,038	16,074
Agricultural and Fishery	7.23	14,481	15,748
General Labourers	5.15	9,963	10,484
Other	4.85	27,103	31,266

Source: Nepal Rastra Bank, 1999

The highest per capita income in the Kathmandu Valley is in administrative and managerial work (see Table 3.10). Employees in these areas get an average income of Rs 46,534 and they are able to save their money, compared to other occupation groups. The majority of the workers have higher expenses than income. General labourers have the lowest income of Rs 9,963, which is a

quarter of the maximum per capita income. Farmers also a good income compared to other groups but a closer look shows that this group has more than seven members in a household. Thus the income may be not enough to serve the family.

4.2 Development Analysis

ICIMOD *et al* (2003a) report that Kathmandu district is ranked first in the overall composite index of National development; the other two districts of Kathmandu Valley, Bhaktapur and Lalitpur rank 4 and 5 respectively (see Table 3.11). It illustrates that Lalitpur district is placed in the lowest overall development rank. All 20 VDCs of Lalitpur district are located in the hilly area of *Mahabharat* Range and only a part of the district is situated inside the Valley, which has lowered its ranking.

the development of physical, economical and social character in Bhaktapur district in 1974. This project had constructed a number of public and individual toilet facilities in the district.

Drinking water coverage (see Table 3.12) is high in every district, but in reality it is very difficult to get drinking water around the year. The pressure on the drinking water supply is very heavy in the Kathmandu Valley due to the overuse of surface water as well as ground water. In dry season, Valley people suffer from lack of drinking water.

Lalitpur district has a larger population and area than Bhaktapur. But the distribution of the per capita development budget is higher in Bhaktapur district. Table 3.13 shows that Bhaktapur has better infrastructural development than Lalitpur. It also shows

Table 3.11: Major Indices Level of Development

Index	Kathmandu	Lalitpur	Bhaktapur
Overall Composite Index	1	3 (5)°	2 (4)
Poverty Deprivation Index	1 (9)	3 (21)	2 (12)
Scio-economic and infrastructural Development Index	1	3	2
Women's Empowerment Index	1 (2)	2 (9)	3 (19)

Source: ICIMOD *et al*, 2003a

Table 3.12: Health and Primary Sector Development

Indicator	Kathmandu	Lalitpur	Bhaktapur
Health Development Index	**1**	**3**	**2**
Contraceptive Prevalence rate %	77.42	77.2	73.14
Drinking Water Coverage %	90.3	84.77	82.45
Toilet Facilities %	93.2	81.68	91.44
Primary Sector Development Index	**3 (72)**	**1 (43)**	**2 (47)**
Agricultural Credit %	3.48	9.94	2.9
Farm Size %	0.24	0.29	0.22
Livestock per farm household %	3.64	4.52	3.37
Irrigated area in %	41.43	57.4	88.88

Source: ICIMOD *et al*, 2003a

Kathmandu district tops in total development facilities (see Table 3.12 and 3.13). However, it takes third place in development activities related to agriculture.

Agricultural facilities are high in Lalitpur district, with only the irrigated agricultural area lower than Bhaktapur district. Bhaktapur district has better sanitation facilities than Lalitpur, because of the involvement of the GTZ project for

that Kathmandu has higher non-agricultural occupation than other districts in the Valley.

4.3 Poverty and Deprivation

All three districts are placed in the top level of the National poverty and deprivation index. Among these districts, Kathmandu ranks first, Bhaktapur second and Lalitpur third. Table 3.14 shows that more than 13 per cent of the child population are used for economic activity in Bhaktapur district, which is close to the figure for Lalitpur district (12.82 per

° Number inside the bracket is National level Ranking

cent). The child illiteracy rate is high in Lalitpur district, because people do not want to send their children to school. They prefer to use their children for household as well as agricultural activities. The school dropout rate is also high in this district.

Educationally disadvantaged groups in a particular district are assumed to be those caste/ethnic groups among the 103 in Nepal, whose literacy rates are below or equal to 30 per cent in that district. The percentage of educationally disadvantaged groups is higher in Bhaktapur district. It shows that there are still ethnic minority groups who do not have access to education facilities.

Marginal farm households are taken as those households with operational agricultural landholdings (worked by the farm household as owner or tenant) of 0.5 ha or less. These types of farm households are higher in Bhaktapur district. It shows that the majority of the population is still dependent on agricultural activities. These marginal farm households population do not have other skills, apart from agriculture.

The major food production in each district is converted into kilocalories per capita per day and used as an indicator of the availability of food. Major food production is taken as the total production of rice, maize, wheat, millet, barley and potatoes. In this regard, Bhaktapur district is richer than the other two districts. It indicates that a large proportion of Bhaktapur's population is still involved in farming and produces surplus food.

Table 3.13: Infrastructural Development in the Kathmandu Valley

Indicator	Kathmandu	Lalitpur	Bhaktapur
Infrastructural Development Index	1	3	2
Road Density 100 sq. km	203.54	87.79	148.74
Banks Density (%)	3.76	1.3	1.72
Cooperatives Density (%)	27.69	23.39	25.37
Health Institutions Density (%)	3.48	3.77	4.25
Post Office Density (%)	3.52	3.99	4.28
Forest User Households (%)	6.37	15.33	17.37
Per Capita Budget Expenditure (NRs.)	20,537	1,500	1,278
Per Capita Development Budget Expenditure (NRs.)	16,532	4,238	4,871
Overall Literacy Rate (%)	77.21	70.92	70.57
Ratio of non-agricultural and agricultural occupation (%)	3.69	1.78	1.41

Source: ICIMOD *et al*, 2003a

Table 3.14: Poverty and Deprivation Index Level

Indicator	Kathmandu	Lalitpur	Bhaktapur
Child Deprivation Index	**1 (4)**	**3 (10)**	**2 (6)**
Child Illiteracy Rate (%)	5.65	9.38	4.17
Child Economic Activity Rate (%)	10.36	12.82	13.85
Child Marriage percentage (%)	0.42	0.56	0.46
Gender Discrimination Index	**1 (7)**	**2 (15)**	**3 (16)**
Educationally Disadvantaged percentage (%)	0.05	0.06	0.4
Marginal Farm Households percentage (%)	16.8	27.09	35.42
Per capita food production (kilo calories)	2,263	2,385	4,267

Source: ICIMOD *et al*, 2003a

5. Conclusion

The rate of population growth has increased in relation to urban growth in the Valley. In 1971, the population density per sq. km was only 623, but it increased to 1,837 in 2001. In the core city area, average population density increased to 9,555 per sq. km in 2001. Similarly, the number of households also increased from 104,993 in 1971 to 345,562 in 2001. This population growth has converted a large portion of prime agricultural land into built-up areas. GIS analysis confirms that almost 13,575 ha of agricultural land has been converted for non-agricultural use from 1955 to 2000 (see Annex B Table B2). It shows that unplanned urban

development has been happening mainly in the agricultural land area of the Valley. The size of land available for urban and peri-urban agriculture is continuing to decrease, while the demand for food in the cities is rising due to the large-scale in-migration from rural areas. This creates pressure on limited resources and physical facilities in these areas. A total 23 per cent of the vegetables consumed in the urban area is produced by poor farmers in urban and peri-urban agricultural areas of the Valley. This figure can be improved to 76 per cent by improving farming practices and constructing a road networking system from the peri-urban to the urban area.

The study found that Kathmandu district has the largest concentration of built-up area in the Valley. These developments have happened in a haphazard way. Unplanned settlements have sprung up on both sides of major road sections. These development patterns have mainly followed infrastructure development. This uncontrolled urban growth is not only creating environmental problems but also threatening the ecological balance, diluting the system of multi-habitation and generating urban poverty in the Valley.

Overall acceptance of the land use planning system and the willingness to abide by rules are important for the successful implementation of any grand scheme. However, since the government does not enforce land use regulation effectively or consistently, the willingness of the general public to abide by these regulations is not strong. Illegal conversion of agricultural land is quite prevalent and, for some land use categories, is almost out of control, which creates conflict between government and local communities.

Slowly, local people have also started to leave their ancient multi-habitation practice. They have started to live in individual houses. In addition, weaker rules and regulations give space for slum and squatter growth in the city area. In the end, the haphazard urban development will generate urban poverty.

With the urban growth, non-agricultural activity has overtaken agricultural activity at the national level. The non-agricultural sector has a higher GDP share than the agricultural sector. This is prominent in the Kathmandu Valley. The per capita income increase of the Valley's people is three times the national average per capita income. It is four times when compared to least per capita income groups of the country. Due to this income gap, the rural poor have been migrating to urban areas and increasing the urban poverty level in the Valley.

Kathmandu district ranks first in total development facilities, but third in development facilities related to agriculture. All agricultural facilities are high in Lalitpur district, but it has poor irrigation facility compared to Bhaktapur. Bhaktapur produces surplus food, which it sells to the city area of the Valley. Bhaktapur's per capita food production is at 4,267 kilo-calories, which is higher than the other two districts. However, Bhaktapur also has the highest percentage of educationally disadvantaged and marginal farm households.

Lalitpur district comes third in total infrastructural development. This is mainly because all 20 VDCs (68 per cent of land) of Lalitpur district are situated in the hilly area of *Mahabharat* Range; only 32 per cent of the district's area is situated inside the Valley, which lowers its ranking.

6. Recommendations

On the basis of findings, it is concluded that unplanned and uncontrolled urban growth are the main causes for quality and quantity of agricultural land use change, which also generates slum and squatter settlements in the study area. Therefore, there is need to change and stop existing practices, which are not suitable to maintain sustainable development. Government bodies have to take sincere initiatives to improve the situation. They have to improve their plans and policies, and implement them effectively at the local level through public and private involvement.

To maintain the sustainable balance in between agricultural and non-agricultural sectors and to minimize the urban poverty, some recommendations are summarized as follows:

Stakeholder Participation: The total urban environmental management (UEM) system of any country is defined as a

closed chain of seven links: the people, their government, the private sector, the educational system, communications, non-government organizations and international non-governmental organizations or donor organizations. These seven groups are the key stakeholders for the UEM system because they have the same common interests. Among these, the government sectors (local officers, MPPW, MLD and DUDBC) have to play a vital role to collect these groups in one place to find out better ways of sustainable development.

Public Participation in Urban Planning Process: Usually, people only participate if the government has properly publicized the planning scheme at the local level. If the up-coming planning and policy are not advertised suitably at the local level, nobody will take any interest in it. In practice, the government promotes the involvement of the local representative of the public for the planning meeting. Till now, there has been no direct and effective communication between government and local residences regarding urban development. This creates a gap between both parties and accelerates conflicts. Inputs in terms of public ideas and comments concerning urban land use planning will make it easier for decision makers to establish appropriate and acceptable regulations to maintain sustainable balance between agricultural and non-agricultural development in the locality. These kinds of practice also help improve the quality of life at the local level, and minimize urban poverty.

Urban Land Use Planning and Management: Urban land use management is a part of urban environmental management as a whole. It is necessary to implement improved land use management practices in the city area, which deal comprehensively with potentially competing land requirements for agriculture, industry, transport, urban development, green spaces, preserves and other vital needs. Hence, comprehensive land-use zoning is necessary to ensure a balance of lands for all purposes. It is also one of the best ways to minimize urban poverty.

To maintain a sustainable balance between the agricultural and non-agricultural sectors, there is a need to implement the following urban policies at the local level that also assist to minimize the rural-urban migration and control the urban poor generation.

1. Zoning and land-division policy and practice should be restructured to serve as a substantive control over conversion of rural agricultural land. Policy should consider rural development activities in the urban context and carefully assimilate them into development proposals to maintain the sustainable rural-urban linkage in the Valley. It also has to be considered that sustainable agricultural systems are an essential foundation for rural as well as peri-urban development, which balance the economical level between the rural and urban population and minimize the rural-urban migration.
2. The “Green belt” concept, which restricts or prohibits the sale or construction of non-farm buildings helps protect productive agricultural land. However, to manage this concept for the long term, the government has to purchase the prime agricultural land and hold it for agricultural zoning. This will also minimize the conflict between government and local communities. On the other hand, the government has to provide an attractive subsidy to farmers who want to keep their land only for agricultural use. The government needs to attract these people by giving them training and skills to produce more cash crops including vegetables and fruits. This will give good opportunity to the farmers and generate employment opportunities for themselves as well as for other people.
3. Urban and peri-urban agriculture has to be put at the highest priority level in the Valley development plan. There is an urgent need to explore the benefits and constraints of urban and peri-urban agriculture in detail for sustainable development of urban environments, considering the importance of urban and peri-urban agriculture in feeding the cities’ people.
4. Tax policy, to the extent that it encourages conversion of agricultural land, must be reformed.

5. Government has to implement industrial zoning plans and policies to control the haphazard growth of individual industries. Industries should be made liable to protect their environment properly. Government agencies have to maintain their regular monitoring and cross-checking to strengthen their urban policies at the local level for sustainable urban environmental management.

Especially, for the Kathmandu Valley, urban development planning processes may be more effective when there is participation and cooperation between the key stakeholders, right from the initial phase of urban development planning process.

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ANNEX A
Non-spatial Data

Table A1: Population Distribution form 1971 to 2001

Year / Districts	1971	1981	1991	2001	Area Sq. km
Kathmandu	353,756	422,237	675,341	1,081,845	395
Lalitpur	154,998	184,341	257,086	337,785	385
Bhaktapur	110,157	159,767	172,952	225,461	119
Kathmandu Valley	**618,911**	**766,345**	**1,105,379**	**1,645,091**	**899**

Source: ICIMOD, CBS and SNV-Nepal, 2003b

Table A2: Population Density (per sq. km) from 1971 to 2001

Year / Location	1971	1981	1991	2001
Kathmandu	646.71	1068.95	1709.72	2738.85
Lalitpur	392.89	478.81	667.76	877.36
Bhaktapur	830.68	1342.58	1453.38	1894.63
Kathmandu Valley	**623**	**963**	**1277**	**1837**
Nepal	79	102	126	157

Source: ICIMOD, CBS and SNV-Nepal, 2003b

Table A3: Average Annual Population Growth Rates (in percent) from 1971 to 2001

Year / Location	1971/81	1981/91	1991/2001
Kathmandu	1.77	4.7	4.71
Lalitpur	1.73	3.33	2.73
Bhaktapur	3.72	0.79	2.65
Kathmandu Valley	**2.41**	**2.94**	**3.36**
Nepal	2.66	2.08	2.25

Source: ICIMOD, CBS and SNV-Nepal, 2003b

Table A4: Number of Households from 1971 to 2001

Year / Location	1971	1981	1991	2001
Kathmandu	59,507	67,933	127,196	235,387
Lalitpur	26,578	29,943	45,682	68,922
Bhaktapur	18,908	25,047	28,160	41,253
Kathmandu Valley	**104,993**	**122,923**	**201,038**	**345,562**
Nepal	2084,062	2,584,948	3,328,721	4,253,220

Source: ICIMOD, CBS and SNV-Nepal, 2003b

Table A5: Average Household Size from 1971 to 2001

Year / Location	1971	1981	1991	2001
Kathmandu	5.94	6.22	5.31	4.6
Lalitpur	5.83	6.16	5.63	4.9
Bhaktapur	5.83	6.38	6.14	5.47
Kathmandu Valley	**5.9**	**6.3**	**5.7**	**5.0**
Nepal	5.6	5.8	5.6	5.4

Source: ICIMOD, CBS and SNV-Nepal, 2003b

Table A6: Rural Population from 1971 to 2001

Year / Location	1971	1981	1991	2001
Kathmandu	203,354	187,077	261,077	369,164
Lalitpur	95,949	104,466	139,883	174,794
Bhaktapur	70,045	111,295	111,830	105,167
Kathmandu Valley	**369,348**	**402,838**	**512,790**	**649,125**
Nepal	11,094,045	14,066,124	16,808,823	19,881,972

Source: ICIMOD, CBS and SNV-Nepal, 2003b

Table A7: Urban and Agricultural Area in the Kathmandu Valley from 1984 to 2020 (projection)

Area \ Year	1984	1991	1994	2000	2010	2020
Urban Area (% of total valley area)	4.8	11	13.1	18	26	34.3
Agricultural Area (% of total valley area)	64	56	49.6	42.2	28.3	14.5

Source: HMG/IUCN, 1995

Table A8: Municipalities with Population above 50 thousand in Nepal

S. No.	Municipality	District	1991	2001	Average Annual Growth Rate
1.	Kathmandu	Kathmandu	421,258	671,846	4.67
2.	Biratnagar	Moran	129,388	166,674	2.53
3.	Lalitpur	Lalitpur	115,865	162,991	3.41
4.	Pokhara	Kaski	95,286	156,312	4.95
5.	Birgunj	Parsa	69,005	112,484	4.89
6.	Dharan	Sunsari	66,457	95,332	3.61
7.	Bharatpur	Chitwan	54,670	89,323	4.91
8.	Mahendra Nagar	Kanchanpur	62,050	80,839	2.65
9.	Janakpur	Dhanusha	54,710	74,192	3.05
10.	Butwal	Rupandehi	44,272	75,384	5.32
11.	Bhaktapur	Bhaktapur	61,405	72,543	1.67
12.	Hetauda	Makwanpur	53,836	68,482	2.41
13.	Dhangadhi	Kailai	44,753	67,447	4.10
14.	Nepalgunj	Banke	47,819	57,535	1.85
15.	Trijuga	Udaypur	37,108	55,291	3.88
16.	Siddhartha Nagar	Rupandehi	39,473	52,569	2.87

Source: http://www.mope.gov.np/population/chapter9.php

Table A9: Land Pooling Projects in the Kathmandu Valley

Municipality	Project	Project Period	Area (ha)	Plot No.
Kathmandu Metropolitan (Completed Projects)	Gongabu	1988-1996	14.4	406
	Dallu	1991-2003	20	691
	Khusibu Pahiko	1995-2003	44.25	1569
	Chabahil	1995-2002	10.9	292
	Sinamangal	1995-2003	36	1070
	Nayapati*		30.5	1600
	Gothatar*		53	2850
	Ichangu*		142.5	6000
	Nepaltar*		25.5	1400
	Kapantar*		14	800
	Bagmati First Stage*		51	2800
	Chamati*		73	3170
	Dhumbarahi South Area*		39.5	2160
Kirtipur Municipality	Tusal*		51	2800
	Chikhu Hanuman Ghaat*		5	280
Lalitpur Sub-metropolitan (Completed Projects)	Bagamti Corridor	1992-2001	9.8	258
	Lubu	1993-1996	13.5	243
	Sainbu	1991-2003	22.5	760
	Harishidi Satelite Town*		827	40,000
Bhaktapur Municipality (Completed Projects)	Kamalbinayak-I	1991-1996	7.3	205
	Liwali	1995-1998	34	770
	Kamalbinayak-II*		28.5	1600
Madhyapur Thimi (Completed Projects)	Sinchitar	1996-2003	26.9	920
	Kamerotar*		46	2520
	Manahari*		98	-

Source: Gorkhaly, 2003
Note: * Under the process of implementation

Table A10: Share in Gross Domestic Product (in per cent)

Fiscal Year	Agricultural GDP at factor cost	Non-agricultural GDP at factor cost
1964/65	68.0	32.0
1969/70	70.0	30.0
1974/75	69.7	30.3
1979/80	58.6	41.5
1985/86	50.3	49.7
1990/91	47.5	52.5
1995/96	41.2	58.8
1999/2000	39.2	60.8
2000/01	36.8	63.2

Source: HMG/MOF, 2001; Poudyal, 1983

Table A11: Major Urban and Peri-urban Agricultural Areas in the Kathmandu Valley

District	Urban	Peri-urban
Kathmandu	Gongabu Nayabazar Shobhabhagabati Kalimati Sowayambhu Teku Tahachal Kalanki	Sanku Thankot Sundarija Pharping Balambu Sitapila
Lalitpur	Sanepa Balkumari Shankhamul	Lele Sishneri Imadol Godawari/Kitni Thecho Chapagaon Thaiba Chhampi
Bhaktapur	Thimi Sanothimi Kamal Binayak Bode Kausaltar Jagati Nagadesh Byasi Lokanthali	Bageswori Balkot Sipadol Gamcha Chundevi

Source: APO, 2002

ANNEX B
Conversion of Spatial Data to Numerical Data

Table B1: Land Use in the Kathmandu Valley from 1955 to 2000 (unit in hectar)

Year / Land Use	1955	1978	1991	2000
Agricultural	38,226	35,378	33,416	24,651
Built-up	3,330	6,152	8,917	16,472
Forest	16,810	16,831	16,028	16,350
Recreational				416
Water Body				473

Note: Recreational and Water body are not indicated in 1955, 1978, 1991 digital data. Because map scale of 2000 follows 1:25000 scales so recreation and water body are visible in the map

Table B2: Agricultural Landuse Change in the Kathmandu Valley (hectar)

Year / District	1955	1978	1991	2000
Kathmandu	19,928	17,945	16,545	12,630
Lalitpur	8,422	8,024	7,566	6,042
Bhaktapur	9,875	9,409	9,305	5,979
Total	38,226	35,378	33,416	24,651

Table B3: Built-up Area in the Kathmandu Valley (unit in hectar)

Year / District	1955	1978	1991	2000
Kathmandu	2,363	3,990	6,185	9,913
Lalitpur	729	1,198	1,674	2,860
Bhaktapur	238	965	1,058	3,699
Total	3,330	6,152	8,917	16,472

Table B4: Forest Area in the Kathmandu Valley (unit in hectar)

Year / District	1955	1978	1991	2000
Kathmandu	11,446	11,803	11,008	10,586
Lalitpur	3,250	3,179	3,160	3,299
Bhaktapur	2,110	1,849	1,860	2,464
Total	16,806	16,831	16,028	16,350

ANNEX C
Pictures

Fig C1: Built-up Area in the Kathmandu Valley

Fig C2: Unplanned Built-up Growth in the Agricultural Land

Fig. C3: Emergence of Housing Complex in the Peri-urban Area

Fig C4: Expansion of Slum Settlement in the City Area

Fig C5: Urban and Peri-urban Agricultural Area

Fig C6: Agriculture Practice in the Kathmandu Valley

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DEVELOPMENT OBJECTIVE. UMP is designed to strengthen the contribution that cities and towns in developing countries make towards human development, particularly in urban poverty reduction through the adoption of participatory urban governance as a tool for achieving improved living and working conditions of the urban poor. This is to be achieved through more efficient and equitable use and distribution of resources, including the harnessing of skills and initiatives of individuals, communities, private and voluntary organizations and local authorities.

IMMEDIATE OBJECTIVES

- *Pro-poor participatory urban governance* practiced by cities in participating countries through institutionalization of the city consultation process, adoption and implementation of action plans/city development strategies and strengthening of the decentralization process at national and subnational level
- *Strengthening the capacity of partner institutions* to institutionalize the city consultation process, promote effective pro-poor policies and participatory urban governance practices, and become repositories of knowledge in urban management.
- Sharing of information, insights, experiences and practices in the field of urban management, and the adaptation of lessons learnt from these through the creation of a *knowledge management* system that is integrated with complementary global and regional initiatives.

UMP focus since its commencement in 1986:

Phase 1 (1986-1991). Focused on applied research in the four theme areas of land management, municipal finance and administration, infrastructure and urban environment, with the purpose of developing urban management policy frameworks and tools at the global level.

Phase 2 (1992-1996). Aimed at using urban management frameworks and tools developed during phase 1 to build capacity at the regional level and to extend it to the country and city levels. A fifth component, the alleviation of urban poverty, was added to the substantive components of Phase 1. The main mechanisms were the establishment of regional capacity, including regional panels of experts and the holding of workshops and consultations at the country level to introduce these policies and tools.

Phase 3 (1997 November-2001). The overriding thrust is to build and strengthen the capacity of local authorities and other stakeholders to address urban problems The three theme areas which the programme specifically focuses on are Urban Poverty Reduction, Urban Environmental Management, and Participatory Urban Governance. Gender responsiveness is central to all three UMP themes.

Phase 4 (2001-2005). Continue with similar themes as in the phase 3, but with stronger focus on pro-poor governance and activities that lead to a definite impact on the living conditions of the urban poor. The partner institutions are expected to be fully engaged in city consultations, while the UMP regional offices are expected to focus on knowledge management through the network of regional institutions and municipal associations.

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