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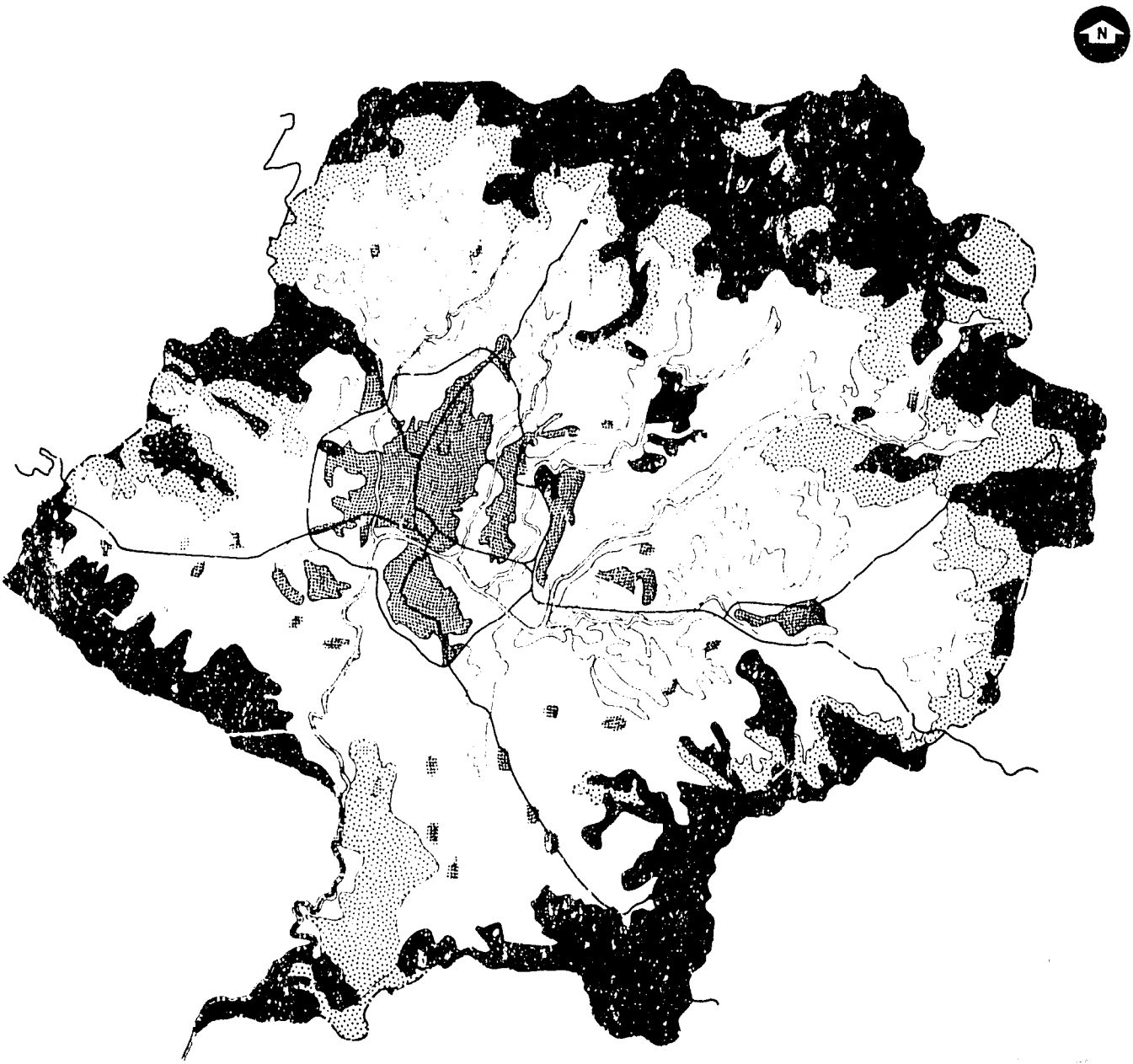
KATHMANDU VALLEY
URBAN LAND POLICY STUDY



APRIL 1986

KATHMANDU VALLEY TOWN PLANNING OFFICE

U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT

KATHMANDU VALLEY URBAN LAND POLICY STUDY

Prepared for

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and
The United States Agency for International Development

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LIST OF ACRONYMS AND CONVERSIONS

BNP	Bhaktapur Nagar Panchayat
CBS	Central Bureau of Statistics
CDO	Chief District Officer
CEDA	Centre for Economic Development and Administration
DHBPP	Department of Housing, Building, and Physical Planning
GC	Guthi Corporation
HMG	His Majesty's Government of Nepal
KNP	Kathmandu Nagar Panchayat
KVTDB	Kathmandu Valley Town Development Board
KVTDC	Kathmandu Valley Town Development Committee
LDC	Less Developed Countries
LNP	Lalitpur Nagar Panchayat
LRMP	Land Resources Mapping Project (HMG/Government of Canada)
MPLD	Ministry of Panchayat and Local Development
MWT	Ministry of Works and Transport
NPC	National Planning Commission
TPIC	Town Plan Implementation Committee
WSSB	Water Supply and Sewerage Board

CONVERSIONS

U.S.$ 1.00	=	NRs. 20.9 (January 1986)
Ropani (of land)	=	508 square meters or 0.0508 hectares
1 mile	=	1.67 kilometers

PREFACE

This report was prepared for His Majesty's Government of Nepal and the US Agency for International Development. The study was financed by the AID Regional Office of Housing and Urban Programs, Bangkok, Thailand, and the AID Mission to Nepal. The work was carried out between October 1985 and January 1986.

Preparation of this study involved close cooperation between the Kathmandu Valley Town Planning Team, the Department of Housing, Building, and Physical Planning, the study team, and the newly-formed Urbanization and Shelter Working Group of the National Planning Commission.

The study team is grateful to the DHBPP and KVTPT for the kind cooperation provided by Mr. H.L. Rajbhandary, Chief Engineer, and Mr. P.B. Chhetri, Chief Planner. The study team is also grateful to various HMG, District, and Town Panchayat Offices that contributed data for this report. The team also wishes to extend its appreciation to Ms. Viviann Pettersson of RHUDO/Bangkok who was involved in the study's conception and review.

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CHAPTER I

SUMMARY AND RECOMMENDATIONS

A. THE KATHMANDU VALLEY CONTEXT

1. Valley Population

The Kathmandu Valley accommodates one of the largest and most rapidly growing populations in the country, and it is becoming progressively urbanized. By 1981, about one-half of the Valley population of 739,000 resided in the town panchayats of Kathmandu, Lalitpur, and Bhaktapur. There are also 100 village panchayats in the Valley with an average population of 4,000 persons. Most of the Valley population resides in the central, western, and southern portions of the Valley. Until recently, most settlements were located on elevated "tar" areas, leaving the flood plains to agriculture. However, as Greater Kathmandu has expanded, these areas have been increasingly encroached upon.

2. The Valley's Role in Agriculture

The Valley is one of the most agriculturally productive areas in Nepal. Its yields of major food grains are significantly higher than national averages. Unlike national trends which show general declines in yields, those of the Valley have been progressively improving. In fact, despite a reduction of 15 percent in arable areas for the eight major crops, an 18 percent increase in production occurred between 1967 and 1984. As of 1981, the Valley produced about 97 percent of its food grain needs largely due to surpluses generated in Bhaktapur District.

3. Land Resources

Land resources in the Valley have been well documented by the Land Resources Mapping Project. Accordingly, the Valley's land capability was ranked as follows:

- Class I:
  Prime agricultural land; 34 percent of the Valley area; consisting of alluvial plains and undissected "tar" (elevated areas).
- Class II:
  Secondary agricultural land; 23 percent of Valley area; consisting of dissected "tars" and alluvial fans.
- Class III:
  Tertiary agricultural land; 28 percent of the Valley area; slopes of 5-30 degrees.
- Class IV:
  Land unsuitable for agriculture but adequate for forestry; 15 percent of the Valley area.

The Valley's arable areas can no longer be extended to increase production or compensate for the loss of urbanized arable land. Furthermore, the denuded forest areas are too limited to provide needed fuelwood and fodder for the Valley.

4. Conversion of Agricultural Land to Urban Use

Valuable agricultural land in the Valley is rapidly being converted into urban land. By the year 2020, at current rates of expansion; all Class I and II lands will be urbanized. This would represent 60 percent of the total Valley area. However, it appears that current rates of agricultural land conversion can be considerably reduced if the following public policy actions are taken:

- Agricultural areas where urbanization is inevitable should be identified;
- Priority agricultural areas requiring protection should be identified;
- Land use regulations and the capacity to enforce them should be developed;
- Alternative areas for urban development should be designated and provided with access roads.

B. PHYSICAL CHARACTERISTICS OF URBAN EXPANSION

1. Urban Population and Densities

The town panchayats of Kathmandu, Lalitpur, and Bhaktapur had populations of approximately 235,000, 81,000, and 50,000 respectively in 1981. Kathmandu was the most rapidly growing of the three towns with an annual growth rate of 4.6 percent per annum, part of which was due to boundary changes. The other towns grew at 3.2 and 2.3 percent per annum respectively. The highest densities in each of the three town panchayats are found in the old cities or city cores. In Kathmandu, for example, densities on the order of 1,200 persons per hectare can be found, while in fringe areas densities are as low as 14 to 50 persons per hectare. In Greater Kathmandu as a whole, an additional 32,000 persons were added to existing core and suburban areas between 1971 and 1981. At the same time, the metropolitan area's residential land doubled. About 43,000 people were accommodated in new residential areas of Greater Kathmandu.

Lalitpur shares with Kathmandu the concomitant characteristics of high and increasing density of the city core with low-density urban sprawl. Both cases place heavy demands on existing infrastructure systems and resources. Between 1971 and 1981, all Lalitpur wards increased in density, but the core area had the highest density of 600 persons per hectare while outlying wards had densities ranging from 17 to 50 persons per hectare.

Bhaktapur is the slowest growing of the three towns, but some increase in population occurred between 1971 and 1981 due to growth in tourism and foreign aid to the town. Rhaktapur still consists primarily of the core area, where densities range between 200 and 600 persons per hectare. Though major suburban growth has not occurred, some development is taking place outside the town, near the Arniko Highway linking Bhaktapur with Kathmandu.

2. Expansion of the Built-up Areas

The period between 1964 and 1981 led to a rapid, accelerating expansion of Greater Kathmandu. Several factors contributed to this growth including in-migration, the relocations of Government offices, growth of foreign aid and tourism, and construction of the Ring Road.

In 1954, urban areas in the Valley were located only on "tar" lands, and there were no vacant lands within the town areas. By 1981, Kathmandu and Lalitpur had tripled in area. In fact, their combined areas increased by 88 percent between 1971 and 1981 while residential areas increased by 134 percent in Kathmandu and 94 percent in Lalitpur. Rapid growth of the built-up area also led to encroachment on low-lying areas and floodplains in places like Baneswar and Teku.

Within town panchayat boundaries, virtually all land uses expanded at the expense of open space and agricultural land. Agricultural areas within the towns fell from 66 to 40 percent in Kathmandu and 71 to 52 percent in Lalitpur. Public land use, which made up 16 and 9 percent of Kathmandu and Lalitpur's built-up areas in 1971, increased to 23 and 17 percent of their respective areas in 1981. In general, inadequate planning judgment has been shown in the location and utilization of public lands and facilities (examples: Kirtipur Campus, Engineering Institute). Lack of Government policy regarding land use in the Valley and the utilization of publicly-owned lands is a serious constraint to planning efforts.

During 1971-1981, Greater Kathmandu's housing stock became more diversified with greater variety in layout, plot and house size, density, and infrastructure standards. Over the period, high- and moderate-standard housing, with tendencies towards densification, experienced the most growth. Though fringe areas are presently of very low density, environmental problems will begin to occur as densification takes place. Consequently, planning standards governing the growth and densification of these areas need to be developed.

3. Framework for Future Physical Expansion

Between 1981 and the year 2001, the populations of Kathmandu, Lalitpur, and Bhaktapur will be on the order of 577,000, 152,000, and 79,000 respectively according to WSSB projections. Thus, their combined built-up areas are expected to increase by about 40 square kilometers. A proposed physical framework to guide urban planning for the year 2001 is presented in Figure III.17. On the basis of the findings of this report, the following principles are recommended to guide future development planning:

- General densities should be increased in fringe areas and new town extensions to reduce arable land loss. At the same time, appropriate land development standards should be developed and implemented to avoid environmental problems.
- Bhaktapur District (north and south of BNP) and the area near Sanagaun in Lalitpur District should be reserved primarily for agriculture. No further access roads to these areas should be introduced.
- Where feasible, flood plains subject to urbanization should be protected by regulation and enforcement.

- Acquisition and utilization of public land and approvals for permits concerned with land use and location of public and private facilities should be coordinated with a planning process. Utilization of existing public land should also be made more efficient.
- Future development should be focused upon "tar" lands both within and outside existing town panchayat boundaries. This will require provision of access roads, water, electricity, and other infrastructure for these areas. Public investment plans for these activities should include cost recovery for revolving investment.

C. LAND DEVELOPMENT

1. Characteristics of Housing and Finance

In 1971, about 70 percent of the housing stock in Kathmandu and Lalitpur town panchayats was over 30 years old; most was more than 50 years old. Since then, a good deal of new housing stock has been added. According to town panchayat data for the two towns, about 12,000 building permits were issued between 1978 and 1982. Thus, if new construction corresponds with the permit data, housing construction is more than keeping pace with household formation. However, distribution is probably skewed to the upper end of the income spectrum. As a rule, building standards of the new development areas, even for moderate-income groups, are relatively high in comparison with other LDCs and towns in the country.

Access to formal housing finance in the Valley, as elsewhere in Nepal, is limited to members of the Provident Fund and employees of various banks and corporations. In any case, no long-term financing is available. Due to a lack of formal credit mechanisms, households must rely on their own assets and savings or turn to family and other sources of informal lending for housing finance.

The lack of a formal housing finance system may be contributing to haphazard, low-density urban sprawl. Given past increases in land values and socio-cultural attachments to land, households are reluctant to dispose of land yet remain unable to develop it. If more households had access to credit, they would be able to construct rental properties, thereby preserving their assets in land.

2. Affordability of Land and Housing

To determine the affordability of land and housing for low- and moderate-income groups earning less than Rs.1,000 monthly (roughly equivalent to the median household income for Greater Kathmandu), a simple affordability analysis was carried out on the basis of a theoretical housing project. The analysis suggests that even if long-term financing were provided, and households could afford 50 percent downpayments, they would be able to afford only a small core house of 18 m2, and a minimally-serviced plot of 95 m2 at a distance of 4 to 5 miles (6.4 to 8 kilometers) from the Kathmandu city center. The price of land appears to be a dominant factor in excluding low-income households, with no land assets in the Valley, from homeownership.

3. Formal Residential Development

Public residential development experience is limited to schemes launched by the KVTDB: The Kuleswar, Galfuttar, and Dullu projects. After eight years of development, Kuleswar is the most advanced. Nevertheless, infrastructure systems are still incomplete; and, despite the fact that the plots were sold long ago to finance land development, no titles have yet been granted. Conceptually, the project made a contribution by introducing better physical land development standards as a model for other areas. However, due to inexperience and poor management, the projects are not replicable as currently conceived. On the basis of this experience, the KVTDB is now planning to delegate management and development authority for the Dullu project to a private developer. This is more consistent with the existing capacity of the organization.

4. Informal Land Development

Informal (unregulated) land development in the Kathmandu Valley is dominant and depends upon the introduction of Government road extension programs carried out in and around the towns. Real estate brokers are responsible largely for the development of residential areas adjacent to these roads. The brokers, possessing a keen understanding of land issues, thoroughly research all matters and then negotiate with landlords and tenants to introduce side-roads and subdivide property. The brokers' profit is the difference between the market price of the land with and without an access road. This is usually a difference of 50 percent.

Real estate brokers play a key and unrecognized role in the urban development process. Brokers are directly or indirectly responsible for the residential expansion brought about in recent decades. The public sector can facilitate and improve this process through: official recognition of brokers; provision of planning guidelines and development standards; simplification of income reporting procedures for brokers' activities; and development of up-to-date cadastral maps and related data.

D. CHARACTERISTICS OF THE LAND MARKET

1. Land Tenure

Land ownership in the Valley can be divided into Private (Raikar), Private Guthi (Guthi is a religious trust type of tenancy), Guthi Corporation, Government, and Public lands. Raikar tenure is dominant, making up 94 percent of the cultivated lands and 61 percent of registered lands. It is the only form subject to taxation. Individuals or groups may own Private Guthi lands, but their outputs are dedicated for some religious or charitable purpose. Research is required to determine the extent of Private Guthi lands in the Valley.

The Guthi Corporation owns about 1,480 hectares of land in the Valley, of which about 51 percent is found in Kathmandu District while 31 and 18 percent respectively are found in Bhaktapur and Lalitpur Districts. Most Guthi Corporation lands are located within town panchayat boundaries. Guthi Corporation lands are under the indirect control of Government and produce

rental revenues. As such, they can play a vital role in preserving selected land areas and developing others for the public good.

2. Land Transactions

Land transaction data collected from District Land Revenue Offices help to clarify land market dynamics in the Valley and indicate areas subject to urban development (see Figure V.1). Among the three districts in 1984/85, 71 percent of land transactions took place in Kathmandu, 21 percent in Lalitpur, and only 8 percent in Bhaktapur. The land market in Kathmandu town panchayat is dynamic, accounting for 63 percent of the land transactions in its district. Most transactions within the town have been in the core and the eastern and western fringe areas. The core alone accounted for 36 percent of transactions.

In Lalitpur District and town panchayat, the number of transactions has remained relatively constant. Transactions in 1984/85 were equally divided between the town and village areas. Transaction data suggests that Lalitpur's core area lacks the dynamism of Kathmandu's core. Most transfers in the town have taken place in the northwestern, western and southern suburban areas. These areas have extensive vacant land and enjoy a good road network and water supply. Comparatively, fewer land transactions occurred in Bhaktapur District between 1980 and 1985. Of these, only about 20 percent took place within the town. This suggests it lacks the dynamism of both Kathmandu and Lalitpur. Village panchayats along the Arniko Highway and old Bhaktapur Road experienced the most growth pressure in the district.

3. Land Prices

Land price data for 126 Valley locations was collected from real estate brokers. General conclusions which can be drawn suggest that:

- Land prices exceeding Rs.100,000 per Ropani (Rs.196/m2) are largely within the Ring Road with the exception of a few places along the Baudha Road and Arniko Highway.
- Land prices decrease with greater distance from central Kathmandu. Average land prices per ropani are: Kathmandu center, Rs.1.2 million (Rs.2,362/m2); 3 miles from center, Rs.288,000 (Rs.567/m2); and 8 miles from center, Rs.40,000 (Rs.78/m2).
- Site-specific land prices vary greatly because of access roads or highways. This is true in both town and village areas.
- Comparatively, prices are higher in the eastern and northern suburban areas of Kathmandu and lower in the eastern and western fringes.
- In Lalitpur, higher prices are found in the northwest and lower prices in the northern and eastern fringe areas.
- In Bhaktapur, higher prices are found along the Arniko Highway than in the town itself.

A recent study suggests that land prices increased in real terms by 633 percent between 1964 and 1978. This is equivalent to a real annual compound growth rate of over 15 percent. A review of interest bearing accounts and bonds suggests that land has been a better investment than anything else. It appears, however, that current land price levels exclude low- and moderate-income people without land assets in the Valley from participating in the land market.

E. PUBLIC LAND INSTRUMENTS AND POLICY

1. Public Land Acquisition

Land acquisition data prior to 1977 were not readily available, although major acquisitions for Tribhuvan University (T.U.) Campus, Balaju and Patan Industrial Estates, and the Ring Road took place. Between 1977 and 1984, the Government reportedly acquired only 123 hectares of land in the three districts, most of which was in the town panchayats, particularly Kathmandu. The most notable land acquisition was for the Engineering Institute, which gobbled up 12.5 hectares in central Lalitpur despite the availability of underutilized land at the main T.U. Campus outside of town.

The Land Acquisition Act of 1977 empowers the HMG to purchase land for public purposes and entitles tenants to a 25 percent share of compensation. Public land acquisition is entrusted to the Chief District Officer and a Compensation Committee which engages in negotiations with landowners. Limitations of the 1977 Act include: lack of guidelines for determining compensation; lack of a requirement that land be acquired in conformance with a clear development plan; and lack of stipulation that compensation be paid within a specific time.

The 1963 Town Committee Development Act contains a provision that the Town Development Committee may prohibit the construction of buildings on any land in the town upon payment of reasonable compensation. This requirement, if implemented, could have major implications for any attempt to preserve or protect land in the Valley. The Town Planning Projects Implementation Act (1973) gives Town Planning and Implementation Committees, in designated Regional Centers, the power to acquire land and restrict development. However, nowhere in the Act is there a clause requiring private landowners to be compensated for loss of development rights as indicated in the 1963 Act. For this reason, the Acts should be reviewed.

According to Chief District Officers in the Valley, the procedure for land acquisition in itself does not pose serious problems for execution. The main problems affecting land acquisition include: rapidly-rising land prices which bog down negotiations and compensation; the high cost of land acquisition; and the inadequacy of cadastral records and maps needed to complete land transactions.

Recently, the HMG has been empowered to acquire Guthi Corporation lands. Guthi Corporation lands can play a potentially important role in guiding or restricting land development in the Valley. As records are incomplete, a survey should be conducted of all Guthi Corporation titles and land locations;

rent collection should be enforced to improve the Corporation's assets; scattered lands should be disposed of and areas needing protection should be obtained; and some land should be developed for revenue-generating activities. The Guthi Corporation should work closely with the Kathmandu Valley Town Planning Office and The Provident Fund in the pursuit of these objectives.

2. Land Use Regulations and Planning

The absence of zoning laws and land use regulations has contributed to the haphazard pattern of urban growth which has occurred in the Valley. Though not in themselves sufficient to achieve orderly urban growth, effective land use regulations are necessary to help separate incompatible land uses, conserve agricultural and forest lands, preserve historic and cultural sites, create a more efficient road network, etc. Presently, new public and private construction occurs usually with no advance planning, consultation, or review.

Even if land use regulations are enacted into law, there will still be formidable problems with implementation and enforcement due to inadequate institutional capacity. Also lacking is a workable structure for land use planning. As a result, there has not been the needed leadership for the establishment of measures to address land use problems.

The absence of public investment planning and coordination in the Valley is a major cause of the emerging land use problems. No land use regulations will be of any use if there is no change in the current practice of constructing major public facilities without any prior study or interagency consultation. To assist in the development of effective land use regulations, the following agenda is suggested:

- A competent authority should define and specify the objectives of land use regulations in the Kathmandu Valley. These might include:
  - -- Preservation of selected agriculture and open spaces
  - -- Separation of uses (industrial, residential, commercial)
  - -- Prohibition of certain uses in certain areas
  - -- Minimum and maximum densities
  - -- Historic preservation
  - -- Construction of safe and sanitary buildings
  - -- Conformance of building construction and infrastructure
- An in-depth review of the land use regulations proposed by the KVTDC should be conducted to determine the extent to which they address desired objectives. This review should:
  - -- Determine required land areas for each proposed use.
  - -- Develop precise zoning categories with specific geographic locations.
  - -- Formulate clear land use standards for each zoning category.
  - -- Develop clear institutional responsibilities and procedures for issuing development permits and granting variances from zoning regulations.
  - -- Expand coverage of the land use plans and regulations to the entire Kathmandu Valley.
- Draft new zoning and subdivision regulations and building codes by a

multi-disciplinary team. Development of such regulations should include:

-- Evaluation of the legal aspects of enacting land use control laws: past constraints and new potentials.

-- Review of existing expropriation laws to develop options for financing the compensation of landowners while preventing undesirable development.

-- Upgrading of institutional capacity for land use planning at the central and local levels. Establish a town and regional planning project for the Valley.

-- Identification of specific mechanisms and improvements required to enforce land use laws such as: personnel upgrading, changes in legal provisions, and tax and permit clearances. Unenforceable regulations should be avoided.

- Development of a transport plan for the Valley. Care should be taken to facilitate movement while avoiding undue access to those areas which should be protected. Road extensions should be executed in those place designated for development. Standards should be developed for improvement of existing areas as well as for town extensions. Rights-of-way for new transport corridors should be legally designated on cadastral maps and protected.

- Personnel should be upgraded in the Town Planning Implementation Committees (TPICs) by adding additional staff and providing technical assistance and training. The TPICs have broad powers to conduct land use planning, implementation, and enforcement. In the short-term, the Pradhan Panch of each respective TPIC should be made chairman. Administrative and legal links should also be made with the town panchayats.

3. Investment Planning

The study attempted to analyze sectoral expenditures in the Valley in order to ascertain purposeful or ad hoc investment priorities. Though expenditure data could not be obtained, budget data for 1978/79 and 1984/85 suggest that transportation, industry, communications, and agriculture had the highest budgeted priority. The transportation sector strongly dominated budgeted investment because of planned improvements to Tribhuvan Airport, which would consume more than 60 percent of the sector's budget. Otherwise, budgeted investment for roads and bridges was no greater than budgets for electricity and forestry.

Agriculture was given increasing attention between 1978/79 and 1984/85, but planned investment was highly skewed in favor of Kathmandu and Lalitpur. Bhaktapur was to receive less than 6 percent of planned investment. This was the case for forestry as well.

To date, no attempt has been made to coordinate investment and development planning for the Valley. The lack of an adequate planning authority in the Valley has contributed to the lack of interagency coordination. At the present time, only the water supply and power sectors have medium- and long-term development plans for the Valley. It is particularly unfortunate that neither

the Road Department nor the town panchayats have developed any medium- or long-term plans for roads and drainage. Investment planning for roads is critical if development is to be facilitated in a planned manner.

The transport master plan suggested in the Seventh Plan should be developed as soon as possible so that a corresponding investment plan may be undertaken. This, in turn, should be supportive of a long-term urban development plan based on the principles shown in Figure III.17.

4. Land Taxation

Land taxes in Nepal include the Land Tax, the Land Registration Tax, and the Houses and Compounds Tax. With the exception of the Land Registration Tax, revenue generation from land taxes is poor. High rates of exemptions are allowed on the Land Tax, and Houses and Compounds Taxes, resulting in a very low ratio of actual to potential revenue collection for these taxes.

Existing tax administration requires significant improvement. Property records are generally disorganized, outdated, and limited in coverage. Tax offices are grossly understaffed and underequipped. The personnel lack training in tax administration. Moreover, tax evasion is widespread.

Existing land taxation systems should be improved before any innovative taxation measures can be tried. Improvements include: personnel upgrading and training; procedural reform; and provision of adequate working facilities such as offices and transport.

The land taxes are all administered by the Central Government with no Local Government participation. Only 60 percent of the Land Tax revenues are returned by the HMG to respective districts. Centralization of tax administration also limits the potential for using land taxes as policy instruments. As a consequence, new land taxation applications will require new laws or changes in existing laws.

Suggested tax reforms include: the merging of the Urban Land Tax and House and Compounds Tax into one urban property tax; revision of tax and fee rates to improve existing tax revenue collection; and transfer of authority over the urban property tax to town panchayats.

The betterment tax (or special assessment) may offer the best prospects of a new tax to assist in cost recovery and "capture" of land value increases caused by public investment. A pre-feasibility study should be conducted for the betterment tax on a pilot basis such as a road improvement project. Use of a vacant land tax to curb speculation or a preferential tax rate on agricultural land to encourage its retention are not recommended at this time. These types of tax tools are beyond the capacity of the current tax administration, and experience with these tools in other countries is uneven.

CHAPTER II
LAND: THE KATHMANDU VALLEY CONTEXT

A. KATHMANDU VALLEY POPULATION AND SETTLEMENTS

1. Valley Population

According to the estimates made for this study, the Kathmandu Valley had a population of approximately 739,000 in 1981. The Valley generally encompasses the three districts of Kathmandu, Lalitpur, and Bhaktapur. However, the boundaries of the districts exceed the strict physiographic boundaries of the Valley. The combined population of the districts in 1981 was on the order of 766,000. Kathmandu District is the largest, accounting for about 55 percent of the combined districts' population.

In 1981, Kathmandu, Lalitpur, and Bhaktapur town panchayats together accounted for 48 percent of their combined districts' population and about 50 percent of the Valley population. Outside the three town panchayats, there are 97 village panchayats in the three districts with average populations on the order of 4,100 (population data are provided in Appendix Tables A.1-A.3). The distribution of population by village panchayat is reflected in the Valley density map presented in Figure II.1. In addition to showing concentrations of population in the three town panchayats, the figure shows that the heaviest concentrations of population are in the central (Kathmandu and Lalitpur), western (Naikap, Kirtipur) and southern (Bungamati, Harsiddhi, Lubhu) portions of the Valley. On the whole, the eastern portion of the Valley is considerably less densely populated than the western.

Population data for villages per se are not recorded by the census. For settlements of more than 1,000 population, surveys were conducted for the 1969 Kathmandu Valley Master Plan. As presented in Table II.1, village panchayat population data for these settlements were collected for 1971 and 1981. Several of these settlements--notably Thimi, Kirtipur, and Sankhu--have populations which are close to or exceed 10,000 persons, sufficient for these settlements to be classified as town panchayats. Though village-level data are lacking, one would expect that settlements such as Kirtipur and Thimi--which enjoy good locations with respect to Greater Kathmandu and Valley transport networks--are growing faster than isolated places such as Sanagau.

2. Spatial Characteristics of Valley Settlement Types

This section is based on an article in the Himalayan Review, "Settlement Patterns in the Kathmandu Valley", Volume 10, 1978, by C.B. Shrestha and K.L. Vaidya. In 1978, there were 346 settlements with more than 19 houses in the Valley (separated by less than 50 meters). The distribution of settlements was as follows:

- Hamlets (100-499 population): 83 percent of settlements
- Villages (500-4,999 population): 14 percent
- Urban areas (<5,000 population>): 3 percent

Table II.1

KATHMANDU VALLEY
Population of Districts and Important Settlements

	1961[1/]	1971[2/]	1981[3/]	Percent Increase in 1971-1981
Kathmandu District	224,867	353,756	422,237	19.35
Kirtipur	7,500	10,482	13,100[4/]	24.97
Sankhu	4,500	7,615	10,520[4/]	38.14
Panga	3,000	4,097	7,134[4/]	74.24
Tokha	2,000	3,370	5,488[4/]	62.84
Chobar	1,700	3,838	4,139	7.8
Jorpati	1,400	2,580	7,607	194.84
Dharmasthali	1,300	2,919	3,575[4/]	22.47
Thankot	1,200	6,377	9,732[4/]	52.61
Satungal	1,100	1,964	2,455[4/]	25.
Chhopkhola (Machhegau)	1.100	4.067	5,044	24.02
Lalitpur District	145,301	154,998	184,341	18.93
Harisiddhi	3,500	2,744	3,732[4/]	36.00
Lubhu	3,100	3,741	6,514[4/]	74.12
Thecho	2,700	4,176	5,476	31.13
Chapagau	2,200	5,647	7,373[4/]	30.56
Khokana	2,100	2,933	3,666[4/]	24.99
Sunakothi	2,000	3,082	4,072[4/]	32.12
Bungmati	1,900	3,352	5,919[4/]	76.58
Badegau	1,600	1,350	1,687[4/]	24.96
Sanagau	1,500	3,708	4,434[4/]	19.57
Thaiba	1,400	1,330	3,343	151.35
Bhaktapur District	89,822	110,157	159,767	45.03
Thimi	10,000	11,167	13,597[4/]	21.76
Bode	2,800	4,338	5,476[4/]	26.2
Sano Thimi	2,300	-	2,875[4/]	25.00
Katunje	1,600	3,229	4,331	34.12
Dadhikot	1,200	3,585	5,206	45.21

Source: 1/ Central Bureau of Statistics, HMG, 1961 and The Physical Developmen Plan for the Kathmandu Valley (For Compact Settlements - Estimated from Village Panchayat Records) 1969, p.81.

2/ Central Bureau of Statistics, HMG, 1971.

3/ Central Bureau of Statistics, HMG, 1981.

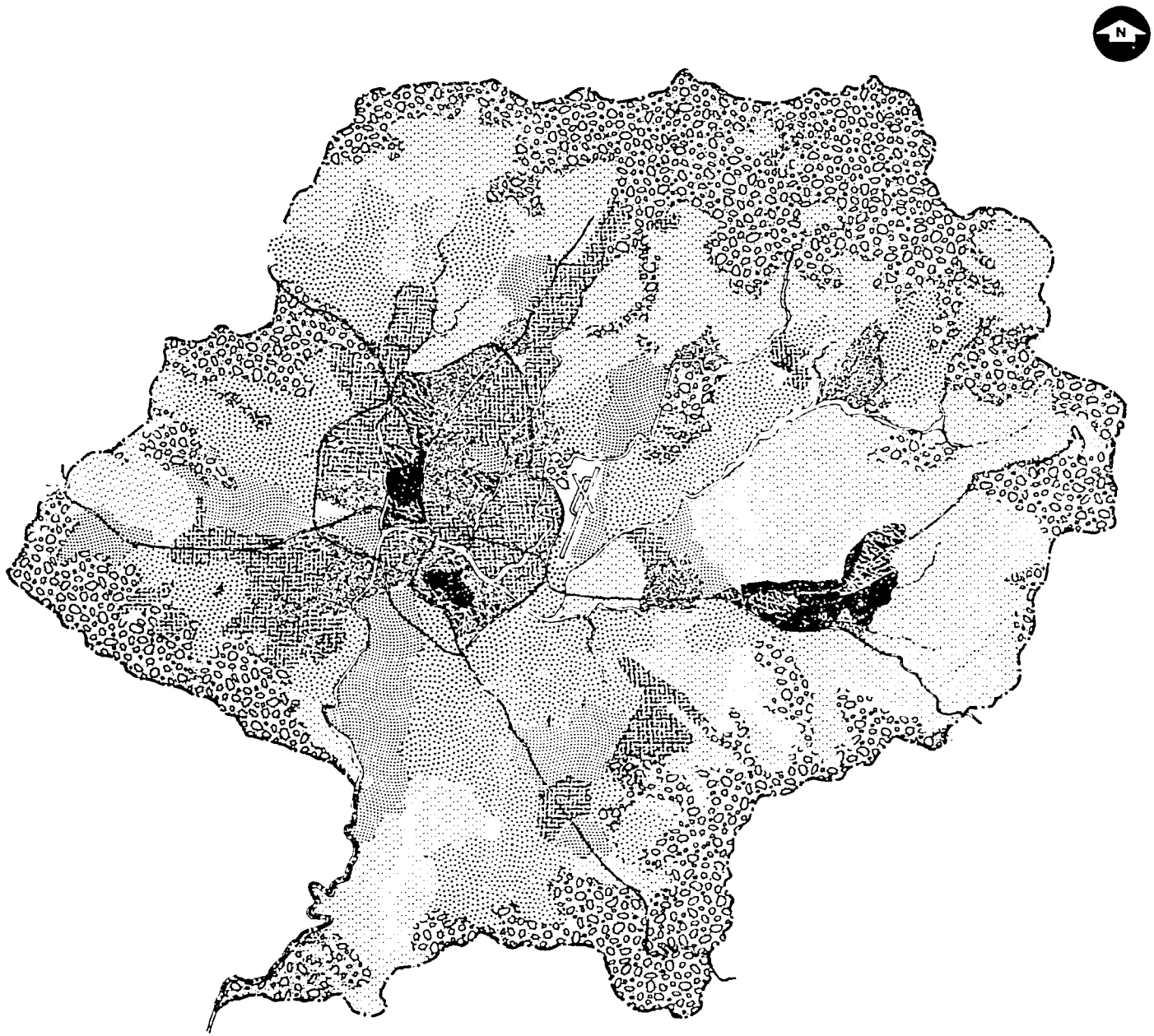
4/ Projected Populations at a rate of 2.5 percent per annum.

FIGURE II 1

KATHMANDU VALLEY

POPULATION DENSITY

1981



SCALE 0 1250 2500 3750 meters

LEGEND

	< 9 Persons/ Hectare
	9 – 13 " "
	14 – 20 " "
	21 – 40 " "
	41 – 100 " "
	101 – 300 " "
	> 300 " "
	Forest

SOURCE – CENTRAL BUREAU OF STATISTICS, HMG, 1971 & 1981 FOR NAGAR PANCHAYAT WARDS COMPUTED ON THE BASIS OF VOTER'S LIST, ELECTION COMMISSION, 1985

PREPARED BY — PADCO, KATHMANDU, 1985

Three types of settlements were noted: compact, dispersed, and mixed. Generally, these types were related to ethnic characteristics: Newars form compact settlements while non-Newars live in largely dispersed developments.

The locational distribution of settlements tends to depend on landforms, soil types, and accessibility. Landforms were classified into three types:

- Hills with elevation of 1600 meters and above
- "Tar" and foothills lying between 1,320 and 1,600 meters
- Lowlands of less than 1,320 meters

About 84 percent of the settlements were located in "tar" and foothill areas, 4 percent in the hills, and 12 percent in low-lying areas. Furthermore, tar/foothill areas accommodated about 83 percent of the hamlets, 96 percent of the villages and 67 percent of the urban areas. Tar areas were preferable to other locations for settlement due to unfavorable slopes in hill areas, flood danger in the lowlands, and the desire to preserve the most valuable agricultural land. In an ideal land use pattern, settlements would remain on tar-lands, lowlands would remain cultivated, and the hill areas would remain forested. The disturbance of ideal land use patterns is a recent phenomenon in the Valley.

Settlements have shown a locational preference for dry, well-drained areas. According to settlement and soil type, the distribution was as follows:

- Urban areas:
  found on loamy, sandy, or clayed haplaquept soils imperfectly- to poorly-drained
- Hamlets:
  primarily on loamy and clayed haplaquepts well-drained and loamy dystrochrepts well- to moderately-well-drained
- Villages:
  distributed among clayed haplaquepts imperfectly- to well-drained, loamy and clayed haplaquepts imperfectly- to well-drained, and loamy distrochrepts well- to moderately-well-drained

In general, well-drained areas correspond to tar areas while wet areas correspond to flood plains. The Land Resources Mapping Project (LRMP) maps in Section C of this chapter (regional land use, land capability, and land systems) are also useful for analyzing the locational characteristics of settlements. For instance, it is clear that the core areas--or old cities of Kathmandu, Lalitpur, and Bhaktapur--were located on tar (elevated hill) areas. In addition, each town had its own hinterland of the best, well-irrigated land situated in nearby flood plains.

Kathmandu, in particular, occupies a central position in the western and largest portion of the Valley. It is noteworthy that Kathmandu has primarily expanded upon adjacent tar areas to the east and north, and has only recently begun to occupy lower-lying flood plains. As Greater Kathmandu expands, easy access to the center is becoming more difficult, resulting in greater development pressure on the lowland flood plains of Kathmandu and Lalitpur. Bhaktapur, on the other hand, has not expanded to a great extent

and still largely consists of the original core area. Nevertheless, it can expand readily along a tarland to the northeast.

B. THE KATHMANDU VALLEY'S ROLE IN AGRICULTURAL PRODUCTION

1. The Role of the Valley Nationally

The Kathmandu Valley is one of the most agriculturally productive areas in Nepal. Between 1967/68 and 1982/83, aggregate Valley yields for the three main crops of rice, wheat and maize increased from 2.2 ton to 3.0 ton per hectare. For the same period, aggregate national yields steadily decreased from 1.83 ton to 1.77 ton per hectare.

Rice is the main crop in the Kathmandu Valley followed by maize and wheat. Barley and millet are minor crops. In 1982/83, average yields in tons per hectare for the main crops were: rice, 3.49; maize, 1.84; and wheat 1.45. These yields are significantly higher than the national average, as is shown in Figure II.2. Area and production data for all crops are presented in Appendix Table A.4.

As Figure II.3 shows, aggregate production of rice, maize and wheat increased steadily between 1967 and 1977, fell off rapidly between 1977 and 1979 due to poor weather conditions, and sharply recovered in 1981, leading to a 32 percent aggregate increase in production over 1967/68.

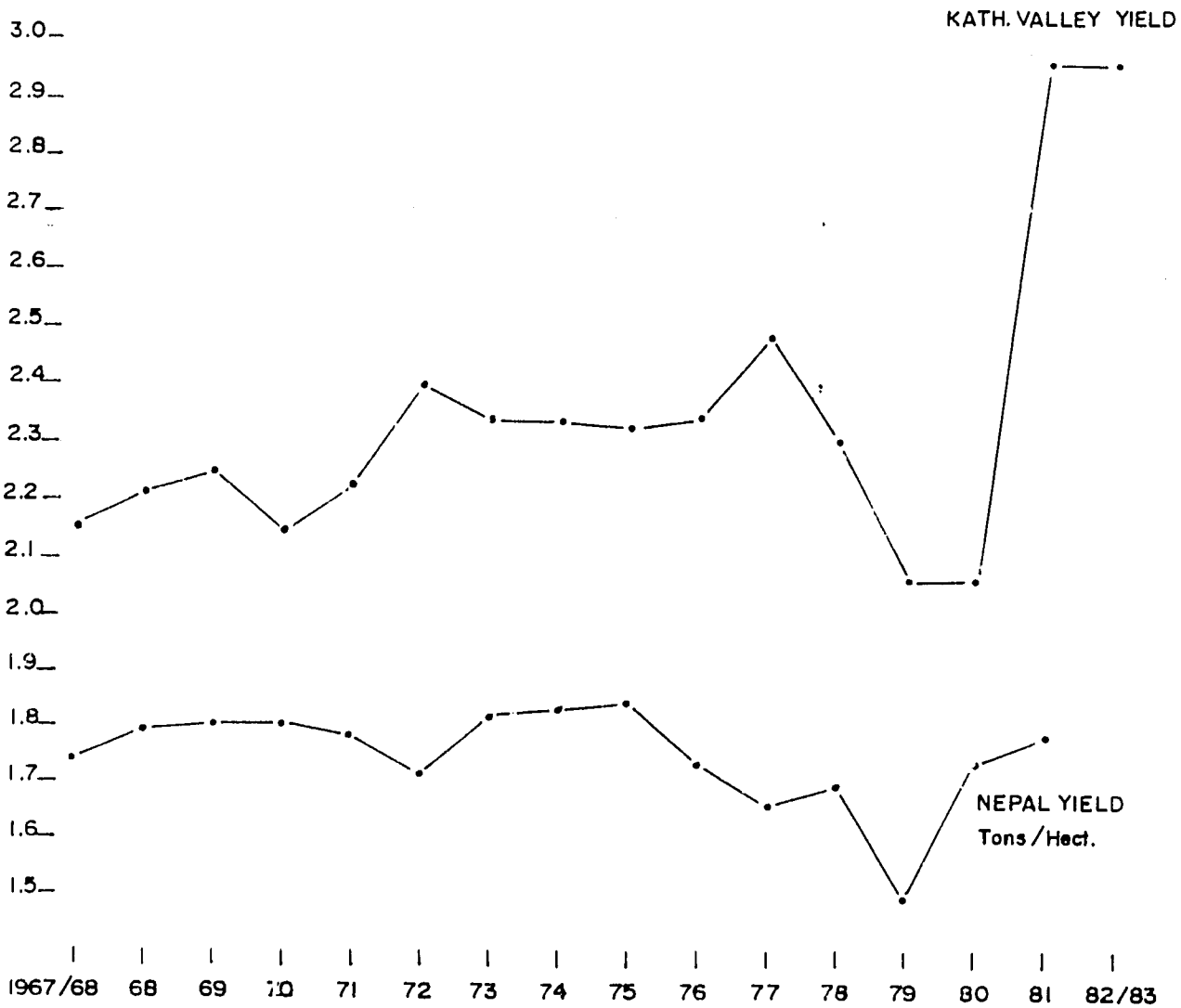
In 1982/83, the cultivated areas for the main crops in the Valley were: rice, 24,432 hectares; wheat, 21,024 hectares; and maize, 17,525 hectares. It is noteworthy that despite a 12 percent aggregate reduction of the cultivated areas of these three crops since 1967/68, their combined production increased considerably. When millet, barley, potato, sugarcane, and oil seeds are added to the main crops, total production appears to have increased by about 18 percent, while cropped areas decreased by about 15 percent. The net loss of agricultural land for the eight crops was 10,310 hectares over this period. It should be noted that while areas under cultivation in Kathmandu Valley decreased, areas under cultivation for the country as a whole increased by about 23 percent.

Comparing the Kathmandu Valley's production with national production gives some indication of the Valley's national role in this sector. Between 1967/68 and 1982/83, production of wheat, maize, and rice in the Valley accounted for an average of about 9.3 percent, 4.1 percent and 3.7 percent respectively of national production. In aggregate terms, Valley production of these three crops accounted for 4.32 percent of national production and about 3.4 percent of total cultivated land occupied by these crops. On the basis of trends shown in Figure II.4, Valley production as a percent of national production for the three principal crops increased moderately between 1967 and 1982 despite a decrease in Valley area as a percent of national area. The percent of national aggregate area for these crops declined from 3.6 percent in 1970/71 to 2.7 percent in 1981/82. Major strides in increasing yields from these crops, particularly wheat, overcame the losses in area.

FIGURE II. 2

KATHMANDU VALLEY & NEPAL

COMPARISON OF KATH. VALLEY YIELD (Tons/Hect.) WITH NATIONAL YIELD (Rice, Wheat & Maize only)

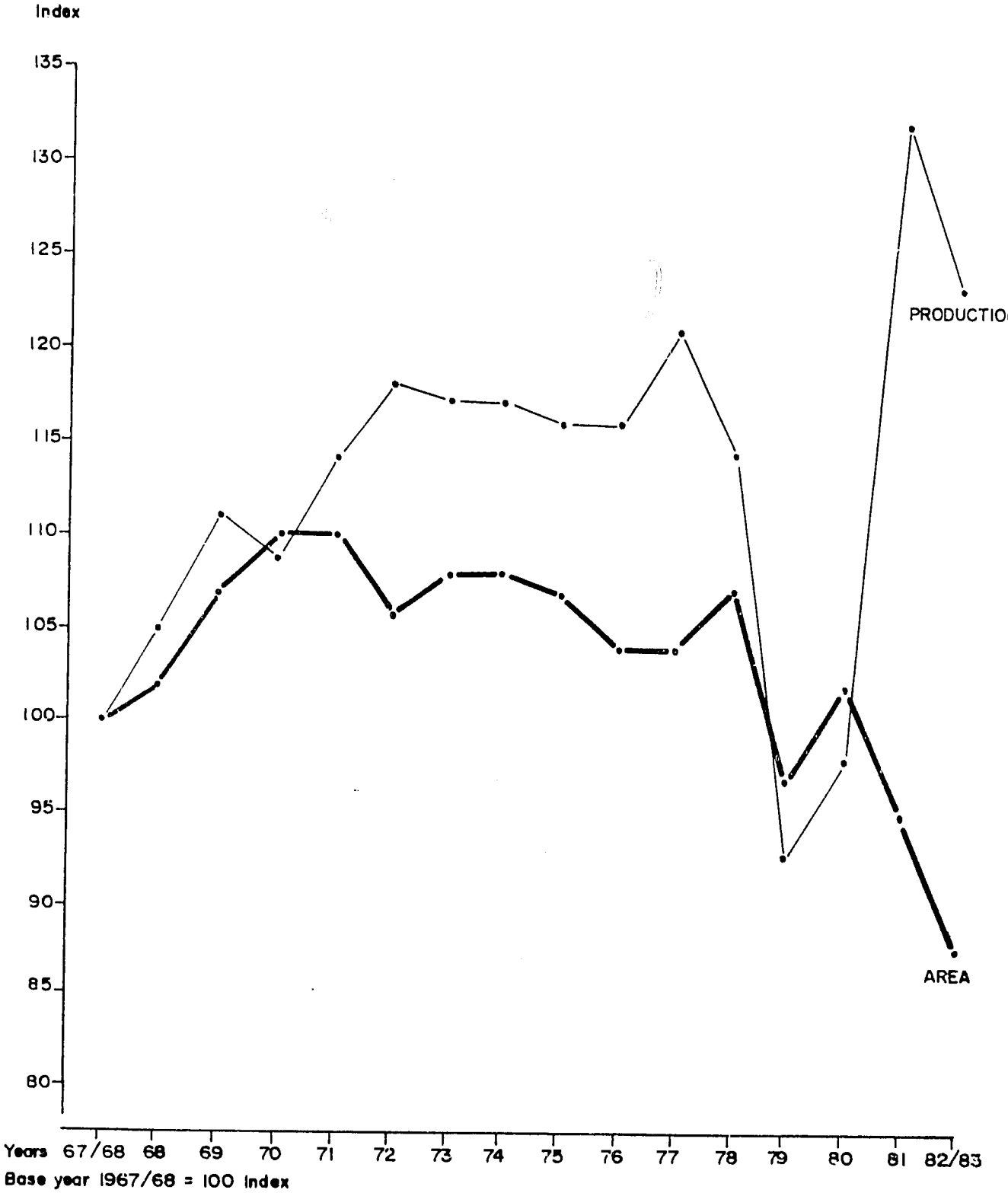


Source - Agricultural statistics of NEPAL '83

FIGURE II. 3

KATHMANDU VALLEY

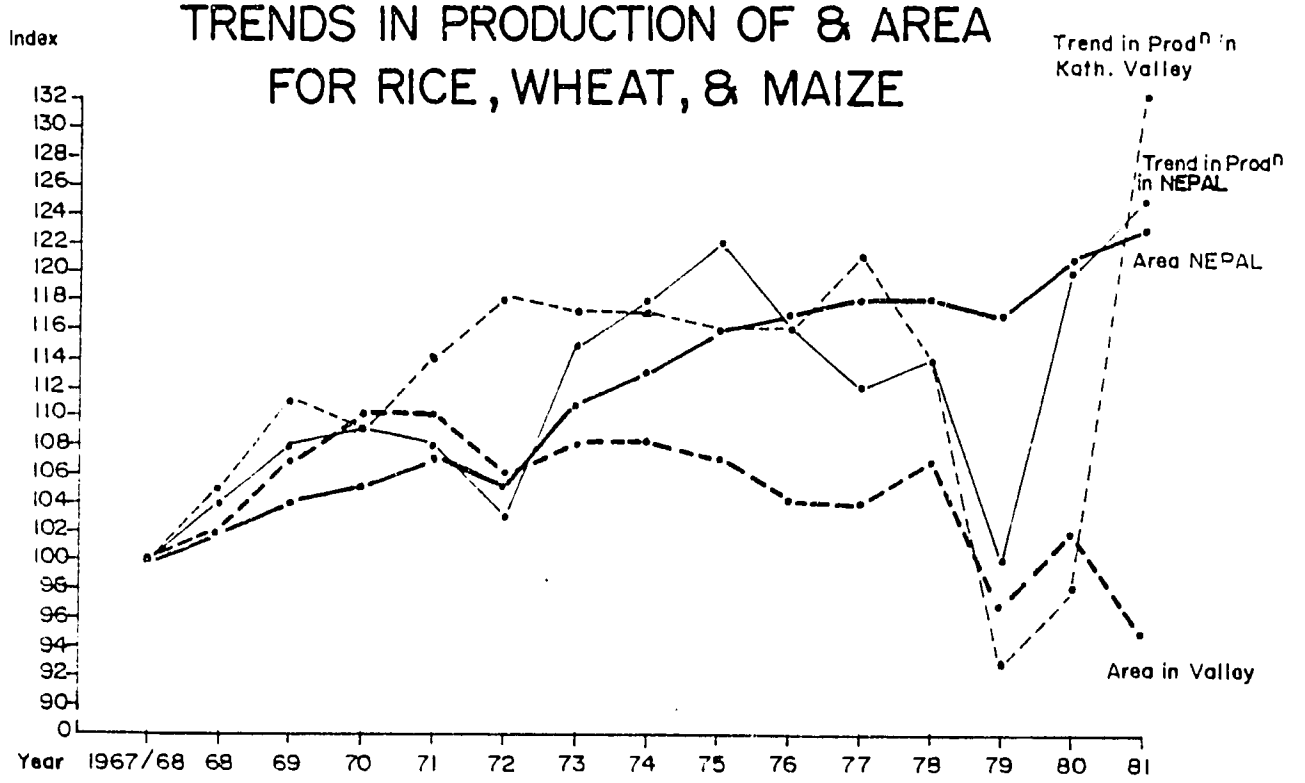
TRENDS IN PRODUCTION OF & AREA FOR RICE, MAIZE & WHEAT ONLY



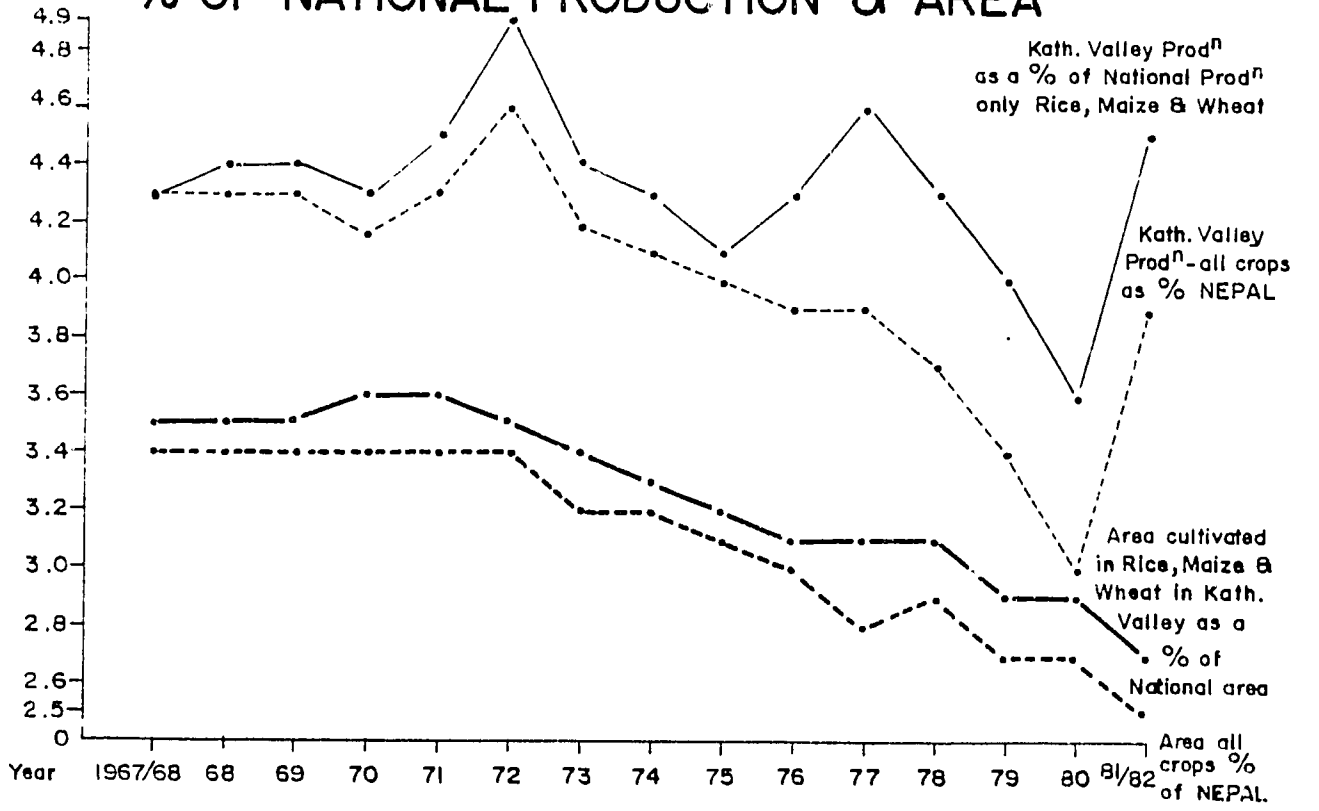
Source - Agricultural statistics of NEPAL, 1983
Computed by- PADCO, Kathmandu, 1985

KATHMANDU VALLEY & NEPAL

TRENDS IN PRODUCTION OF & AREA FOR RICE, WHEAT, & MAIZE



PRODUCTION OF & AREA FOR RICE, MAIZE & WHEAT % OF NATIONAL PRODUCTION & AREA



Source - Agricultural statistics of NEPAL, 1983
Computed by - PADCO, Kathmandu, 1985

2. Valley Self-Sufficiency in Food Grains

As a proxy for a food balance estimate for the Valley, an estimate has been made for Kathmandu, Lalitpur, and Bhaktapur districts. On the basis of Table II.2, the three districts produced a food surplus of about 3 percent in 1971, though Kathmandu district was in deficit. By 1974/75 and 1980/81, the districts produced about 98 and 97 percent of their foodgrain needs. In the latter year, Kathmandu district produced only about 76 percent of its needs, while Bhaktapur produced more than twice its own requirements, thereby reducing the cumulative foodgrain deficit for the three districts.

The Kathmandu Valley has the most developed urban economy in Nepal. Though it was not within the scope of this study to thoroughly review other economic activities in the Valley, a brief discussion of a few key sectors is presented in Appendix B.

C. KATHMANDU VALLEY LAND RESOURCES

The principal source of land resources data for the Kathmandu Valley is the Land Resources Mapping Project (LRMP) sponsored by the HMG and the Government of Canada. The project provides district-level data throughout the country on land systems, land capability, and land utilization. The data are based on 1979 aerial photographs and extensive ground verification which was undertaken during 1983 and 1984. Tabular LRMP data for the Kathmandu, Lalitpur, and Bhaktapur Districts are presented in Appendix Tables A.5-A.7. Since Kathmandu and Lalitpur Districts have areas outside the Kathmandu Valley, as defined by this study (see Appendix I), the LRMP map was measured and tabulated for the Valley alone. These data are presented in Tables II.3-II.5 and Figures II.5-II.9.

1. Land Systems

On the basis of LRMP data, about 17 percent of the Kathmandu Valley is occupied by alluvial plains while river channels make up about 1.4 percent of the land area. The principal alluvial plains lie along the principal waterways: Bagmati, Manahara, Vishnumati, and Dhobi Khola in Kathmandu District; Kodku, Godavari, and Nakhu Kholas in Lalitpur District; and Hanumante Khola in the Bhaktapur District.

The alluvial plains are very productive, easily irrigable, and intensely cultivated. As many as three crops per year can be grown on them. As can be seen in Figure II.5, lowlands (such as Kamaladi, Tukuche, Baneswar, and Kopondol) are gradually being encroached upon in proximity to Kathmandu and Lalitpur. Previously, settlement took place uniquely on tar or elevated lands; but, as the towns have expanded, increasing development pressure has been exerted on the lowlands as well. It is costly to build in these areas since the water table is high and the land is subject to flooding during the monsoon.

Table II.2

FOOD BALANCE IN KATHMANDU VALLEY

(in Metric Tons)

1971/72	(A)	(B)	(C)	(D)	*E =0.93D	(F)
District	Population	Consumption per Capita	C = AxB Total Consumption	Production Foodgrains	Production Edible Foodgrains	f = (E-C) Balance
KATH.	353,756	0.269 Ton	95,160.	74,048	68,865	- 26,295
LALIT.	154,998	0.189	29,295.	44,365	41,259	+ 11,964
BHAKTA.	110,157	0.126	13,880	34,357	31,952	+ 18,072
VALLEY	618,911		138,335	152,770	142,076	+ 3,741
1974/75**					Surplus 3%	
KATH.	379,773	0.269 Ton	102,159	78,871	73,350	- 28,809
LALIT.	166,071	0.189	31,387	45,549	42,360	+ 10,973
BHAKTA.	127,830	0.126	16,106	33,824	31,456	+ 15,350
VALLEY	673,674		149,652	158,244	147,166	- 2,486
1980/81					Deficit 2%	
KATH.	422,237	0.269 Ton	113,582	92,310	85,848	- 27,734
LALIT.	184,341	0.189	34,840	35,280	32,810	- 2,030
BHAKTA.	159,767	0.126	20,131	49,080	45,664	+ 25,533
VALLEY	766,345		168,553	176,670	164,322	- 4,231
					Deficit 3%	

Source: Population Census 1971 & 1981 and Agricultural Statistics of Nepal, 1983.

** Population growth rate was computed based on 1971 & 1981 figures, and 1974/75 population was computed - Kath: 1.79%, Lalit:1.74% and Bhakta: 3.79%.

Assumptions: (a) According to "Agricultural Statistics of Nepal" per capita (annual) consumption of 5 major foodgrains in the 3 districts were 0.269 Tons in Kath., 0.189 in Lalit., and 0.126 in Bhakta. in 1971/72. We assume the same per capita consumption is valid in 1974/75 and 1980/81.

*(b) Dr. Gurung (Dimensions of Development: Nepal) estimates that about 7% of total foodgrains production is lost in dehusking and milling process. Since our production weights are non-processed weights, we have to adjust them (reduce by 7%) to make them comparable with "edible" foodgrain consumption.

Table II.3

LAND SYSTEMS OF THE KATHMANDU VALLEY*

1. River Channels	823 Hectares	1.38 Percent
2. Alluvial Plains	10300 "	17.27 "
3. Alluvial Fans	3775 "	6.32 "
4. Non-dissected Tars	9125 "	15.39 "
5. Dissected Tars	9850 "	16.50 "
6. Moderate Mountainous Terrains	16450 "	27.57 "
7. Steep Mountainous Terrains	9350 "	15.67 "
Total	59675 Hectares	100.00 Percent

*Source: Area calculated from LRMP Map, 1984.

Table II.4

KATHMANDU VALLEY
LAND CAPABILITY*

Category	In Hectares	In Percentage of the Total
I	20,704.75	34.19
II	13,399.25	22.46
III	16,447.25	27.56
IV	9,123.75	15.29
Total Area	59,675.00	100.00

*Source: Areas calculated from LRMP Land Capability Map, 1984.

Table II.5

THE KATHMANDU VALLEY
LAND UTILIZATION*

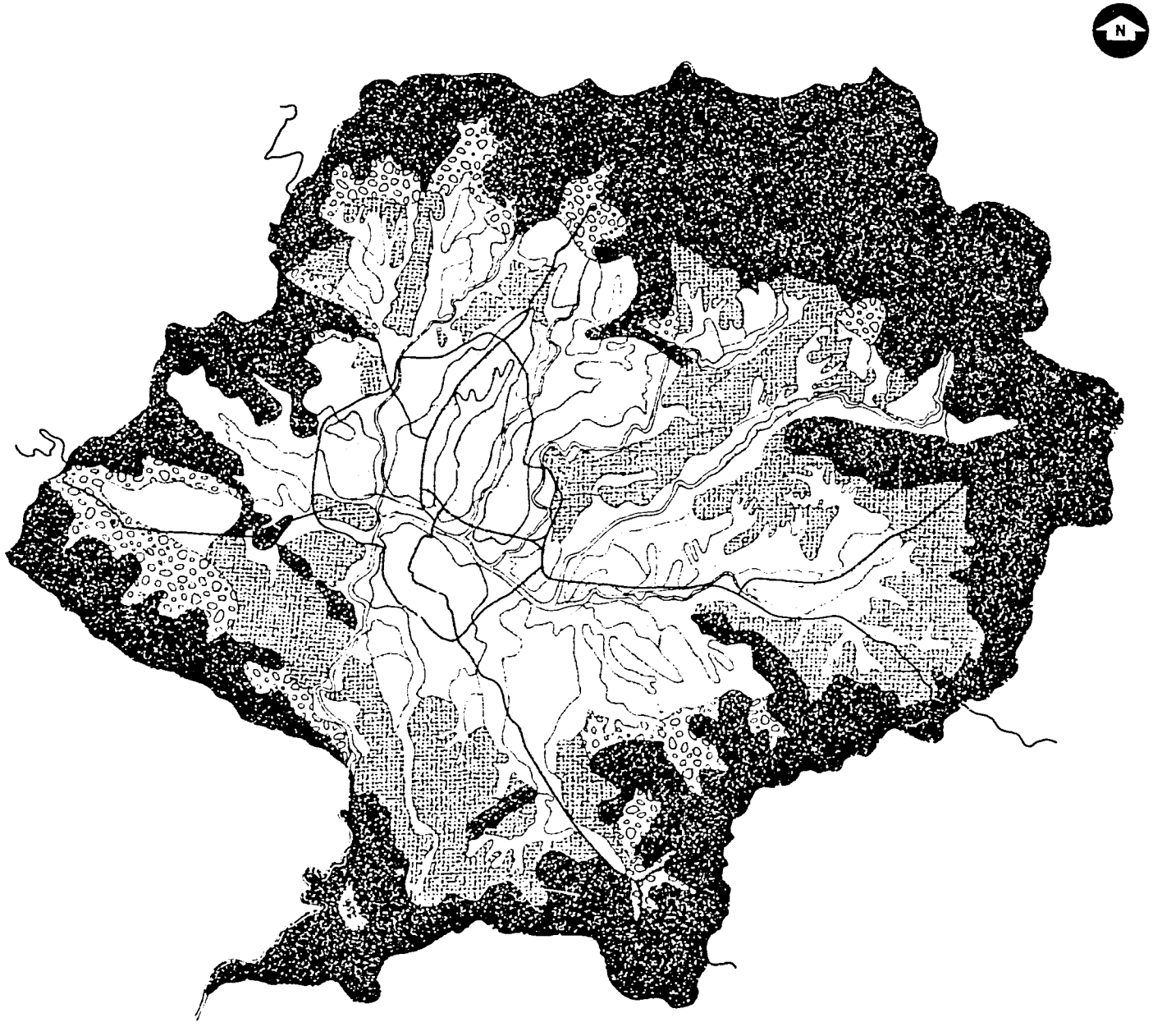
Category	Area in Hectares	In Percentage of the Total
1. Urban Area	2,850	4.77
2. Rivers	825	1.38
3. Lowland Agriculture	31,650	53.04
4. Upland/Slope Agriculture	6,000.	10.06
5. Grazing	75	0.12
6. Forest and Shrub	18,275	30.63
Total	59,675	100.00

*Source: Areas calculated from LRMP Map, 1984.

FIGURE II . 5

KATHMANDU VALLEY

LAND SYSTEM



SCALE 0 1850 3700 3750 meters

LEGEND

- ALUVIAL PLAINS
- ALUVIAL FANS
- DISSECTED TARS
- NON-DISSECTED TARS
- MOUNTAIN TERRAINS

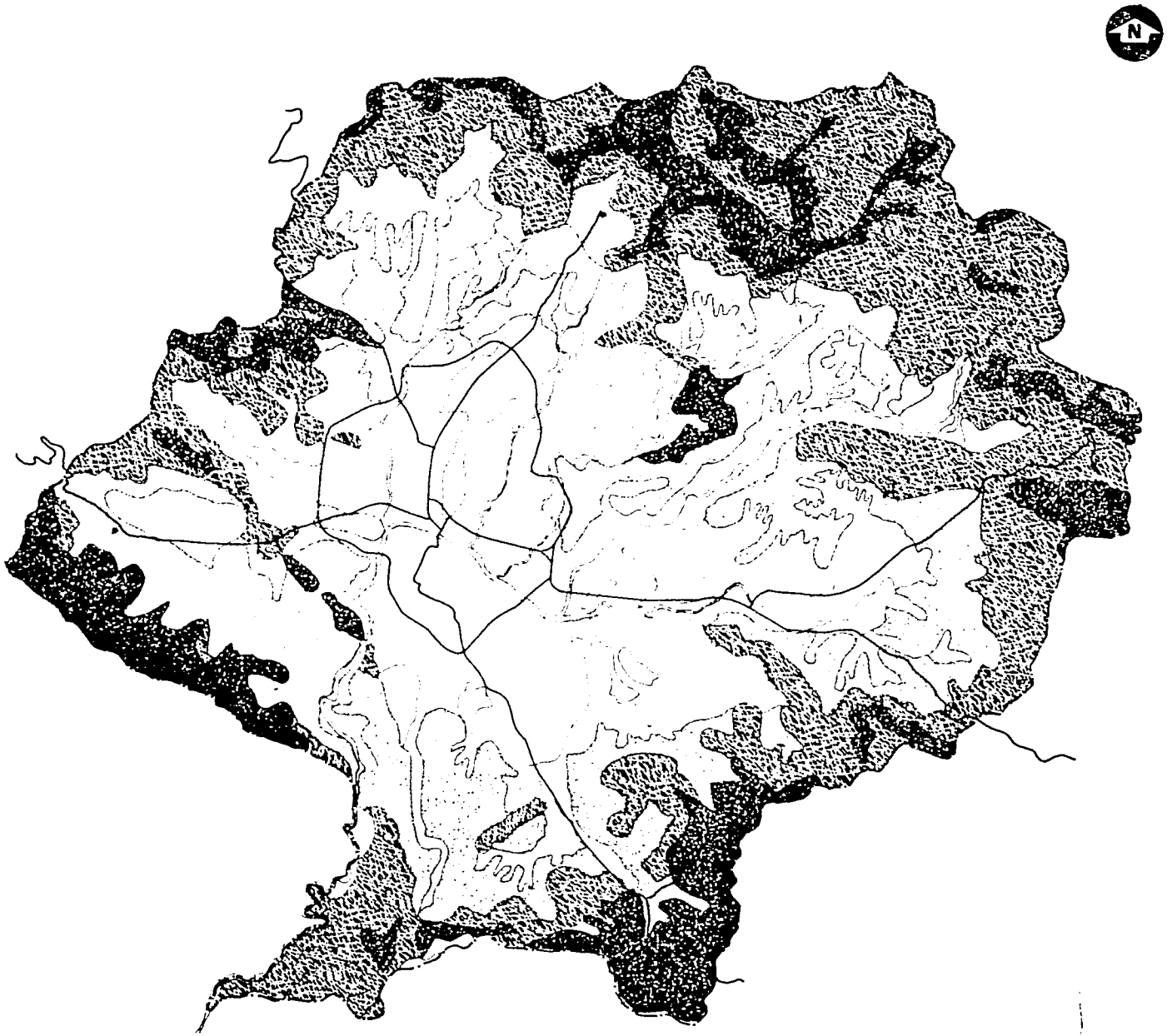
SOURCE _ LAND RESOURCES MAPPING PROJECT, 1984

PREPARED BY _ PADCO, KATHMANDU, 1985

FIGURE II C

KATHMANDU VALLEY

LAND CAPABILITY



SCALE 0 1250 2500 3750 meters

LEGEND

	I	LEVEL LAND
	II	GENTLY SLOPING (SLOPES 1°- 5°)
	III	MODERATELY SLOPING (SLOPES 5°–30°)
	IV	STEEPLY SLOPING (SLOPES > 30°)

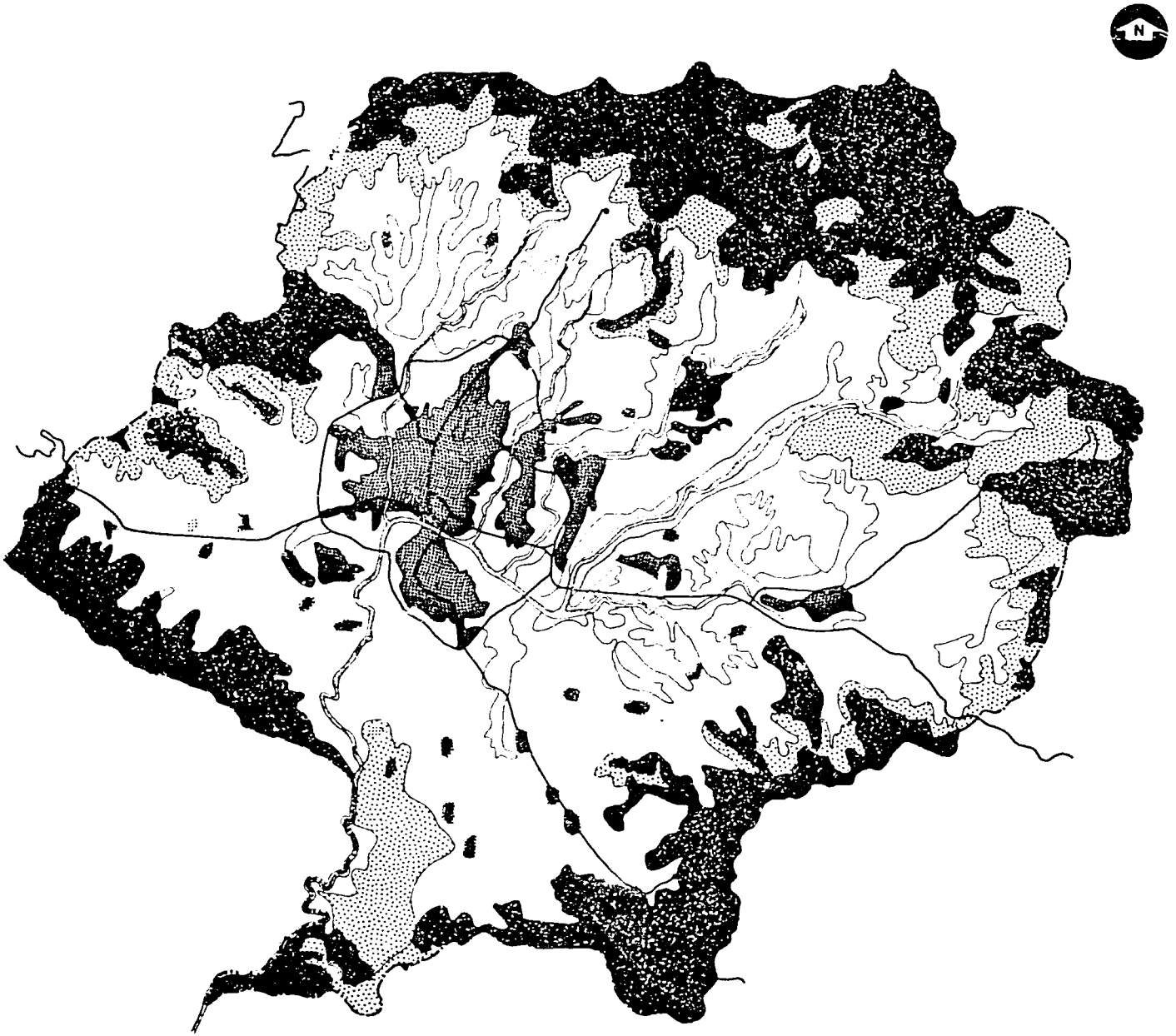
SOURCE – LAND RESOURCES MAPPING PROJECT, 1984

PREPARED BY – PADCO, KATHMANDU, 1985

FIGURE II. 7

KATHMANDU VALLEY

LAND USE



SCALE 0 1250 2500 3750 meters

LEGEND

- URBAN AREAS + SETTLEMENTS
- LOW LAND AGRICULTURE
- UPLAND / SLOPE AGRICULTURE
- FOREST AND SHRUB

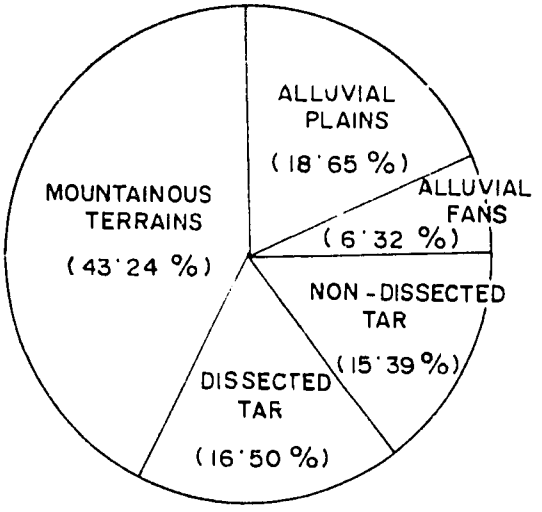
SOURCE – LAND RESOURCES MAPPING PROJECT, 1984

PREPARED BY – PADCO, KATHMANDU, 1985

FIGURE II . 8

KATHMANDU VALLEY

LAND SYSTEM



LAND CAPABILITY

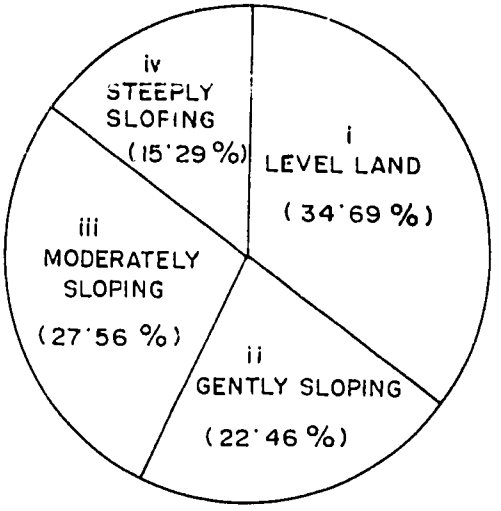
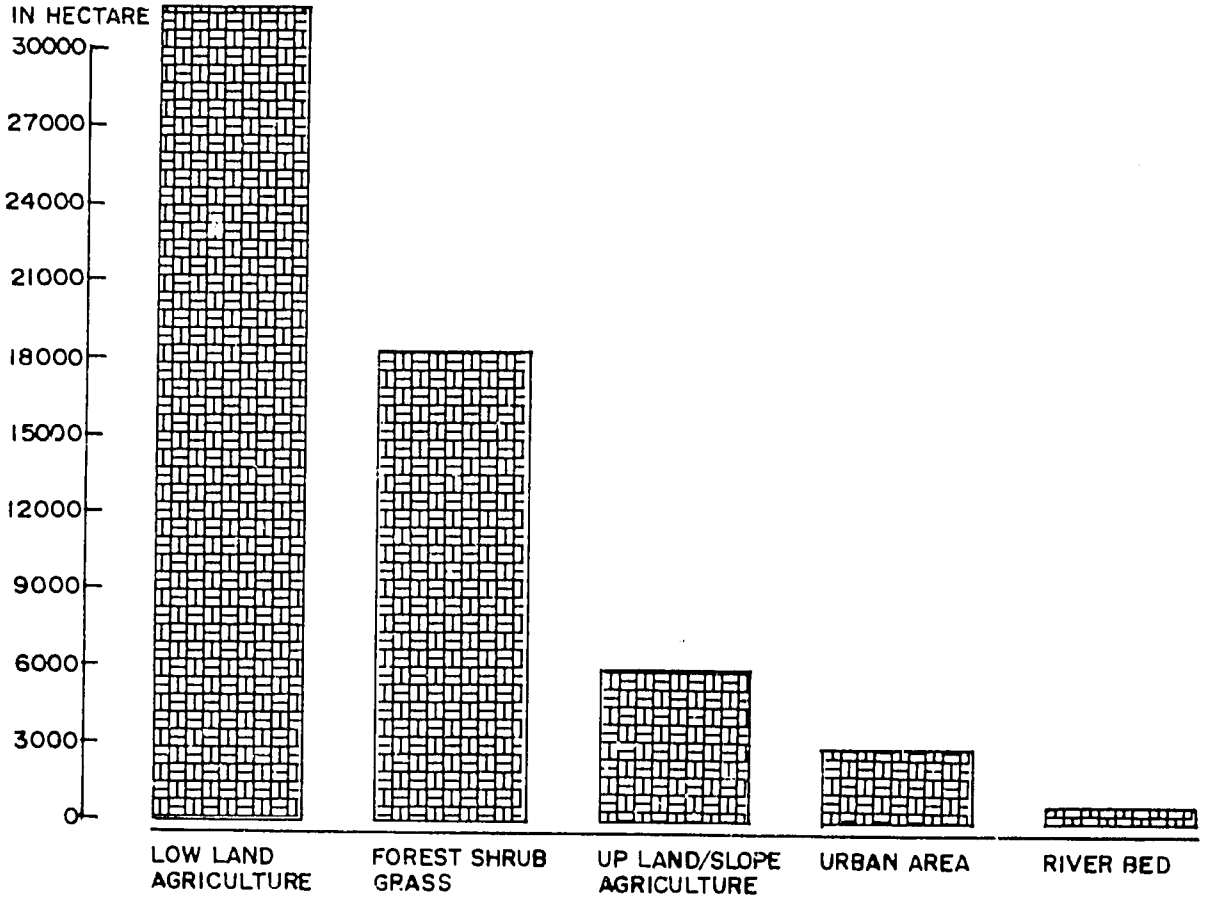


FIGURE II. 9

LAND USE



Source - LRMP Maps, 1984
Computed by-PADCO, Kathmandu , 1985

The most striking feature in the Valley land forms are the "tarlands". These lie between the alluvial plains and are flat plateau-like land forms which are separated from the flood plains by sharp escarpments. Dissected (topographically irregular) and non-dissected "tarlands" each make up about 16 percent of the Valley area. Until relatively recent, settlement areas such as the city cores and former Rana palaces were largely located on non-dissected "tarlands". In fact, northward extension of Kathmandu towards Maharajgunj has been along a principal tarland. Lalitpur is also located on a tar area where considerable room is left for expansion. Like Kathmandu and Lalitpur, Bhaktapur City and other important villages (such as Thimi, Bode, Kirtipur, and Nakadesh) are situated on non-dissected tarlands. Extensively dissected tarlands which are not suitable for urban development are located in southern Lalitpur District, southern and eastern Bhaktapur District, and in northeastern and southwestern Kathmandu District.

As the Kathmandu Valley is defined by mountain ridges, considerable Valley area is occupied by mountainous terrain: 27.5 percent of Valley land consists of moderate slopes ranging from 5 to 30 degrees, and 15.7 percent is occupied by steep slopes greater than 30 degrees. The steep areas are most suitable for forest coverage. The Sheopuri Watershed Management Project is a good example of required efforts to keep these areas in forest.

Alluvial fans are gently sloping, highly dissected, and less productive for agricultural use than most alluvial plains and tar lands. The fans, which make up about 6.3 percent of Valley area, are suited for non-agricultural use and are situated towards the outer limits of the Valley.

The land systems map presented in Figure II.5 provides a good basis for assessing where urban expansion can take place if "tar" areas are given preference over flood plains and lowland areas. Planning for the expansion of urban areas is taken up in Chapter 3, Section F.

2. Land Capability

LRMP land capability classifications found in the Kathmandu Valley are defined as follows:

I	Few limitations on agriculture
II	Terracing or contouring needed
III	Terracing mandatory for agriculture
IV	Due to excessive slopes, suitable for forestry only

In general, the LRMP land classes form concentric rings in the Valley: Class I is in the center surrounded by Classes II, III, and IV respectively. As a rule, Class I land consists of alluvial plains and undissected tar areas making up about 34 percent of the Valley area. These largely flat areas are composed of deep, fertile soil which is very productive and intensively farmed. The urban areas of Kathmandu, Lalitpur, and Bhaktapur fall exclusively upon this category of land with the exception of the area occupied by Tribhuvan Airport. In fact, as Figure II.6 shows, Kathmandu and Lalitpur lie in the middle of the largest Class I area in the Valley. Currently, the largest undisturbed Class I area lies to the southeast of Greater Kathmandu in

proximity to Sanagaun and Balkot. According to LRMP map data, Class I land made up about 20,700 hectares of which 2,850 or 14 percent was occupied by urban uses in 1979.

Class II consists of dissected tars and alluvial fans and makes up about 22 percent of the Valley area. Soils in these areas are deep and well-drained, though gully erosion is common. Most Category II land lies towards the outer limit of the Valley, with the exception of the dissected tarland which begins at the airport and continues northeast across the Valley towards Sankhu. The third and fourth categories of land consist of sloping and mountainous areas and make up about 44 percent of the Valley area. Land capability in the Valley is quite high: arable areas consisting of Classes I, II, and III land make up 85 percent of the Valley area.

3. Land Utilization

Land utilization data for the Valley are illustrated in Figure II.7 and Table II.5. As noted previously, urban areas occupy about 4.8 percent of Valley area and about 14 percent of Class I land. Lowland agricultural areas, consisting essentially of Class I and II soils, make up about 53 percent of the Valley area. In these areas, paddy and wheat are the principal crops, and between two and three crops can be grown per year. Terraced farming takes place in upland/slope areas which occupy about 10 percent of the Valley area. In these areas, maize and millet are the principal crops. Grazing areas occupy a marginal percentage of Valley land while forest and shrub areas make up about 30.6 percent of the Valley.

The poor ratio of agricultural land to forest area in the Valley is partially offset by the high use of fertilizer. Nevertheless, the lack of forest areas in proximity to the Valley have made fuelwood and fodder (forest leaves for livestock) high priced and difficult to obtain.

On a district basis, Kathmandu (the largest district) had the largest area of land devoted to agriculture, but proportionately Bhaktapur District's agricultural land use was highest (80 percent). While only about 45 percent of Lalitpur District was found to be cultivated, it had the highest proportion of forest/shrub lands. The LRMP data indicate that the cultivated area of the Valley is reaching the limit of available arable land and has already surpassed the limit in Bhaktapur District. Thus, there is no more scope for adding new cultivated land to raise agricultural production or compensate for land lost to urbanization. Increasing agricultural income will depend on raising yields and introducing more profitable crops.

D. CONVERSION OF AGRICULTURAL LAND TO URBAN USE

The Kathmandu Valley is one of the most fertile and agriculturally productive areas in Nepal. It also houses the largest and most rapidly-growing urban population and economy in the country. The Valley's urban activities are located upon Class I land, as defined by the LRMP, and will necessarily result in loss of more agricultural land as they expand. Therefore, it is inevitable that growing conflicts will occur between the utilization of Valley land for urban and agricultural uses. The purpose of this

section is to determine at what rate agricultural land is being lost to urbanization; to project future losses of arable land; to define the scope of the problem and its tradeoffs; and to suggest a future course of action.

As shown in Chapter III., Section C, the built-up area of Greater Kathmandu increased by 88 percent between 1971 and 1981, a growth rate of 6.52 percent per year. The growth resulted in a loss of about 1,500 hectares of agricultural land.

Relatively little agricultural land was converted to urban use in Bhaktapur. According to 1979 LRMP data shown in the previous section, urban areas occupied about 2,350 hectares in the Valley: 14 percent of Class I land and 8.4 percent of Classes I and II lands combined. Thus, though urban areas are starting to have a decided impact upon Class I lands, more than 90 percent of the valuable agricultural lands still remained untouched in 1979.

Projections regarding the future loss of arable land due to urbanization depend on a number of factors, including population growth and density, growth in urban land uses, etc., over which Government can, in principle, exercise some control. Nevertheless, if past trends persist, it appears from Tables II.6 and II.7 that:

- 56 percent of Class I land may be urbanized by 2001 and 100 percent by 2010
- 35 percent of Classes I and II land may be urbanized by the year 2001 and 60 percent by 2010.

At this rate, no prime agricultural land will exist in the Valley in the year 2020, when almost 60 percent of the entire Valley will have been urbanized. At that time, if current trends persist, the Valley will have a built-up area of 34,000 hectares. Prime agricultural land is more likely to be urbanized than secondary arable land simply because the prime land is located on the fringes of the existing urban areas. Lower quality arable land is located on the edges of the Valley away from the cities.

Is the conversion of prime agricultural land to urban use necessarily bad? It is not possible within the scope of this study to conduct a financial or economic analysis of the tradeoff between urban and agricultural land in the Valley. At the present stage of development, the conversion of Valley agricultural land to urban land is likely to be favorable financially, economically, and socially. The high prices of land on the urban fringe almost certainly indicate that the rate of return and net benefits of converting agricultural land to urban use are positive. Yet, the potential benefits of converting land to urban use may conceal other costs, including pollution, congestion, loss of green space, and rising costs for urban management and services.

In any case, it is clear that the Valley makes an important contribution to agricultural production. From a policy point of view, the Valley should be kept as self-sufficient in food as possible. Urban development can be more effectively planned and controlled. Therefore, it is wise to preserve the best agricultural lands in the Valley for as long as possible.

The main task needing attention is to begin to lay the groundwork for long-term planning and control of urban land use patterns. Preservation of prime agricultural land would fit in as one of several important objectives of this effort. The steps which need to be taken include:

Table II.6

PROJECTED CONVERSION OF VALLEY AGRICULTURAL LAND
TO URBAN USE
(Density Method)

Year	Urban Pop. (000) @ 4%/Yr. Growth Rate	Urban Population Increment (000)	Incremental Amount of Urban Land Needed @ 40 p/ha	Estimated Ha. of Class I Land Remaining in Valley	Estimated ha. of Class I & II Total Ag. Land Remaining
1081	364			17,850	31,650
2005	905	541	13,525	4,325	18,125
2009	1,078	173	4,325	0	13,800
2020	1,630	552	13,800	0	0

Table II.7

PROJECTED CONVERSION OF VALLEY AGRICULTURAL LAND
TO URBAN USE
(Built up Area Growth Rate 6.52% Per Annum)

Year	Built up Area	Remaining Class I Land	Remaining Class I and II Land
1981	3,291	17,850	31,650
1991	6,181	14,960	28,760
2001	11,639	9,502	20,412
2011	21,890	0	13,051
2017	31,977	0	0

1. Identify areas where imminent urbanization is inevitable
   These include areas along major roads in proximity to the built-up areas (Thankot, Bhaktapur, the Ring Road, etc.), and areas in close proximity to existing towns.

2. Identify prime lands which need preservation
   These areas should be out of the path of inevitable development. Areas of prime land can be found in northern and northeastern Kathmandu District, southern Lalitpur District, and eastern and southern Bhaktapur District. As Figure II.7 indicates, the largest area of Class I agricultural land is found in proximity to Sanagaun and Balkot. Substantial areas in Bhaktapur District should also be protected since it is the most agriculturally-productive district in the Valley. The best way to preserve undisturbed agricultural areas is to restrict access by road.

   Flood plains are the richest arable areas in the Valley and are not well suited for urban development. As a consequence, they should be protected to the maximum extent feasible. Protection of flood plains from encroachment will also reduce costly investment in drainage systems if these areas urbanize. Furthermore, maintenance of flood plain areas for agricultural use within the towns will create open space in the city as the town develops.

3. Develop and enforce regulations to preserve arable land
   Regulations prohibiting urban development on those lands to be preserved are needed. These should specify when special exemptions apply and the criteria for granting such exemptions should be clear. The regulations should also allow for protected areas to be modified over time. A high level commission should be established to review development proposals and monitor the preservation of the lands in question.

4. Target specific areas for development and raise urban densities
   If desired arable areas are to be protected, an outlet for expansion of the urban areas must be established. It will be necessary to encourage higher density development upon tar areas in Kathmandu and Lalitpur Districts. The tar areas south of the Lalitpur core area, north of Maharajgunj and Boudha, and Swayambhu and Thimi should be targeted for development. The best way to encourage development in these areas is to introduce access roads. If reasonable densities can be achieved, projected losses of agricultural land on the basis of current trends could be significantly reduced as a result of these actions.

   Provision of incentives to encourage development of specific areas should be made in the context of an implementable public investment program so that major facilities such as roads, water systems, and public buildings are evaluated and constructed in accordance with a plan. Land protection regulations should be part of an overall land use plan and law for the Valley which would include other types of zoning such as forest, watershed, open space, historic preservation, industry, etc. The plan should include zoning regulations, development approvals, subdivision regulations, and building codes.

CHAPTER III
PHYSICAL CHARACTERISTICS OF URBAN EXPANSION

A. URBAN POPULATIONS AND DENSITIES

1. Town Panchayat Populations

Table III.1 and Figure III.1 present populations and growth rates of Kathmandu, Lalitpur, and Bhaktapur for 1961, 1971, and 1981. Of the three towns, Kathmandu has been growing the most rapidly, followed by Lalitpur. Population growth in Bhaktapur has been relatively modest.

Table III.1
POPULATION OF TOWN PANCHAYATS*

	1961	1971	1981	Percent Increase 1971-1981
Kathmandu Town Panchayat	121,019	150,402	235,160	56.35%
Lalitpur Town Panchayat	47,713	59,049	79,875	35.62%
Bhaktapur Town Panchayat	33,877	40,112	48,472	20.84%

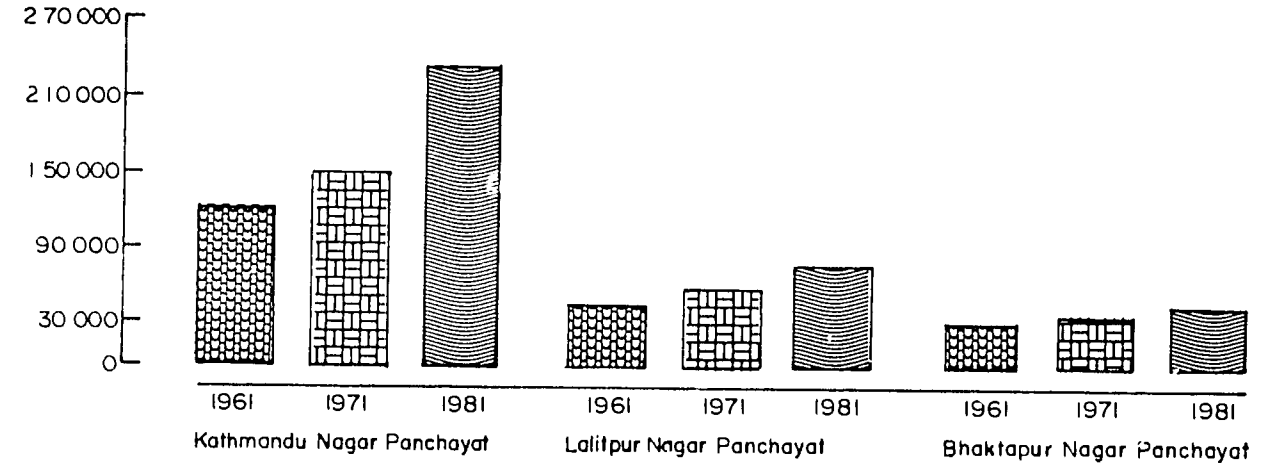
*Source: Central Bureau of Statistics

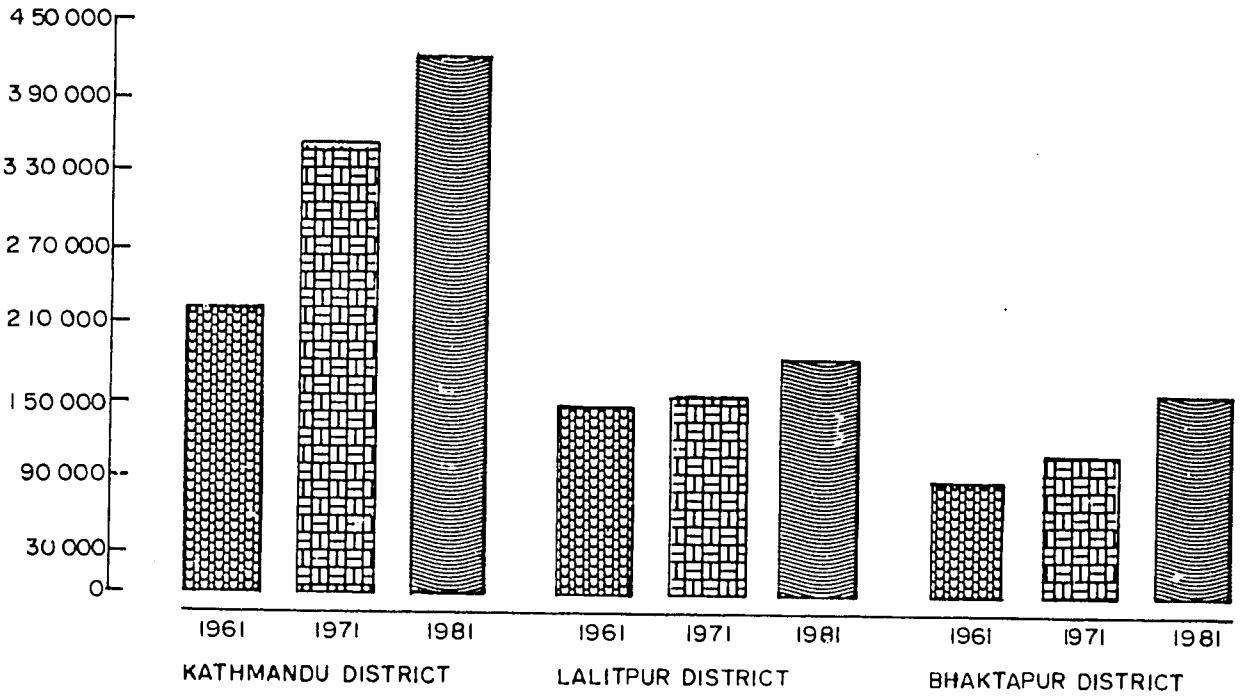
Part of Kathmandu's rapid rate of growth can be attributed to boundary changes. In 1981, several village panchayats were incorporated to the east (1,225 hectares) and west (848 hectares) of Kathmandu. Comparatively, no major extension of Lalitpur town panchayat occurred during the same period. However, even discounting boundary changes, it would appear that Lalitpur is growing slightly less rapidly than Kathmandu. In the case of Bhaktapur, growth appeared to have declined between 1961 and 1971. The introduction of the Arniko Highway and the loss of trade with Tibet were factors which seriously affected the economy of the town. Since 1971, growth has been roughly equivalent to the natural growth rate, most likely due to better access to Greater Kathmandu caused by the tram, the injection of development aid (GTZ), and the rise in tourism. Nevertheless, migration to Greater Kathmandu for employment opportunities is still common. In addition, it appears that village panchayats in the vicinity of Thimi, between the Arniko and old Bhaktapur Highways, are becoming increasingly more attractive for construction and development activities than Bhaktapur.

Figure III.1

KATHMANDU VALLEY

POPULATION





Source - Central Bureau of Statistics, HMG/NEPAL 1961, 1971 & 1981
Computed by - PADCO, Kathmandu, 1985

2. Town Panchayat Densities

Kathmandu Town Panchayat

Figures III.2-7 and Tables III.2-4 illustrate ward densities in Kathmandu, Lalitpur, and Bhaktapur town panchayats. In Kathmandu, the core or old city is by far the most dense area. Of the 12 wards concerned, 10 had densities exceeding 400 persons per hectare, while two had densities exceeding 1,200 persons per hectare. Outside of the core area, densities are generally low. In the nine wards of the eastern and northern suburban areas, very low densities of 20 to 100 persons per hectare are found. Only in Ward 33 are densities as high as 165 persons per hectare. The eastern fringe area, consisting of 5 wards, has densities generally less than 50 persons per hectare. In fact, Ward 6 has the lowest density in Kathmandu of only 13.7 persons per hectare. These wards were village panchayats until they were absorbed into the town panchayat in 1981.

The four wards of the western fringe area were also previously village panchayats until 1981. With the exception of Ward 13, these wards also have densities less than 50 persons per hectare. Comparing 1971 and 1981 density data suggests that substantial increases in density have occurred in city core wards and moderate increases in density occurred in northern suburban and fringe wards (Ward 33 of the eastern fringe area and Ward 13 in the western fringe). The increases in core area ward densities between 1971 and 1981 may be in part due to a reorganization of ward boundaries. Nevertheless, that data suggest that a population of about 32,000 was added to the core area during the decade. Densification has been occurring through both infill of vacant areas as well as densification within the existing housing stock. Presently, as the only open space left in the core area is found in Wards 12, 17, and 18, little additional infill is expected. Despite deplorable conditions due to high density in some parts of the core, further densification will probably take place, due to unaffordability of land by poor and migrant groups.

In the northern and eastern suburban areas, densities are expected to remain low due to the large number of open and public spaces: Tundikhel, stadium, Singha Durbar, Royal Palace, hotels, diplomatic buildings, etc. However, some open space is left for development in northeastern Wards 3, 4, and 5. Considerable vacant land exists in the eastern and western fringe areas where further densification is anticipated.

In Lalitpur, as in Kathmandu, wards in the core area are considerably more dense than outside the core. Of the 12 wards in Lalitpur's core area, 4 have densities greater than 600 persons per hectare, and 10 have densities greater than 200 persons per hectare. Wards 19 and 20 have the lowest densities in the core area. In Lalitpur's northern and eastern fringe areas, densities vary between 50 and 200 persons per hectare; while in eastern, western, and southern suburban areas, densities are generally lower than 50 persons per hectare. Of all wards, Ward 2 had the lowest density of 17 persons per hectare.

In comparing 1971 and 1981 ward density data for Lalitpur, it appears that densities have increased in virtually every ward. The substantial increases in density were recorded in Lalitpur's central core wards. Presently, there are

few open spaces left in the core area so further infill is not likely to take place. However, as in Kathmandu, the existing housing stock in the core area will still be subject to further densification.

Densities are low in the northern and eastern fringe areas where large tract areas of vacant land can be found. These are prime agricultural areas in flood plains without adequate internal roads and lacking access to Kathmandu. Construction of bridges to Kathmandu would have a decided impact on densification of these areas. As extensive vacant areas still remain in the western and southern suburban residential areas, further densification is anticipated.

Unlike Kathmandu and Lalitpur, Bhaktapur has not undergone dramatic changes in population and density over the past two decades. For example, only 176 land transactions took place in Bhaktapur during 1984/85 compared to 1,624 and 7,336 in Lalitpur and Kathmandu town panchayats respectively. Also, unlike Kathmandu and Lalitpur, there is less variation in density among the Bhaktapur wards, since there has been little expansion outside the traditional core area. Bhaktapur panchayat's gross density was on the order of 314 persons per hectare in 1981, while densities in Kathmandu and Lalitpur were about 130 and 51 persons per hectare respectively.

In Bhaktapur, no ward had a density of less than 100 persons per hectare and most ranged between 200 and 600 persons per hectare. Between 1971 and 1981; some densification occurred in Wards 15, 2, 12, and 8. Though no suburban areas have developed in Bhaktapur, some development outside the town panchayat has occurred along the Arniko Highway.

B. SPATIAL EXPANSION OF KATHMANDU

The historical expansion of Kathmandu was the subject of an article prepared by N.G. Ranjitkar and M.S. Manandhar in December 1983 for the Geographical Journal of Nepal. The study was concerned only with Kathmandu, but its general conclusions are true for Lalitpur as well. The authors note that the growth of Kathmandu can be characterized by four distinct periods. These periods and their essential characteristics include:

- Development of the core area (up to 1846)
  Significant growth of the core area did not take place until the Malla period (1257-1768 AD). The development of entrepot trade between India and Tibet contributed to making Kathmandu a prosperous and growing town in the Valley. The Malla Kings built walls around the city which led to the densification of the core area. With Privthi Narayan Shah's conquest in 1768, Kathmandu became the capital, and new residential and administrative buildings were constructed in the core. Nevertheless, a few major structures began to be built outside the old city: Bhimsen Tower, Bagh Durbar, Bhimsen Thapa Palace, etc.

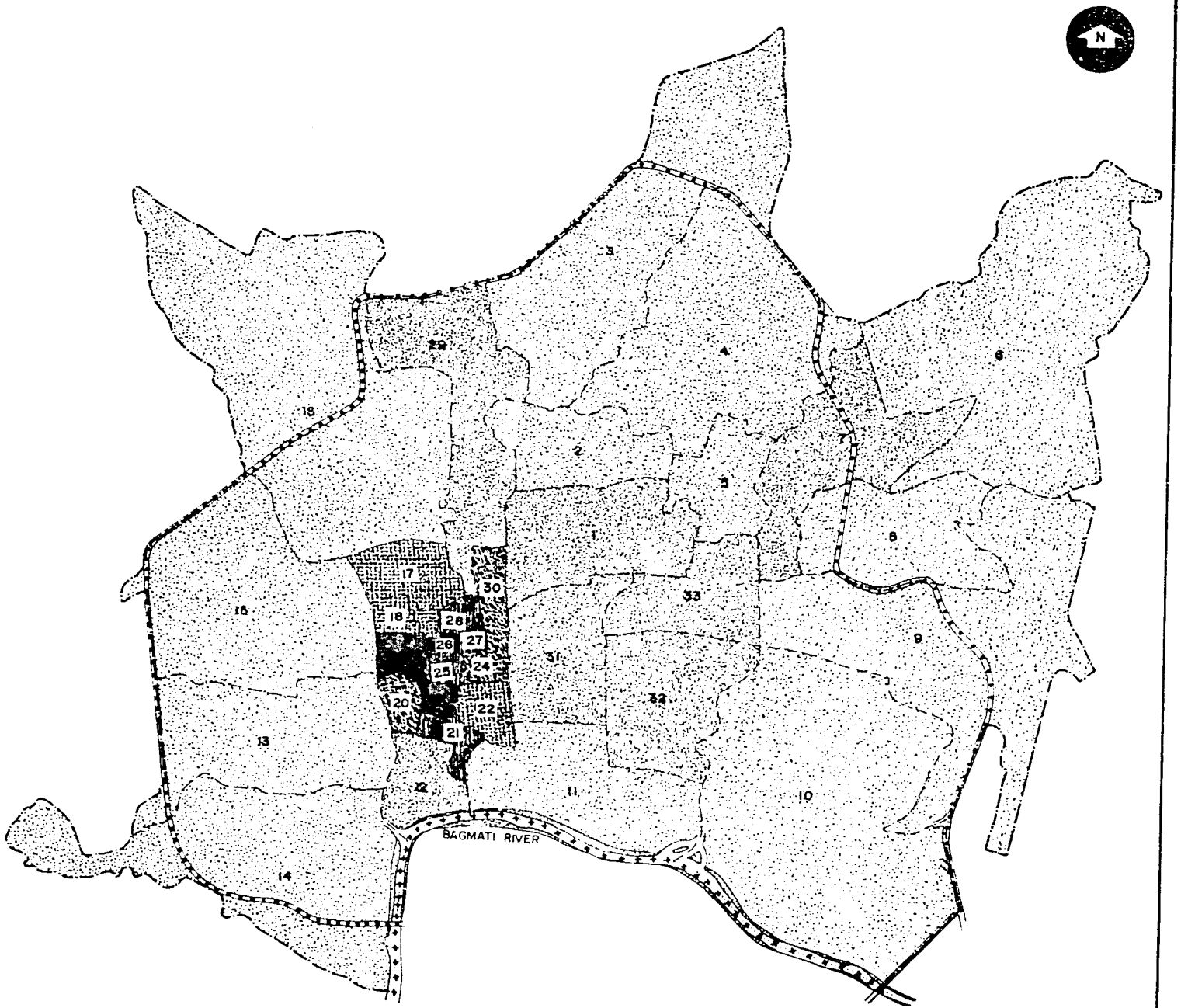


FIGURE III. 2

KATHMANDU NAGAR PANCHAYAT

URBAN POPULATION : DENSITY
1971

SCALE
600 300 0 600 1200 Meter

LEGEND

0 — 50	Persons / Hectare	
51 —100	"	"
101 —200	"	"
201 —400	"	"
401 —600	"	"
601 —800	"	"
801 —above	"	"

SOURCE _ KATHMANDU - LALITPUR HOUSING DEPT. OF HOUSING, BUILDING & PHYSICAL PLANNING, HMG, 1976
PREPARED BY_ PADCO, KATHMANDU, 1985

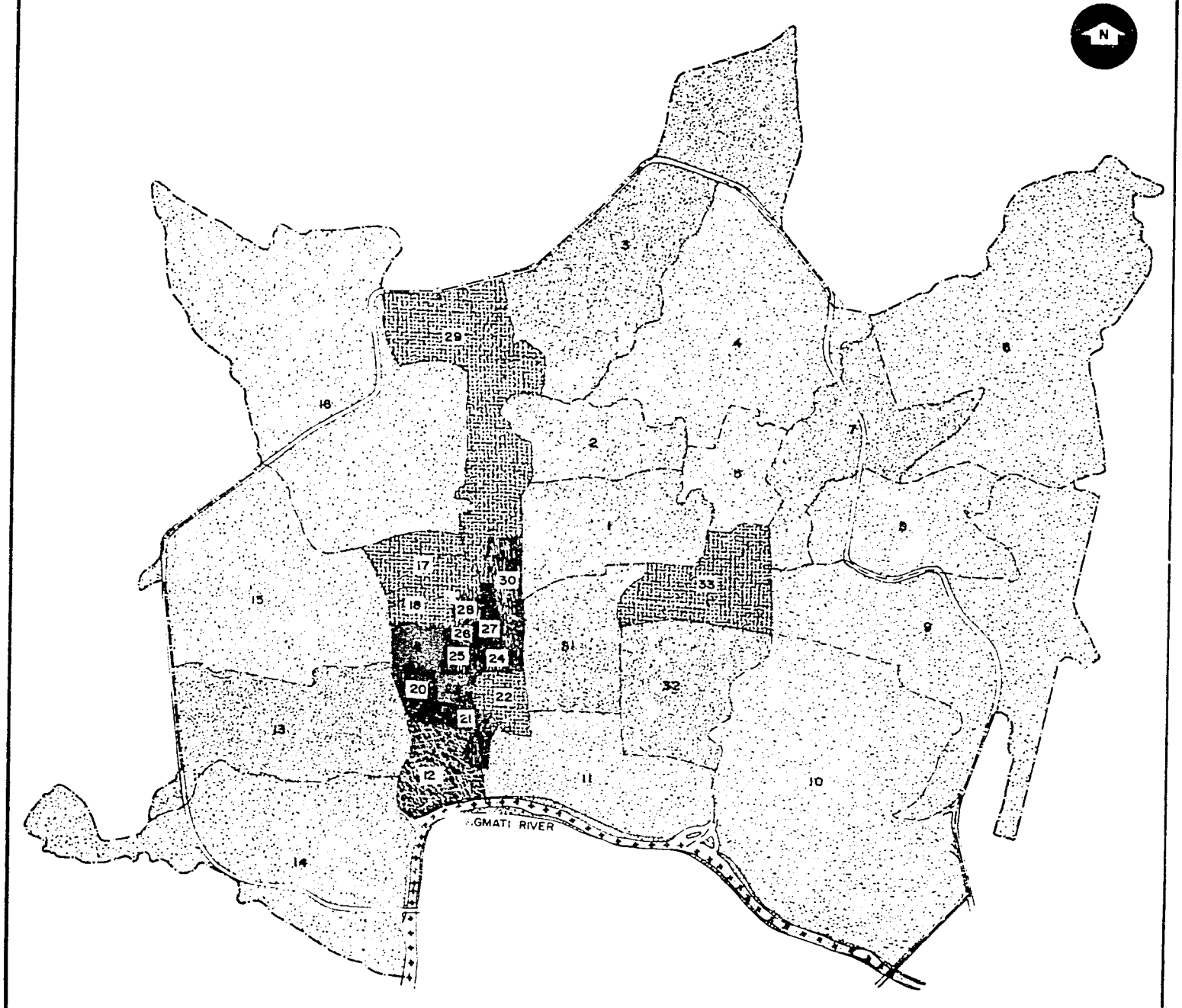


FIGURE III. 3

KATHMANDU NAGAR PANCHAYAT

URBAN POPULATION : DENSITY 1981

SCALE

600 300 0 600 1200 Meter

LEGEND

	0 – 50 Persons / Hectare
	51 – 100 " "
	101 – 200 " "
	201 – 400 " "
	401 – 600 " "
	601 – 800 " "
	801 – above " "

SOURCE – COMPUTED ON THE BASIS OF VOTER'S LIST, ELECTION COMMISSION, 1981

PREPARED BY– PADCO, KATHMANDU, 1985

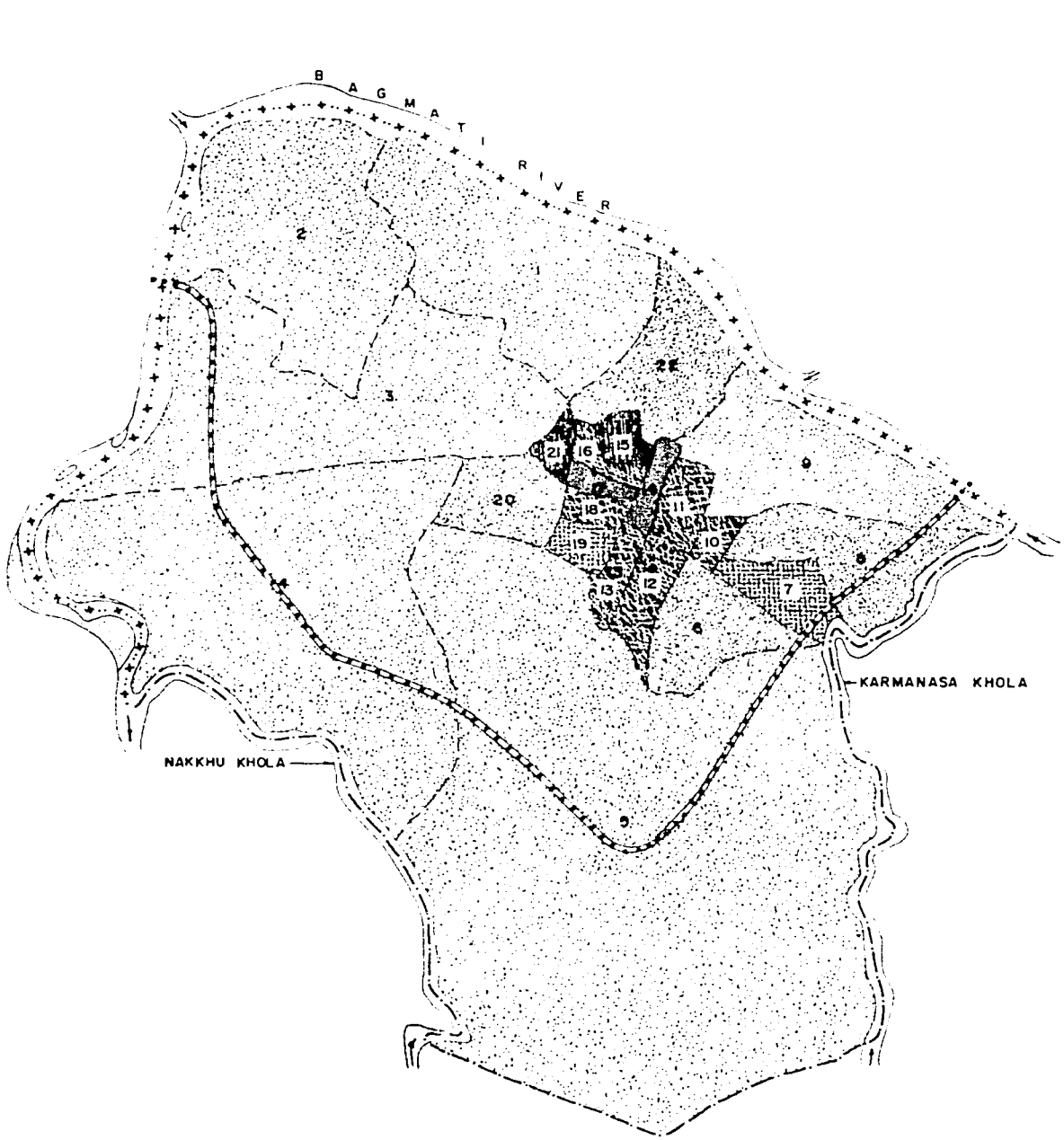


FIGURE III. 4

LALITPUR
NAGAR PANCHAYAT

URBAN POPULATION : DENSITY
1971

SCALE
400 200 0 400 800 Meter

LEGEND

	0 – 50 Persons / Hectare
	51 – 100 " "
	101 – 200 " "
	201 – 400 " "
	401 – 600 " "
	601 – 800 " "

SOURCE – KATHMANDU-LALITPUR HOUSING DEPT. OF HOUSING, BUILDING & PHYSICAL PLANNING, HMG, 1976

PREPARED BY – PADCO, KATHMANDU, 1985

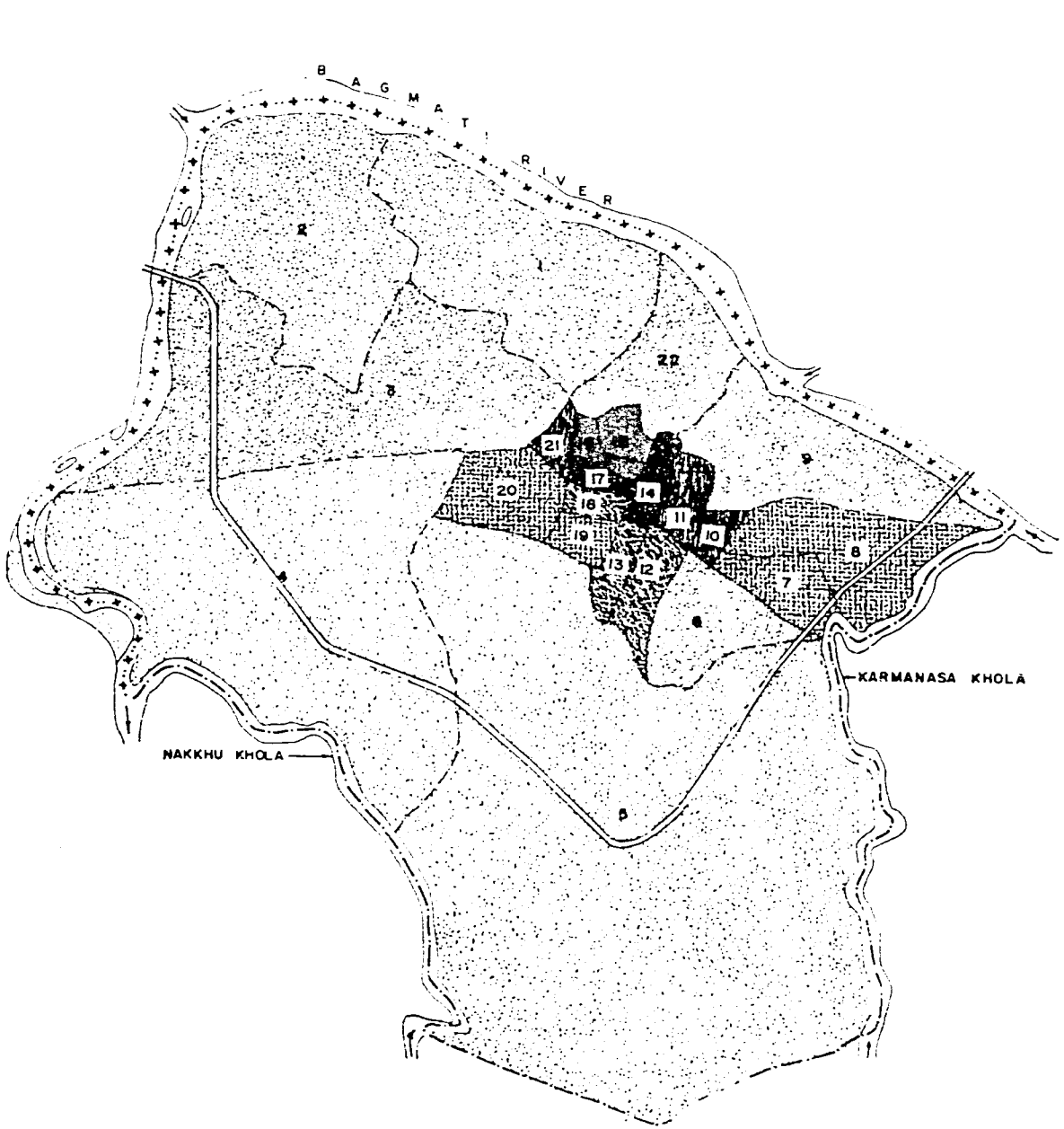


FIGURE III. 5

LALITPUR NAGAR PANCHAYAT

URBAN POPULATION : DENSITY 1981

SCALE

400 200 0 400 800 Meter

LEGEND

	0 – 50 Persons / Hectare
	51 – 100 " "
	101 – 200 " "
	201 – 400 " "
	401 – 600 " "
	601 – 800 " "
	801 – above " "

SOURCE – COMPUTED ON THE BASIS OF VOTER'S LIST, ELECTION COMMISSION, 1981

PREPARED BY – PADCO, KATHMANDU, 1985

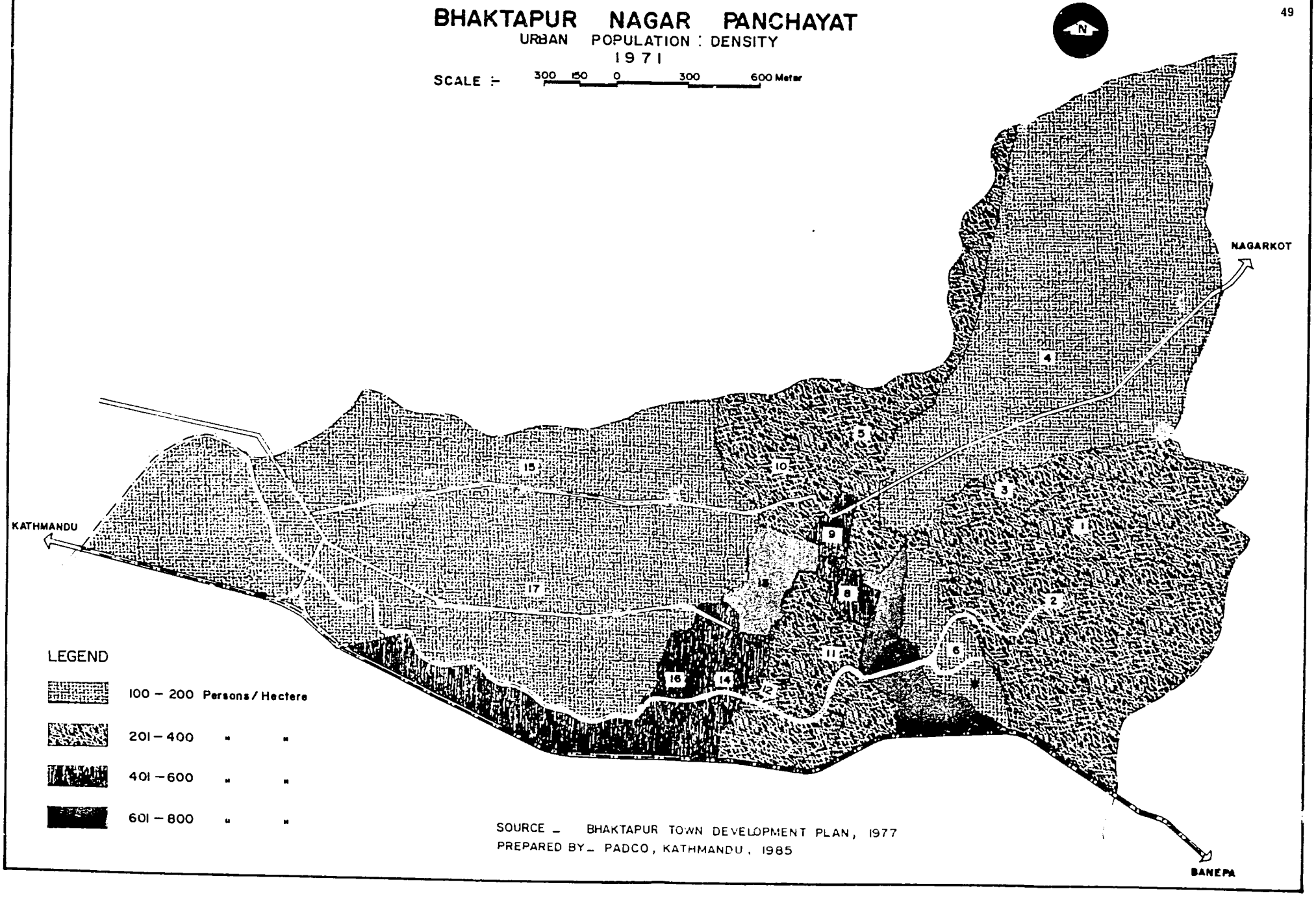
FIGURE III. 6

BHAKTAPUR NAGAR PANCHAYAT

URBAN POPULATION : DENSITY

1971

SCALE :- 300 150 0 300 600 Meter



SOURCE – BHAKTAPUR TOWN DEVELOPMENT PLAN, 1977

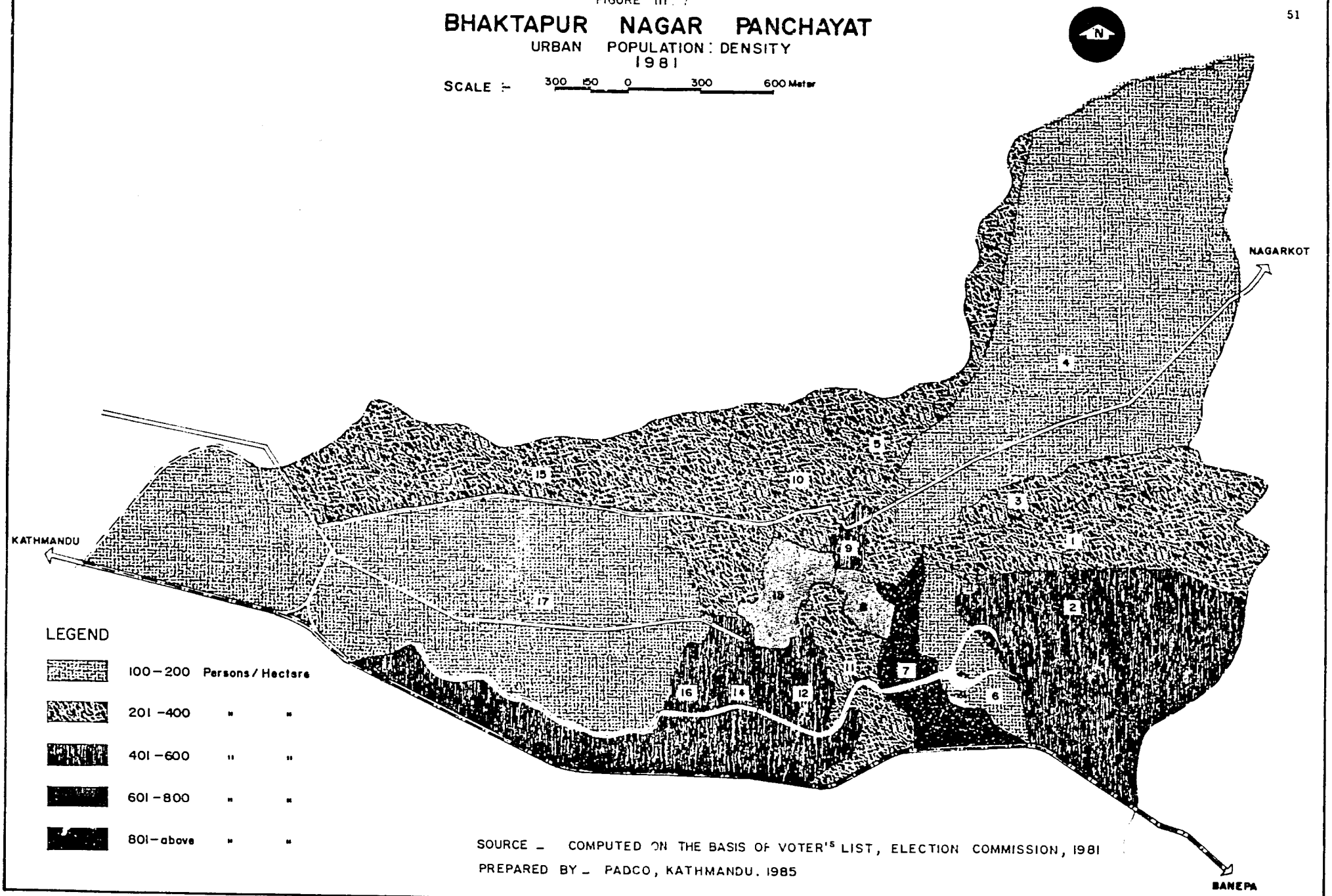
PREPARED BY– PADCO, KATHMANDU, 1985

FIGURE III . 7

BHAKTAPUR NAGAR PANCHAYAT

URBAN POPULATION : DENSITY 1981

SCALE :- 300 150 0 300 600 Meter



SOURCE – COMPUTED ON THE BASIS OF VOTER'S LIST, ELECTION COMMISSION, 1981

PREPARED BY – PADCO, KATHMANDU. 1985

Table III.2 DENSITY OF URBAN POPULATION
LALITPUR NAGAR PANCHAYAT

Density	1971* Wards	1981** Wards
1. 0-50 Persons per hectare	1,2,3,4,5,9	1,2,4,5
2. 51-100 " "	6,8,20,22	3,6,9,22
3. 101-200 " "	7,19	7,8,19,20
4. 201-400 " "	10,11,12,13,16,18	12,13,18
5. 401-600 " "	21,15	10,11,21
6. 601-800 " "	14,17	16,15
7. 801 and above "	x	14,17

Table III.3 DENSITY OF URBAN POPULATION
KATHMANDU NAGAR PANCHAYAT

Density	1971* Wards	1981** Wards
1. 0.50 persons per hectare	2,3,4,5,11,16,13,6,8, 9,10,14,15,16	4,5,6,8,9,10,11,14, 15,16
2. 51-100 " "	1,7,12,29,31,32,33	1,2,3,7,13,31,32
3. 101-200 " "	17,18,22	17,18,22,29,33
4. 201-400 " "	20,24,30	12
5. 401-600 " "	21,25,27,28	20,21,24,25,28,30
6. 601-800 " "	19,23	19,23
7. 801 and above "	26	26,27

Table III.4 DENSITY OF URBAN POPULATION
BHAKTAPUR NAGAR PANCHAYAT

Density	1971* Wards	1981** Wards
1. 101-200 persons per hectare	4,6 & 17,15	4,6 & 17
2. 201-400 " "	1,2,3,5,10,11 and 12	1,3,5,10,11 & 15
3. 401-600 " "	8,9,14 & 16	2,9,12,14 & 16
4. 601-800 " "	7 & 13	8 & 13
5. 801 and above	x	7

*Source: Kathmandu - Lalitpur Housing Report, 1976.
**Source: Computed from Voter's list, 1981, Election Commission.

- The Rana period: slow and sporadic development (1846-1950)
  Large residential palaces constructed by Rana aristocrats outside the core area set the pattern for later development and urban sprawl. Over time, infrastructure networks evolved to serve the palaces which, in turn, served to foster development in their proximity. As more people began to converge on Kathmandu, settlements sprang up outside the core area along the highways and palace roads. For instance, Kalimati/Dallu developed to serve the west, and Dillibazaar and Baneswar to serve the east. Growing numbers of civil servants in the administration and military, from outside the Valley, took up residence outside the core area where a growing number of administrative functions were established as well.

- The period of steadily accelerating growth (1950-1964)
  Between 1952 and 1961, the population of Kathmandu only increased by 13.5 percent. The town was still largely pedestrian, and the provision of utilities was still limited and irregular. However, during this time, new political, economic, diplomatic, and cultural ties began which resulted in considerable new construction. In particular, the Balaju Industrial Estate, the Soaltee Hotel, hospitals, the Academy Hall, and embassies in Lazimpat Pani Pokhari were constructed.

- The period of rapid development (1964-present)
  During this period, thousands of immigrants were attracted to Kathmandu, initiating a housing boom in suburban areas. (Interestingly, residents of the old city, mainly Newars, did not move into suburban areas in significant numbers until the 1970s.) New infrastructure systems were added and old ones improved. In 1973, fire destroyed most of Singha Durbar, the largest Government Secretariat building, and Government offices were relocated in fringe areas and along the Thapathali-Minbhawan Road. Expansion and development of the built-up area were also encouraged by growth in foreign aid and tourism and by the construction of the Ring Road in 1977. The latter continues to have the single most important impact on present-day urban expansion.

The spatial expansion of Kathmandu during the latter period was not uniform. Continuous growth has taken place only towards the north. Towards the east, growth was broken up by the low-lying Dhobi Khola, beyond which high- and middle-class residential development took place in Baneswar, while institutional expansion occurred along the new Bhaktapur and Airport Road. Expansion of the built-up area to the east and south has been constrained by the Bagmati flood plain or dol. To the west, the Vishnumati River has been less of a constraint to development but less development has evolved there since most public facilities were constructed east of the core area.

C. EXPANSION OF GREATER KATHMANDU'S BUILT-UP AREA

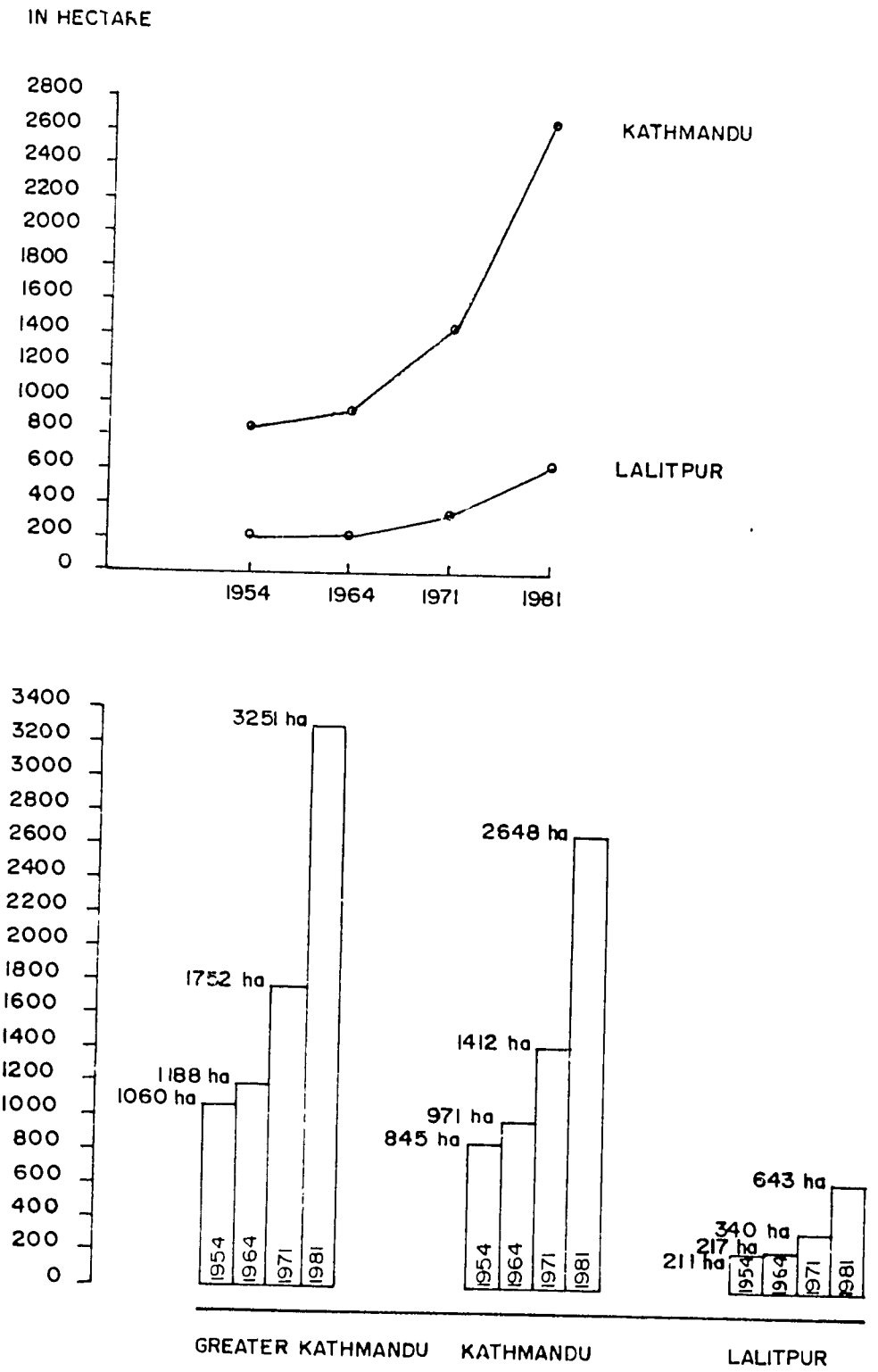
The spatial expansion of Greater Kathmandu between 1954-1964 and 1971-1981 are illustrated in Figures III.8-10 and Tables III.5 and III.6.

In 1954, most of the built-up area of Greater Kathmandu was comprised of the core areas, Rana palaces, and linear development along the main roads. At that time, all development had taken place on "tar" or elevated lands preserving the fertile, low-lying areas. However, by 1964, some lowlands such as Kamaladi were encroached upon by public functions.

FIGURE III. 8

BUILT - UP AREA

KATHMANDU & LALITPUR NAGAR PANCHAYATS



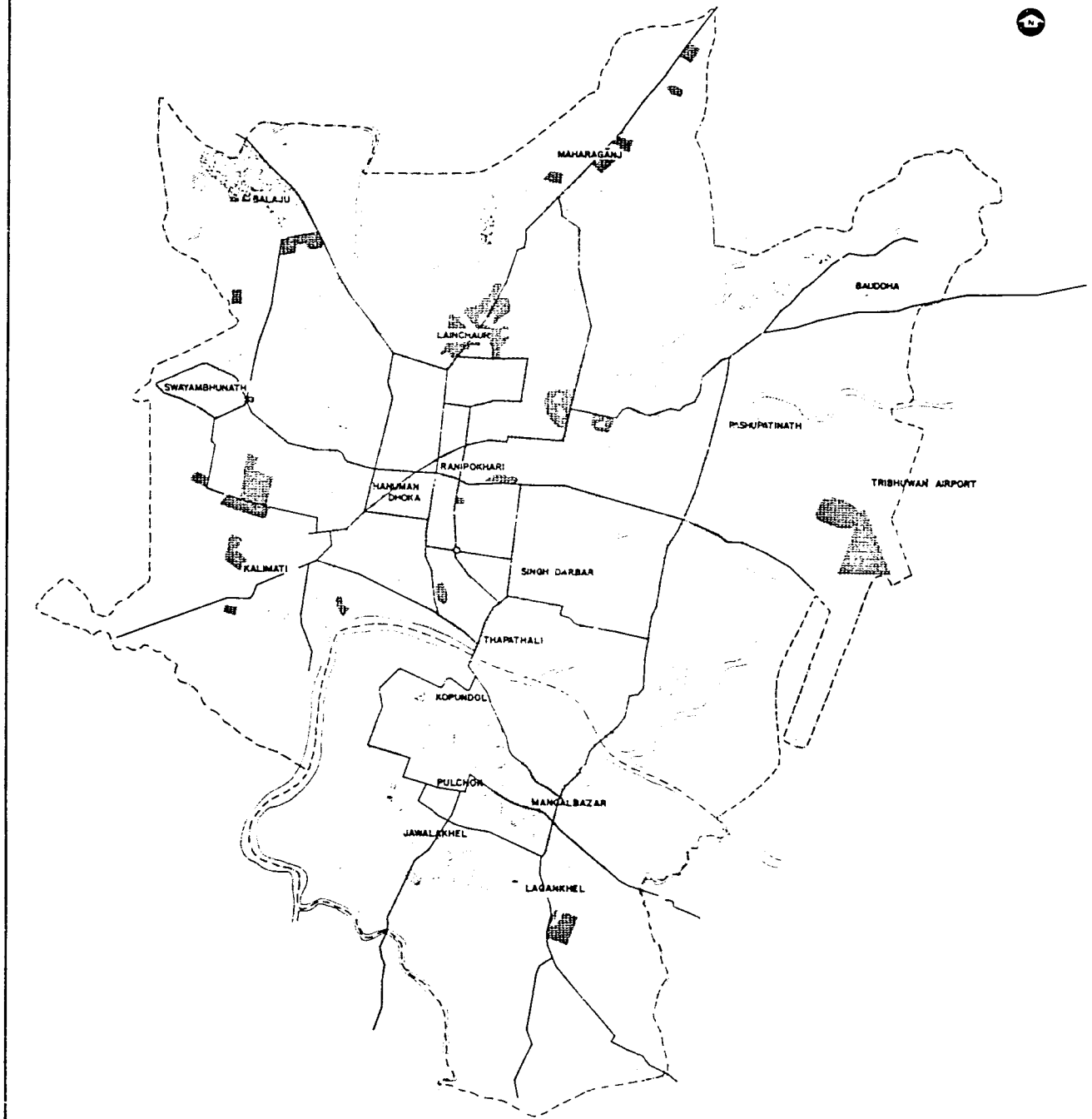
Source - AERIAL PHOTOGRAPHS, 1954, 1964, 1971 & 1981
Computed by-PADCO, KATHMANDU, 1985

FIGURE III. 9

GREATER KATHMANDU

BUILT UP AREAS

1954 1964



SCALE 0 0.4 0.8 1.2 1.6 Km

LEGEND

1954 BUILT UP AREA

1964 BUILT UP AREA

FOREST

SOURCE - Dr. N. G. RANATKAR'S PH.D. DISSERTATION AND AERIAL PHOTOGRAPHS 1954/1964

PREPARED BY - PADCO KATHMANDU 1985

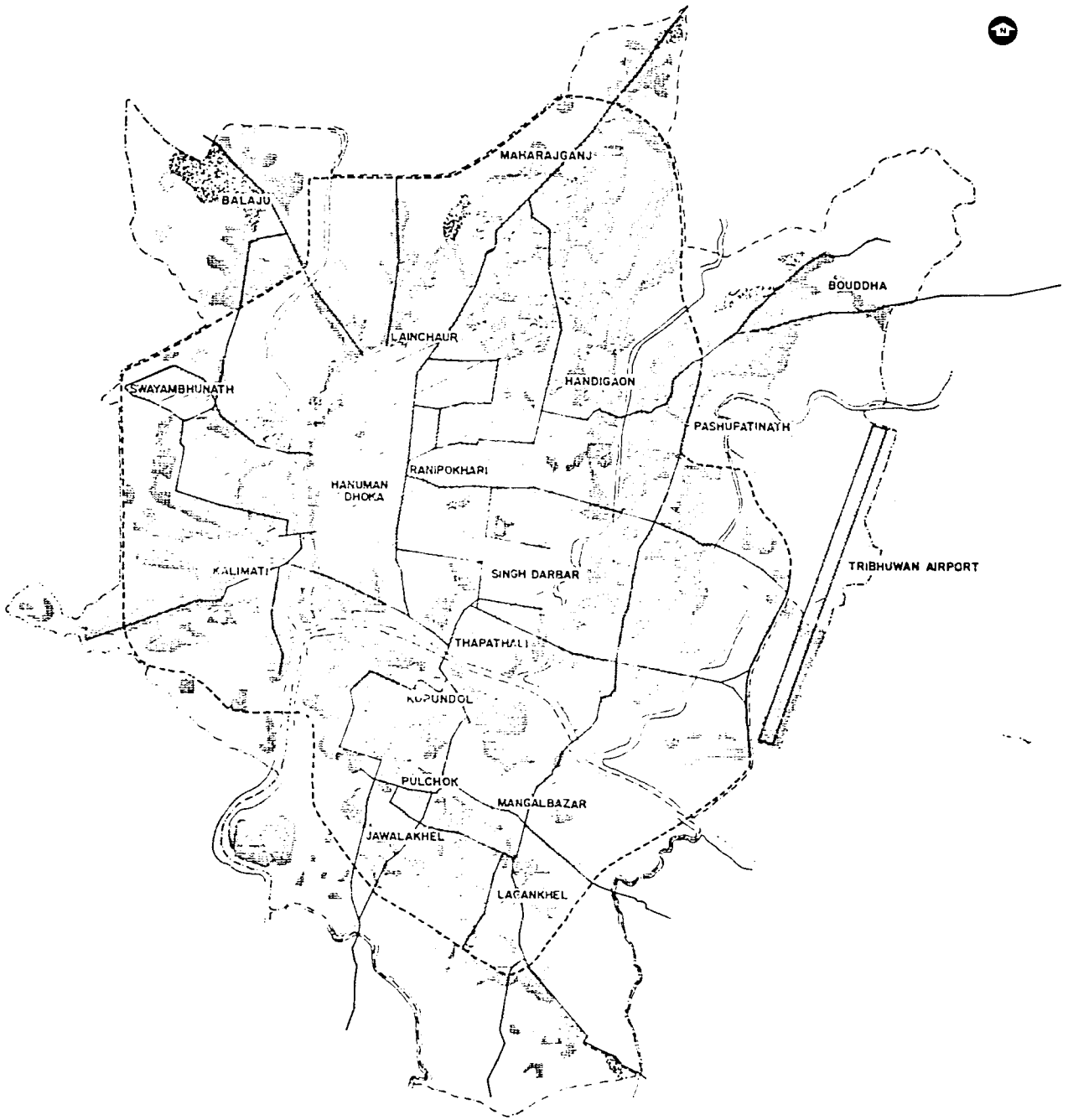


FIGURE III 10 59

GREATER KATHMANDU

BUILT UP AREAS

1971 1981

SCALE 0 0.4 0.8 1.2 1.6 Km

LEGEND

1971 BUILT UP AREA

1981 BUILT UP AREA

FOREST

SOURCE - AERIAL PHOTOGRAPHS 1971 / 1981

PREPARED BY - PADCO, KATHMANDU 1985

Table III.5

BUILT-UP AREA OF KATHMANDU NAGAR PANCHAYAT*

	1954		1964		1971		1981		Change (1954 - 64)		Change (1964 - 71)		Change (1971 - 81)	
	Hectare	%	Hectare	%	Hectare	%	Hectare	%	Hectare	%	Hectare	%	Hectare	%
Built-up Area	849.30	17.90	970.83	20.46	141.91	29.76	2648.32	55.82	121.53	+14.31	441.08	45.43	+1236.41	+87.57
Forest	57.49	1.21	57.49	1.21	57.49	1.21	57.49	1.21	x	x	x	x	0	0
River	128.07	2.70	128.07	2.70	128.07	2.70	128.07	2.70	x	x	x	x	0	0
Agricultural Land	3709.82	78.19	3588.29	75.63	3147.21	66.33	1910.80	40.27	121.53	- 3.28	441.08	-12.29	-1236.41	39.25
Total	4744.68	100%	4744.68	100%	4744.68	100%	4744.68	100%						

*Source: Aerial Photographs, 1954, 1964, 1971 and 1981.

Computed by: PADCO, Kathmandu, Nepal.

Table III.6

BUILT-UP AREA OF LALITPUR NAGAR PANCHAYAT*

	1954		1964		1971		1981		Change (1954 - 64)		Change (1964 - 71)		Change (1971 - 81)	
	Hectare	%	Hectare	%	Hectare	%	Hectare	%	Hectare	%	Hectare	%	Hectare	%
Built-up Area	211.36	13.39	216.72	13.73	339.99	21.53	643.37	40.75	5.36	+ 2.54	123.27	56.88	303.38	39.23
Forest	3.16	0.20	3.16	0.20	3.16	0.20	3.16	0.20	x	x	x	x	0	0
River	112.2	7.11	112.2	7.11	112.2	7.11	112.2	7.11	x	x	x	x	0	0
Agricultural Land	1252.13	79.30	1246.77	78.96	1123.50	71.16	820.12	51.94	5.36	- 0.43	123.27	-9.89	303.38	-27.00
Total	1578.85	100%	1578.85	100%	1578.85	100%	1578.85	100%						

*Source: Aerial Photographs, 1954, 1964, 1971 and 1981.

Computed by: PADCO, Kathmandu, Nepal.

Between 1964 and 1971, expansion of the built-up area took place primarily towards the north (Maharajgunj), and east (Dilli Bazaar and Old Baneswar). It was not until after 1971 that the low-lying areas of Dhobi Khola and the Bagmati River were encroached upon and that considerable growth began to take place west of the Vishnumati River. In Lalitpur, during this period, residential expansion of the built-up area took place largely in Jawalakhel, Kupondol, and Pulchowk. In Satdobat and Khumaltar, growth was largely due to institutional and industrial uses.

In 1954, the built-up areas of Kathmandu and Lalitpur were only 849 and 211 hectares respectively, or about one-third their areas in 1981. Between 1954 and 1964, the urbanized areas of the towns expanded by only 14.3 percent in Kathmandu and 2.5 percent in Lalitpur; but, between 1964 and 1971, town areas increased by 45 and 57 percent respectively. Even more rapid growth took place between 1971 and 1981 when Kathmandu's urbanized area increased from 1,411 to 2,648 hectares (an increase of 88 percent); and, Lalitpur's area increased from 340 to 643 hectares (an increase of 90 percent). In other words, Greater Kathmandu's built-up area doubled during this period.

In 1971, the Ring Road did not exist. Nevertheless, for comparative purposes shown in Tables III.7 and III.8, the built-up area within the Ring Road increased from about 34 percent of the enclosed area in 1971 to 60 percent in 1981 for both Kathmandu and Lalitpur. Of the area outside the Ring Road, but within town panchayat boundaries, the built-up area increased from 19 to 43 percent in Kathmandu, and from 5 to 14 percent in Lalitpur. As a rule, growth outside the Ring Road in Lalitpur has been much slower than in Kathmandu.

Until 1964, there were virtually no vacant areas within the built-up areas of Kathmandu and Lalitpur. However, between 1971 and 1981, vacant areas in Kathmandu increased from 114 to 151 hectares, while in Lalitpur vacant areas decreased from 55 to 34 hectares. No doubt, in both towns, vacant areas are in flux as densification occurs and new vacant areas are incorporated within the built-up area as the towns expand.

The expansion of Kathmandu's built-up area has largely taken place along transport corridors in the direction of Bansbari, Chabahil, Baudha, Baneswar, Balaju, Dullu, Kuleswar and Kalimati. At the same time, somewhat haphazard infilling has been occurring simultaneously in old and new Baneswar, Chabahil, Maharajgunj, Pani Pokhari, Rabi Bhawan, and Thachal. Encroachment on the low-lying flood plains of Dhobi Khola and the Vishnumati River has occurred but not to a great extent in Nayabazaar, Balaju, and Bhagabati.

In Lalitpur, continuous growth of the built-up area took place towards the northwest, west, and south including Kupondol, Sanepa, Jawalakhel and the Lagan Khel areas. Major expansion has not occurred towards the east and northeast due to a lack of access roads and because of the cremation grounds at Masan.

In 1971, about 79,000 persons were accommodated in 3,600 hectares of suburban areas in Kathmandu, while 71,400 persons resided in the core area of 273 hectares. At that time, the gross density of Kathmandu was on the order of only 20 persons per hectare in suburban areas and 285 persons per hectare in the core area. By 1981, gross densities in suburban areas and core areas increased to 40 and 387 persons per hectare respectively.

Table III.7

BUILT-UP AREA OF KATHMANDU TOWN PANCHAYAT*
INSIDE AND OUTSIDE THE RING ROAD

	1971				1981				Change (1971-81)			
	Inside the Ring Road		Outside the Ring Road		Inside the Ring Road		Outside the Ring Road		Inside the Ring Road		Outside the Ring Road	
	Ha.	%	Ha.	%	Ha.	%	Ha.	%	Ha.	%	Ha.	%
Built-up Area	1180.48	33.42	231.43	19.08	2130.08	60.32	518.24	42.72	+949.60	+80.44	+286.81	+123.92
Forest	7.5	0.21	49.99	4.12	7.5	0.21	49.99	4.12	0	0	0	0
River	110.84	3.14	17.23	1.42	110.84	3.14	17.23	1.42	0	0	0	0
Agricul-tural Land	2232.65	63.23	914.56	75.38	1283.05	36.33	627.75	51.94	-949.60	-42.53	-286.81	- 31.36
Total	3531.47	100%	1213.21	100%	3531.47	100%	1213.21	100%				

*Source: Aerial Photographs, 1971 and 1981.

Computed by: PADCO, Kathmandu, Nepal.

Table III.8

BUILT-UP AREA OF LALITPUR TOWN PANCHAYAT*
INSIDE AND OUTSIDE THE RING ROAD

	1971				1981				Change (1971 - 81)			
	Inside the Ring Road		Outside the Ring Road		Inside the Ring Road		Outside the Ring Road		Inside the Ring Road		Outside the Ring Road	
	Ha.	%	Ha.	%	Ha.	%	Ha.	%	Ha.	%	Ha.	%
Built-up Area	309.80	33.77	30.19	4.56	549.01	59.85	94.36	14.27	+239.21	+77.21	+64.17	+212.55
Forest	x	x	3.16	0.48	x	x	3.16	0.48	x	x	0	0
River	64.02	6.98	48.18	7.28	64.02	6.98	48.18	7.28	0	0	0	0
Agricul-tural Land	543.54	59.25	579.96	87.68	304.33	33.17	515.79	77.97	-239.21	-44.00	-64.17	-11.06
Total	917.36	100%	661.49	100%	917.36	100%	661.49	100%				

*Source: Aerial Photographs, 1971 and 1981.

Computed by: PADCO, Kathmandu, 1985.

In 1971, Lalitpur's city core accommodated 28,400 persons in 99 hectares, while 30,600 persons resided in suburban areas of 1,440 hectares. Thus, gross densities of 21 and 287 persons per hectare were found in suburban and core areas respectively. By 1981, densities in these areas had increased to 32 and 341 persons per hectare respectively.

In the 1971-1981 period, residential land use increased by 135 percent in Kathmandu and 94 percent in Lalitpur. The large increase in residential area was due to urban sprawl of very low density. Those areas which accounted for expansion of the built-up area had densities of only about 40 persons per hectare.

During this period, Kathmandu and Lalitpur increased in population by 85,000 and 22,000 respectively or 107,000 persons. On the basis of ward population data, it appears that about 32,000 persons were absorbed in the core cities of Kathmandu and Lalitpur, 32,000 were accommodated in existing areas outside the core, and only 43,000 in new areas. As a consequence, concomitant low-density urban sprawl and high densification caused considerable strain on existing infrastructure systems. In addition, it is likely that the distribution of urban land among income groups became less equitable.

The study had access only to an incomplete set of 1985 aerial photographs for Kathmandu and Lalitpur. Therefore, the entire built-up area of both towns could not be studied. Nevertheless, it is clear that the trends noted above are still in effect: infill within the Ring Road; expansion along major transport corridors and roads; eastern, western, and northern expansion in Kathmandu; western and southern expansion in Lalitpur; and infill and densification of the city cores and suburban areas.

D. GREATER KATHMANDU LAND USE

On the basis of aerial photographs and an in-depth knowledge of the metropolitan area, 1971 and 1981 land use maps were prepared as presented in Figures III.11 and III.12. In addition, land use areas were measured by planimeter for each land use type as presented in Figure III.13 and Tables III.9--III.11. Most land use types presented are self-explanatory. Those requiring clarification include:

- **Institutional uses:**
  Include all Government, semi-Government and corporations (hospitals, health centers, educational facilities, telecommunications, etc., but police and military facilities are listed separately). As the Tribhuvan University Campus is located outside the towns, it is not included in this analysis.
- **Industrial land uses:**
  Include large- or medium-scale industries such as the Balaju and Patan Industrial Estates, Bansbari Shoe Factory, Patan Distillery, and the fertilizer plant.
- **Residential/commercial land uses:**
  Include mixed residential-commercial uses such as housing units with shops on the ground floor.

- Open space includes:
  All religious and recreational areas such as the Exhibition Grounds, Pashupati-Gujeswari, Swayambhu, Tundikhel, stadium, and ghats (temple areas on the banks of the Bagmati River).
- Service/commercial land use:
  includes commercial units such as banks, hotels, travel agencies, and major trading units.

In 1971, agricultural land use in Kathmandu town panchayat accounted for 66.3 percent of the total land area; residential land use accounted for 14 percent; institutional use and open space about 5 percent each; and all others were less than 2 percent of the town area. In Lalitpur nagar panchayat, 70 percent of the total land area was devoted to agriculture; 12.4 percent to residential land use; 3.8 and 2.1 percent to institutional land uses and roads; and less than one percent of land area for all other uses. However, if all public areas (institutional, military, roads, industry, airport, and open space) are considered, they occupy 16 and 9 percent of the town panchayat areas of Kathmandu and Lalitpur respectively.

If the 1971 urban land uses of both cities are situated with respect to the Ring Road location, agricultural uses still occupied about two-thirds of the area in Kathmandu and Lalitpur. Residential areas in Kathmandu and Lalitpur occupied 18 and 21 percent of each's respective area within the road, while for both cities, institutional uses occuped 6.2 and 4.3 percent of the areas.

Between 1971 and 1981, Kathmandu and Lalitpur expanded both physically and functionally. While agricultural areas declined from 66 to 40 percent and 71 to 52 percent of Kathmandu and Lalitpur town areas, residential land uses doubled. Residential areas increased from 14 to 33 percent of town area in Kathmandu and from 12 to 24 percent in Lalitpur (respective increases of 135 and 91 percent). During this period, the population of Greater Kathmandu increased by 107,000 persons, but only about 43,000 of this increase was accommodated in new residential areas. The old city and existing residential areas together absorbed population increments of 32,000. As a consequence, strains on transport, electricity, water supply, and sanitation occurred as a result of excessive densification in the core and low-density urban sprawl in new areas.

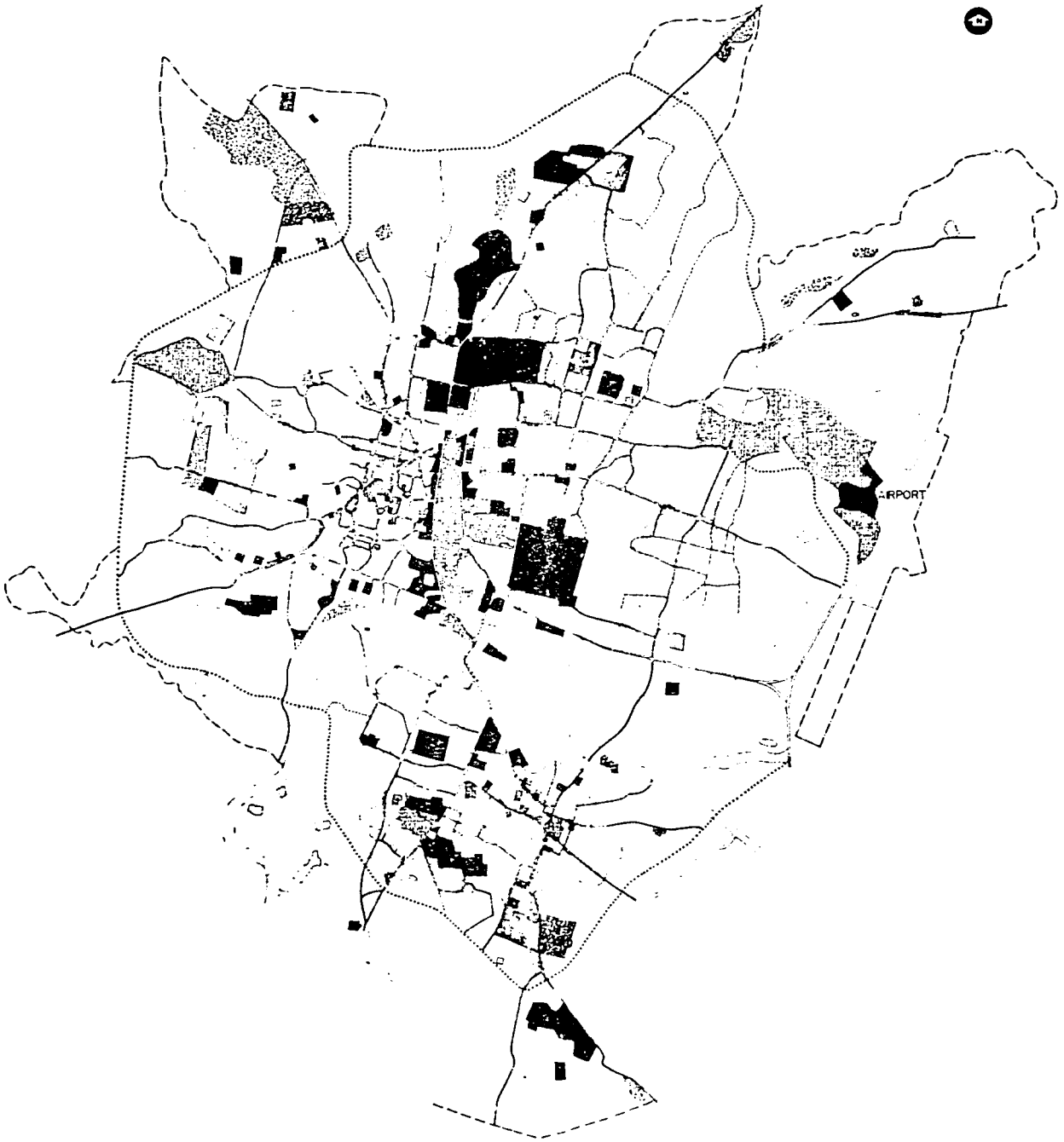
Between 1971 and 1981, the expansion of residential areas occurred not only on "tar" areas but in lowlands adjacent to such areas as the Dhobi Khola and Vishnumati River as well. For the most part, infill of lowlands situated within the built-up area is inevitable. However, as these areas are subject to flooding and high water tables, alternative sites should be encouraged.

FIGURE III. 11

GREATER KATHMANDU

URBAN LAND USE

1971



SCALE 0 0.4 0.8 1.2 1.6Km

LEGEND

- INSTITUTIONAL
- INDUSTRIAL
- SERVICE / COMMERCIAL
- OPEN SPACE / OTHER RECREATIONAL
- RESIDENTIAL / COMMERCIAL
- RESIDENTIAL
- VACANT / AGRICULTURAL LAND
- RIVER
- ROAD
- FOOT PATH
- POLICE / MILITARY
- FOREST

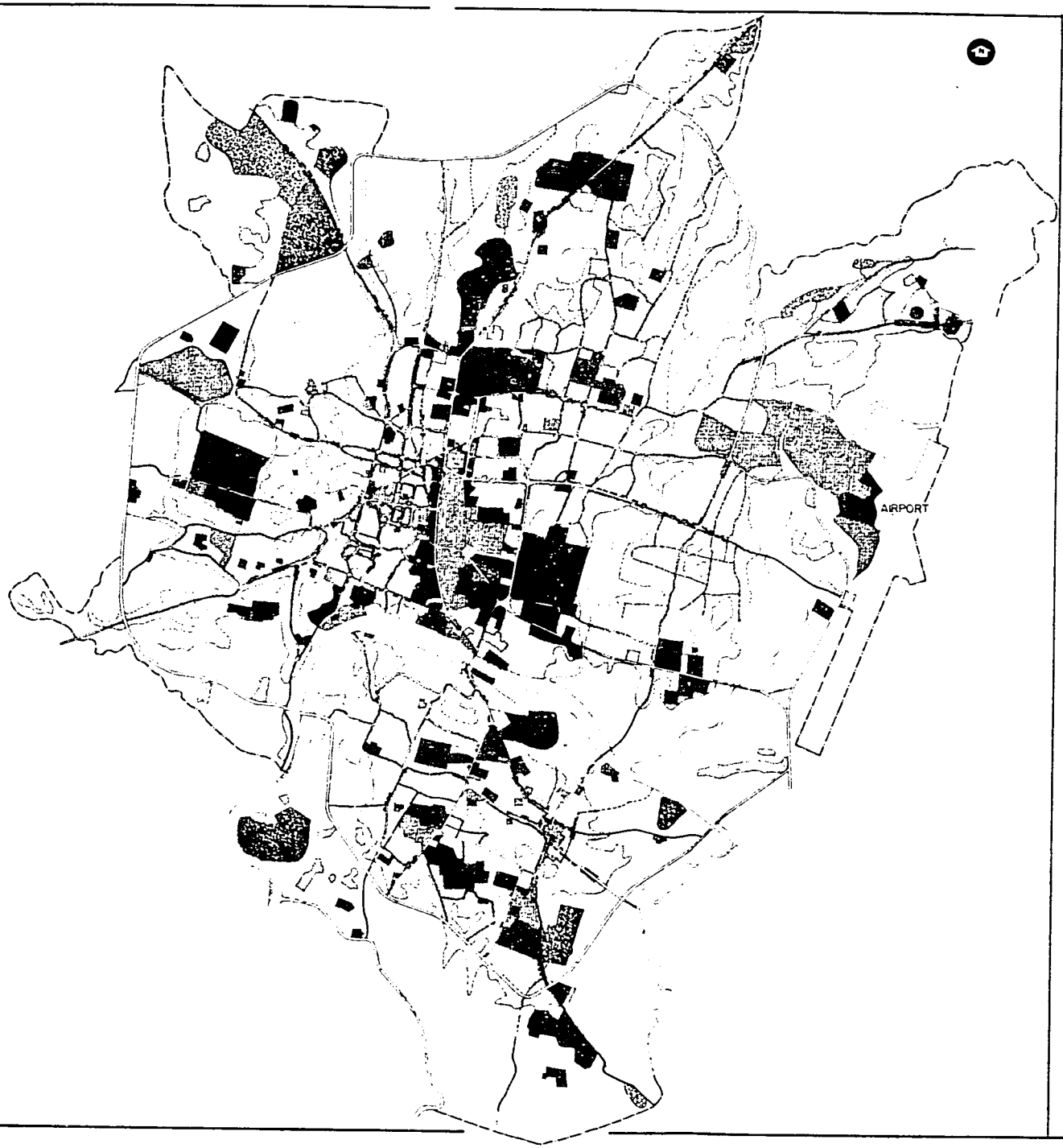
SOURCE :- AERIAL PHOTOGRAPHS 1971
PREPARED BY :- PADCO KATHMANDU 1985

FIGURE III. 12

GREATER KATHMANDU

URBAN LAND USE

1981



SCALE 0 0.4 0.8 1.2 1.6 Km

LEGEND

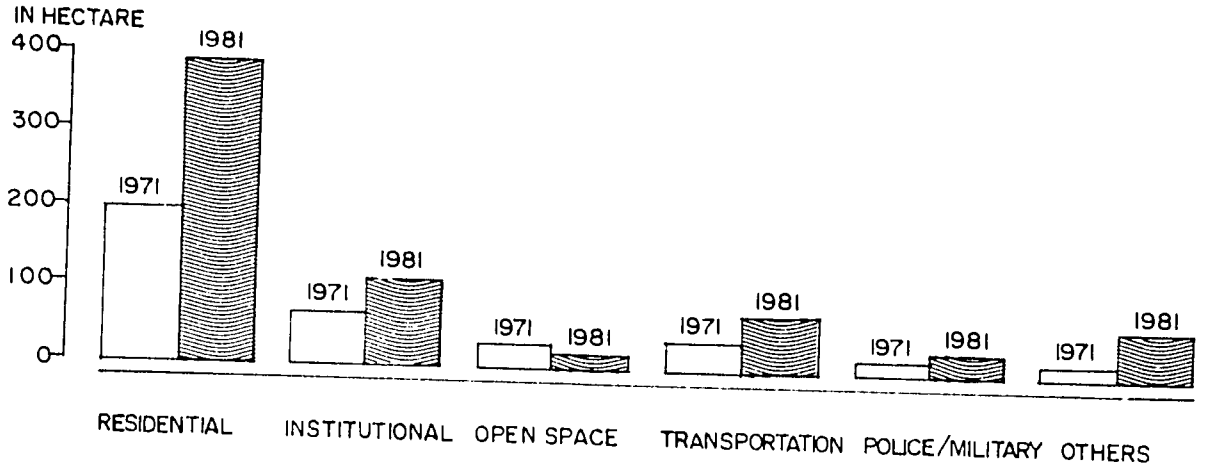
- INSTITUTIONAL
- INDUSTRIAL
- SERVICE / COMMERCIAL
- OPEN SPACE / OTHER RECREATIONAL
- RESIDENTIAL / COMMERCIAL
- RESIDENTIAL
- VACANT / AGRICULTURAL LAND
- RIVER
- ROAD
- FOOT PATH
- POLICE / MILITARY
- FOREST

SOURCE - AERIAL PHOTOGRAPHS 1981
PREPARED BY - PADCO KATHMANDU 1985

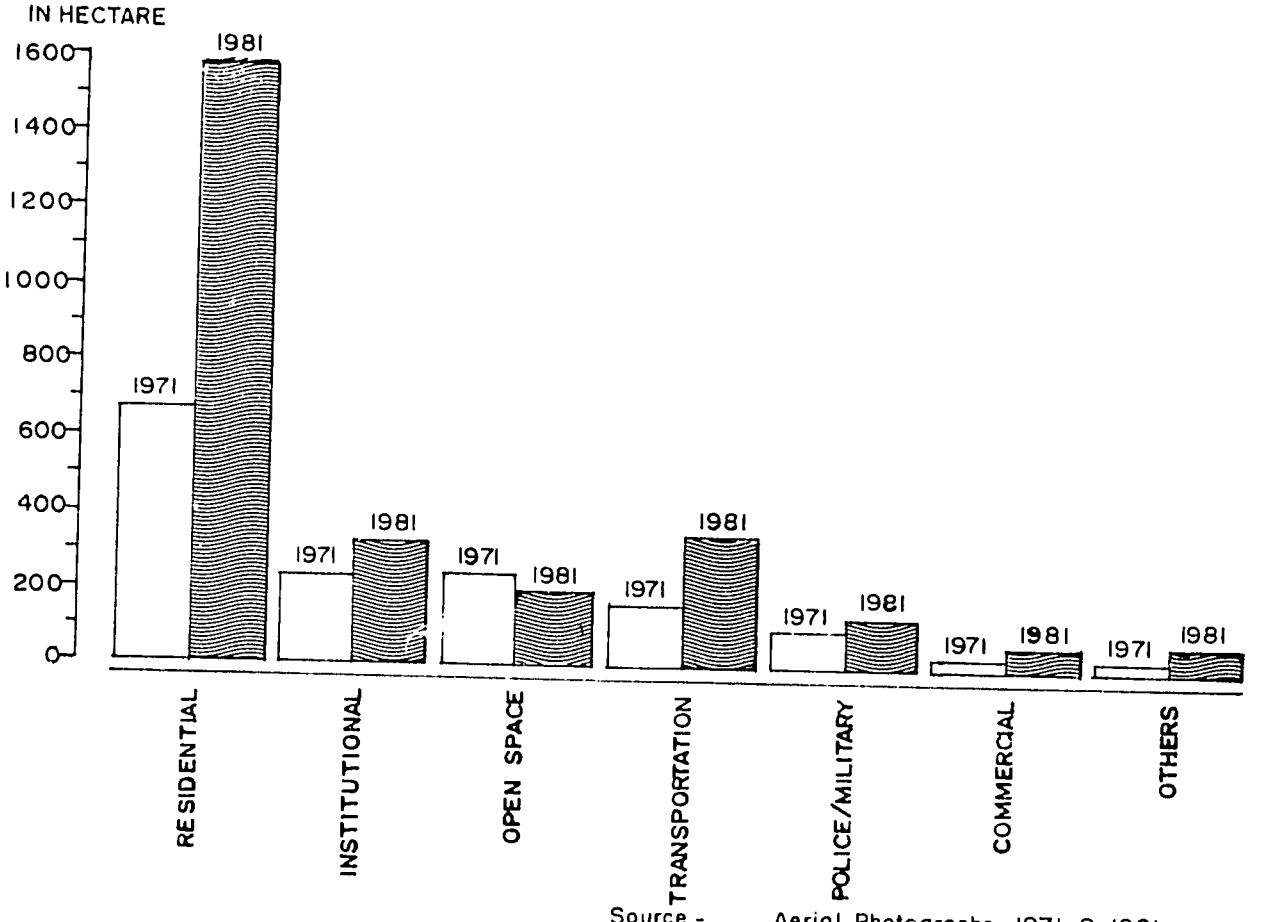
FIGURE III.13

URBAN LAND USE

LALITPUR NAGAR PANCHAYAT



KATHMANDU NAGAR PANCHAYAT



Source - Aerial Photographs, 1971 & 1981
Computed by-PADCO, Kathmandu, 1985

Table III.9

URBAN LAND USE*
KATHMANDU AND LALITPUR DISTRICTS

Use	Kathmandu						Lalitpur					
	1971		1981		Change (1971-81)		1971		1981		Change (1971-81)	
	Ha	%	Ha	%	Ha	%	Ha	%	Ha.	%	Ha	%
Residential Use	664.85	14.01	1560.17	32.88	+895.32	+134.66	196.44	12.44	375.55	23.79	+ 179.11	+91.18
Institutional Use	224.78	4.74	309.49	6.52	+ 84.71	+ 37.68	60.00	3.80	103.04	6.53	+ 43.04	+71.73
Residential/ Commercial Use	5.45	0.11	9.32	0.20	+ 3.87	+ 71.00	1.05	0.07	1.52	0.10	+ 0.47	+44.76
Service/ Commercial Use	22.57	0.48	50.52	1.06	+ 27.95	+123.83	x	x	3.10	0.20		
Open Space/ Recreational Use	229.03	4.83	220.67	4.65	- 8.36	- 3.65	26.22	1.66	24.80	1.57	- 1.42	- 5.41
Industrial Use	15.07	0.31	45.71	0.96	+ 30.64	+203.31	10.61	0.67	53.66	3.40	+ 43.05	+405.74
Police/Military	35.71	2.02	129.99	2.74	+ 34.28	+ 35.81	13.28	0.84	14.26	0.90	+ 0.98	+ 07.37
Road	79.95	1.68	207.9	4.38	+127.95	+160.03	32.39	2.05	67.44	4.27	+ 35.05	+108.21
Airport	74.50	1.57	114.55	2.41	+ 40.05	+ 53.75	x	x	x	x	x	
Forest	57.49	1.21	57.49	1.21	0	0	3.16	0.20	3.16	0.20	0	
Agricultural Land	3147.21	66.33	1910.8	40.27	-1236.41	- 39.28	1123.50	71.16	820.12	51.94	- 303.38	- 27.00
River	128.7	2.70	128.07	2.70	0	0	112.2	7.11	112.20	7.11	0	
Total	4744.68	100%	4744.68				1578.85	100%	1578.85			

*Source: Aerial Photographs 1971 and 1981.
Computed by: PADCO, Kathmandu, 1985.

Table III.10

URBAN LAND USES
LALITPUR*

Land Uses	1971				1981			
	Inside the Ring-Road		Outside the Ring-Road		Inside the Rig-Road		Outside the Ring-Road	
	Area in Hectare	Area in %	Area in Hectare	Area in %	Area in Hectare	Area in %	Area in Hectare	Area in %
Residential Use	190.04	20.72	6.40	0.97	343.83	37.48	31.72	4.80
Institutional Use	39.33	4.29	20.67	3.13	74.69	8.41	28.35	4.29
Residential/ Commercial Use	1.05	0.11	x	x	1.52	0.17	x	x
Service Commercial Use	x	x	x	x	3.1	0.34	x	x
Open Spaces/ Recreational Use	26.22	2.86	x	x	24.80	2.70	x	x
Industrial Use	10.61	1.15	x	x	22.49	2.45	31.17	4.71
Police/Military Use	13.28	1.45	x	x	14.26	1.56	x	x
Roads	29.27	3.19	3.12	0.47	64.32	7.01	3.12	0.47
Airport	x	x	x	x	x	x	x	x
Forest	x	x	3.16	0.47	x	x	3.16	0.47
Agricultural Land	543.54	59.25	579.96	87.68	304.33	33.17	515.73	77.98
River	64.02	6.98	48.18	7.28	64.02	6.98	48.18	7.28
Total	917.36	100%	661.49	100%	917.36	100%	661.49	100%

*Source: Aerial Photographs, 1971 and 1981.
Computed by: PADCO, Kathmandu, 1985.

Table III.11

URBAN LAND USES
KATHMANDU*

Land Uses	1971				1981			
	Inside the Ring-Road		Outside the Ring-Road		Inside the Ring-Road		Out-side the Ring-Road	
	Area in Hectare	Area in %	Area in Hectare	Area in %	Area in Hectrea	Area in %	Area in Hectare	Area in %
Residential Use	650.19	18.41	14.66	1.2	1342.76	38.02	217.41	17.92
Institutional Use	219.80	6.22	4.98	0.41	304.38	8.62	5.11	0.42
Residential/ Commercial Use	4.73	0.13	0.72	0.06	8.41	0.24	0.91	0.06
Service / Commercial Use	21.84	0.62	0.73	0.06	36.32	1.03	14.20	1.15
Open Space/ Recreational Use	131.36	3.72	97.67	8.05	123.0	3.49	97.67	8.05
Industrial Use	0.29	0.01	14.78	1.21	0.71	0.02	45.00	3.71
Police/Military Use	83.54	2.37	12.17	1.00	117.82	3.34	12.17	1.00
Road	68.73	1.95	11.22	0.93	196.68	5.57	11.22	0.93
Airport	x	x	74.50	6.15	x	x	114.55	9.44
Forest	7.5	0.21	49.99	4.12	7.5	0.21	49.99	4.12
Agricultural Land	2232.65	66.22	914.56	75.39	1283.05	36.33	627.75	51.74
River	110.84	3.14	17.23	1.42	110.84	3.13	17.23	1.42
Total	3531.47	100%	1213.21	100%	3531.47	100%	1213.21	100%

*Source: Aerial Photographs, 1971 and 1981.
Computed by: PADCO, Kathmandu, 1985.

During this period, institutional land uses increased by 38 and 74 percent respectively in Kathmandu and Lalitpur (rising to 6.5 percent of each town area). Virtually all urban land uses increased in percentage terms with the exception of open/recreational space which declined. Public approval was given to develop some open space (i.e. open space was converted to institutional use at Lainchaur, Jawalakhel, and Lagankhel). Among those uses which increased significantly are road areas, which doubled for both towns due to the construction of the Ring Road, and industrial areas in Lalitpur, which also doubled due to expansion of the industrial estate and construction of fertilizer plants. In 1981, all public functions occupied 23 and 17 percent of town areas in Kathmandu and Lalitpur, increasing from 16 and 9 percent in 1971. It should be noted that the Kirtipur campus is excluded from these data as it lies outside the town panchayat boundary.

With respect to changes which occurred between 1971 and 1981 within and outside the Ring Road location, the following may be observed:

- Residential areas within the road increased from 18 to 38 percent in Kathmandu and from 21 to 38 percent in Lalitpur.
- Residential areas outside the Ring Road but in the town panchayats increased from 1 to 18 percent in Kathmandu and from 1 to 5 percent in Lalitpur.
- Industrial uses occupy greater areas outside the Ring Road than within.

E. GREATER KATHMANDU HOUSING TYPOLOGY

During the period 1971-81, Greater Kathmandu residential land use increased by 1,074 hectares or 125 percent while the built-up area expanded by 1,535 hectares or 88 percent. Thus, residential land use is occupying an increasingly larger part of the built-up area due to lower-density development. The residential expansion that occurred between 1971 and 1981 differs significantly from the traditional patterns of the city core and the sporadic development which previously took place around Rana palaces. The housing stock became more diversified with a larger variety of distinct housing sub-areas. Until the 1960s, housing types in Kathmandu and Lalitpur could be grouped into three principal categories:

- **The city core and historic settlement:**
  consisting of row houses, usually 3 to 3½ storeys high, with burnt brick walls and tiled roofs built around a series of inter-connecting courtyards; blocks so formed laid in an informal grid pattern.
- **The palatial compounds:**
  consisting of numerous palaces built during the Rana period outside the core area. Palace construction brought about the establishment of road and infrastructure networks connecting these places with the city core. These roads and systems helped open up adjoining land which sufficed for urban expansion until the late 1970s. In other cases, the compounds themselves were subdivided for high-standard residential development.

- **Scattered development:**
  built after 1950, consisting of linear, sporadic development in areas served by the roads and services built during the Rana period. The areas to the north and northeast of the Kathmandu city core were the principal areas where this type of development occurred. Unlike the city core, the new development encouraged detached units within a compound, giving an overall density as low as 40 persons per hectare.

High-standard housing was attracted to the spaces around palace buildings where all the parcels within a compound belonged to a single, or like-minded, group of owners. As a consequence, it was possible to create a uniform layout, a dominant characteristic of high-standard housing in Greater Kathmandu. Subdivision of palatial compounds into plots for high-income households also helped to enhance the viability of the surrounding area for further development.

During the 1950s to 1970s, the majority of housing development occurred along corridors between the palatial compounds. Although substantial infill between the city core and Dhobi Khola occurred, it was not until the the 1970s that the city began to expand beyond the Dhobi Khola to the Baneswar area.

To permit a better understanding of residential areas and their evolution between 1971 and 1981, housing typologies were prepared on the basis of aerial photographic interpretation. The housing typologies identify specific sub-areas with distinct spatial and physical characteristics (access to roads, plot size, dwelling unit size, etc.). Given the fact that most residential expansion has been owner-initiated (without public intervention or assistance), it is likely that the physical characteristics of distinct housing types closely correlates with the socio-economic characteristics of the inhabitants. For instance, a type consisting of large plots and dwelling units with access to a motorable road suggests a higher-income category, while a type with small plots and access to only a footpath suggests a more moderate-income group.

The classification is largely a result of spatial organization of the housing as it appears on aerial photographs and an in-depth knowledge of the urban area. However, in comparing the housing typologies which were prepared for 1971 and 1981, it should be noted that:

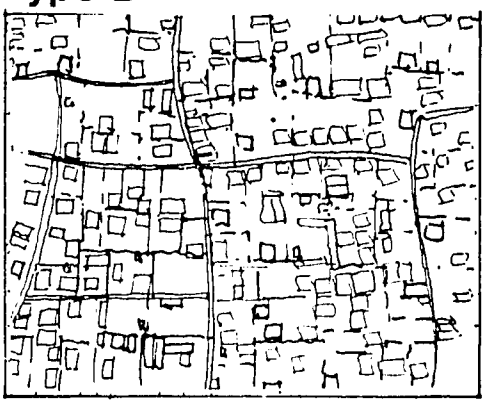
- Very little field verification was possible to test the accuracy of the typologies.
- Between 1971 and 1981, levels of infrastructure may have been altered which would change some characteristics of the types.
- Because of the nature of informal development, a mixture of dwelling unit types and standards is likely to occur. For example, it was difficult to disaggregate areas smaller than one hectare in the typology.

Despite these considerations, seven types of housing were identified which show distinctly different characteristics, as shown in Figures III.14 and III.15. The differentiation is based on layout, house and plot size, density, and infrastructure standards. In this typology, the newly emerging squatter areas and the few public land development schemes in Greater Kathmandu (i.e. Kuleswar) are excluded because they are neither important in scope nor typical housing types. Those types which have been identified include:

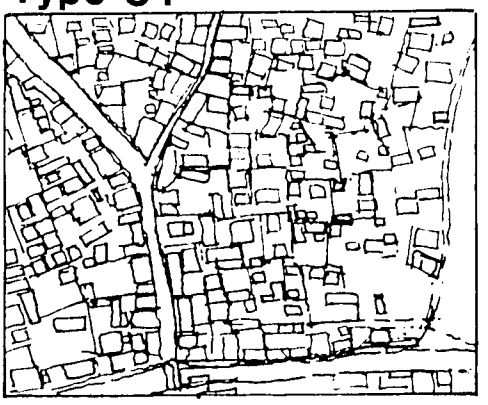
Figure III.14
GREATER KATHMANDU HOUSING TYPES

Type A

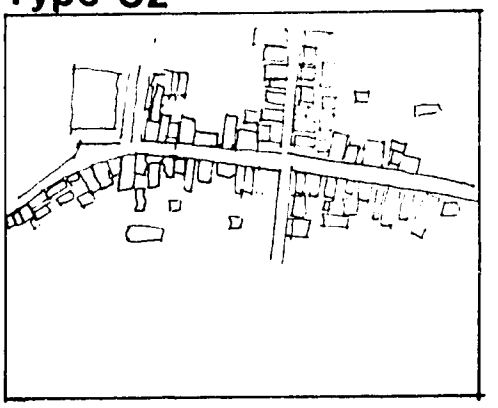
Type B



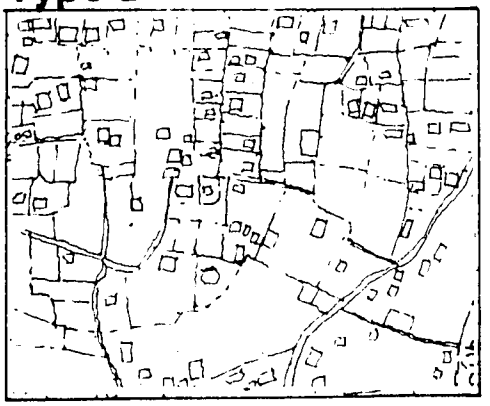
Type C1



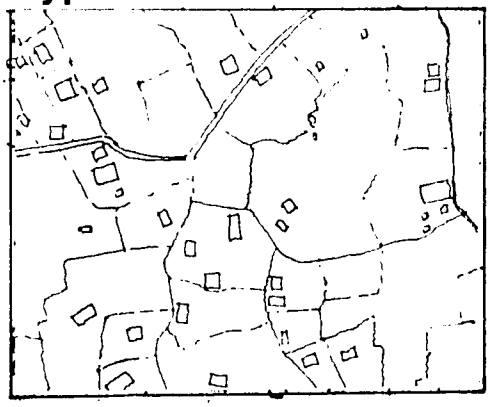
Type C2



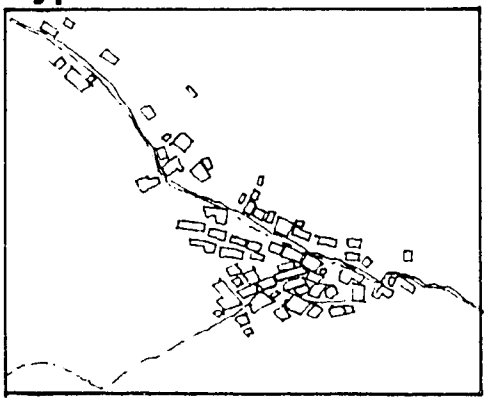
Type D



Type E



Type F



Core

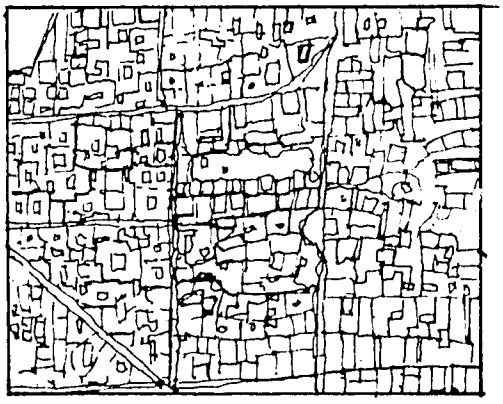
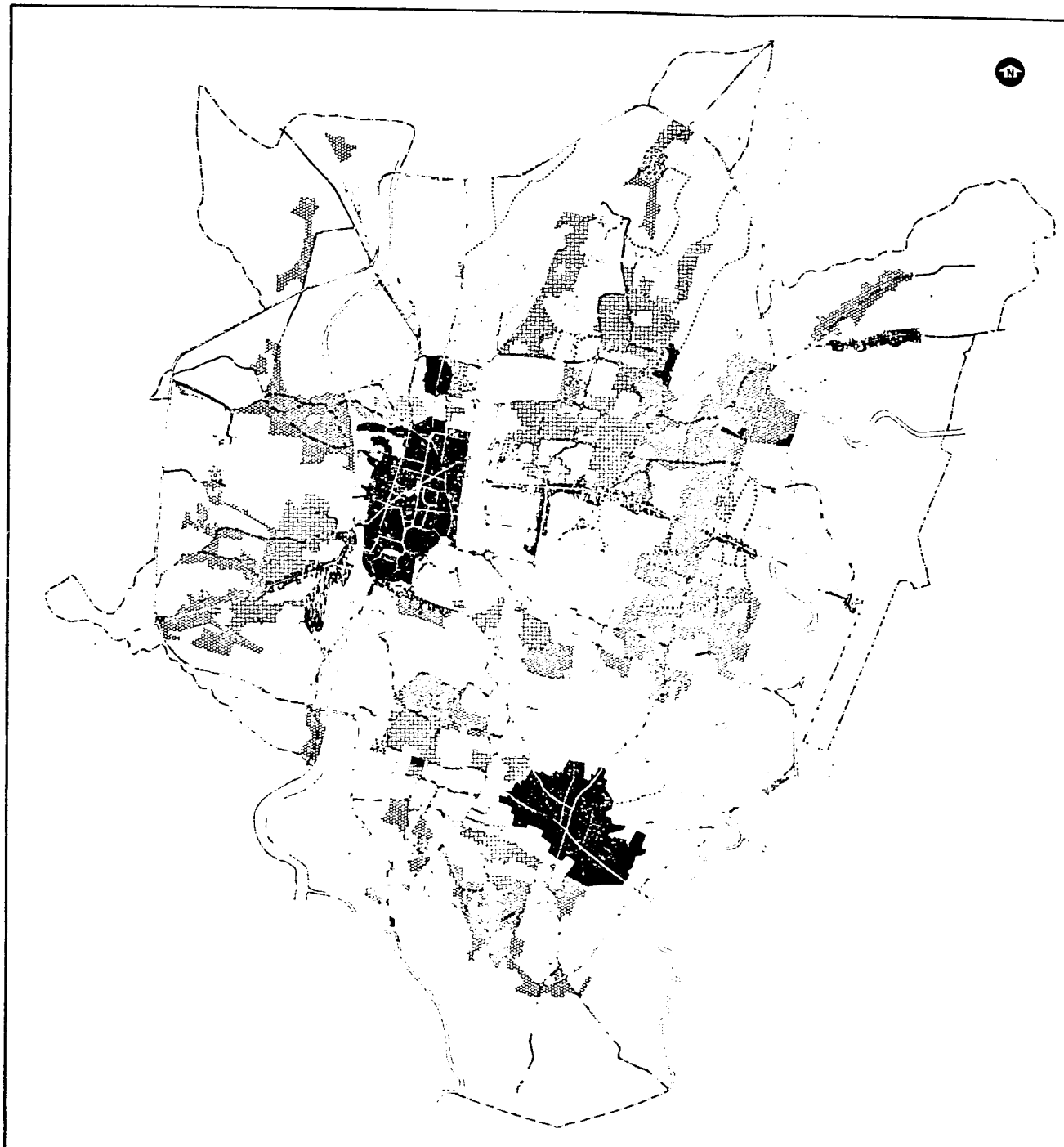


FIGURE III 15

GREATER KATHMANDU

HOUSING TYPOLOGY

1981



SCALE 0 0.4 0.8 1.2 1.6 Km

LEGEND

- A TYPE HOUSING
- A2 "
- B "
- C1 "
- C2 "
- D "
- E "
- CORE

SOURCE - AERIAL PHOTOGRAPHS 1981

PREPARED BY - PADCO KATHMANDU 1985

- Type A1:
  Housing with regular street layout of uniform width; permanent type of vehicular access to each plot; detached, large dwelling units, generally of two storeys with plinth areas of about 139 m2; large plot sizes of over 1-1/2 ropanis or 760m2; low net density of 50-70 persons per hectare; exclusively residential.
- Type A2:
  Palatial compounds
- Type B:
  Housing with regular layout and vehicular access to the majority of plots; detached dwellings 2-3 storeys with plinth areas over 112 m2; fairly large, regular, plot areas of 0.75 to 1 ropani (380-500 m2); 25-40 percent ground coverage; net density of about 150 persons per hectare; predominantly residential use with frequent occurrence of non-residential uses (mainly offices).
- Type C1:
  Housing with regular to irregular layout; winding and varying width of roads; limited vehicular access, irregular plot shape and sizes ranging between 3-8 annas or 95-250 m2; detached, 3 storey dwellings with 74-84 m2 plinth area; high ground coverage; and net density on the order of 175-200 persons per hectare.
- Type C2:
  Row housing along main roads; 3-5 storeys units with high ground coverage; small plot sizes of 3-5 annas or 95-150m2; residential use heavily mixed with commercial/retail and office uses.
- Type D:
  Loosely developed housing mainly along secondary and tertiary roads; road network not fully emerged; pockets of undeveloped land between houses; access by seasonal tertiary roads; generally regular orientation of buildings; varying plot sizes; densities on the order of about 100 persons per hectare.
- Type E:
  Area in an early stage of development; scattered houses primarily along main roads; access to plots limited to tracks; varying house and plot sizes; limited infrastructure.
- Type F:
  Compact or loosely defined villages in fringe areas, limited access and infrastructure.
- Core:
  Historic core area and settlement areas such as Bhatbhatei. Row-houses built around a series of courtyards forming a city block of non-uniform size; extremely high density on the order of 500 persons per hectare.

In 1971, as Table III.12 illustrates, those housing types with the largest areas included: Type E, Core, and Type A1 in Kathmandu; and Core, Type D, and Type A2 (palatial compounds) in Lalitpur.

Table III.12

GREATER KATHMANDU HOUSING TYPOLOGY*

(in Hectare)

House Types	Kathmandu				Lalitpur				Total			
	1971		1981		1971		1981		1971		1981	
	Area	% Area	Area	% Area	Area	% Area	Area	% Area	Area	% Area	Area	% Area
A	104.4	15.0	337	21.6	15.4	7.8	45.7	12.2	115.8	13. 4	382.7	19.7
B	5.1	0.8	241.5	15.5	10	5.1	88.8	23.7	15.1	1.8	330.3	17.1
C_1	59.8	9.0	29.8	1.9	-	-	-	-	59.8	6.9	29.8	1.5
C_2	35.7	5.4	144.2	9.2	4.2	2.2	25.9	6.8	39.9	4.6	170.1	8.8
D	54.9	8.3	374.4	24.0	43.8	22.3	84	22.4	98.7	11.5	458.4	23.7
E	258.6	38.9	251.8	16.1	7.3	3.7	40	10.6	265.9	30.9	291.8	15.1
A_2	39.4	5.9	24.7	1.58	28.8	14.7	3	0.8	68.2	7.9	27.7	1.4
Core	110.8	16.7	157.6	10.1	86.8	44.2	88.3	23.5	197.6	23	245.9	12.7
Total	665	100	1561	100	196.3	100	375.7	100	861	100	1936.7	100

*Source: Based on Aerial Photographs, 1971 & 1981.

Computed by: PADCO, Kathmandu, 1985.

The importance of Types D and E in both towns suggests an early stage of development outside the core area. The prevalence of Type A1 in Kathmandu indicates a concentration of high-standard housing.

In 1981, on the other hand, the most dominant housing types in Kathmandu included Types D, A1, E, and B; while in Lalitpur, Types B, Core, D and E were most dominant. Types D and E housing are in an early stage of development and set the pattern for future growth so a great deal of infill in these areas will occur in the future. The fact that Type E in Kathmandu occupies a greater percentage of area in both years compared to Lalitpur suggests that the attraction of Kathmandu is greater. Growth of Types A1 and B housing indicates the establishment of fully developed high- and moderate-standard residential areas where less densification is likely to occur.

Between 1971 and 1981, those housing types in Greater Kathmandu which experienced the most important increases in area included Types B, C2, D, and A1. Growth was most spectacular in Type B, while Type C2 and D areas increased three-fold and Type A1 areas more than doubled. During this period, areas of Types C1 and A2 actually declined as they were converted into other types or uses. Interestingly, some growth in the core areas of both Kathmandu and Lalitpur occurred as well. However, the core's importance, in terms of area, declined considerably in both towns over the period.

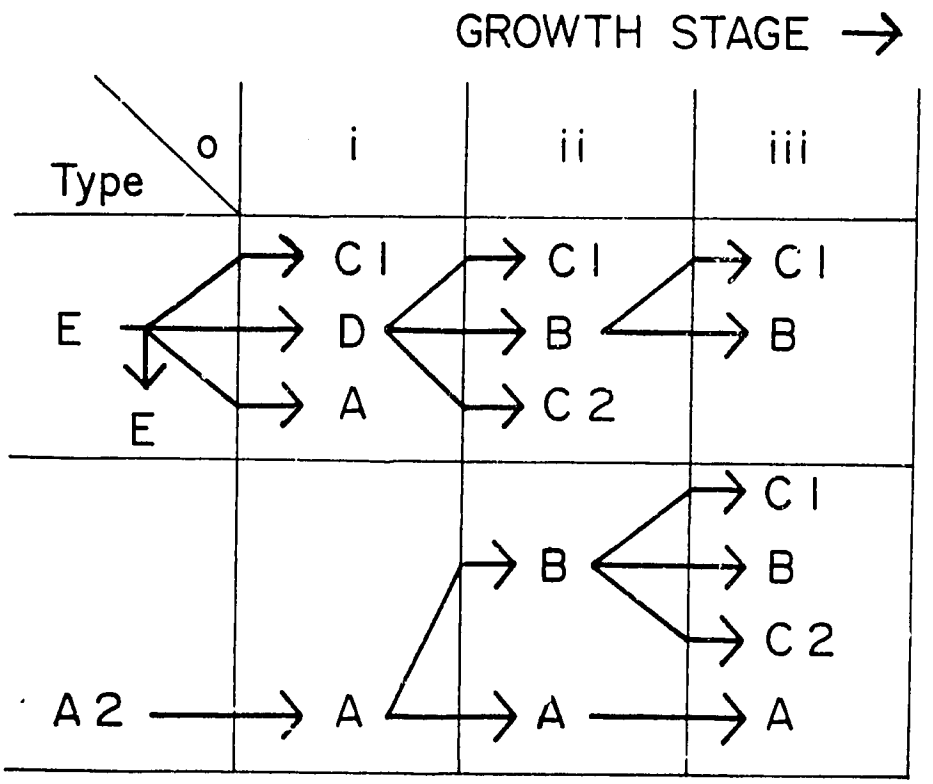
Changes in house types suggest an evolution as presented in Figure III.16. For example, it appears that over the decade some of Type E housing was converted into Type D and Type D into Type B. In addition, it appears that Type A1 originally emerged from Type A2, though at a later stage; Type A1 areas, such as Baneswar Heights and Tahachal-Chauni, developed independently. In other cases, it appears that Type A1 areas became Type B due to densification, possibly through subdivision of plots by family members or commercial development pressure. The area southeast and east of Kamal Pokhari can be cited as an example of such change.

The natural evolution of housing types is influenced by a number of variables such as cadastral configuration, infrastructure extension and improvement programs, road networks, location of influential property holders, public land acquisition, extension of bus service, etc. If present trends prevail, Types D and B will be most dominant in the future as they conform to existing informal development processes. Concomitantly, the problems associated with informal development will gain an added future dimension.

Some problems (such as a lack of public space, difficulty in servicing plots due to irregular layout, and mixing of incompatible land uses) could lead to serious environmental deterioration and pose a threat to public welfare. At the present time, with the exception of the core areas, these problems do not seem serious enough to warrant concerted public action. This is primarily due to the fact that an appreciable amount of vacant land still exists within these types for development. Once these areas fully densify, however, strains on existing services and the environment will be felt. Public interventions to improve this situation should strive to:

FIGURE III.16

EVOLUTION OF HOUSING TYPES



- Encourage efficient layout for optimal use of land.
- Broaden the access to land and housing for a wider range of income groups.
- Initiate and establish a cost-sharing and cost-recovery system for urban infrastructure (i.e. a betterment tax) to enable a neighborhood to receive a level of services in line with its ability to pay.
- Encourage an orderly progressive development process which introduces development standards such as road rights-of-way.

F. PHYSICAL FRAMEWORK FOR URBAN EXPANSION IN THE VALLEY

The purpose of this section is to provide some guidelines for future expansion of urban areas in the Valley, particularly Greater Kathmandu. The proposed framework is no substitute for a master plan or an implementable land use plan which should be prepared with sufficient detail to be of use at the operational level. Nevertheless, the framework does incorporate broad policy objectives which have arisen during the course of this study and may serve as a basis for future planning and preliminary programming in the Valley. Suggested means to implement and improve on the proposed framework are discussed in the context of Chapter I.

1. Estimated Urban Land Requirements (1981-2001)

According to projections made by the Water Supply and Sewerage Studies (1984), town populations in the year 2000 will be on the order of 577,000 in Kathmandu, 152,000 in Lalitpur and 79,000 in Bhaktapur. For all three towns, the increment of added population between 1981 and 2001 will be about 342,000 in Kathmandu, 164,000 in Lalitpur, and 29,000 in Bhaktapur. A general approximation of the future urban expansion requirements can be obtained by dividing the anticipated increase in urban population by the anticipated density.

In Greater Kathmandu, the average density of new development between 1971 and 1981 was on the order of 40-50 persons per hectare. But the average urban density was about 96 persons per hectare largely due to the high densities of the cities' cores. Assuming that policy and planning measures to reduce loss of arable land take effect by the year 2001, an average density of 100 persons per hectare (at least) for new expansion areas is feasible. On this basis, new urban land requirements will be on the order of 3,420 hectares in Kathmandu, 610 hectares in Lalitpur, and 190 hectares in Bhaktapur. The combined expansion areas of the three towns would be 4,320 hectares or 43.2 square kilometers.

This estimate tallies well with another approximation which suggests that about 60,900 persons can be absorbed in existing 1981 residential areas, if each housing type were to reach its maximum density, and new urban areas were to have a gross density of about 75 persons per hectare. In that case, also, about 40 square kilometers would be required for the expansion of Greater Kathmandu. With respect to Kathmandu and Lalitpur, Table III.13 presents projections of required land use for the year 2000 on the basis of per capita land use areas in 1981. These data are meant to be indicative of

future land requirements; whether expansion of the towns takes place as estimated over the next 15 or 20 years is not critical. Of principal concern is where development should take place and where it should not.

2. Principles of the Proposed Framework

It is clear from the study's analyses that:

- Residential densities should be increased in suburban and fringe areas to reduce the loss of arable land.
- Urbanization should be confined to the western Valley, leaving Bhaktapur District largely for agricultural use. The large area in proximity to Sanagaun, in particular, should be preserved.
- Public land acquisition and utilization should be tied to a development plan for the Valley and carefully planned and executed to maximize the use of lands which have been or will be acquired. Presently, Government is holding more land than it requires, rendering many hectares of land idle. Government should aim at vertical expansion or densification of these sites before any new lands are acquired.
- Towns should expand upon tar areas leaving the flood plains for agriculture; or, to the extent possible, lowlands or flood plains should be protected from urban development.

3. Infill of Existing Urbanized Area

Low-density areas of Greater Kathmandu can accommodate about 60,900 persons. Greater densification will probably occur if no plans are made for infrastructure extensions, particularly roads. Those areas where densification, infill and expansion are expected to occur in Kathmandu include: Swayambu-Tahachal, Kalimati, Balaju, the eastern half of the northern suburbs, Boudha, and Baneswor. In Lalitpur, the southern, western and eastern areas will witness major growth and densification. Development in Bhaktapur District will largely take place in proximity to Thimi, between the Arniko Highway and old Bhaktapur Road.

4. Preservation of Lowlands for Agricultural Use

Suitable areas along the Bagmati, Khodaky, and Nakhu of Lalitpur, and the Bagmati, Vishnumati, Balkhu, and Samakoshi of Kathmandu should be preserved for agricultural use. Not only are these "vegetable belts" fertile, but they have high water tables and are poorly-drained. Thus, they are not good sites for urban development. If these areas are developed, it can be expected that the Government will eventually be required to install expensive drainage schemes, realign river channels and streams, install check dams, etc., to alleviate those problems which will surely occur.

Preserving the flood plains for agriculture will not only avoid costly environmental problems but also will maintain a series of greenbelts throughout the urban area as it expands. If these farmer-tended "open spaces" are not preserved, one can expect that the same sort of environmental damage which has occurred along the Vishnumati will occur along the other waterways as well.

Table III.13

PROJECTED LAND USE REQUIREMENTS IN
GREATER KATHMANDU
(1981 - 2001)

	KATHMANDU			LALITPUR		
Year	1981		2001	1981		2001
Population	235,160		577,000	79,875		152,102
	Total Population	Area in Hectare	Area in Hectare	Total Population	Area in Hectare	Area in Hectare
Uses	235,160			79,875		
Residential		1,569	3,849		378	720
Institutional		309	758		103	196
Open Space		221	542			
Service/Commercial		51	125		3	6
Industrial		46	113		54	103
Police/Military		130	319		14	27
Transport		322	790		67	127
Total		2,648	6,496		644	1,227

Some of the low-lying southern portions of the Vishnumati, Dhobikhola, and Samkoshi flood plains have already been encroached upon by urban development. The entire area on the right bank of the Bagmati, extending from Teku in the west to the mouth of the Dhobikhola in the east, has been filled in by urban development. Conditions here are nearly as deplorable as they are along the Vishnumati, and responsibility lies squarely with the Government. Facilities established by the the Departments of Health and Roads and the Solid Waste Management Board have ruined the potential of this site, once an important socio-cultural and religious area.

On the Lalitpur side of the Bagmati, low-lying areas are relatively intact; only Kupondole has been filled in. However, areas adjacent to the Bagmati, such as Sanepa, are developing very rapidly. Fortunately, there still remain broad belts of agricultural land in the flood plains of the Bagmati, Vishnumati, and Dhobi Khola in Kathmandu, as well as the areas of Khodku and Nakhu in Lalitpur.

5. Physical Expansion of the Towns

Although tarlands are best suited for urban development, inadequate tarland exists for urban expansion over the next 20 years within the town boundaries. At the projected rates of urban expansion, all the land within Kathmandu town panchayat and most of that in Lalitpur would be swallowed up by the year 2001. Thus, it will be necessary for the towns to expand into tar areas outside existing town panchayat boundaries as shown in Figure III.17. Those tar areas which can be used for urbanization within existing boundaries include Balaju, Bansbari, Baudha, and Kalankisthan, accounting for 400 hectares in Kathmandu; and Khumaltar, Tikhedewal, and Bugdol in Lalitpur accounting for 300 hectares of land. In general, possible areas for expansion include:

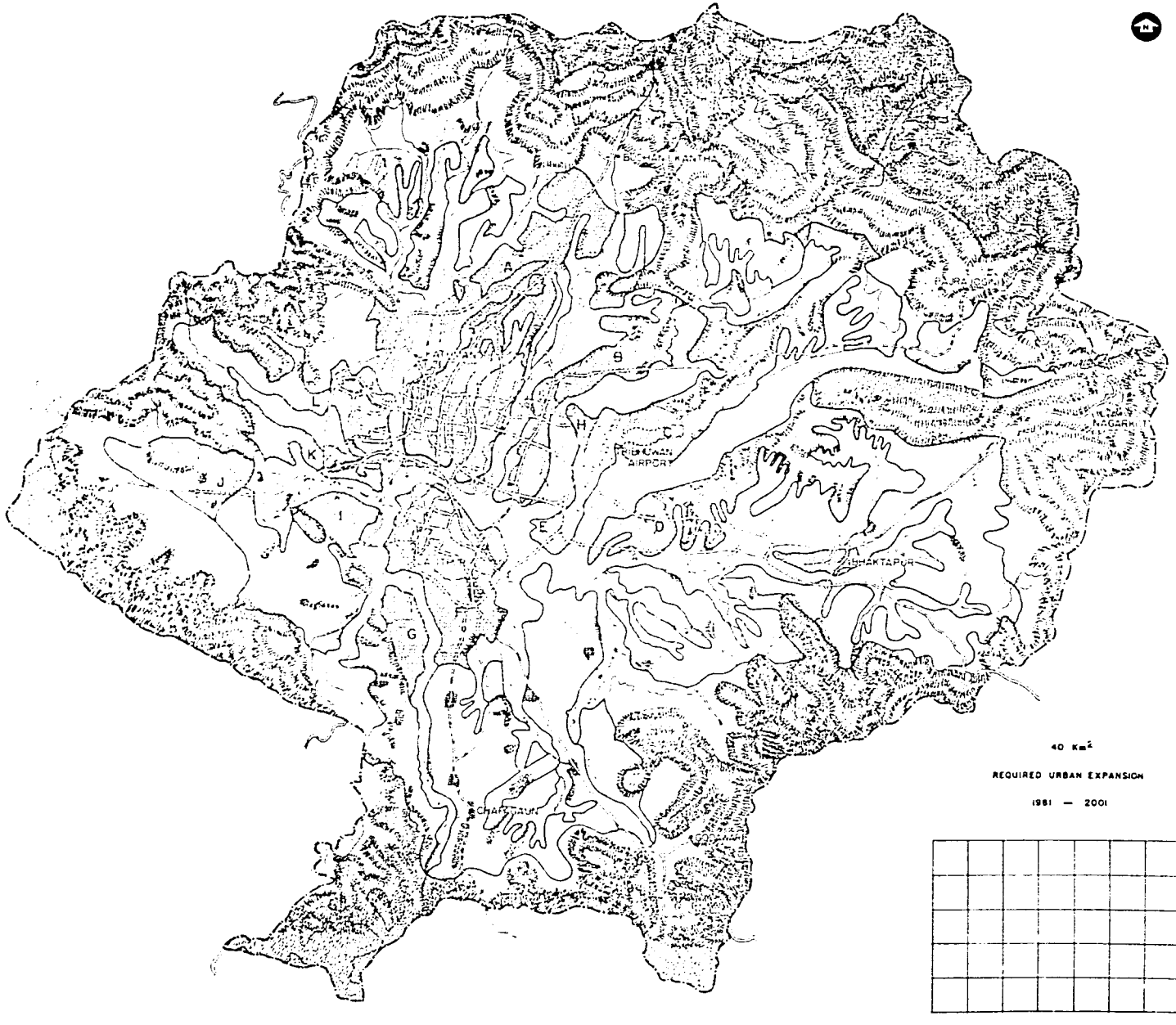
- The area immediately south of Lalitpur (Sunakothi-Thecho and Khokona-Bungmati). This area appears most suited for residential and institutional use.
- The area west of Lalitpur and in proximity to Kirtipur. This area is most suited for institutional and residential use. Special care should be given to replanning the Kirtipur campus to improve land utilization.
- The area along the Thankot Road up to allowable limits of the satellite station (Balambu). This area is most suitable for warehousing, light manufacturing, and some residential development.
- Expansion west of the Vishnumati (Swayambhu) and beyond the Ring Road (Seuchatar-Madol and Sitapaila). This area is most suited for residential development and brickmaking.
- Expansion on flood plains in Balaju/Gongabun should be controlled. Too much pressure will exist for this area to be fully preserved. It is best suited for non-residential use due to drainage problems.
- Expansion beyond Maharajgunj (Bansbari) is best suited for residential development.

FIGURE III 17

KATHMANDU VALLEY

PHYSICAL FRAMEWORK FOR URBAN EXPANSION

SCALE 0 1 2 3 4 km



LEGEND

- TOPOGRAPHICAL CONSTRAINT
- FLOOD/ALLUVIAL PLAIN
- BUILT UP AREA (1981)
- PROJECTED URBAN EXPANSION

URBAN EXPANSION AREAS

ZONE	AREA (Hectares)
A	952
B	341
C	300
D	484
E	167
F	504
G	261
H	50
I	211
J	185
K	245
L	420
	4150 Ha. (41.5 sq km)

SOURCE - LAND RESOURCES MAPPING PROJECT, 1984

PREPARED BY - PADCO - KATHMANDU, 1985

- Expansion beyond Baudha and northeast of the airport towards Sankhu. This area is best suited for warehousing and light industry, but better access is required.
- Expansion between the airport and Bhaktapur, in proximity to Thimi is also best suited for airport-related industry, warehousing, and residential development.
- Expansion of Bhaktapur towards the west.

Areas of each respective expansion zone are presented in Figure III.17.

CHAPTER IV
URBAN LAND DEVELOPMENT

A. CHARACTERISTICS OF LAND AND HOUSING DEVELOPMENT

1. Housing Permit Data

Significant growth of residential areas is a relatively new phenomenon in Greater Kathmandu. In 1971, for example, 69.7 percent of the housing stock in Kathmandu and Lalitpur panchayats was 30 or more years old (most was between 30 and 50 years old). Residential areas doubled in size between 1971 and 1981; thus, it may be assumed that the age of the housing stock has diminished somewhat. According to town panchayat housing permit data for Kathmandu and Lalitpur, about 12,000 building permits were issued between 1978 and 1982.

It is interesting that for an average year (1981) the population increase for both panchayats (13,000) and household formation (2,100) is roughly equivalent to the number of permits issued for new construction and additional storeys (2,507). Thus, if new construction corresponds with the permit data, housing construction is more than keeping pace with household formation. However, housing distribution is probably skewed to the upper end of the income spectrum.

It is also noteworthy that for Kathmandu and Lalitpur town panchayats the growth rates of building permit issues were 12.9 and 13.8 percent per annum during 1977-1982, significantly higher than population growth rates. A good variety of data are collected by the town panchayats before issuing permits. These data indicate instance:

- Permits issued for new construction accounted for about 79 and 86 percent of those issued in Kathmandu and Lalitpur respectively.
- In Kathmandu, about 86 percent of the permits were for construction on an individual's own land.
- A wide range of plot sizes were recorded. Most of these were in the range of roughly 4 annas in size (127 m2).
- Floor areas differed significantly but most fell in the "800 less than 2400 square feet" range (74-220 m2).
- A wide range of building heights were recorded but most were 1 and 2 storeys.
- Most units were designed with 4 to 10 rooms.
- More than 90 percent planned a toilet of some kind within the dwelling unit.
- About 50 percent of the plots had access to electricity.
- About 70 percent of the plots had access to a motorable road.
- More than one-half of the plots had direct access to drinking water.
- More than 70 percent planned to build an individual septic tank.

2. Housing Finance Data

On the basis of data on 1981 construction costs and estimates of floor areas built, it would appear that housing investment in 1981 was on the order of Rs.530 million and Rs.220 million for Kathmandu and Lalitpur town panchayats (total US$43 million). These estimates are for building construction only and do not include land.

It appears that a serious constraint on housing development is the lack of formal housing finance. The Provident Fund provides loans to subscribers, and the Nepal Bank, Agriculture Development Bank, and Nepal Commercial Bank give loans to employees. Country-wide applicants are elgible, but since most employees are residents of the Valley, or would-be homeowners, one can assume that the vast majority of loans finance construction in the Kathmandu Valley.

In 1981, these institutions provided loans totalling about Rs.28.2 million for housing-related purposes, which is only about 4 percent of the estimated investment required to finance building permits issued. Average loan sizes granted in 1981 were quite low: Nepal Bank, Rs.59,000; Provident Fund, Rs.11,815; Commercial Bank, Rs.40,500. Loans of this size would finance only housing ranging between 7 and 50 square meters; in other words, households would require other sources of financing as well. Long-term loans were not available.

It is clear that informal housing finance mechanisms provide the majority of funding for housing construction. How efficiently and equitably the informal finance sector operates is unknown and requires study. It would appear, however, that the existence of vacant areas within the built-up area can be partly explained by a lack of finance for construction. Households are generally disinclined to sell their land assets for immediate gains. Land is conserved as a family asset as long as possible. If housing finance were more accessible, more households would be able to develop their vacant land for rental housing and preserve their assets. In terms of land use, making housing finance available would probably result in less low-density urban sprawl and more inefficient development.

B. AFFORDABILITY OF LAND AND HOUSING

In a setting where access to land and housing is largely governed by the informal sector, it is difficult to assess to what extent low- and moderate-income groups have access to land and housing. Furthermore, no recent data on household income and expenditure or income distribution have been prepared. Nevertheless, on the basis of income data for civil servants and projections from past budget and expenditure data, it is safe to assume that at least 50 to 60 percent of households have incomes less than Rs.1,000 per month in Greater Kathmandu.

In order to provide some indication of the extent to which moderate-income households have access to land and housing, the proposed Dullu housing project, sponsored by the Kathmandu Town Development Board, was used as a case study. The project is designed to serve households with incomes ranging between Rs.1,000 and Rs.3,600 monthly. An affordability analysis, presented in Table IV.1, was prepared on the basis of the Bertaud Model. Of particular concern for this analysis are the assumptions and characteristics which most affect the target group (households earning Rs.1,000 monthly):

- Raw land costs of Rs.150/m2 and developed land costs of Rs.209 per m2.
- High marketable area of 77 percent.
- Project area of 15.2 hectares and 779 plots, of which 252 are destined for the target group.
- Plot sizes for the target group of 95.4 m2.
- Provision of water supply, drainage, electricity, and gravelled roads, but no sanitation.
- Core house for the target group of 18 m2.
- Financial terms: down-payments by the target group of 50 percent; loans of 15 years at 15 percent interest.
- Cross subsidy by other plots which permits a target group land sale price of Rs.200 per square meter rather than Rs.270, which is the net cost to be recovered.
- Monthly payments on the order of 31 percent of monthly income.

Thus, on the basis of the above project assumptions and characteristics, the moderate-income group of Rs.1,000 monthly could afford a small plot and dwelling unit in areas where land prices do not exceed Rs.150 per square meter. On the basis of data presented in Chapter V, Section C, it is clear that land prices in this range are generally found about 5 miles (8 kilometers) from the Kathmandu city center, or considerably beyond the built-up area (the Ring Road is on average about 3 miles or 4.8 kilometers from the city center).

Assuming no housing project was involved, but that the target group household could obtain a loan at the same terms to acquire the same size plot (without services) and dwelling unit, the maximum price of land the household could afford would be Rs.200 per square meter. In this case, also, the household could only afford land between 6.4 and 8 kilometers from the city center. Thus, because of high land prices, low-income households cannot afford land and housing at basic standards in proximity to Greater Kathmandu.

It may be hypothesized that lower-income, long-term residents of the Valley have been able to capitalize on the rising prices of land to gain access to higher-standard housing. One may assume that these households have been able to sell off part of their land to finance housing construction for habitation or rent. On the other hand, recent first or second generation migrants with no assets in land would have much more difficulty in gaining access to the land and housing market.

Table IV.1

HYPOTHETICAL HOUSING AFFORDABILITY ANALYSIS

	Base Cost /Unit	PERCENTAGE Physic Conteng.	Design Sup & Mg	Inter. Const.	*To Be Recovered $/m²
I. LAND AND DEVELOPMENT COSTS					
Land cost	150	0	12	10	184.80
On-site infra.	25	0	0	0	25.00

*Developed Land Cost/Gross m² to be Recovered: 209.80

II. LAND USE & PRICING OF NON-RESIDENTIAL LAND

			*Percent	Pricing of Non-Residential Land
Total Area	Ha	15.2	100.00	
Circulation	%	15.	15.00	
Open Space+Com.Fac.	%	7.57	7.57	
Commercial #1	m²	6549	4.31	900.00
Total Marketable	m²	117694	77.43	
Total Residentl Area	m²	111145	73.12	
Total Number Plots		779	Household size:	6
Population Density per Ha		308		

*Developed Land Cost/Net m² to be Recovered: 270.95

III. PRICING & AFFORDABILITY OF RESIDENTIAL PLOTS

Plot Types	#1	#2	#3	#4
Monthly Income/Hshd	3600	2333	1667	1000
Plot Size in m²	318.10	190.86	127.34	95.43
Plot/Type Percentage	7.06	19.14	41.46	32.34
*Number Plots/Type	55	149	323	252
Plot Saleprice/Net m²	280	250	225	200
Superst. Cost/Plot	65000	53000	40000	25000
Other Cost per Plot	300	300	300	300
*Total	154368	101015	68952	44386

Plot Types	#1	#2	#3	#4
Downpayment Percent	50.00	50.00	50.00	50.00
Interest Rate/Year	15	15	15	15
Loan Term (Years)	15	15	15	15
Loan Monthly Payment	1080.26	706.90	482.52	310.61
Total Monthly Payment	1080.26	706.90	482.52	310.61
Percent Monthly Payment	30.01	30.30	28.95	31.06

IV. COST RECOVERY

Amount Recovered for Developed Land Cost/Net m²:	271.68	
Average Developed Land Cost per Net m²:	270.95	
Surplus or Deficit in Millions and Percent:	0.08	0.27%

C. FORMAL LAND DEVELOPMENT

Formal land development is defined as development carried out by formally recognized private or public institutions. The Government's experience in public land development for housing is limited to three schemes which were launched about 8 years ago in Kuleswar, Dullu, and Galfuttar. An evaluation of the Kuleswar project was undertaken in April 1985 for the DHBPP. The principal conclusions of the evaluation are useful in determining what sort of future role the Government should play in land development.

The Kuleswar project is the most advanced of the housing projects launched by the Kathmandu Valley Town Development Board (KVTDB). The fundamental aim of the project has been to develop and sell serviced plots to various categories of civil servants. No provision was made for plot acquisition or building construction loans. Lending institutions provided loans to the KVTDB for the acquisition of land, and plots have been sold on an installment basis to raise capital for project development. Land compensation of about 5 million rupees was paid by taking loans from the National Commercial Bank and the Provident Fund at interest rates of 17 and 14 percent respectively. However, delays in selling plots to make payments on the loans resulted in high-interest costs, equivalent to about 9 percent of the estimated project investment.

Land for the project was expropriated on a compulsory basis. The rate of compensation was fixed by a valuation committee which consisted of the Chief District Officer, the District Panchayat Chairman, a representative from the Land Revenue Office, and a representative from the project. As land values rose significantly during land acquisition (which took four years), delayed compensation has been a serious problem. Some compensation remains to be paid, and rates will be significantly higher than originally planned.

In addition, according to the Land Reform Act, tenants must give their approval before landlords can sell the land. By law, they are entitled to 25 percent of the proceeds from the land sale, but they can informally negotiate and receive up to 50 percent of the compensation. Landlords are often happy to sell since if tenants occupy the land they cannot displace them, and receive no benefits if the land is not sold. No provision was made to provide landowners or tenants with plots in the project unless they had already constructed a house.

As yet, no new or old plot owners have received title to the land. As a result, plot owners have been unable to mortgage the land for loans, and little construction has occurred. However, in response to public demand, the KVTDB has recently provided the plot owners with temporary "title".

Issuance of title and changing land registration is complex in Nepal. Because of inadequate cadastral records, new registrations must be based on the original plot boundaries. Thus, there is no way to erase existing boundaries and start fresh with a new plot and road layout. Each new plot registration must detail parts of the property formerly held. The only way to resolve the title issue at Kuleswar is to wait until an ongoing urban cadastral survey is completed, or to carry out a detailed land survey.

Other difficulties experienced by the project were largely due to poor planning and management of the project. According to the evaluation:

- The project will run a projected deficit on the order of Rs.5.9 million (April 1985).
- Project planners and managers were inexperienced in the complexities of dealing with existing land and building owners on project sites, land acquisition, project finance, etc.
- No systematic approach to project design and implementation was developed.
- Despite KVTDB requests to project planners at an early stage of the project, no detailed project proposal or work program for project implementation were ever prepared.
- Records of KVTDB decisions and assignments, project income and expenditures, institutional agreements, etc., were not kept on an orderly basis.
- The board meeting notes suggest that many decisions by the board were not followed up. Coordination with other institutions with roles in project development were neglected, and appropriate agreements were not established early in project development. In fact, no agreements of any kind were arranged until recently.
- Lack of expertise in project financial planning and management were particularly apparent. Though the project was conceived in such a way that it could have been self-financing, its planning was based on fixed plot prices and sales early in the project. Poor management led to major delays in project execution resulting in higher costs.
- Functional conflicts and a lack of clear responsibilities between the planning and implementation wings of the KVTDB contributed to the poor management of the project.

To help improve the project development process, the evaluation made the following recommendations:

- The Chief Planner or Executing Officer of the KVTDB should be made fully responsible for the project; he should, in turn, designate a project manager and sufficient staff for the project.
- The Chief Planner or Executing Officer and project manager should ensure that all project documentation and records are assembled at the planning office for reference and all materials should be brought up-to-date.
- A written report should be prepared for the board which include: the current technical and financial status of the project; all decisions which must be made by the board; draft agreements which need to be established with other institutions; a draft work program to complete the project with individual assignments and timing specified; and a budget to carry out all necessary activities.
- After presentation of this report to the board, a monthly progress report should be prepared by the project manager indicating management, financial, and technical developments and specific tasks carried out by individuals in the work program.
- The KVTDB should strive to complete the Kuleswar project. However, in the future, it should divorce itself from a direct role in land development planning and implementation. Rather, it should strive to engage the private sector in this function.

On the basis of the Kuleswar evaluation, and a tentative proposal for involving the private sector in the design and management of the Dullu housing project, the KVTDB has elected to request from an emerging private housing company a proposal to plan and implement the project.

D. INFORMAL LAND DEVELOPMENT

This section discusses the informal land development process, then suggests how it might be improved. Informal land development--unregulated, lacking any public involvement--is the dominant form of urban land conversion in the Kathmandu Valley. Due to the lack of formal development mechanisms, informal development deserves both the credit and responsibility for the town expansion which has taken place.

Road extensions carried out in and around the town by the Government or town panchayat make adjoining land suitable for development. The degree to which the adjoining land develops for urban use depends on a number of factors, including: whether side or feeder roads develop; topography and drainage; proximity to built-up areas; quality of the access road; and availability of bus service.

Inasmuch as formal road extension programs are relatively limited in number and scope, development occurs quite selectively along these roads. The precious accessibility created by the roads results in large land value increases, restricting the number of households able to afford land adjacent to the roads. Furthermore, in the absence of neighborhood planning and rational subdivision, initial development is largely linear without corresponding side-road development. Thus, large areas of land in proximity to the roads are left undeveloped or inefficiently developed.

The development of land in proximity to main roads is dependent upon some type of access: side-road or footpath. Yet, due to a lack of cooperation among landowners, adequate access to these adjoining lands is very irregular. The result is an extremely inefficient type of growth that is also quite costly to service with infrastructure. The lack of landowner collaboration in land development is due to a variety of factors including absentee landowners, lack of acquaintance, different needs and aspiration, personal disputes, and discouragement by tenants.

These impediments to land development are to some degree overcome by the intervention of local real estate agents in the Valley who serve as brokers between the landlords, tenants, and prospective buyers of land. In this process, the brokers control the direction of feeder roads and access to other land areas. Their profit is the difference in land price obtained between the original landlords' and tenants' sale price and the purchase price of subdivided plots sold to prospective buyers.

In general, a broker (or group of brokers) operates in a specific geographical area. As a rule, brokers possess a sound working knowledge of laws and regulations pertaining to land and maintain good relations with personnel in the local land revenue, survey, maintenance, and legal offices. The brokers operate in a traditional fashion, relying largely upon confidence and trust among the parties concerned. The brokers' success is largely determined by their ability to identify areas with high development potential and their ability to gain the cooperation of local landowners and tenants. Brokers may spend between 3 and 5 years building rapport among these parties before an operation is begun.

In a given locality, brokers prefer to deal with owners of relatively large tracts of land, areas of persistent quarrels between tenants and landlords, and areas off the main road but with the possibility of access by a feeder or side-road. The broker's aim is largely to introduce access roads to the adjoining land so that it may be developed. However, as side-roads must, in practice, follow property boundaries, there are relatively few points along the main roads where they can be effectively introduced. For this reason, land at these places can command a premium in price, requiring brokers to engage in secretive negotiations with owners of land at the road entry point. The broker's goal is to obtain the front parcel to permit access, gain the cooperation of landowners and tenants along the projected path of the road, and to sell the subdivided land with road access at a higher price. The broker's actions require meticulous checking of property records and field books, landowner inventories, revenue records, and the family lineage of property owners (to avoid legal problems with "first right of purchase").

When the broker's research is complete, he sets out to negotiate deals with each of the landowners and tenants. Conditions of agreement include a sales price, a time period for payment, and an advance which must be given to each owner in anticipation of the satisfactory completion of the operation (sale of all land at a given price and time). Normally, about 5 to 10 percent of the agreed land price is advanced to the owners and tenants. Furthermore, if the final transaction is not completed within the stipulated time, the owner is free to sell his property to anyone and is entitled to keep the advance.

When the general agreements are complete, the broker purchases the road access plot outright. Once the front plot is purchased, the brokers begin looking for buyers of subdivided land in the lands adjoining the main road. Potential purchasers are organized into groups depending upon their ability to pay a deposit and pay off the price of the plot. All transactions for a given area take place in a single day. Plots are later subdivided according to the respective purchasing power of the buyers, resulting in a curious mixture of plot sizes and irregular development.

Subdivision and sale of plots in other areas along the projected path of the access road take place progressively; it may take up to five years for a targeted development area to be completely subdivided and sold by the brokers.

Ownership of access roads is held in the names of the brokers to avoid encroachment. Roads become public property when a new cadastral survey is prepared. The new plot purchasers on each side of an access road cede the road right-of-way to the broker. Once the access is demarcated in the official records, further extension of the road and development takes place. The direction the road takes is dependent upon the willingness of landlords of adjoining land to participate in the scheme. If they choose not to participate, the road heads in another direction or is stopped by the broker. Thus, once an access road is introduced, the broker has more bargaining power with landowners.

As noted previously, a single operation may require 3-to-5 years to complete. The broker's profit is derived from the increased value of land caused by the access road; this is generally about a 50 percent increase over the original price. For instance, an area without access selling for Rs.40,000 per Ropani, or Rs.78 per square meter, will be sold by the broker at Rs.60,000 per Ropani, or Rs.118 per square meter. The brokers may also sell access rights to the road without any property exchange.

Therefore, real estate brokers play an important role in town extension as well as infill of urban areas. Though little is known about the income groups that benefit from their operations, preliminary research suggests that brokers do help households of modest means to acquire land. Brokers subdivide land based on the purchaser's ability to pay, and their schemes often include a mixture of socio-economic levels.

It would appear that greater cooperation between the Government and brokers is both desirable and possible. Residential land use more than doubled between 1971 and 1981, largely due to informal land development, and this process is expected to play a dominant role in land development for the foreseeable future. Thus, in order to exercise a positive influence on land development, the Government should strive to encourage, improve, and support the informal process.

Government actions to support informal development should not stifle the activities of the brokers nor negate the various benefits which the process provides to individual households. For example, individuals participating in this process enjoy freedom in making investment decisions (when, where, and what amount). They have been doing so without any initial public investment support, and the informal process has not generated the resistance that formal processes usually bring about.

Nevertheless, the informal development process would benefit from public support. Despite the positive dynamism of informal land development, the process requires improvement:

- Because informal development occurs without regard to any design standards, the Government incurs higher costs in order to provide the areas with appropriate levels of infrastructure later on.
- Such developments tend to maximize immediate benefits of those involved at the expense of future community needs; for example, inadequate provision is made for road rights-of-way, open space, and public facilities.
- As such developments largely operate outside official channels, public agencies may be reluctant to extend services and amenities.
- Construction of individual rather than multi-family dwelling units is encouraged.
- The lack of basic planning know-how and technical skills in the process is responsible for low quality of development, manifested in such problems as excessively narrow streets and poor drainage.

These deficiencies can be alleviated with appropriate public support; but, at the present time, brokers prefer to work independently of the public sector. Attempts to formalize the activities of brokers could easily inhibit their effectiveness. The current policy and regulatory framework is characterized by non-responsive service agencies, irrational tax procedures, unsuitable rules and regulations, highly-subsidized public services, the absence of a development-related tax, and a lack of incentives which might rationalize private investment. Given these issues, the Government should consider the following course of action:

- Since brokers are, in effect, responsible for the legality of land transactions, they should be encouraged to formalize their activities. In other words, the role of brokers in land development should be officially recognized so that public support can be provided. Brokers should be encouraged to voluntarily form a recognized professional association.
- Brokers might be made directly responsible for administering all land transactions and holding of titles (i.e. roads). The initial transfer of land titles to brokers will, in turn, enable the brokers to use the land as collateral for development loans.
- Government should provide appropriate guidelines and technical assistance to brokers on physical standards and provision of services. To do so, it must concern itself with cost recovery and land taxation. The preparation of manuals and holding of training sessions should be considered.
- Government would encourage the formalization of the broker's role by requiring that all land transactions within designated development areas be witnessed by brokers.
- Unambiguous income evaluation procedures should be formulated to assess broker income for tax purposes. Presently, there is no rationale to the evaluation procedure, which discourages brokers from registering their businesses.
- Adherence to development standards and reservation of land for public open space or facilities should be required of the brokers. Related costs should be absorbed in plot sales. Enforcement of minimum standards should be appropriately executed by local panchayats, the land revenue office, and town planning units.
- The Government should formulate and implement a metropolitan infrastructure extension program, particularly for roads, in order to provide a planned framework for brokers to operate in.
- Existing legal provisions for "first right of purchase" and six-month waiting periods to finalize land transactions should be eliminated in cases where transactions carry brokers' names as witnesses. In addition, the land transaction re-recording system should be improved and computerized, if possible, to speed up this process.
- Existing provisions for tenancy rights in cases of urban land development for housing should be limited to fair compensation; other provisions should be eliminated.
- Once an appropriate policy and legal framework to formalize the brokers' role has been established, a campaign should be launched to raise awareness among the public, brokers, and officials of land revenue, survey and panchayat offices.
- As a matter of urgency, Government should update cadastral data: maps, areas, locations, types, owners, and tenants. Accuracy of the maps should be improved and all such information should be made accessible to users. Cadastral information should be used as a uniform basis for other related purposes such as land taxation.

CHAPTER V
CHARACTERISTICS OF THE LAND MARKET

A. LAND TENURE

Land Ownership in the Valley may be classified into the following broad categories:

- Government
- Public
- Private Ownership (Raikar)
- Private Guthi
- Guthi Corporation

Government lands for agencies' offices, education and health facilities, police and military installations, etc., are largely concentrated within the town panchayat boundaries. Public lands include ponds, roads, walkways, playgrounds, courtyards, squares, gardens, parks and religious spaces. Public lands cannot be sold or used for any other purpose, nor can the land's shape and size be altered in any way. Government and public lands do not constitute major tenure types in the Valley. For instance, in Greater Kathmandu they each accounted for about 550 hectares respectively, or 1 percent of the Valley area.

Private or Raikar lands are the dominant tenure form in the Valley, covering 94 percent of the cultivated land area or 76 percent of the Valley area. Unlike Government, Public, and Guthi land, Raikar land is subject to taxation through the land revenue tax and the house and compound tax. Raikar lands are subject to expropriation by the state.

In 1959, an earlier tenure type, Birta lands, were converted to Raikar tenure form. In the past, Birta and Guthi lands were considered "safe" (not subject to expropriation), and their landowners took more interest in their improvement and cultivation. Some Birta lands were exempt from taxation while others paid taxes at a concessional rate. The 1959 Birta Abolition Act terminated this tenure form's privileges and converted it into Raikar land. Revenues from Raikar lands are mainly collected within town panchayat boundaries. A lower tax rate is applied in village panchayat areas.

Guthi lands are those whose ownership or output has been transferred to charitable, religious, or philanthropic institutions. As a rule, they are of two types: private Guthi lands and Guthi Corporation lands. Private Guthi lands are of Raikar class but their outputs have been dedicated for some religious or charitable purpose. Private Guthi lands cannot be resold, but tenancy rights can be transferred. Individuals or groups may own Private Guthi lands. Guthi lands which have been entrusted to the care of the Government are registered with the Guthi Corporation.

The Land Reform Act has directed all owners of Private Guthi land to register the land under their names. It also has a provision permitting tenants on private Guthi lands to register, thereby maintaining their tenancy. If owners register with the Corporation, they remain owners, but proceeds of the land go to the Corporation. Land under tenancy, on the other hand, becomes property of the Guthi Corporation upon registration. Recently, a provision has been made for tenants to purchase Guthi land at a price to be stipulated by the Corporation.

Guthi Corporation lands make up about 5 percent of the Valley area and 6.2 percent of cultivated land in the Valley. There are two types of Guthi Corporation land: that owned by individuals who pay rent to the Corporation and direct Corporation-owned land. The latter accounts for 99 percent of the land of the Corporation. Very recently, the HMG has been empowered to acquire Guthi Corporation land. The Guthi Corporation can also now sell land to an individual or private company with the concurrence of the Ministry of Finance. For example, the Corporation recently sold some land in order to finance the construction of rental properties.

As Table V.1 indicates, about 51 percent of Guthi Corporation lands in the Valley are found in Kathmandu District, 31 percent in Bhaktapur and 18 percent in Lalitpur. Apparently, there are virtually no Guthi Corporation lands outside the Valley itself. Most Corporation lands are concentrated in or near the town areas. Guthi Corporation lands in Kathmandu District are not evenly distributed. Of the 29,108 ropanis found in the district, about 7,923 or 27 percent are found within the town panchayat boundary. Another 35 percent of these lands are concentrated in the village panchayats of Sangla, Jorpati, Kopan, Indrayani, Gagalphedi, Manameiju, Gongabu. Phutung, Pharping, Sesnarayan, and Jhor Mahakal. In Kathmandu town panchayat, extensive Guthi Corporation lands are located in the eastern fringe area, particularly in Wards 6-10. There are also large Corporation lands in the western fringe areas of Wards 13 and 16. These seven Wards account for about 60 percent of the town's Guthi Corporation land.

Table V.1

GUTHI LAND IN THREE DISTRICTS OF THE KATHMANDU VALLEY*

Districts	Guthi Land (in Ropanis)	Percentages
Kathmandu	29,108	50.72%
Lalitpur	10,320	17.98%
Bhaktapur	17,965	31.30%
Total	57,393	100.00%

*Source: Guthi Corporation, 1984

Additional data on Guthi Corporation lands are shown in Tables V.2 and V.3. In Lalitpur District, they make up about 3.6 percent of the District's cultivated area. As in the case of Kathmandu, most Guthi Corporation lands are found in proximity to the town panchayat. Other concentrations of Corporation lands are found in the village panchayats of Bungmati, Sonaguthi, Dhapa Khel, Harisiddhi, Saibu, Chhampi, and Bishankhu (Bistachhap).

Table V.2

GUTHI LAND IN THE KATHMANDU VALLEY

(in Ropanis)

District	Total Registered Land*	Total Cultivated Land	Other Categories Includes Govt. Land Road, Ponds & Others	Guthi Corporation Land**	Guthi Corporation Land Percentage of Total Cultivated Land
Kathmandu	659,060 (33,540 hectares)	465,763	193,297	29,108	6.2%
Lalitpur	537,938 (27,376 hectares)	283,687	254,251	10,320	3.6%
Bhaktapur	216,425 (11,014 hectares)	169,225	47,199	17,965	10.6%
Total	1413,423	918,675	494,747	57,393	6.2%

*Source: Department of Survey, HMG.

**Source: Guthi Corporation, 1984.

Table V.3

GUTHI LANDS UNDER GUTHI CORPORATION*

District	Guthi Lands (in Ropanis)	Ownership Certificate Issued to G.C.**	Percentage of Guthi Land
Kathmandu	29,108	28,297	97%
Lalitpur	10,320	10,033	97%
Bhaktapur	17,965	15,006	83.5%
Total	57,393	53,336	93.8%

*Source: Guthi Corporation, 1984.

**The guthi lands under Guthi Corporation in the Valley come to about 57,393 ropanis, but Land Revenue Offices have issued ownership certificate for only 53,336 ropanis of land. The certificate for remaining 4,057 ropanis of land are yet tobe issued to Guthi Corporation.

Proportionally, Bhaktapur has the highest percentage of Guthi Corporation lands of the three districts: 10.6 percent of the district's cultivated area. Unlike Kathmandu and Lalitpur, the Corporation lands are distributed throughout the district. All village panchayats of the district lie within the Valley and, with the exception of Nagadesh, have at least 100 ropanis of Guthi Corporation land within each panchayat. In addition, of Bhaktapur's 21 village panchayats 15 have more than 400 ropanis of Corporation land. Five of these--Chitapol, Chhaling, Changu Narayan, Nankhel, and Jhaukhel--have more than 1,000 ropanis of Guthi Corporation land and account for 46 percent of Guthi land in the district. Only 10 percent of Bhaktapur District's Guthi Corporation land is located in the town panchayat; while in Lalitpur and Kathmandu, the towns had 15 and 27 percent of district Guthi land within their boundaries.

For future development planning, Guthi Corporation lands can play a vital role. For example:

- Some Corporation lands which require protection can be more easily preserved.
- Guthi Corporation lands can serve as buffer zones between the built-up area and areas where development is not desired.
- Guthi Corporation lands where development is desirable could be used for some types of social functions: open space, gardens, low-income housing, etc.
- The Guthi Corporation could, with its tremendous assets in land, serve as a land bank or land developer; or, it could operate in conjunction with developers.

If the Guthi Corporation is to take an active role in land preservation, development, and banking, it should carry out an in-depth survey of its existing lands and coordinate the management of its assets with the KVTDB. For instance, it may be desirable to sell Guthi Corporation land in remote parts of the Valley and purchase land in flood plains in order to protect them from urbanization.

B. LAND TRANSACTIONS IN THE KATHMANDU VALLEY

Data on land transactions were collected from each District Land Revenue Office in order to gain a better understanding of land market dynamics in the Valley. The transaction data collected from the Kathmandu, Lalitpur, and Bhaktapur Districts are classified by village and town panchayat and show the relative importance of transactions for urban vs. rural areas. The data are also broken down by specific village panchayat and town ward so that a locational analysis of transactions is feasible (Figures V.1 and V.2).

The data indicate location where the volume of land transactions is highest and, thus, where development pressure or anticipation is most intense. Among the three districts for 1984/85, 71 percent of land transactions took place in Kathmandu District, 21 percent in Lalitpur and 8 percent in Bhaktapur.

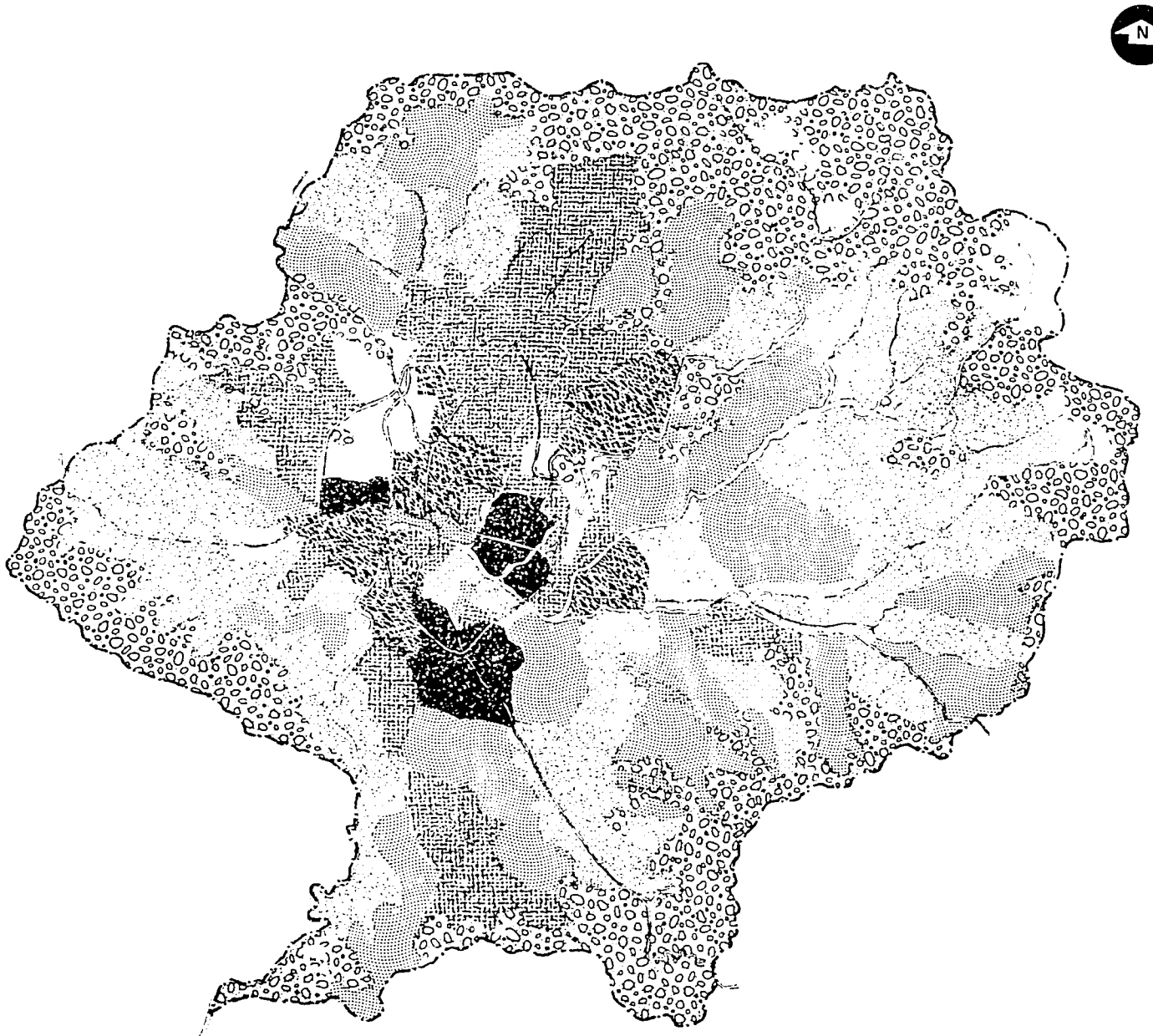


FIGURE V I

KATHMANDU VALLEY

LAND TRANSACTIONS

(WARD & VILLAGE PANCHAYAT WISE)

1984 — 1985.

SCALE 0 1250 2500 3750 meters

LEGEND

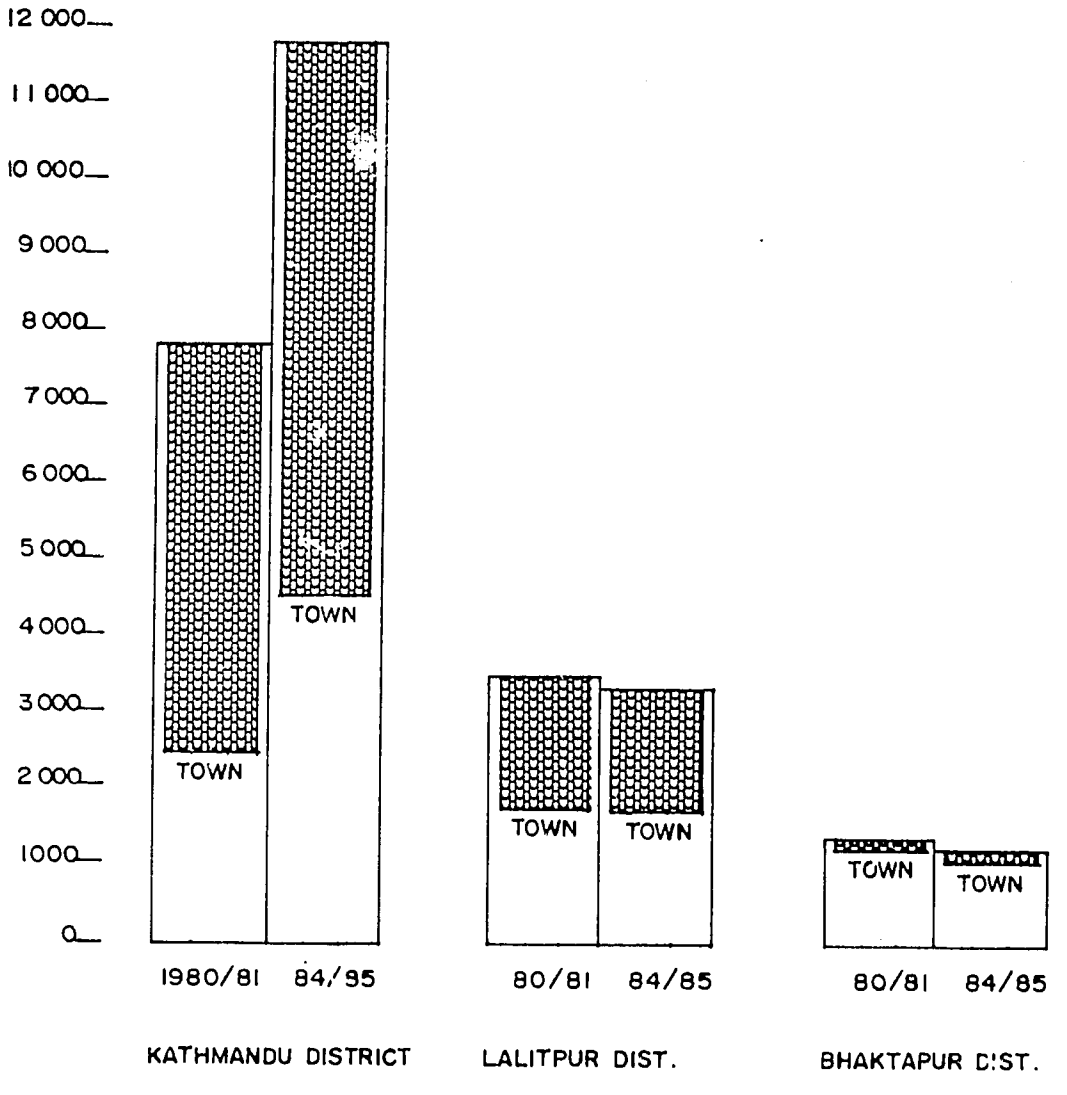
- < 21 Land Transactions
- 21 — 50 " "
- 51 — 100 " "
- 101 — 200 " "
- 201 — 300 " "
- 301 — 400 " "
- >400 " "
- Forest

SOURCE — DISTRICT LAND REVENUE OFFICES OF KATHMANDU, BHAKTAPUR & LALITPUR 1985

PREPARED BY — HADCO, KATHMANDU, 1985

Figure V.2

LAND TRANSACTIONS
KATHMANDU, LALITPUR & BHAKTAPUR



Source - Land Revenue Offices, Kath., Lalit., & Bhakt. '85

Kathmandu District's land transactions for 1980/81 and 1984/85 are presented in Table V.4. The table gives the number of transactions taking place in the town and village areas. Land transfers in Kathmandu were most numerous in the town panchayat area, where 68 and 63 percent of transfers occurred in 1980/81 and 1984/85, respectively. Over this four-year period, the number of land transfers increased by 72 percent in village areas, and 37 percent in town areas. Thus, the village share of transfers is increasing at a rapid rate. In nearly every village panchayat, the number of land transfers increased. Those village panchayats where land transfers more than doubled over this period were: Khadka Bhadrakali, Dhapasi, Gongabu, Chapali, Jorpati, Thankot, Chapasi, Vishnugaon, Manamaiju, Layku, Sinamangal, and Sitalpaila. The number of transfers in Thankot village panchayat over this period increased six-fold. In most cases, the village panchayats showing increases in land transfers are found in proximity to the Ring Road, town panchayat boundaries, major highways, and access roads. Rising land values in the town area, and an ever-expanding built-up area have also led to increased land transfers in outlying village panchayat areas or those places with medium-term development potential.

In order to analyze the number of land transfers taking place within Kathmandu town panchayat for 1980/81 and 1984/85, the wards were grouped into five categories as shown in Table V.5. For both years, the greatest number of transactions occurred in the core and eastern fringe areas. However, over the four-year period, the percentage of transfers was increasing most rapidly in the western fringe and eastern suburban areas and decreasing in the eastern fringe and northern suburban areas. The core, eastern, and western fringe areas combined accounted for 77 percent of land transfers in the town in 1984/85. In both 1980/81 and 1984/35, about 36 percent of all land transfers occurred in the core area. This may be attributed to development of vacant areas within the core and urban renewal. Many old buildings along the main roads are being demolished and replaced with "modern" structures of mixed commercial/residential use.

In Lalitpur District between 1980/81 and 1984/85, the number of land transactions per year has remained relatively constant or decreased slightly as shown in Table V.6. In addition, the number of transactions in village panchayat areas was about equivalent to that in the town panchayat area. Among the land transfers that took place in Lalitpur's 39 village panchayats, 50 percent occurred in ten: Imadol, Lamatar, Sunakothi, Dhapakhel, Thecho, Capagaon, Chhampi, Saibu, Thuruwarashi, and Laylay. Each of these panchayats is linked by roads with Lalitpur City but may not be in close proximity to the town.

To analyze land transactions in Lalitpur town panchayat, central wards have been grouped into the "core" area as presented in Table V.7. As in the village panchayats over the period 1980-85, the number of land transactions per year has remained relatively constant. Since 1980/81, there has been a significant reduction in land transactions in the core area, with an increase in transfers in Ward 5 south of the core area. On the basis of these data, it would appear that the core area of Lalitpur is relatively static, lacking the dynamism of Kathmandu's core area. Though the number of land transactions for LNP has remained relatively stable over the past five years, increases in transactions have taken place in the northwestern, western, and southern suburban sectors. These areas, consisting of Wards 1-5, accounted for about 70 percent of all transactions in 1984/85. These areas still have extensive agricultural or vacant areas and enjoy relatively good access to the road network and water supply. Therefore, it can be expected that transactions and development in these wards will continue unabated in the future.

Table V.4

LAND TRANSACTIONS IN KATHMANDU DISTRICT*

Land Transactions	1980/81	Percentage	1984/85	Percentage
Kathmandu District	7,904	100	11,682	100
Village Panchayats	2,530	32.00	4.346	37.20
Town Panchayats	5,374	68.00	7,336	62,80

*Source: Land Revenue Office, Kathmandu, 1985.

Table V.5

LAND TRANSACTIONS IN KATHMANDU NAGAR PANCHAYAT*

	1980/81	Percentage	1984/85	Percentage	% Increase
1. Core Area (includes Ward No. 12,17,18,19,20,21, 22,23,24,25,26,27, 28 and 30)	1,919	35.70	2,695	36.74	+ 40.44
2. Western Fringe Area (includes Ward No. 13,14,15 and 16)	909	16.92	1,439	19.62	+ 58.30
3. Northern Sub-Urban Area (includes Ward No. 2,3,4 and 29)	587	10.92	627	8.54	+ 6.81
4. Eastern Sub-Urban Area (includes Ward No. 1,5,11,31,32 and 33)	710	13.22	1,049	14.30	+ 47.75
5. Eastern Fringe Area (includes Ward No. 6,7,8,9 and 10)	1,249	23.24	1,526	20.80	+ 22.18
Total Transactions	5,374	100.00	7,336	100.00	

*Source: Land Revenue Office, Kathmandu, 1985.

Table V.6

LAND TRANSACTION IN LALITPUR DISTRICT*

	1980/81	1981/82	1982/83	1983/84	1984/85
Nagar Panchayat	1,730	1,934	1,725	1,600	1,624
Village Panchayat	1,894	1,659	1,989	1,594	1,793
Total	3,624	3,593	3,714	3,194	3,417

*Source: Land Revenue Office, Lalitpur, 1985.

Table V.7

LAND TRANSACTIONS IN LALITPUR NAGAR PANCHAYAT*

Ward No.	1980/81	1981/82	1982/83	1983/84	1984/85
Core Area (included Ward No. 10,11,12,13,14,16,17, 18,19,20,21 and 15	798	221	222	241	252
Ward No. 1	105	227	166	169	135
2	117	271	199	171	215
3	110	85	91	104	112
4	105	295	290	223	243
5	166	642	497	485	429
6	50	98	116	81	112
7	85	16	36	26	22
8	75	29	37	28	50
9	77	33	60	57	40
22	72	17	11	15	14
Total	1,730	1,934	1,725	1,600	1,624

*Source: Land Revenue Office, Lalitpur, 1985.

Surprisingly, though Wards 6,7,8, and 9 are in close proximity to Lalitpur's core area, the number of land transactions that have occurred in these areas is quite low, actually decreasing over the five-year period. In 1984/85, they made up only about 15 percent of the land transactions in the panchayat. These areas lack internal roads and can be considered fringe areas of Greater Kathmandu without access to the rest of the metropolitan area.

In the past few years, considerably fewer land transactions have occurred in Bhaktapur District than in Kathmandu or Lalitpur Districts (Table V.8). Over the past three years, about 80 percent of land transactions in Bhaktapur have occurred in village panchayat areas and only about 20 percent in the town. In the district, eight village panchayats accounted for about 68 percent of the village land transactions. These include Katungya, Dadhikot, Jaukhel, Tathali, Sipadol (Sudol), Duwakot, and Chitpol. Some of these village panchayats lie between the main Arniko Highway and the old Bhaktapur Road, an area experiencing considerable growth pressure.

In Bhaktapur town panchayat, only about 176 land transactions occurred in 1984/85, which suggests that the town is not undergoing major expansion. Of the transactions that did occur, about 50 percent of these occurred in Wards 1, 4, and 17, wards with good access to roads. Very few transactions occurred in the other 14 wards.

Table V.8

LAND TRANSACTIONS IN BHAKTAPUR DISTRICT*

Year	1982/83	1983/84	1984/85
Town Panchayat	132	199	176
(Unclassified)	84	39	78
TOTAL	216	238	254
Village Panchayat	1,326	1,023	1,128
GRAND TOTAL	1,542	1,261	1,382

*Source: Land Revenue Office, Bhaktapur, 1985

C. LAND VALUATION AND PRICES

The private land market in the Valley is extremely vigorous. Almost all socio-economic groups participate in the land market as buyers and sellers. In the Valley, as elsewhere in Nepal, land is the main form of wealth for all segments of the population. Moreover, land provides people with higher and more secure financial returns than most other forms of saving or investment. In addition, land is an asset to pass onto future generations.

Rapid urbanization in the Valley over the past two decades has been associated with a significant escalation of land prices. The general perception seems to be that land prices in the Valley have been rising too fast; that speculators are reaping large unearned profits; and that people of modest income can no longer afford to purchase land for shelter. This section attempts to shed some light on the validity of these assertions.

1. Minimum Land Values

Land prices officially registered with the Land Revenue Office do not reflect market prices because of a legal provision called "nikhanya". Until recently, under this provision, the near relatives of the seller had the right to purchase the land at the price stated in the registration document within six months of the transaction. As a consequence, the price in the registration document was generally higher than the amount actually paid to the seller. Quite recently, the regulations have been modified, and a provision called "sandisarpan" has been adopted. According to this provision, only close relatives of owners of adjoining land have the right of purchasing back (nikhanya). Now buyers obtain the official concurrence of such people before the lands are transacted in the Land Revenue Office. Once their official concurrence is given, they cannot repurchase the land. As a result of this provision, buyers now state a much lower-than-market level purchase price in order to reduce registration taxes.

As a consequence, land values as registered with the Land Revenue Office generally do not provide an accurate basis for studying market values of land. For tax purposes, minimum valuations are set by the Land Revenue Office in case the price on the registration document is too low. In fixing the minimum valuation of land in a given area, the Land Revenue Office takes into account the land's productivity and access to roads, water supply, drainage systems, electricity and telephone lines. Road access is particularly important in determinimg the minimum valuation of lands within the town panchayat boundaries. In village panchayats, on the other hand, valuation is based on both the agricultural productivity of the land and access to roads.

In Kathmandu town panchayat, the minimum valuation of land varies between Rs.10,000 and Rs.550,000 per ropani. The lowest valuations are in areas that have been newly incorporated into the town but lack road accessibility. The highest values are in central areas such as New Road and King's Way. The minimum valuations of lands throughout the panchayat are presented in Table V.9.

Table V.9

MINIMUM VALUATION OF LAND IN KATHMANDU NAGAR PANCHAYAT*

A. Core areas of the Nagar Panchayat, where the Cadastral survey was done in 1975-76.

The lands in the core areas have been broadly grouped into six categories. These are:

		Minimum Valuation (per Ropani)
A.	Category - New Road & King's Way	Rs.5,50,000
	The Rest of A.	3,00,000
B.	"	2,00,000
C.	"	1,50,000
D.	"	1,00,000
E.	"	70,000
F.	"	50,000

B. Sub-urban areas, where Cadastral survey was done in 1965, lands have been grouped into six categories.

1.	Along the main road	Rs.2,00,000
2.	Along the side road	1,25,000
3.	Along the jeepable road	1,00,000
4.	Along the track road	75,000
5.	Not having road link	50,000

C. The Eastern and Western fringe areas, that include the former village panchayats. For minimum valuation purpose, the lands in the fringe areas of Nagar Panchayat have been broadly grouped into six categories.

1.	Along the main road	Rs.2,00,000
2.	Along the side road	1,00,000
3.	Baneshore, Bhimsen Gola, Baneshore Mahadev, Battisputali, Pashupati, Chabahil, Bhagvansthan, Swyambhu, Dallu, Tankeshore, Tahachal and Kalimati	60,000
4.	Baudha, Balaju, Kalankisthan, Koteshore, Sinamangal (along the road)	50,000
5.	Areas t at do not have road accessibility in Baudha and Balaju	30,000
6.	The remaining areas	10,000

*Source: Land Revenue Office, Kathmandu, 1985.

The minimum valuation of village panchayat areas in Kathmandu District is based on two categories: khet (alluvial plain) land, and pakho (upland and non-irrigated) land. Khet land ranges from Rs.2,000 to Rs.10,000 per ropani in minimum valuation while pakho lands range from Rs.300 to Rs.1,000 per ropani generally. However, in areas where these lands have access to roads, the minimum valuation may be as high as Rs.8,000 for both khet and pakho land.

In Bhaktapur town panchayat, the lands have been categorized into three groups for valuation purposes. These are:

- Category A:
  Land along the main highway, main roads of the town, Durbar Square area and main market area. The minimum valuation is Rs.60,000 per ropani.
- Category B:
  Lands along the side-road to Nagarkot and along the other side-roads. Minimum valuation is Rs.30,000 per ropani.
- Category C:
  All remaining land in the town panchayat. Minimum valuation is Rs.20,000 per ropani.

Minimum valuations for village panchayat land in Bhaktapur District are also based on road accessibility and productivity. Along the Arniko Highway, the valuation is on the order of Rs.60,000 per ropani. However, in Ward 2 of Balkumari village panchayat, the valuation is as high as Rs.150,000 per ropani along the road. Away from the main road, valuations decrease. Along side- and jeepable-roads, valuations are on the order of Rs.30,000 and Rs.20,000 respectively. Khet lands in Bhaktapur District are grouped under four types, and pakho lands under two types. Minimum valuations vary from Rs.1,000 to Rs.15,000 per ropani.

In Lalitpur town panchayat, for the purposes of valuation, land has been divided into two areas: a) The core area consisting of Wards 10-21, and B) the suburban areas consisting of Wards 1-9 and 22. The cadastral survey of the core area was completed in 1976, while the suburban areas were completed in 1965.

The valuation of lands in the suburban areas of Lalitpur is based primarily on road accessibility. Other facilities like telephone, electricity, and water supply are taken into consideration but do not dominate. The minimum valuation of lands along the main roads is Rs.200,000 per ropani. In the case of the Kupondole Jawalakhel road, the valuation is Rs.300,000. Along side-roads in Lalitpur, the minimum valuation is Rs.100,000 per ropani. However, 75 feet from these roads the minimum valuation is 50 percent less.

Comparatively, the minimum valuation of land is highest in Kupondole, Sanepa, Jhemsekhel, and Pulchowk followed by Jawalakhel, Lagankhel, Satdobato and Akantakuna areas. In fringe areas, the minimum value of lands is about Rs.75,000 along the road and Rs.30,000 for the remaining land.

The valuation levels fixed by Land Revenue Offices in Kathmandu and Lalipur are comparable to a considerable extent. Rs.200,000 per ropani is the minimum value of lands along main roads; between Rs.100,000 and Rs.125,000 per ropani along side-roads; and Rs.50,000 for remaining lands in the suburban areas of both Kathmandu and Lalitpur town panchayats.

2. Land Prices

Data on land prices in 1982, 1983, and 1984 were collected from real estate brokers for 126 locations around Greater Kathmandu (see Figure V.3). The data are fragmentary and do not cover the core areas of the three town panchayats or the entire Valley. Nevertheless, the data do point to some useful conclusions. For example:

- Land prices decline as the distance from the center of Kathmandu City and Lalitpur City increases.
- Prices exceeding Rs.100,000 per ropani in 1984-85 are limited to the area within the Ring Road, except in a few locations along the Arniko Highway and Baudha Road.
- Sharp land price differences within close proximity indicate various site specific influences on land prices: road access, differences in terrain, etc.
- While not randomly representative, the data show that higher land values tend to follow transportation corridors out of Kathmandu (Arniko Highway, the Baudha Road, Trecho Road, Bhadrakhali Road).

In Table V.10, price data have been aggregated into different quarters of Kathmandu. On this basis, it appears that land is most costly in the eastern suburban area and the northern suburban area. In the eastern and western fringe areas, land prices are lower.

Land prices in village panchayats are a function of accessibility. Land prices along paved roads are usually 300 percent higher than along jeepable-roads and much lower where no roads exist at all.

In Lalitpur District, as shown in Table V.11, high land prices have been recorded in the suburban areas to the northwest. Lower prices were noted in the northern and eastern fringe areas. As in Kathmandu, the land prices along paved roads in village panchayats are higher than along jeepable-roads. The land prices of Lalitpur District are comparable to those of Kathmandu District.

In Bhaktapur District, land prices are higher in village panchayats along the highways than they are in the town panchayat (Table V.12). Furthermore, prices are 50 percent higher along the Arniko Highway than along the old Bhaktapur Road.

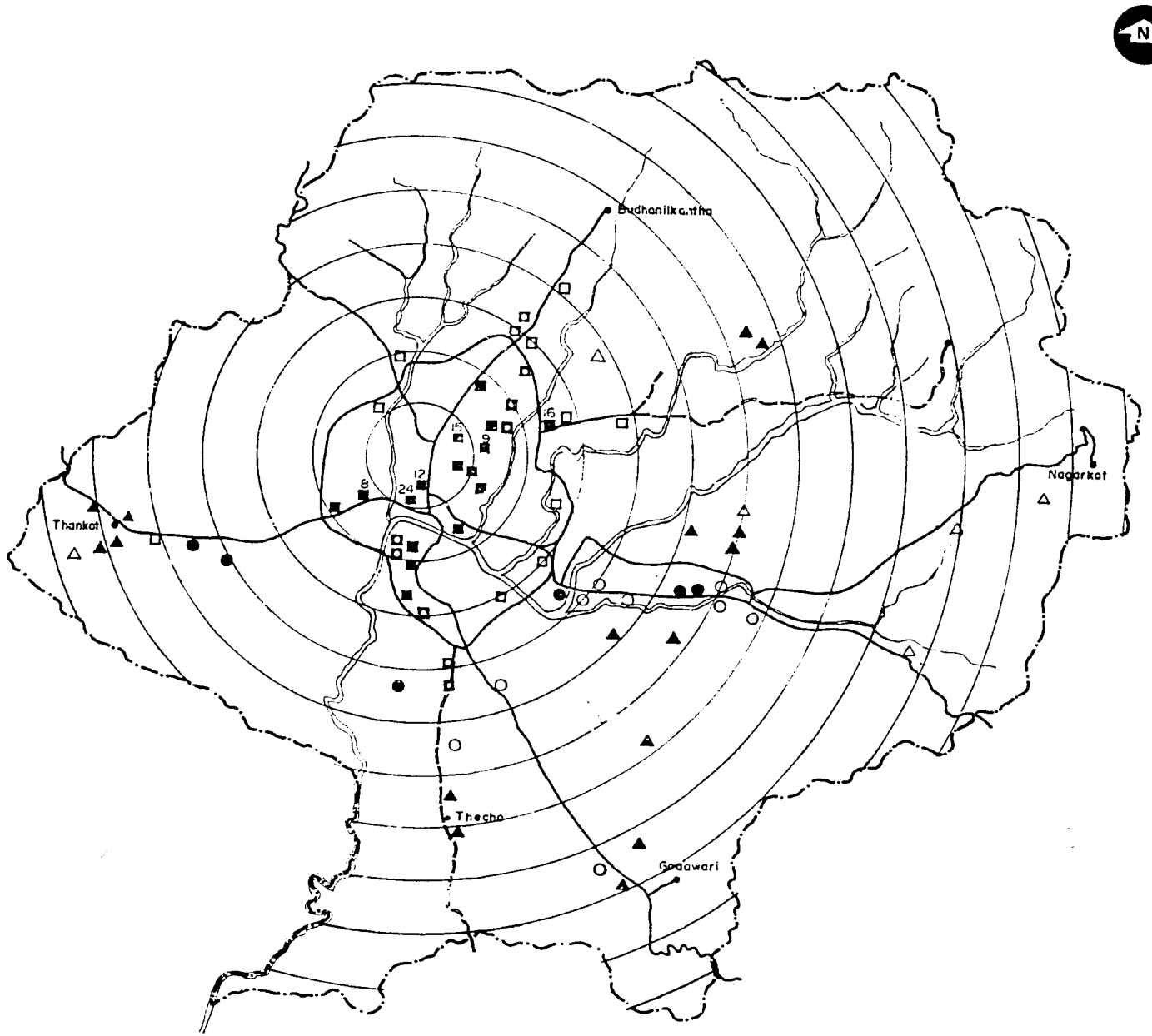


Figure V.3

KATHMANDU VALLEY

LAND PRICES

1985

SCALE 0 1250 2500 3750 meters

LEGEND

△	< 20 Rupees / Ropani (Rs in thousand)
▲	20 – 40 " "
○	41 – 60 " "
●	61 – 100 " "
□	101 –200 " "
◘	201 –400 " "
■	>400 " "

— THE FIGURE INDICATES LAND PRICE IN LAKH OF RUPEES PER ROPANI

SOURCE – REAL ESTATE DEALERS, 1985
PREPARED BY – PADCO, KATHMANDU, 1985

Table V.10

AVERAGE LAND PRICES IN KATHMANDU DISTRICT*
(in Rupees per Ropani)

	1982	1983	1984	1985
Kathmandu Nagar Panchayat	312,000	307,500	455,000	561,000
Northern Sub-urban Area	-	250,000	362,500	450,000
Eastern Sub-urban Area	350,000	487,500	400,000	800,000
Eastern Fringe Area	275,000	233,000	125,000	275,000
Western Fringe Area	-	295,000	170,000	650,000
Village Panchayat	16,000	20,000	28,000	28,750
Along metalled road	60,000	73,000	93,000	121,000
Along jeepable road	20,000	28,000	28,000	32,500
No road	-	-	-	15,000

*Source: Real Estate Dealers, Kathmandu, 1985.

A spatial tabulation of the land prices is shown in Table V.13. Average prices in 1985 constant value have been calculated for one-mile concentric rings radiating from Durbar Square in Kathmandu. The figures confirm a clear decreasing land price gradient from the center of the city. Average land prices per ropani range from a high of Rs.1.2 million in the first ring (up to one mile from Durbar Square) through Rs.288,000 in the third ring (just inside the Ring Road), to below Rs.40,000 eight miles or more from the city center. The table gives equivalent 1985 values per square meter in US dollars.

The land price data points which were collected are inadequate to analyze land price trends over time. The points are not randomly representative, and there are insufficient points for years other than 1984 and 1985. Nevertheless, real estate brokers report land price increases of as much as 20 percent nominally per year.

Table V.11

AVERAGE LAND PRICES IN LALITPUR DISTRICT*
(in Rupees per Ropani)

	1984	1985
Sub-urban Area	383,000	435,000
Fringe Area	117,500	152,000
Ring Road	200,000	220,000
Village Panchayat		
Along the metalled road	35,000	46,000
Along the jeepable road	25,000	33,000

* Source: Real Estate Dealers, 1985.

Table V.12

AVERAGE LAND PRICES IN BHAKTAPUR DISTRICT*
(in Rupees per Ropani)

	1982	1983	1984	1985
Village Panchayat				
Along the highway	38,000	46,500	-	60,000
Along the old Bhaktapur Road	-	-	-	40,000
No Road	-	-	24,000	32,000

* Source: Real Estate Dealers, 1985.

Table V.13

LAND PRICES IN KATHMANDU VALLEY
(Constant 1985 Value)1/

One-Mile Rings2/	Rs.(000)/ Ropani	Rs./m^2	US$/$m^2$3/	Number of Observations
1	1,191	2,340	130	7
2	446	876	49	32
3	288	566	31	23
4	146	287	16	27
5	76	149	8	15
6	52	102	6	18
7	40	79	4	17
8+	37	73	4	12
Total				151

1/ Data on transactions in 1982-83-84-85 in constant 1985 Rupees.

2/ Concentric rings of one mile with mid-point of Durbar Square in Kathmandu.

3/ At US$1.00 = Rs.18.00.

Source: Compiled by PADCO from records of various Real Estate Dealers.

3. Past Price Trends

A recent study by N.G. Ranjitkar, "Change in Agricultural Land Use and Land Value in the Urban Fringe of Kathmandu City" (Doctoral Dissertation, Tribhuvan University, November 1983), collected and analyzed time series data on land prices in Kathmandu town panchayat through a survey of local residents. Ranjitkar asked local residents to give him estimates of current land prices and to recollect past prices for the same plots. According to Ranjitkar's data, average land prices in the fringe areas of Kathmandu town panchayat increased in real terms by 94 percent between 1954 and 1964 and by 633 percent between 1964 and 1978.

In terms of annual compound growth rates, the annual average real (inflation adjusted) price increase for 1954-64 works out to 6.8 percent and that for 1964-78 to 15.3 percent. These annual average price increases represent a very good real rate of return on land. This means that in the 1954-64 period, land would double in value in about 10 years; and, in the 1964-78 period, the price would double in only five years.

If these price increases are reliable, they confirm that land has been a better better investment than almost anything else. A review of current financial interest rates bears this out. In November 1985, the highest interest rate obtainable in Nepal's formal financial market was 13.5 percent on fixed term commercial bank deposits of two years or more. Government bonds were offering a return of 13.0 percent per annum. The interest rate on HMG development bonds was 10.5 percent and on regular bank savings 8.5 percent.

There are several reasons why one would expect a healthy, positive rate of return on investment in urban fringe land in the Valley:

- The supply of land is fixed, and the urban population is growing rapidly.
- The supply of land suitable for urban development--land with road access and served with infrastructure--can be increased, but such land is not being adequately supplied. The public sector is far behind in construction of roads, water supply systems and other facilities. Therefore, land with access and services commands a premium price.
- Significant real land price increases are a response to increased demand for urban land brought about by the great changes taking place in the economy of the Kathmandu Valley. As Ranjitkar points out in his study, the Valley has evolved over the past 30 years from an agricultural area with little outside contact to an economically diversified region with links to the nation and the outside world.
- The real price of land has been increasing, making it a good investment in itself, compared with alternatives in Nepal.
- Speculators create additional demand for land, beyond the demand for immediate development. Land speculation has the effect of reducing the supply of land, as speculators hold land off the market while they wait for prices to increase. Most governments, including those of developed countries, have had little success in controlling speculation.

4. Conclusion

Land prices have risen dramatically in the urban areas of the Kathmandu Valley over the past 20 to 30 years. However, the extent to which land price escalation is a problem is yet to be demonstrated. In Chapter IV, Section B, it was shown that low/moderate-income groups cannot afford land less than 6.4 kilometers from the center of Kathmandu even if finance is provided. However, given the scale of the town, this distance is still acceptable.

The transportation of agricultural land to urban use, with its concomitant land price increase, reflects a process of successful bidding for land by parties wishing to create new urban uses. Land is being acquired for residential, commercial, and industrial use. Land acquisition by households is financed by sources such as sale of assets (including other land), personal loans (including HMG loans to civil servants), and savings from the household or relatives. Land purchases by private or public institutions for establishment of offices, hotels, banks, diplomatic and other facilities have surely been important factors influencing land prices.

With respect to "unearned" increases in value obtained by landowners, it is unknown how the proceeds from land sales have been invested. If profits are not being invested productively, the problem is not with the land market, but with the financial system of Nepal as a whole. In any case, there is no evidence that the land market in the Valley is controlled by a small number of landowners. To the contrary, it appears that landownership is fairly widely distributed. As a result, the benefits of active buying and selling of land are spread among a large portion of the Valley population.

The HMG has already been dealing with high prices of land it wishes to acquire by negotiating the price down to below market level. Expropriation values are often based on official land values set by District Land Revenue Offices.

A program to preserve agricultural land or open space in the Valley could have a strong impact on land prices. Preventing urban development in the flood plains, for example, would shrink the supply of land available for urban growth, driving prices up even further. As a consequence, an alternative supply of land must be provided through the introduction of access roads.

If the Government should choose to intervene in the land market to influence prices, there are three categories of measures it can take, but none have been particularly successful internationally. Examples include:

- **Fixing prices:**
  The Government may simply pass a law limiting land price levels or rates of increase. The problem is one of enforcement.

- **Advance public land purchase:**
  This approach, known as land banking, involves Governmental purchase of land before its price escalates in response to urban development pressures. Government then can theoretically control the price and rate at which land is released. Land banking is often advocated, but several problems are involved including: high investment required, sophisticated administrative and planning requirements, tendency towards abuse, etc. However, there would appear to be some scope for involving the Guthi Corporation in a limited role in land banking.

- **Taxation:**
  Land taxation can be used as a policy tool to address land price problems. Heavy capital gains taxes can be levied on transactions to curb speculation, but the tax may cause an increase in land prices. Penalty taxes on vacant land can also be imposed, but such taxes are difficult to impose. Finally, betterment taxes have been used in some countries to "recapture" the increase in land value attributable to public investment such as roads. Betterment taxes can be effective, but they require a sophisticated administrative capacity.

CHAPTER VI
PUBLIC LAND INSTRUMENTS AND POLICY

A. PUBLIC LAND ACQUISITION

1. Recent Acquisitions

Public land acquisition records for the districts of the Kathmandu Valley are available only for the years 1977 onward. Between 1977 and 1984, the Government acquired 2,417 ropanis (123 hectares) of land in the three districts, of which 63 percent was acquired in Kathmandu, 28 percent in Lalitpur, and only 9 percent in Bhaktapur. On a town panchayat basis for this period, 8 percent of total land acquisition took place in Kathmandu town panchayat, 19 percent in Lalitpur town panchayat, and 7 percent in Bhaktapur town panchayat (see Figure VI.1).

Recent land acquisitions which have taken place in the Kathmandu Valley include:

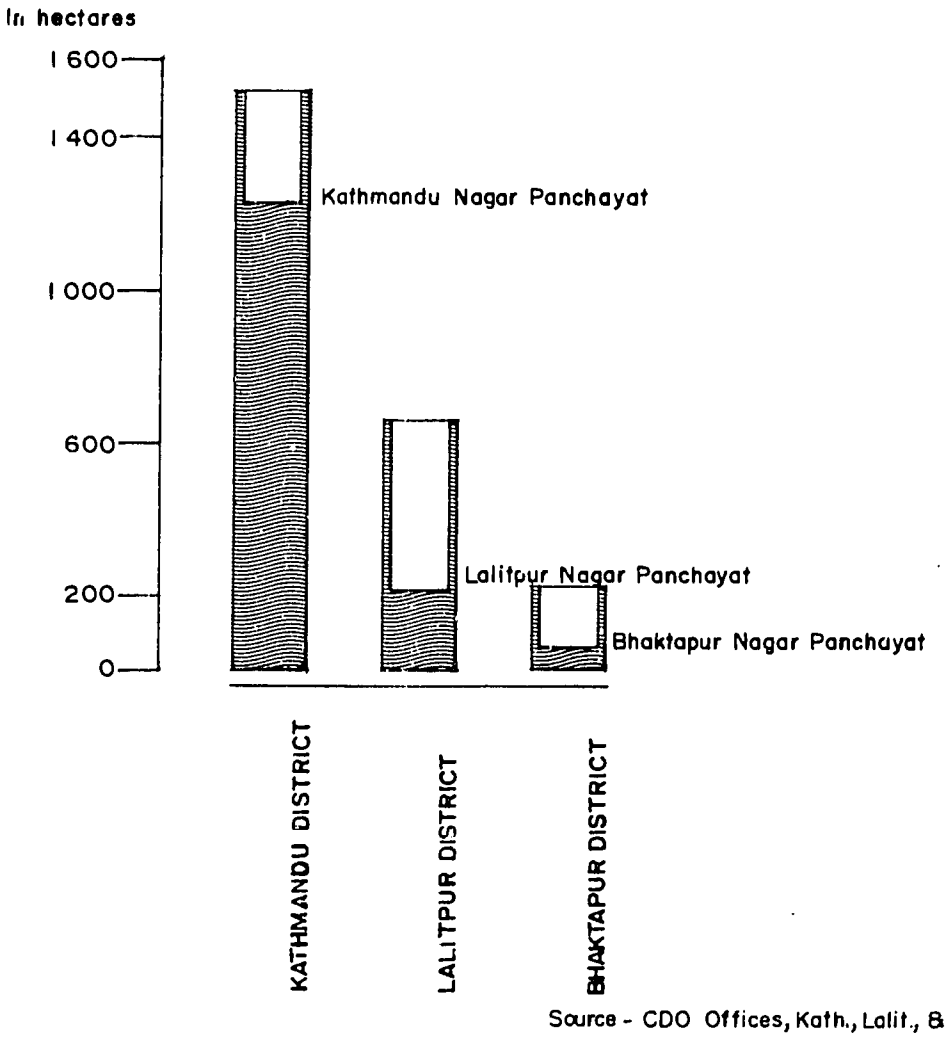
- In the Kathmandu District, about 1,015 ropanis (51.7 hectares) were acquired for the Sheopur Watershed and Wildlife Preservation Project in the Budanilkantha area.
- In KNP Ward 3 (Manarajgunj), 87 ropanis (4.4 hectares) were acquired for construction of the Birendra Police Hospital and 162 ropanis (6.1 hectares) were expropriated for the Tribhuvan University Teaching Hospital. The teaching hospital is likely to be expanded by another 79 ropanis (4 hectares). Most other land acquisitions in KNP during this period were for extensions or widening of roads.
- In LNP, an area of 246 ropanis (12.5 hectares) was acquired for the Engineering Institute Campus in Ward 1 (Kupondole). Other acquisitions largely involved the construction of roads in the panchayat.
- Land acquisitions in the Bhaktapur District occurred only in BNP. Acquisitions included an industrial estate of 85 ropanis (4.3 hectares), a motor park of 16 ropanis (0.8 hectares), and a treatment pond of 60 ropanis (3.1 hectares). According to the Bhaktapur CDO, more land is likely to be acquired along the Arniko Highway, outside the BNP, for industrial purposes because of the area's reasonable land prices in comparison to Kathmandu and Latitpur.
- Prior to 1977, the most prominent, or largest, public land acquisitions included the Tribhuvan International Airport Extension, the Ring Road, and the Kuleswar, Galfuttar, and Dullu housing project sites. Public land acquisition for institutional use has not been particularly well planned or efficient. As a rule, utilization is of very low density including large open space with construction of only one or two storeys. Furthermore, the choice to build the Engineering Campus upon a valuable piece of land in central Lalitpur rather than in the poorly-utilized Tribhuvan University campus must be seriously questioned. In both cases, no consultation was undertaken with planning authorities in the Valley.

FIGURE VI.1

KATHMANDU VALLEY

LAND ACQUISITION
(1977 - 1984)

KATHMANDU DISTRICT	LALITPUR DISTRICT	BHAKTAPUR DISTRICT
1524 Ropanis	664 Ropanis	229 Ropanis
Kathmandu N. P.	Lalitpur N. P.	Bhaktapur N. P.
196 Ropanis	451 Ropanis	163 Ropanis



Source - CDO Offices, Kath., Lalit., & Bhaktapur

Public acquisition of land for road construction throughout the Valley has facilitated development and led to higher land prices in proximity to the roads. The Ring Road and the recent link between Nagpokhari and Narayan Chaur in Ward 1 of Kathmandu town panchayat are good examples of this occurrence. Public land acquisition of educational and institutional facilities appears to have had little impact on land prices.

2. The Land Acquisition Process

Until 1977, land acquisition was carried out under the chairmanship of the Zonal Commissioner, and compensation rates were fixed by a committee. In practice, compensation rates for agricultural land have been much lower than prevailing market rates, about one-tenth the true value. Compensation rates in urban areas have been higher in order to gain collaboration for widening of roads, etc.

Since 1977, the authority for land acquisition has been entrusted to the Chief District Officer of each district. Now, a committee under the chairmanship of the CDO--consisting of the Land Revenue Officer, the concerned Pradhan Panch, the Town Planning Officer, and an appointed district level officer--arranges land acquisition. As a rule, negotiations with landowners take place to ensure that an equitable compensation is paid.

3. The Land Acquisition Act, 1977

Public Land Acquisition through expropriation is governed chiefly by the Land Acquisition Act of 1977. The Act empowers the HMG to purchase land for any broadly-defined public purpose. Any HMG agency is authorized to acquire land, and an officer of any HMG institution may initiate a land acquisition proceeding. In practice, requests for land are initiated by HMG agencies but acquisition itself is carried out under the guidance of the CDO. Under the Act, the concerned agency officer begins by making a preliminary investigation of the land being considered for acquisition. If the land is found suitable, a notice of intent to acquire is issued. At this point, the local Land Administrator or Revenue Officer suspends processing of any further transactions concerning the land. The landowner may appeal the decision to acquire his land to the Zonal Commissioner. Compensation due the landowner is determined by a Compensation Fixation Committee composed of the Chief District Officer, the Chief Revenue Officer, the Director of the HMG agency concerned, and a representative from the district panchayat. Compensation must be in cash or, if the owner wishes, in other HMG land if it is available. No timetable is given in the Act on the period within which compensation must be paid.

The Land Acquisition Act specifies that tenants on expropriated land are entitled to receive 25 percent of the total compensation paid. Tenants also must receive the full value of any houses they may have constructed. The Act contains a "quick take" provision (Section 25) empowering HMG to "occupy a parcel in special circumstances" simply by issuing a notice. However, this provision is for emergency situations and has not been exercised to date. If such action is taken, the landowner has no right of appeal except regarding the amount of compensation to be paid. The Land Acquisition Act

also includes a section explicitly permitting land to be acquired through negotiation rather than expropriation, a process which is increasingly undertaken. However, none of the provisions of the Act apply to negotiated land acquisition.

The main limitations of the Land Acquisition Act are:

a. Guidelines for the amount of compensation to be paid are inadequate. Section 16 of the Act states that the compensation committee must take into consideration the current land price, the value of improvements and crops, and potential losses incurred by the owner due to dislocation. In many countries, however, the law requires compensation to be equal to the fair market value or just value of the land. The vagueness of the Act in this regard permits lower than market prices for land to be paid. This often results in legal disputes which seriously impede planned development programs.

b. The Act fails to require that land be acquired in conformance with a clear development plan. In fact, Section 33 states that if the acquired land is not actually needed for the original purpose, the HMG can use it for any other purpose. As a consequence, landowners are exposed to arbitrary expropriation.

c. The Act does not contain any requirement that compensation be paid within a certain time limit. Thus, landowners can be harmed by long delays in receiving compensation, and development programs may be held up by legal and administrative disputes caused by the delays.

4. The Town Committee Development Act, 1963

Other Acts which include public land acquisition provisions include the 1963 Town Development Committe Act and the 1973 Town Planning Projects Implementation Act. Section 6 and 7 of the 1963 Act permit Town Development Committees to acquire land including what appears to be a "quick take authority". Unlike the Land Acquisition Act, the 1963 Act specifies that landowners must be fully compensated within one year (Section 7[6]). It also contains an important provision dealing with the power to prohibit development. If the Government wishes to limit the right of a private landowner to construct a building or develop his land, this may be regarded as a deprivation of property or development right. Section 6 [2] [c] states that the Town Development Committee may prohibit the construction of buildings on any land, category of lands, or zone of the town on payment of reasonable compensation. This requirement, if implemented, could have significant implications for preservation of agricultural land, forest, watersheds, etc. In fact, potential financial outlays would probably prohibit significant protection efforts.

A proper balance needs to be struck between private development rights and public requirements insofar as compensation is concerned. In some countries, loss of private development rights is possible without compensation due to the state's power to promote public health, safety, morals, and general welfare.

In Nepal, it may be necessary to consider new laws dealing with governmental power to restrict development for conservation of sensitive lands. Land exchange or land readjustment schemes as forms of compensation should be cared for by landowners and tenants to avoid problems of management and accountability.

5. The Town Planning Projects Implementation Act, 1973

This Act is more limited in scope than the 1973 Act since it applies only to regional development centers and was designed to deal with discrete project areas rather than whole towns, cities and regions. Nevertheless, it is an important law which has served as the basis for some of the institutional structure for urban planning in the Kathmandu Valley. Section 5 of the Act gives the TPIC the power to "acquire or requisition of any immovable property within the Town Planning Project area according to law". The same section also makes it illegal for anyone to engage in any property transactions, build any structures, or tamper with natural cultural resources without the approval of the Board. As these restrictions apply to the planning project area, clear boundaries must be defined. Nowhere in the Act is there a clause requiring private landowners to be compensated for loss of development rights, a potential contradiction with the 1963 Act.

According to the Chief District Officers interviewed for this study, the existing procedure for land acquisition by the public sector does not pose serious problems for execution of HMG projects. In fact, they reported that most land acquisition currently takes place through negotiation rather than expropriation. According to the CDOs, the main problems in land acquisition do not stem from legal procedures but from high and rapidly-rising land prices. Land acquisition tends to get bogged down because: 1) the HMG simply cannot afford to purchase the needed land even at lower than market prices; 2) delays in projects startup lead to costs higher than original project budgets; 3) long delays between setting of compensation and its payment cause significant reductions in the real value of the compensation, leading to disputes. The latter problem has helped cripple implementation of two public housing projects in Kathmandu Valley: Dullu and Kuleswar.

6. Inadequacy of Cadastral Surveys and Records

Despite the positive views expressed by the CDOs, the process of public land acquisition is complicated by various problems, including the inadequacy of cadastral records. In this respect, the HMG is in the same position as a prospective private land purchaser. Before buying land, the purchaser must ascertain that: the seller is the rightful owner; there are no tenants with claims on the land; there are no relatives who have rights-of-first-refusal; the parcel is free of liens, mortgages, or other precommitments; the parcel's shape, size, and location are recorded correctly in the cadastral map, field-book and title certificate; the parcel has not been illegally sold to others; etc.

The core city areas of Kathmandu and Lalitpur have resurveyed for cadastral purposes in the last three years, but cadastral records for other areas of the town panchayats and lands outside them are decades old. Land registration

records are not well organized, accessible, or up-to-date. As a result, every parcel of land may potentially cause disputes over ownership or other property rights of a would-be purchaser. In addition, because of the lack of accurate cadastral surveys--the majority were not performed with adequate controls and the scale of maps is too large--current practice is to avoid erasing old plot boundaries and superimposing new ones. This makes the assembly of parcels extremely cumbersome, if not impossible.

7. Public Acquisition of Guthi Land

Lands under the jurisdiction of the Guthi Corporation are an important asset for the public good and the planning of the Valley. An appropriate agreement should be drawn up to permit the Guthi Corporation, the Kathmandu Valley Town Planning Office, and the Provident Fund to work together.

As Guthi lands were originally willed for charitable or religious purposes, it is consistent that the Guthi Corporation use its "endowment" to protect agricultural land, to help preserve important historical sites, and to launch social programs such as low-income housing programs. At the same time as it is executing programs for the public's welfare, the Corporation should also take care to conserve its current assets. Planning expertise and financing from the KVTPT and Provident Fund would be useful in this regard.

Presently, Guthi Corporation lands are scattered in various locations, and the institution's land records are incomplete. If the Guthi Corporation is to play a more vital role in the planned development of the Valley, the following should be carried out:

- All Guthi Corporation titles and land locations should be ascertained.
- Rent collection for Guthi Lands should be enforced.
- Scattered Guthi lands should be sold off and the income invested in the acquisition of lowlands in proximity to and within urban areas. (This should be accompanied by decrees preserving specific flood plain areas for agricultural use.)
- Maintain agricultural use in low-lying Guthi lands.
- Develop sizable land assets and income generating activities.

B. LAND USE REGULATIONS

1. Purpose and Requirements of Regulations

Land use regulations most commonly include zoning, subdivision regulations, and building costs. Their purpose is to restrict and specify the types of uses to which land may be put, and the specific improvements (buildings, roads, infrastructure, etc.) that may be installed on the land. Good land use regulations should set forth not only the categories of allowed and prohibited uses, but also the legal and institutional procedures for changing the regulations, Government approval of proposed land uses, and settling disputes over different interpretations of the regulations.

Land use regulations--usually laws, Acts, decrees, or similar instruments--are only one of several types of tools available for land use control by Government. In addition to legal restrictions, Government may also use taxation, Government purchase of land or development rights, and public infrastructure planning, and investment or "capital budgeting" to control land use.

As of the end of 1985, Nepal had no zoning laws, subdivision regulations, or building codes for the Kathmandu Valley, or anywhere else in the country. In effect, there is no systematic legal control over land use (although laws do exist covering land registration, surveying, transfer and taxation). Several proposals for zoning regulations and building codes have been formulated over the years, but none of these have been passed into law or implemented. The only laws that deal with the establishment of a vaguely defined institutional structure for town development and planning are the Town Development Committee Act of 1963 and Town Planning Projects Implementation Act of 1973. These laws have served as the basis for establishing a set of planning institutions in the Kathmandu Valley. However, these institutions have been largely ineffective in influencing the course of urban development.

The lack of a workable institutional structure for urban development in the Valley is inseparable from the lack of land use regulations. Confusion and uncertainty over which institutions have jurisdiction over what aspects of urban planning and development have made it difficult for proposals to be translated into effective laws to guide and control urban land use. Responsibility for planning, regulatory functions, enforcement, and physical development is fragmented and overlapping among a multitude of central and local agencies. Thus, the need for institutional reform goes hand-in-hand with the need to develop truly effective legal and regulatory instruments for land use.

Another reason for the lack of land use regulations is the absence of a tradition of governmental planning or coordination. The sudden decision to build the Ring Road around Greater Kathmandu in the early 1970s is a good example of the ad hoc planning which has taken place. No previous plans for such a road had ever been discussed; and, no analysis was done to verify the need for, or impact of, the road. It simply was designed and built.

2. Background

There have been several attempts in the past years to formulate land use regulations, especially zoning and building codes. These are documented in a 1979 report by CEDA, "Kathmandu Valley Town Planning and Its Impact", Tribhuvan University, 1979.

The 1969 "Physical Development Plan for the Kathmandu Valley", carried out by the Department of Housing and Physical Planning, has served as the basis for subsequent zoning proposals. In 1973, a land use map of the Valley titled, "Kathmandu Valley Physical Development Plan", was prepared. This map was reportedly "unsupported by detailed sectoral analysis and narrative backup" and had no legal status. In 1976, the Kathmandu Valley Town Development Committee (KVTDC), a special body set up by Cabinet decision to direct urban development in the Valley, prepared a series of documents including zoning proposals dividing the urban areas of the Valley into broad land use categories based on the 1973 and 1969 work.

The 1976 zoning proposals, which carry the English title "Instructions for Various Actions to be Taken in Different Areas of Kathmandu Valley Town Development Plan", were accompanied by other policy documents dealing with general urban design, planned residential development, development along major roads, and urban infrastructure. The "Instructions" dealt primarily with building codes and height and bulk limitations for central city areas but remained vague on standards for other types of zones. The legal status of the 1976 zoning regulations is unclear. They were officially approved by the KVTDC, and some attempt has been made to enforce them. However, there is widespread doubt about the legal authority of the KVTDC to issue or enforce such regulations. On the other hand, the 1976 zoning "Instructions" have never been contested in court.

The 1979 CEDA report pointed out several important problems with these zoning regulations:

- A clear zoning map with precise boundary demarcations was never prepared.
- The zoning categories were not specific enough with regard to the types and intensities of uses permitted and prohibited.
- The zoning categories did not attempt to specify permitted lot sizes or densities.
- Except for brief references to the need for sanitary facilities in buildings, no attempt was made to specify standards for urban infrastructure systems such as streets, water supply, sewerage, or drainage.
- Little attention was given to areas beyond the Ring Road.
- It would have been better to avoid mixing together building code regulations with land use/zoning regulations. The former deal with specifics of building materials, dimensions, safety standards, and interior facilities. Zoning regulations apply to the broad geographical pattern of types of land uses, densities, and the proximity of different uses.

As none of the 1976 proposals were ever turned into law or implemented in any other way, they have no practical impact. Land development in the Valley has continued without any control. However, the above criticisms serve as useful guidelines for future work.

3. Recent Proposals

The latest attempt to push forward with land use regulations appears in a 1984 document, "Kathmandu Valley Physical Development Concept" (Kathmandu Valley Town Planning Team, Vol.1, Text and Vol.2, Plans, 1984). This document includes proposed zoning regulations that are almost identical to the 1976 "Instructions". The main improvement by this latest effort is the preparation of a zoning map called "Proposed Land Use" covering the area within the Ring Road. The map contains some inconsistencies which are elaborated on in Appendix C of this study. Nevertheless, the 1984 work represents the first attempt to think through the spatial distribution of desired land uses in Greater Kathmandu.

The 1984 Development Concept document addresses some of the main issues affecting land use in the Valley, including: open acknowledgement of the current system of ad hoc development by both Government and the private sector; the importance of transportation in governing land use; the need to keep in mind a vision of the economic role of the Kathmandu Valley, mainly as an administrative, cultural, touristic, and agricultural area and not as a major industrial center; and the reality that financial resources are limited, restricting what can be realistically achieved in the short-to-medium run.

The 1976 "Instructions" and the 1984 Planning Team proposal both build on the 1969 and 1973 efforts. While the proposal provides some thoughts about how to deal with land use control, it still poses some serious problems that limit its usefulness. First, most of the zoning categories are not defined in terms of specfic standards for land uses permitted in them. In most cases, there is merely a statement saying that the Implementation Committee must review and approve development proposals within the zoning category. No guidance is provided on what criteria the committee should use in approving or rejecting proposals. This puts a lot of power in the hands of the committee without checks against arbitrary or unreasonable decisions.

Second, the few standards which are provided deal basically with building codes, not land use standards. Other issues which regulations need to address in more detail include: separation or coexistence of specific uses, agricultural or open space preservation, densities, lot sizes, service and infrastructure standards, and procedures for reviewing development proposals and granting variances.

Third, the zoning map which appears in Volume 2 of the 1984 "Development Concept" is not entirely consistent with proposed zoning categories. Also, the map covers only the area within the Ring Road. Zoning demarcations are needed for outlying areas of the Valley as well. Finally, the zoning scheme is not attached to a workable institutional framework for further planning, enforcement, or coordination among agencies. There is currently no one agency responsible for these functions in the Valley, or even a reasonable division of responsibility among existing institutions. This confusion is the main reason why no effective land use law yet exists.

4. Institutional Limitations

In recent years, the main institution involved in urban planning for the Kathmandu Valley has been the Kathmandu Valley Town Development Committee (also known as the KVT Implementation Committee). This organization was established under the general guidelines set by the Town Development Committee Act of 1963 and the Town Planning Projects Implementation Act of 1973. These laws provide only a very general and ambiguous framework for urban planning. As a result, the actual structure of the KVTDC (and its supporting organizations) has been created through Cabinet decisions, not through passage of a clear and specific enabling law.

The KVTDC is chaired by the Minister of Works and Transport and includes as members the secretaries of numerous ministries, heads of various agencies, and panchayat leaders. It has been largely ineffective because its responsibilities are ill-defined and overlap considerably with those of other sectoral institutions. This is true both in regulatory and development-related activities. In addition to an unclear role, the KVTDC lacks trained personnel, and its poor financial base makes it incapable of taking the lead in much of the complex work that needs to be done.

Internally, the KVTDC is linked to the Department of Housing, Building, and Physical Planning (DHBPP) through the Kathmandu Valley Town Planning Team which reports to both the KVTDC and DHBPP. The head of the Town Planning Team must share authority with the Member Secretary and Chief Executive of the KVTDC, who is the Deputy Zonal Commissioner of the Bagmati Zone. This individual's institutional relationships and allegiances are complex and confused.

The KVTDC's lack of internal cohesion has made it almost impossible for the KVTDC to build sustained, effective working relationships with Ministries, Departments, Boards, Corporations, and district and town panchayats. This is so despite the fact that each of the three town panchayats in the Valley has a Town Plan Implementation Committee (TPIC) which reports to the KVTDC. The TPICs include the pradhan panchas of each town as well as the Chief District Officers of the respective districts; they are supported by small staffs of planners.

The 1979 CEDA report recognized these problems. It recommended that the KVTDC be abolished and that one of two alternatives be carried out:

a. Responsibility for preparation of plans and regulations would be assigned to the Kathmandu Town Planning Team working for the DHBPP. Such plans and regulations would be cleared by the NPC. District and town panchayats would receive authority and manpower to enforce the regulations. Development functions would remain with the various HMG agencies, but their activities in the Valley would have to be in conformance with plans and regulations developed by the Town Planning Team.

b. Creation of a Kathmandu Valley Development Authority with power to prepare comprehensive plans for the Valley, implement these plans through land acquisition and execution of physical works, coordinate all development projects of other agencies, and manage development controls.

In December 1984, additional proposals to institutionalize Kathmandu Valley planning and development were submitted by the MWT and MPLD. The MWT's proposal suggests that a Kathmandu Development Authority be created with responsibility for planning, programming and budgeting of Valley investment and land development. The MPLD's proposal stresses decentralization of planning and programming through the various panchayats and an overall coordinating function by the Zonal Commissioner.

5. Limitations of 1963 and 1973 Town Development and Planning Acts

The 1963 Town Development and 1973 Town Planning Acts remain the principal laws pertaining to urban development in Nepal. Neither of these provide even a remotely adequate framework for effective land use regulation. Both Acts were intended to facilitate the implementation of short-term urban renewal projects. While they both refer to "plans", neither Act contains a definition of what a plan is, what its objectives should be, who should participate in planning, or how a plan should be formulated.

The 1963 Act, in addition to these limitations, specifies a very centralized form of operation in which the NPC, DHBPP, the Zonal Commissioner, and even the Rastriya panchayat get involved while local panchayats are excluded completely. The 1973 Act gives broad power to the Town Planning Board, but its composition is unspecified. Also, the 1973 Act applies only to "regional centers" and consistently refers to projects as opposed to towns and regions as the focus of the Board's powers.

In sum, the 1963 and 1973 Town Development and Planning Acts are inadequate foundations for land use regulation because:

- Plans and their objectives are not defined;
- No planning process is laid out;
- Membership of Committees and Boards is undefined, as are institutional relationships;
- There are no provisions for Local Government participation.

C. BUDGETING AND INVESTMENT PLANNING

1. Allocation of Development Budgets in the Valley

In order to shed some light on development priorities in the Valley, the study team attempted to collect actual expenditure data for sectoral investment but was unable to do so. Instead, the study team obtained sectoral budget allocation data. This information was collected by the Kathmandu Town Development Board for the years 1978/79 to 1984/85 (except 1980/81). These figures had to be adjusted as categorization of budget items differed from year-to-year and because the totals did not always add up. In addition, categories were found to be very broad, making it difficult to isolate allocations for the Kathmandu Valley from those for other places. Therefore, despite the fact that the budget data originated in the NPC, the accuracy of the data is questionable and a much more rigorous investment study should be conducted. Budget data have been compiled in Table VI.1 and Figure VI.2. On the basis of the study's analysis, some clear trends can be seen which should be further researched. These include:

- Between 1978/79 and 1984/85, the total budget rose by about 206 percent or an average of 34 percent per year.
- Those sectors receiving the largest share of budget included transportation, industry, communications, and agriculture.
- Those receiving the lowest share of investment included tourism, electricity, and health; other sectors were in a mid-range.

Table VI.1

DEVELOPMENT BUDGET ALLOCATION IN KATHMANDU VALLEY

Rs. in '000 Thousands

		1978/79	1979/80	1981/82	1982/83	1983/84	1984/85
AGRICULTURE	Kath.	1,67,83	1,99,70	2,78,43	4,19,59	4,39,12	9,79,09
	Lalit.	90,37	1,73,28	2,84,03	5,07,10	4,63,17·	4,03,71
	Bhakt.	-	-	9,34	64,46	13,51	3,00
	Valley	2,58,20	3,72,98	5,71,80	9,9,115	9,15,80	13,76,80
FORESTRY	Kath.	1,85,02	5,47,04	3,35,69	3,60,54	72,19.5	3,45,35
	Lalit.	23,81	23,65	3,30	44,02	45,92	69,98
	Bhakt.	3,23	5,54	3,30	-	-	-
	Valley	2,12,06	5,76,23	3,42,29	4,04,56	1,18,11.5	4,15,33
TRANSPORTATION INFRASTRUCTURE	Kath.	5,91,96	6,62,14	15,91,06	18,96,83	18,23,18	17,46,82
	Lalit.	6,00	2,33	30,83	1,83,12	1,63,66	85,30
	Bhakt.	16,50	18,33	35,34	2,76,74	30,49	35,00
	Valley	6,14,46	6,82,80	16,57,23	23,56,69	20,17,33	18,67,12
COMMUNICATION	Kath.	2,92,45	1,28,46	14,33,74	10,44,98	11,55,70	9,04,30
	Lalit.	32,00	3,50	22,30	3,87,20	1,12,65	1,06,93
	Bhakt.	29,90	11,97	8,80	26,20	61,76	1,06,93
	Valley	3,54,35	1,43,93	14,64,84	14,85,38	13,30,11	11,18,16
COMMERCE INDUST	Kath.	4,58,04	14,47,65	3,34,42	3,02,44	7,32,10	4,90,25
	Lalit.	86,16	76,26	68,44	1,64,49	66,69	17,77,41
	Bhakt.	68,40	46,80	-	24,70	67,16	51,19
	Valley	6,12,60	15,70,71	4,02,86	4,91,63	8,65,95	23,18,85
TOURISM	Kath.	40,69	20,85	12,00	13,08	Included	Probably
	Lalit.	-	-	-	50	in	included
	Bhakt.	-	-	-	50	Industry	in Industry
	Valley	40,69	20,85	12,00	14,08	-	-

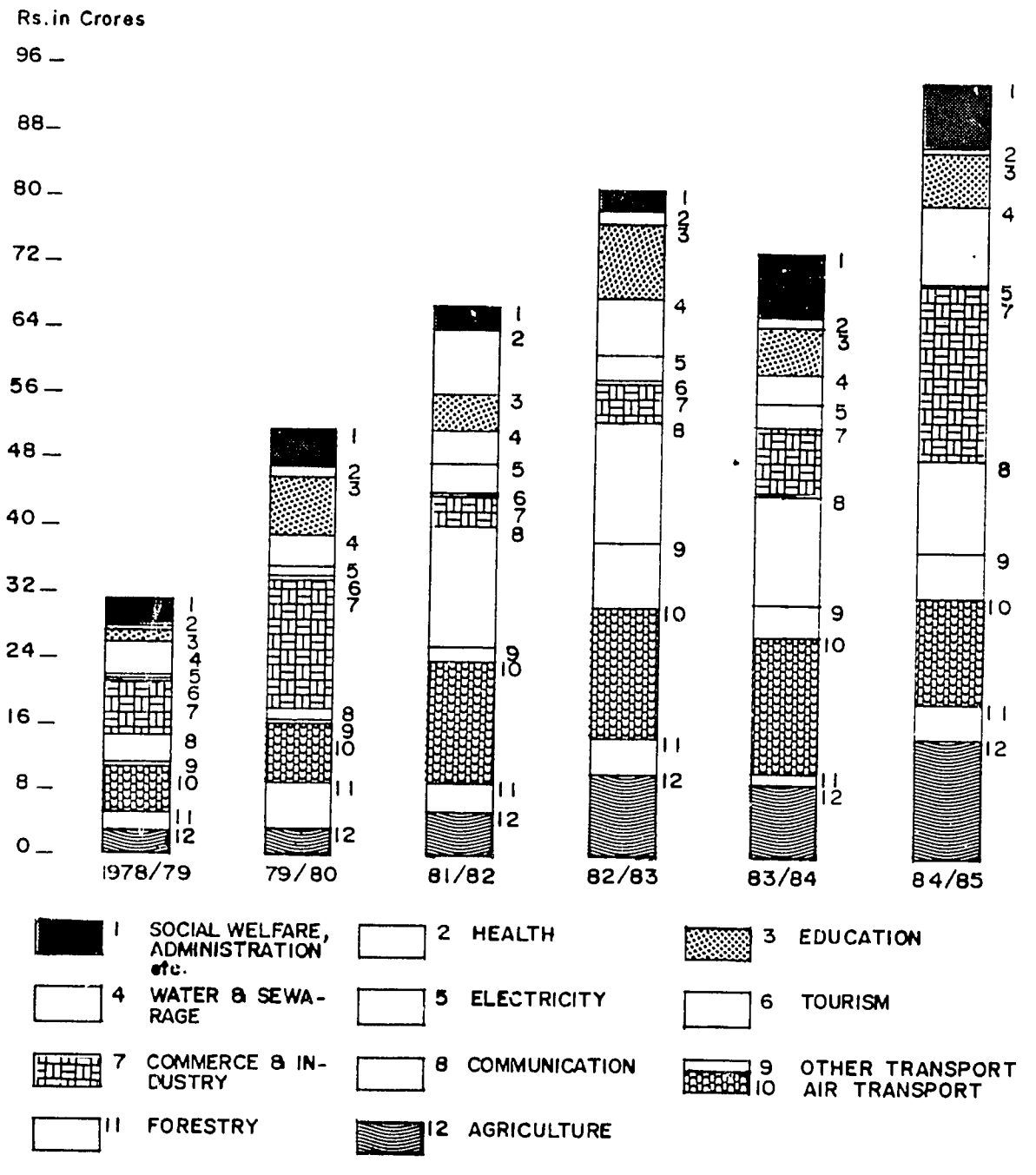
Table VI.1 (CONTINUED)

		1978/79	1979/80	1981/82	1982/83	1983/84	1984/85
ELECTRICITY	Kath.	11,99	1,48,78.75	2,65,57	1,32,90	89,66	3,24
	Lalit.	-	-	92,55	98,55	89,66	3,23
	Bhakt.	-	-	-	98,55	89,66	3,23
	Valley	11,99	1,48,78.75	3,58,12	3,30,00	2,68,98	9,70
WATER SEWERAGE	Kath.	4,27,56	3,70,15.6	3,02,04	5,84,09	3,34,98	7,07,62
	Lalit.	-	13,00	54,62	31,34	-	9,32
	Bhakt.	19,00	9,81.28	70,13	64,33	23,57	62,67
	Valley	4,46,56	3,92,96.9	4,26,79	6,79,76	3,58,55	7,79,61
EDUCATION	Kath.	1,28,55	6,19,97.3	3,54,92	3,91,78	5,76,94	4,22,64
	Lalit.	6,06	93,00	30,58	4,87,56	-	2,45,16
	Bhakt.	8,75	-	31,57	33,61	-	-
	Valley	1,43,36	7,12,97.3	4,17,07	9,12,95	5,76,94	6,67,80
HEALTH	Kath.	35,15	1,03,86.4	6,84,40	1,22,18	1,15,52	56,95
	Lalit.	9,75	3,00	10,00	27,47	-	2,00
	Bhakt.	-	2,68	-	4,47	-	-
	Valley	44,90	1,09,54.4	6,94,00	1,54,12	1,15,52	58,95
SOCIAL WELFARE ADMINIST, ETC,	Kath.	1,80,98	3,13,29	1,69,57	2,39,56	4,73,80	2,99,81
	Lalit.	37,30	20,83	6,00	18,05	34,62	1,37,02
	Bhakt.	1,14,28	96,05	1,28,06	4,50	2,57,08	3,38,31
	Valley	3,32,56	4,30,17	3,03,63	2,62,11	7,65,50	7,75,14
Total Valley Budget		30,71,73	51,61,94.35	66,50,63	80,55,43	73,32,79.5	93,87,46

FIGURE VI. 2

KATHMANDU VALLEY

DEVELOPMENT BUDGET ALLOCATION



- The transportation budget strongly dominated all other sectors, but the major share of budgeted investment (66 to 93 percent over the six years) was for upgrading the Tribhuvan Airport.
- Agriculture has been given increasing attention over the six-year period. However, the distribution of funds among the three districts is highly skewed in favor of Kathmandu and Lalitpur. Bhaktapur, despite its record for agricultural production and employment, received consistently less than 2 percent of the Valley's agriculture budget except for one year when it received 6 percent.
- The distribution of the forestry budget was also found to be highly skewed in favor of Kathmandu and Lalitpur districts over Bhaktapur.

The transport sector was the only one for which a comparison between budgeted and actual expenditures was attempted (see Table VI.2). Expenditure/budget ratios show that the Tribhuvan Airport expenditures lagged considerably behind budgets but that for other items a relatively close correlation occurred. In addition, it was found that for both budget and expenditures, the airport upgrading required more than 80 percent of the transport sector budget and expenditure. Surprisingly, roads and bridges received a small share of budget and investment: less than 10 percent of transport investment and comparatively little with respect to other sectors as well.

2. Investment Planning

Sectoral investment planning for infrastructure systems should be developed in coordination with a development plan for the Valley. However, this study found that no such link exists between planning and investment in the Valley. Of the principal infrastructure systems--roads, drainage, water supply, and power--only the latter two sectors have any sort of master plan and investment program, but even these are not coordinated with the Kathmandu Valley Town Planning Team. It is particularly unfortunate that neither the Road Department nor the town panchayats have developed a medium- or long-term road program for the Valley or towns. As pointed out earlier, development planning for urban growth is largely dependent upon the introduction of new access roads.

In addition to the lack of an investment plan for urban areas in the Valley, the Road Department's annual programs reflect:

- An absence of prioritization: all programs large and small are treated the same way.
- No clear criteria for selection of a given program.

The Seventh Plan calls for the preparation of a transport master plan for the Kathmandu Valley. This should provide the basis for developing an investment program in this key sector. Also, the framework presented in Chapter III for future physical expansion of the towns of the Kathmandu Valley (see Figure III.17) would have a strong impact on infrastructure investment plans.

Table VI.2

BUDGET AND ACTUAL EXPENDITURE IN TRANSPORTATION SECTOR
IN KATHMANDU VALLEY

Budget/Expenditure in '000 Rs.

	1978/79	1979/80	1980/81	1981/82	1982/83
Roads, Bridges etc.	4,169	4,000	4,700	12,633	39,078
	4,808	3,236	4,689	12,358	30,804
Air-Transport	54,814	62,779	52,421	159,491	162,566
	23,835	46,645	44,283	5,092	71,129
Total Transport	58,983	66,779	57,121	171,124	201,644
	28,643	49,881	48,972	64,450	101,933

Source: Auditor General's Office.

D. LAND TAXATION

This section will review the types of land tax currently used in Nepal and briefly assess their application in the Kathmandu Valley. A thorough analysis of their effectiveness in revenue generation and their potential use as land policy tools is beyond the scope of this study. As a rule, the land taxes generate little revenue; their real utility is in the provision of receipts of payment which help verify property titles during land transfers.

There are three types of land tax used in Nepal: the Land Tax (or Land Revenue Tax), the Land Registration Tax, and the Houses and Compounds Tax (essentially an urban property tax). All three taxes are collected by the Central Government.

1. The Land Tax

The Land Tax is levied on rural and urban land. The tax is governed by the Land Tax Act of 1978 and the Land Tax Rules of 1980. In rural areas, the tax is assessed on the land's productive capacity and quality. Four basic categories (abal, doyam, sim, and chahar) are applied with different standards to both khet (lowland) and pakho (upland) land. These eight gradations also vary according to whether the land is in the Terai or in the Hills.

The establishment of Land Tax grading categories for urban areas began just recently. The Land Survey and Measurement Rules of 1975 give a general framework for a system of six grades, A through F. These grades are to be based on proximity to a hierarchy of roads (primary, secondary, and tertiary), paths, and lanes. Availability of infrastructure is also to be taken into account. The Rules do not provide any specifics or methodology for grading urban land. So far, District Land Revenue Offices have been slow to adopt and apply the urban land tax. By 1985, all three Districts of the Kathmandu Valley had developed simple classification systems for town panchayat areas, but it was unclear how much of the land had been graded or what amount of urban land revenue was actually being collected. The December 10, 1984 edition of the Nepal Recorder contained a directive for the year 1984-85 indicating:

- The urban land tax should be levied on land that had been graded.
- Ungraded land within town panchayats should be taxed at the rate for Category E (the next to lowest).
- Rural and urban land taxes may not be levied on the same plot.

Table VI.3 presents the amount of land tax revenue collected for each of the past five years in the districts of the Kathmandu Valley. The striking thing about the figures is the low amounts collected and the fact that the revenues are not growing. In 1984-85, only about one million rupees in land taxes were collected in the entire Kathmandu Valley--an area containing the most fertile agricultural and the most expensive urban land in Nepal. There are two explanations for this. One is that properties smaller than 20 ropanis are totally, or almost totally, exempt from the Land Tax. In Lalitpur District, for example, the Land Revenue Office gives properties smaller than 20 ropanis a 99 percent discount on the Land Tax. The 20-ropani exemption covers the vast majority of privately-owned parcels in the Valley (and in Nepal as a

Table VI.3

LAND TAX REVENUE COLLECTION BY DISTRICT
IN KATHMANDU VALLEY 1980-85
(Including Rural and Urban Land Tax)
(Thousands of Current Rupees)

	Kathmandu	Lalitpur	Bhaktapur	Total
1979-80	497	NA	NA	NA
1980-81	614	560	46	1,220
1981-82	708	537	37	1,282
1982-83	686	209	31	926
1983-84	627	269	31	927
1984-85	730	315	31	1,076

Source: District Land Revenue Offices

Table VI.4

LAND REGISTRATION TAX REVENUE COLLECTED
BY DISTRICT IN KATHMANDU VALLEY 1980-85
(Thousands of Current Rupees)

	Kathmandu	Lalitput	Bhaktapur	Total
1979-80	10,655	NA	NA	NA
1980-81	13,340	3,105	709	17,154
1981-82	16,143	4,464	1,032	21,635
1982-83	17,692	4,572	1,632	23,896
1983-84	26,795	7,238	2,022	36,055
1984-85	27,704	6,318	2,205	36,227

Source: District Land Revenue Offices

whole). Nationally, in 1984-85, the Land Tax generated Rs.85 million in revenue, accounting for 2.6 percent of total tax revenues for the year (Ministry of Finance, Economic Survey 1984-85). Land Tax revenues nationally have not been growing in recent years.

2. Land Registration Tax

The Land Registration Tax is levied on most land transfers (with some types of public sector transactions exempted). This tax generates the greatest amount of revenue nationally of the three types of land taxes used in Nepal. In 1984-85, the Land Registration Tax raised an estimated Rs.179.0 million, about 5.5 percent of the total national tax revenue for the year (Ministry of Finance). Receipts from the Land Registration Tax have been rising rapidly in recent years. In 1979-80, only Rs.65 million were collected, which means that Land Registration revenues grew in nominal terms by an average of 22 percent per year over the past five years.

The tax is levied as a percentage of the selling price of the land parcel. Up to 1977, officially declared sales prices tended to be higher than real prices, as insurance against the possible exercise of "right of first refusal" (a legal option on property availabe to relatives of land sellers). After this law was changed, declared values tended to be lower than actual selling prices in order to reduce the amount of Registration Tax paid.

As of 1982, District Revenue Offices have begun to set official minimum land values per ropani to guide collection of the Land Registration Tax. Both Kathmandu and Lalitpur Districts have land value schedules for each ward within town panchayat areas and for each village panchayat as discussed in Chapter V, Section C.

A comparison of the official minimum values with actual market prices obtained from real estate brokers suggests that the official prices are not too far from actual prices. However, it appears that the highest appraised values are too low in both urban and rural areas. As Table VI.4 indicates, revenues collected from the Land Registration Tax in the past five years are much greater than those collected from the Land Tax. For 1984-85, Land Registration revenues for the three districts of the Kathmandu Valley were Rs.36.2 million, compared with only about Rs.1.08 million collected through the Land Tax. Since prices are higher and more transactions occur in Kathmandu District, a much greater volume of revenues is collected there than in the other two districts. For example, in 1984-85, Kathmandu accounted for 76 percent of the Valley's land registration revenues. According to District Land Revenue Offices, the total number of transactions in 1984-85 were 11,682 in Kathmandu and 3,422 in Lalitpur. This suggests an average tax per transaction of Rs.2,372 and Rs.1,846 in each town respectively.

The relatively good rate of collection of the Land Registration Tax reflects the fact that payment of the tax is a requirement for carrying out a legal land transfer. Thus, administration of the Registration Tax is easier than for other land taxes. Buyers and sellers are obligated to come to the Land Revenue Office and work with officials in clarifying the property's value, boundaries, and title status. In the process of formalizing the transaction, it

is relatively convenient for the tax authorities to assess an accurate property value and enforce its payment.

3. Houses and Compounds Tax

The Houses and Compounds Tax is applied to property in urban areas only. The general legal framework for this tax is given in the Houses and Compounds Tax Act and Rules of 1963. The intention of this tax was basically to generate revenue, as stated in the Act's Preamble. Article 12 of the Act notes that the tax is essentially focused on private residential property (real estate belonging to HMG, the Royal Family, foreign governments, and compounds used for factories and mills are exempt). No mention is made of houses and compounds devoted to commercial use.

The Houses and Compounds Tax is supposed to be levied yearly. A Valuation Committee is responsible for overseeing the administration of the tax in each urban area. Valuation tables exist for all three town panchayats in the Valley (Nepal Gazette, Bhadra 30, 2032 [1975]). These 1975 schedules prescribe a method for calulating urban property values based on construction cost per square foot for 12 different construction types, premiums for location among six zones of the city, depreciation for the age of the building, premiums for location along certain roads, and average land costs in each of the six zones. The tax schedules have not been updated since 1975 but are still in use.

The method of valuation for the Houses and Compounds Tax is extremely simplistic, but its great advantage is ease of application. The valuation schedule has some serious limitations, however, that should be corrected. First, the schedule requires updating. Maximum construction values of Rs.50 per square foot and maximum land values of Rs.20,000 per ropani are far too low. Second, construction costs cover roofs and walls only. There is no consideration of water supply, sanitation, or other important amenities.

According to the Nepal Recorder of September 26, 1985 (Vol.9, No.33), the Houses and Compounds Tax Rates for 1985-86 are as follows:

- Up to Rs.100,000: Exempt
- Next Rs.100,000: 1.0 percent
- Next Rs.100,000: 1.5 percent
- Next Rs.100,000: 2.5 percent
- Higher Amount Rs.: 3.5 percent

On the basis of these rates, it is difficult to determine what potential revenues might be. The main reason is that only a small fraction of urban properties have been assessed for tax purposes. Administration of the Houses and Compounds Tax is generally weak. This is reflected in the fact that, nationally, the tax is one of the smaller sources of tax revenue. In 1984-85, the Houses and Compounds Tax generated an estimated Rs.36.6 million, about 1.1 percent of national tax receipts (Ministry of Finance). On the other hand, revenues from this source have been growing very rapidly. Receipts were only Rs.6.6 million in 1980-81, representing an average growth rate of 53 percent per year in nominal terms over the past five years.

The potential of the Houses and Compounds Tax as a revenue source is seriously hampered by very high exemption levels recently imposed. In his budget speech of July 1985, the Minister of Finance announced that houses of up to 3,000 square feet used as a main residence, plus an additional one-half ropani of land around such houses, would be exempt from the tax. Any area above this would be taxed after imposition of the existing Rs.100,000 exemption. The budget speech states that the rationale for this is "to lighten a great burden on those who have no substantial source of income" and to "relieve the small taxpayers" so that authorities can concentrate on recovering taxes from the largest property owners.

The practical effect of this measure was to exempt the vast majority of houses and compounds in the urban areas of the Valley. If one examines the above exemption limit, properties of up to one ropani in size are exempt from the tax. According to a report carried out by CEDA in 1974, "Evaluation of Urban Property, Kathmandu and Lalitpur", 86 percent of house compounds in Kathmandu town panchayat were of one ropani or less in that year. Over the three town panchayats of the Valley. the percentage of exemption from the Houses and Compounds Tax is undoubtedly higher.

Administrative capacity for collecting the Houses and Compounds Tax is very weak. Within the Zonal Tax Office, there is currently one Tax Officer in charge of the Houses and Compounds Tax for KNP and LNP. His staff consists of one engineer (GIII), three inspectors (NGI), three overseers (NGI), and one clerk. None of these personnel have had any training in tax matters. No transport facilities or allowances for trips outside the office are available and there are no specialists in tax assessment or collection.

A special project has been underway during FY85 and FY86 to increase the rate of registration, assessment, and tax collection of urban properties in Kathmandu and Lalitpur town panchayats. This project has provided the Tax Office with 60 people who have been working on all phases of the process: obtaining data on properties, delivering forms to property owners, following up to ensure information is supplied, verifying the data, performing assessments, informing owners of taxes owed, and collecting the taxes. The project is scheduled to end in July 1986. According to the Tax Officer, about 4,000 property owners were registered and regularly paying the Houses and Compounds Tax before the special project began. As of September 1985, about 8,000 property owners had been added to the tax rolls. The total of 12,000 registered property owners still represents a very tiny fraction of the total number of property owners in Kathmandu and Lalitpur town panchayats. Coverage of the tax is likely to remain low after the special project ends because of:

- The Lack of manpower in the Tax Office for maintaining and expanding the system.
- Lack of skills among personnel in the Office.
- Lack of a systematic procedure for updating and maintaining tax records and carrying out assessments.
- The fact that tax evasion is widespread.

Tax evasion methods include under-reporting by property owners (facts about properties are gathered mainly through self-reporting by owners), artificial division of property under names of various family members, and bribing of tax personnel. The very low probability of sanctions for such practices increases their frequency.

4. Land Taxation as a Policy Tool

To date, land taxation has not been used as a policy tool to influence land use or curb speculation. Policy purposes which land taxation could perform are:

- To redistribute income or wealth.
- To reduce land speculation.
- To encourage development of vacant land in the towns.
- To capture increments in land value caused by public capital investment in roads and infrastructure.
- To promote retention or conversion of certain land uses.
- To help establish claims to landownership.

The potential for using taxation as a land policy tool is limited by public administrative capacity. Administration of the existing tax structure is poor. Adding new, more complex systems at the present time is inadvisable. For the moment, the existing tax administration should be improved to the point where it has the capacity to implement some additional land taxation measures.

General findings and recommendations of this section, and of the report in general, are presented in Chapter I.

APPENDIX A
DEFINITION OF THE KATHMANDU VALLEY

The definition used in this study is that of the "Kathmandu Physical Development Concept", prepared by the Kathmandu Town Planning Team in 1984. The boundaries of the Kathmandu Valley Town Planning area are as follows:

1. East
   From Godavari Bhanjyang to the ridge of Chipudanda following the ridges of Tribenidanda and Pati Bhanjyang, eastern watershed of Amaldoi, ridges of Rohini and Kartike Bhanjyang and Machurilekh.

2. West
   From Simpani to Panchmane Bhanjyang following Kaji Gaon, Bhattarchaur, Dakshinkali, Gurdum Khola, northern watershed of Chakhel, Chandragiri, Simbhanjyang, eastern watershed of Masini Village, Dahachowk Hill, Majuwa Village, Bhimdhunga and easter watershed of Thumki and lastly Mudku.

3. North
   From Panchmane Bhanjyang to Chipudanda following the ridges of Shivapuri and Bolang.

4. South
   From the ridge of Godavari Bhanjyang to Simpani following the watershed of Dhungakhani, ridges of Bhagawandanda and Lele, Deurali Thumki, Babai Village, southern watershed of Mane and along the course of the Bagmati River.

APPENDIX B
SELECTED ECONOMIC CONSIDERATIONS

1. Economically Active Population in the Kathmandu Valley

Census data from 1971 and 1981 on the economically active population in the three Valley districts and town panchayats of Kathmandu, Lalitpur, and Bhaktapur proved to be incompatible, and no definitional clarifications could be provided by the CBS. With the exception of the total increase in economically active population between the two periods (57 percent), census comparisons yielded improbable results and were rejected. For example, it was found that the Valley's economically active population in agriculture increased by over 400 percent during the decade while the active population in such sectors as clerical, services, and production declined significantly. Similar "trends" are noted in each district and town panchayat as shown in Tables A.B.1 and A.B.2.

Kathmandu town panchayat's active population engaged in agriculture, for example, supposedly increased ten-fold over the censal decade. Similar inconsistencies were found for the Bhaktapur and Lalitpur town panchayats where no boundary change took place between the censuses.

2. Employment in Some Key Sectors

As the census data were unable to provide the study with reliable trends concerning the economically active population of the Valley, it was decided to study three principal employment sectors (manufacturing, Government, and tourism) to see how they evolved over the period. In these areas, considerable difficulties were also encountered with the data, suggesting that more attention should be given to establishing an appropriate data base in this field.

a. Manufacturing

A clear picture of the evolution of industrial establishments in the Valley could not be ascertained due to a lack of comprehensive data. Several sources--including the Census of Manufacturing Establishments, CBS, the Ministry of Industry's Industrial Profile, and the ISC's Industrial Profile--were consulted. In addition, data from the Cottage Industry Department was sought but could not be obtained.

According to the Census of Manufacturing Establishments carried out by the CBS, the number of industrial establishments increased from 291 in 1946/65 to 798 establishments in 1981/82. According to the same source, employment increased from 2,381 to 16,315 jobs over the same period. Kathmandu absorbed most of the new industrial establishments and jobs created during this period. However, as Table A.B.3 suggests, Bhaktapur and Laliput have become alternative sites for industry as well.

b. Government

Data on Government sector employment in the Kathmandu Valley was collected from the CBS and the Department of Administrative Management. Data for 1971/72, 1974/75, and 1984/85 are presented in Table A.B.4.

Based on these data, there were approximately 10,400 Government employees in the Valley in 1971. By 1974, the number of employees had risen to over 14,000; and, by 1984, more than 31,500 employees were working in the Government sector. Thus, it appears that the number of Government workers in the Valley tripled between 1971 and 1984.

c. Tourism

Between 1970 and 1982, an average of 136,428 tourists (103,244 excluding Indian tourists) visited Nepal annually. Over this period, the average annual growth rate of arrivals was on the order of 8.9 percent per year. On average, 85 percent of tourists arrived by Tribhuvan International Airport, and 69 percent spent between one and seven days in Kathmandu. Tourism provides a principal source of foreign exchange for the country as well as employment in the hotel, service, and handicrafts sectors. One indicator of recent growth in Valley tourism is the growth in the hotel industry. For example, in 1971, there were 15 "starred" hotels with 521 rooms and about 1,140 employees; while in 1984, there were 30 "starred" hotels with 1,895 rooms and about 4,360 employees. No trend data are available for smaller non-star hotels and lodges, but there were about 320 such establishments in 1985 with an estimated 3,200 rooms and 2,560 jobs.

The tourist industry is both capital intensive and labor intensive. It is a substantial employment generator because it creates employment not only in hotels but restaurants, travel agencies, airlines, handicrafts, manufacturing, etc. A survey by the ADB in 1972 concluded that employment stimulated by tourism expenditure is three times the number of hotel employees. Thus, on the basis of 5,100 hotel jobs in 1984, there were about 15,000 jobs in the sector in the Kathmandu Valley. In other words, tourism is roughly as important an employment sector as manufacturing in the Valley.

Table A.B.1

TRENDS OF ECONOMICALLY ACTIVE POPULATION IN DIFFERENT OCCUATPIONAL SECTORS - TOWN PANCHAYATS

KATHMANDU TOWN PANCHAYAT

	Total Active Pop.	Prof/Tech % of Total	,Administr %	,Clerical %	Sales %	Service %	,Farm/Fish %	Prod/Lead %
1971	42,614 100%	2,953 6.9%	280 0.7%	7,569 17.8%	5,832 13.7%	6,567 15.4%	6,405 15%	13,008 30.5%
1981	103,964 100%	3,961 3.8%	2,516 2.4%	7,521 7.2%	9,104 8.8%	2,196 2.1%	71,912 69.2%	6,753 6.5%
Change from 1971-1981	+61,350 +144%	+1,008 +34.13%	+2,236 +798.6%	- 48 -0.6%	+3,272 +56%	-4,371 -66.6%	+65,507 +1022.7%	-6,255 -60%

LALITPUR TOWN PANCHAYAT

1971	17,648 100%	1,012 5.7%	104 0.6%	2,172 12.3%	1,888 10.7%	1,368 7.8%	6,361 36%	4,743 26.9%
1981	36,244 100%	1,317 3.6%	631 1.7%	1,952 5.3%	1,753 4.8%	206 0.6%	27,243 75.2%	3,141 8.7%
Change	+18,596 +105.4%	+305 +30.1%	+527 +506.7%	-220 -10.1%	-135 -7.2%	-1,162 -84.9%	+20,882 +328.3%	-1,602 -33.8%

BHAKTAPUR TOWN PANCHAYAT

1971	14,528	316 2.2%	8 0.1%	566 3.9%	1,180 8.1%	390 2.7%	9,547 65.7%	2,521 17.4%
1981	19,425	473 2.4%	79 0.4%	471 2.4%	1,251 6.4%	69 0.4%	15,555 80%	1,526 7.9%
Change	+4,877 +33.7%	+157 +50%	+71 887.5%	-95 -16.8%	+71 +6%	-321 -82.3%	+6,008 +70%	-995 -39.5%

Table A.B.1 (CONTINUED)

TOTAL KATHMANDU VALLEY URBAN

1971	74,790	4,281	392	10,307	8,900	8,325	22,313	20,272
1981	159,633	5,751	3,226	9,944	12,108	2,471	114,710	11,420
Change	+84,843 +114%	+1,470 +34.3%	+2,834 +723%	-363 -3.5%	+3,208 +36%	-5,854 -70.3%	+92,397 +414%	-8,852 -43.7%

Table A.B.2

TRENDS OF ECONOMICALLY ACTIVE POPULATION IN DIFFERENT OCCUPATIONAL SECTORS - DISTRICT LEVEL

KATHMANDU DISTRICT

	Total Active Pop.	Prof/Tech	Admnistr	Clerical	Sales	Service	Farm/Fish	Prodn/Labor
		% of Total	% of Total	% of Total	% of Total	% of Total	% of Total	% of Total
1971	113,838	3,982	382	12,460	7,902	9,229	60,643	19,040
		3.5%	0.3%	10.9%	6.9%	8.3%	53.3%	16.7%
1981*	184,065	4,994	2,665	11,015	9,871	2,542	141,757	11,221
		2.75%	1.4%	6%	5.4%	7.4%	77.0%	6.1%
% Change from 1971-81	+62%	+25%	+598%	-12%	+25%	-73%	+134%	-41%
LALITPUR DISTRICT								
1971	58,458	1,227	110	3,590	2,287	1,941	43,020	6,283
		2.1%	0.2%	6.1%	3.9%	3.3%	73.6%	10.7%
1981*	77,423	1,916	691	3,270	2,312	428.	64,099	4,707
		2.5%	0.9%	4.2%	3.0%	0.6%	82.8%	6%
% Change from 1971-81	+32%	+56%	+523%	-9%	+1%	-78%	+49%	-25%
BHAKTAPUR DISTRICT								
1971	41,960	530	15	1,728	2,605	881	30,576	5,625
		1.3%	0.04%	4.1%	6.2%	2.1%	70.9%	13.4%
1981	69,225	968	184	2,661	2,962	359	58,705	3,386
		1.4%	0.3%	3.8%	4.3%	0.5%	84.8%	4.9%
% Change from 1971-81	+65%	+83%	1126%	+54%	+14%	-57%	+92%	-40%
3 DISTRICTS								
1971	214,256	5,739	507	17,778	12,794	12,251	134,239	30,948
1981	330,713	7,878	3,540	16,946	15,145	3,329	264,561	19,314
% Change from 1971-81	+54.4%	+37.3%	+600%	-4.7%	+18.4%	-72.8%	+97.1%	-37.6%

Table A.B.3

EMPLOYMENT IN MANUFACTURING INDUSTRIES*

(Rs. in '000)

	No. of Establishments	Employment	Fixed Assets
1964/65:			
Kathmandu	197	1,868	16,049
Lalitpur	62	437	1,417
Bhaktapur	32	76	347
	291	2,381	17,813
1976/77:			
Kathmandu	368	4,506	145,946
Lalitpur	141	2,508	37,772
Bhaktapur	99	1,064	1,790
	609	8,078	185,508
1981/82:			
Kathmandu	521	10,582	227,465
Lalitpur	148	3,476	86,904
Bhaktapur	129	2,257	86,944
	798	16,315	401,313

*Source: Census of Manufacturing Industries, CBS, 1981 & 1985.

Table A.B.4

EMPLOYMENT IN GOVERNMENT SERVICE 1971*

A. I. Government Employees Excluding Employees of Ministries and Departments 1971:

	No. of Estab.	Gazetted	Non-Gazetted	Total
Kathmandu	29	50	1,352	1,402
Lalitpur	24	17	486	503
Bhaktapur	26	85	561	646
	79	152	2,399	2,551

*Source: Central Bureau of Statistics, HMG, 1974.

A.II. Department of Adm. Management: Government Employees in Ministries & Depts. (Organization Chart)

(i) Gazetted officers:	Administrative -	756		
	Technical -	757		1,513
(ii) Non-gazetted :	Administrative -	3,189		
	Technical -	1,818		5,007
(iii) Peons :	Administrative -	1,290		
	Technical -	35		1,325
			TOTAL:	7,845

1971/72 Rough Total Govt. Employment = I + II = 2,551 + 7,845 = 10,396

Table A.B.4 (cont'd)

EMPLOYMENT IN GOVERNMENT SERVICE - 1974/1975*

(in Rs.'000)

B. 1974/75:	No. of Estab.	Employees	Regular Budget
Kathmandu	245	10,059	18,842
Lalitpur	81	1,488	1,708
Bhaktapur	39	342	1,589
	365	11,889	22,139
**Add: 18% peons		+ 2,140	
		14,029	

*Source: Civil Records Office, 1974 Cited by Harka Gurung, Nepal Dimensions of Development, 1984.

**The gazetted and non-gazetted figures exclude employees of the peon category. Dr. Gurung estimates as 18% of total personnel.

EMPLOYMENT IN GOVERNMENT SERVICE-1984*

C. 1984:

	No. of Estab.	Gazetted	Non-Gazetted	Peons	Total
1. Kathmandu	195	1,053	5,027	2,475	8,555
2. Lalitpur	62	153	669	411	1,233
3. Bhaktapur	50	104	531	271	906
4. Central Offices	138	3,588	1,4663	2,581	20,832
	445	4,898	20,890	5,738	31,526

*Source: List of Civil Government Officials, Ministry of General Administration, 2041.

APPENDIX C

REVIEW OF THE KVTPT PROPOSED LAND USE PLAN FOR KATHMANDU

This study included a review of the Proposed Land Use Plan for Greater Kathmandu. The "Kathmandu Physical Planning Concept" was prepared by the Kathmandu Town Planning Team in 1984. The purpose of this section is to provide some constructive observations so that the Proposed Land Use Plan can be improved.

1. The proposed land use plan should cover the areas within the Kathmandu and Lalitpur town panchayats for ten-year development planning. However, the following areas were excluded in the map: Balaju, Kalankisthan, and southern Balkhu in Kathmandu, and Nakhu, Hatiban, and Khadku plain in Patan. Longer-term planning must necessarily concern the Valley as a whole.

2. Some areas proposed as agricultural land reserves are already being urbanized (but the study recognizes the importance of preserving these areas if possible): Kindol (Swyayambhu), Dullu, the right bank of the Vishnumati Khola, and Gyaneshor in Kathmandu, and Sanepa, Balkhu, Jawalakhel, and southern Lagankhel in Lalitpur. Also, proposed agricultural areas north of the Patan Industrial Estate and the Mahalaxmi area of Lagan Khel in Lalitpur are now residential areas.

3. On the basis of a land use review, the following should be noted:
   - An agricultural area in Teku is occupied by the Solid Waste Management Project's land fill. Also in Teku, suggested residential areas are occupied by Government buildings.
   - Proposed residential use near the museum is a military area. Also, an area proposed for military use is occupied by the museum.
   - Open space at St. Xaviers School, Pashupati Kailash, and Tera Gaon Hotel have been proposed as residential areas.
   - Proposed institutional land at Gyaneswor, Hadigaon, and Lazimpat (Shanker Hotel Area) are private properties.
   - Suggested commercial land use at Lazimpat is occupied by the Mining Department and Scout Office.
   - Suggested residential areas east of the Satduwat road in Patan are occupied by a school and Khumaltar Agricultural Farm.
   - The Bal Mandir (Orphanage) and Maternity Hospital at Thapathali are not identified by that use.
   - Residential development proposed at Maharajganj and Kalankisthan in Kathmandu are non-dissected tar areas suitable for development.
   - In Patan, proposed low-density sites for residential development at Satduwat and Balkumari east of the core and in proximity to the Ring Road are in proximity to drinking water, electricity, and roads. The middle part of this area, however, suffers from drainage problems.

4. Suggested modification of proposed land uses includes:

   - Residential development as proposed at Koteswor is not recommended due to its proximity to the airport.
   - Proposed residential developments at Nayabazar, Balaju, Swayambu, and Samakhu are situated on low lands in proxmity to the Vishnumati and Samakushi Khola where flooding occurs. These lands should be preserved for agriculture. Proposed "E" residential development at Chawni should also be left for agricultural use.
   - Proposals for new residential development at Balkumari and industrial development at Samkhamol should be changed. These areas are the most productive vegetable lands in Lalitpur. Local people call this area Deko (lowland outside the core) and Aluko (potato lowland). These areas are presently without access roads and, if they remain so, development will not be encouraged. Also in this area is the Masan or cremation ground which is not compatible with proposed residential development.
   - Proposed areas for institutional development east of Singha Durbar at Ghatekhola, Dillibazaar lie in a lowland subject to flooding.
   - Proposals for preservation (park, forest and open space) at Maharajgunj, Balaju, and Chauni are simply cultivated lands with no special significance.

APPENDIX D
LAND REFORM MEASURES

Though a series of land reforms has been carried out in Nepal, the most comprehensive of these was the Land Reform Act of 1964. The main objectives of this Act are:

- A more equitable distribution of cultivable land.
- Improved production through provision of technology and resources to land tillers.
- Mobilization of unproductive capital and human resources from land to other sectors of the economy.

The Act sets ceilings on ownership of land at 332 ropanis (17 hectares) in the Terai, 80 ropanis (4.1 hectares) in the Hills and 50 ropanis (2.6 hectares) in the Kathmandu Valley. All larger lands were to be acquired by the Government and redistributed to the tillers and landless. In addition to the above land ceilings, households are allowed to keep for residential purposes:

- 40 ropanis (2 hectares) in the rural Terai and 13.3 ropanis (0.67 hectares) in Terai town panchayats;
- 16 ropanis (0.8 hectares) in Hill rural areas and 10 ropanis (0.5 hectares) in Hill town panchayats;
- 8 ropanis (0.4 hectares) in rural areas of the Kathmandu Valley and 5 ropanis (0.25 hectares) in town panchayat areas.

A household is defined as a husband, wife and minor children. Sons 16 years of age and daughters 35 years of age are entitled to own land separately according to the above guidelines.

Loopholes on landownership ceilings exist in the Act. A landowner, for example, can acquire 5 ropanis of land from his tenants for construction of a building. In fact, because of evasion of the legal provisions of the Act, only 23,000 hectares of land were acquired by the Government for redistribution. This is less than 1 percent of the total cultivated land in the country. Large landowners were able to circumvent the Act because of the time lag involved in its implementation, loopholes in the land ceiling regulation, time requirements to execute the cadastral survey, and inadequate recordkeeping.

The Land Reform Act provides for tenancy rights for all those who till lands for one main cropping season. Ceilings on tenancy rights are as follows:

- 53.2 ropanis (2.67 hectares) in the Terai
- 20 ropanis (1.02 hectares) in the Hills
- 10 ropanis (0.5 hectares) in the Kathmandu Valley

Rent payable to landowners was fixed at 50 percent of the annual production (later changed to 50 percent of the main crop). However, in 12 districts of the Terai and the three districts of the Kathmandu Valley, an absolute amount has been fixed as rent. These rents are generally less than 50 percent of the main crop's output.

A tenant cannot sell or transfer his tenancy rights. Tenancy rights are transferred to sons of the tenant upon his death but no provision is made for daughters. When transfer of tenant rights to more than one son is involved, the approval of the landowners is required. This often leads to litigation between the sons and between the sons and the landlord.

The Act specified that tenants cannot be evicted unless they fail to fulfill the conditions of the Act. These include: failure to pay the rent within a specified time, failure to cultivate the land for one year, gross negligence leading to reduction of the land's productivity or value, or payment of 25 percent of the land's total value as compensation.

Limits which have been set on payment of compensation to tenants include: 6.6 ropanis (0.33 hectares) in Terai village panchayats, 2.66 ropanis (0.35 hectares) in Terai town panchayats, 10 ropanis (0.5 hectares) in Hill village panchayats, and 5 ropanis (0.25 hectares) in Hill town panchayats and the Kathmandu Valley.

Though the Act specifies that tenants are entitled to 25 percent of the value of the land upon eviction, in practice, they often receive one-third of the land's value. Thus, tenants benefit from land value increases as well. These earnings are generally invested in building construction, truck farming, or farming improvements.

Though the Land Reform Act has not resulted in a more equitable distribution of land, it has resulted in fewer absentee landowners and greater efforts by the landlords to increase the land's productivity. Nevertheless, because of the Act, agriculture is less of a priority for investment. On the other hand, investment in urban land has been highly lucrative, particularly in the Kathmandu Valley. To discourage this trend, some consideration is being given to further reducing land holdings, and improving cadastral surveys and recordkeeping.

Table A.1

KATHMANDU DISTRICT

Population of Village Panchayats

	Population in 1971 1/	Area in Hectare 2/	Population in 1981 3/	Persons Per Hectare
Sunatol	2,655	520.7	3,887	7.47
Lapsephedi	3,638	632	2,434	3.85
Sankhu Pukhulachhi	2,116	238	2,708	11.37
Sankhu Salkha	2,844	296	3,925	13.26
Indrayani	1,614	105	5,405	51.47
Bhedrabas	1,252	112	3,460	30.89
Sundarijal	1,603	873	4,380	5
Gokarna (Gokarneswar)	-	221	5,984	27
Danchhi	3,743	460	5,023	10.9
Mulpani	2,733	388	3,669	9.45
Gothatar	3,525	393	4,415	11.23
Koteswar	2,575	329	2,528	7.68
Jorpati	2,580	446	7,607	17.05
Budanilkantha (Vishnugau)	3,057	488	4.057	8.31
Jhor	1,926	621	3,276	5.27
Manmaiju	2,524	240	6,024	25.1
Sanglakuchi	2,898	1,421	2,758	1.94
Kabhresthali	1,950	610	2,490	4.08
Jitpurphedi		529	3,234	6.11
Dharmasthali	2,919	384	3,575	9.30
Goldhunga	3,606	481	4,560	9.48
Sitapaila	3,984	524	5,856	11.17
Ramkot Danda Pauwa	3,394	641	6,746	10.52
Seuchatar	2,590	243	3,578	14.72

Source: 1/ Central Bureau of Statistics, HMG, 1971.

2/ Area Calculated from Records of Department of Survey, HMG.

3/ Central Bureau of Statistics, HMG, 1981.

4/ Projected Populations at a Rate of 2.5 percent per annum.

Table A.1 (CONTINUED)

	Population in 1971	Area in Hectare	Popualtion in 1981	Persons Per Hectare
Tinthana	1,977	120	4,357	36.30
Panga (Binshu Devi)	1,597	25.27	1,996	78.99
Panga	2,500	155	5,143	33.18
Chobar	3,838	415	4,139	9.97
Machhegau	4,067	438	5,044	11.51
Matatirtha	1,969	256	5,868	22.92
Balambu		255	5,718	22.42
Thankot	3,417	336	6,032	17.95
Alapot	1,711	161	2,138[4/]	13.28
Bhimdhunga	1,536	478	1,920[4/]	4.01
Chalnakhel	1,923	350	2,403[4/]	6.86
Chapali (Bhadrakali)	1,791	1,044	2,238[4/]	2.14
Dahachok	2,295	474	2,868[4/]	6.05
Dhopasi	1,648	242	2,060[4/]	8.51
Gongabu	1,883	352	2,353[4/]	6.68
Kapan	2,290	437	2,862[4/]	6.55
Khadkabhadrakali	1,418	121	1,772[4/]	14.64
Kirtipur Bahirigaon	2,915	165	3,643[4/]	22.08
Kirtipur Chithubihar	2,387	41	2,983[4/]	72.77
Kirtipur Layaku	3,069	103	3,836[4/]	37.24
Kirtipur Paliphal	2,111	53	2,638[4/]	49.78
Naikap Naya	2 038	109	2,547[4/]	23.37
Naikap Purano	1,937	167	2,421[4/]	14.49
Satungal	1,964	190	2,455[4/]	12.92
Sinamangal	2,559	267	3,198[4/]	11.98
Phutung	1,664	215	2,080	9.67
Nayapati	2,397	485	2,996	6.17
Tokha Chandeswari	1,994	256	2,492	9.73
Tokha Sarawati	1,376	192	1,720	8.95
Thankot Mahadev	2,960	278	3,700	13.30
Gagalphedi	2,708	507	3,385	6.67
Chunikhel	1,936	613	2,420	3.94
Badbhanjyang	1,648	503	2,060	4.09
Bhadragaon	2,551	121	3,188	26.35

Table A.2

LALITPUR DISTRICT
Population of Village Panchayats

	Population in 1971 [1/]	Area in Hectare [2/]	Population in 1981 [3/]	Persons Per Hectare
Saibu Bhaisepati	2,421	424	6,439	15
Khokana	2,933	259	3,666	14
Sunaguthi	3,082	296	4,072	13
Harisiddhi	2,744	266	3,732	14
Sanagau	3,708	225	4,434 [4/]	19.7
Tikathali	2,526	287	3,345 [4/]	11.6
Imadol	-	412	5,094	12.3
Lamatar	5,896	1,328	5,488 [4/]	4.13
Lubhu	3,741	295	6,514 [4/]	22
Badegau	1,350	95	1,687 [4/]	17.7
Godam Chaur	2,633	326	3,291 [4/]	10
Bistachhap	-	546	6,044	11
Kitini (Godavari)	2,541	427	3,280	7.68
Thaiba	1,330	108	3,343	30.9
Dhapakhel	3,160	386	4,119	10.6
Bungamati	3,352	399	5,919	14.8
Chhampi	3,408	1,535	5,882	3.8
Thecho	4,176	1,199	5,476	4.5
Jhuruwarasi	1,815	334	4,510	13.5
Chapagau	5,647	684	7,373	10.7
Badekhel	1,866	640	2,332 [4/]	3.6
Dukuchhap	1,650	471	2,062 [4/]	4.37
Total				

Source: 1/ Central Bureau of Statistics, HMG, 1971.
2/ Area Calculated from the Records of Department of Survey, HMG.
3/ Central Bureau of Statistics, HMG, 1981.
4/ Projected Population at a rate of 2.5 percent per annum.

Table A.3

BHAKTAPUR DISTRICT
Population of Village Panchayat

	Population in 1971 1/	Area in Hectare 2/	Population in 1981 3/	Persons Per Hectare
Katunje	3,229	464	4,331	9.33
Gundu	3,096	593	4,440	7,48
Changu Narayan	3,855	606	4,102	6.76
Chitapol	3,188	842	3,934	4.67
Chherling	3,155	821	6,906	8.41
Jhaukhel	3,125	540	4,708	8.71
Tathali	2,736	774	3,753	4.84
Dadhikot	3,585	626	5,206	8.3
Dibyaswari	2,306	453	3,436	7.58
Duwakot	3,394	628	4,393	6.99
Nagarkot	2,487	1,257	3,491	2.77
Nil Barahi (Bode)	4,338	308	5,476	17.77
Nakhel	2,976	685	3,790	5.53
Balkumari	6,226	92	7,428	80.73
Balkot	2,747	375	3,629	9.67
Bangeswari	2,848	590	4,986	8.45
Bhimsen (Chapayo)	4,941	95	6,169	64.93
Siddhi Ganesh (Nagades)	2,829	94	3,567	37.94
Sipadol	2,419	808	3,811	4.71
Sundol	4,156	1,005	5,176	5.15
Somlangaswar	2,409	139	3,604	25.92

Source: 1/ Central Bureau of Statistics, HMG, 1971.
2/ Area Calculated from the Records of Department of Survey, HMG.
3/ Central Bureau of Statistics, HMG, 1981.

Table A.4

PRODUCTION AND AREA OF DIFFERENT CROPS*

(in Metric Tons/Hectare)

Year	Rice	Maize	Wheat	Millet	Barley	Potato	Sugarcane	Oilseeds
1967/68	77,208 25,200	30,920 17,400	23,105 18,200	4,041 4,000	21 25	21,125 2,340	320 25	670 1,150
68/69	80,500 25,500	31,436 17,600	26,290 19,200	4,100 4,100	21 25	19,820 2,150	316 28	680 1,160
69/70	83,210 25,850	32,438 18,000	29,950 21,000	4,248 4,200	28 32	20,833 2,320	384 30	741 1,220
70/71	88,280 26,800	33,922 18,400	21,249 21,500	4,178 4,100	32 36	15,692 2,550	453 35	758 1,260
71/72	87,240 26,800	33,168 18,328	29,109 21,873	3,261 4,100	12 37	21,132 2,650	453 35	725 1,260
72/73	90,581 26,390	35,337 19,010	28,698 19,100	4,035 3,908	31 37	21,052 2,580	453 35	1,005 1,800
73/74	92,178 26,500	33,335 17,900	28,580 21,500	4,264 4,108	33 38	21,277 2,571	518 40	988 1,780
74/75	92,170 26,500	33,257 17,900	28,580 21,500	4,262 4,153	35 40	22,010 2,670	519 40	988 1,780
75/76	91,330 25,500	33,570 17,940	27,030 21,806	4,312 4,154	36 41	22,610 2,650	410 30	954 1,725
76/77	84,205 22,895	31,888 17,819	35,650 22,535	3,853 3,718	87 111	11,203 1,304	50 8	937 1,662
77/78	91,410 24,150	28,138 15,050	38,630 24,220	2,958 3,270	70 80	5,300 850	- -	870 1,470
78/79	86,230 22,840	28,190 19,570	35,790 22,650	2,580 2,860	90 100	6,720 1,800	- -	1,090 1,540
79/80	69,860 21,490	25,030 15,300	27,630 22,400	2,420 2,560	80 80	6,200 960	- -	1,030 1,470
80/81	71,690 22,620	29,668 17,840	26,770 21,530	2,870 2,880	90 90	6,600 1,330	- -	320 510
81/82	100,180 21,140	31,540 16,170	41,850 20,610	2,970 2,830	90 90	14,910 1,750	- -	310 510
82/83	78,100 20,730	44,980 16,170	38,030 16,760	2,470 2,330	70 70	13,490 1,570	- -	240 400

*Source: Agricultural Statistics of Nepal, 1983.

Table A.5

LAND CAPABILITY AND LAND USE
BY DISTRICT IN KATHMANDU VALLEY *
(Percentages of District Areas)

Land Capability[1/]	Kathmandu	Lalitpur	Bhaktapur	Total
I	22.8	10.3	31.1	18.6
II	20.5	11.4	23.1	17.0
III	28.0	27.9	24.1	27.4
IV	18.4	37.2	11.3	25.5
V	2.2	1.1	2.4	1.8
VI	7.8	10.9	7.6	9.1
Land Utilization				
Lowland agriculture	41.4	21.9	60.8	35.7
Upland/slope agriculture	18.2	23.1	19.7	20.5
Grazing	0.9	0.2	0.2	0.5
Forest	3.2	4.8	-	3.5
Degraded forest[2/]	30.2[3/]	48.0[4/]	16.2	35.9
Urban	5.4	1.2	0.2	3.2
Sand, gravel, rock	0.6	0.8	0.1	0.8
Total Area (hectares)	41,201.6	39,266.9	12,016.4	92,484.9

1/ Land Capability Classes:

I. Few limitations on agriculture or forestry.

II. Terracing or contouring needed for agriculture; ground cover required for forest usage.

III. Terracing mendatory for agriculture.

IV. Not suitable for agriculture due to excessive slope; suitable for fuelwood, fodder, timber production under proper management.

V. Flood plain; suitable for fodder collection and grazing only.

VI. Highly fragile ecosystem; protection required.

2/ Includes immature forest and shrub areas.

3/ Includes 380.3 ha of plantation.

4/ Includes 50.8 ha of plantation.

* Source: Computed from Land Resources Mapping Project (LRMP) data.

Table A.6

LAND USE DISTRIBUTION IN KATHMANDU VALLEY
BY DISTRICT, 1979*
(Hectares)

	Kathmandu	Lalitpur	Bhaktapur	Total
Lowland agriculture	17,084.3	8,593.8	7,312.4	32,990.5
Upland/slope agriculture	7,519.5	9,065.8	2,368.4	18,953.7
Grazing	366.6	87.0	24.8	478.4
Forest	1,327.8	1,889.7	-	3,217.5
Degraded forest 1/	12,424.6 2/	18,837.8 3/	1,947.2	33,209.6
Urban	2,216.9	459.2	255.7	2,931.8
Sand, gravel, rock	261.9	333.6	107.9	703.4
Total Area	41,201.6	39,266.9	12,016.4	92,484.9

1/ Includes immature forest and shrub areas.

2/ Includes 380.3 ha of plantation.

3/ Includes 50.8 ha of plantation.

*Source: Land Resources Mapping Project (LRMP).

Table A. 7

COMPARISON OF AGRICULTURAL LAND CAPABILITY AND LAND USE BY DISTRICT IN KATHMANDU VALLEY, 1979*

	Percent of District Area			
	Kathmandu	Lalitpur	Bhaktapur	Total
Land suitable for agriculture (Classes I, II, III)	71.3	49.6	78.3	63.0
Present agriculture land use	59.6	45.0	80.5	56.2
Difference	11.7	4.6	-2.2	6.8
Difference expressed in hectares	4,820.6	1,806.3	-264.4	6,362.5

*Source: Computed from Land Resources Mapping Project (LRMP) data.

Table A.8

GUTHI LANDS IN KATHMANDU DISTRICT*

		Total Guthi Land (1984) (in Ropanis)
1.	Sangla V.P.	3,411
2.	Sitapaila V.P.	496
3.	Kabhresthali	352
4.	Chhaimalay V.P.	195
5.	Jitpurphedi V.P.	326
6.	Koteshore V.P.	272
7.	Danchhi	11
8.	Machhegaon	305
9.	Tinthana	255
10.	Gokarna (Suntakhan and Baluwa)	584
11.	Mulpani	259
12.	Dharmasthali	297
13.	Gothatar	490
14.	Goldhunga	168
15.	Seuchatar	143
16.	Mattatirtha	307
17.	Sankhu (Pukhulachhi and Salkha)	168
18.	Bhadrabas (+Alapot)	151
19.	Jorpati (Kapan)	1,959
20.	Bhadrakali (Chapali)	896
21.	Indrayani (Gagalphedi)	2,045
22.	Sundarijal (Nayapati)	447
23.	Ramkot (Dadapauwa + Bhimdhunga)	439
24.	Balambu (Purano Naikap and Satungal)	456
25.	Thankot (Dahachowk and Badabhanjyang)	595
26.	Manamaiju (Gongabu and Phutung)	853
27.	Tokha (Chandeswari and Saraswati)	371
28.	Swakhel (Pharping + Chalnakhel)	503
29.	Dakshinkali (Pharping and Sheshnarayan)	818
30.	Sunatol(Sankhu Sunatol)	190
31.	Panga (Panga Balkumari)	236
32.	Jhor (Jhor Mahakal)	1,143
33.	Chovar (Chobar Bhutkhel)	511
34.	Basundhara (Dhapasi)	192
35.	Kirtipur (Paliphal)	523
36	Naikap (Paliphal)	86
37.	Budhanilkantha (Vishnu)	357
38.	Bagbhairava (Chithubihar)	50
39.	Talku (Talku Dudechaur)	69
40.	Mahakal Chunikhel	256
41.	Kathmandu Nagar Panchayat	7,923
	Grand Total	29,108

*Source: Guthi Corporation, 1984.

Table A.9

GUTHI LANDS IN LALITPUR DISTRICT*

Village Panchayats	Total Guthi Land (in Ropanis)
1. Imadol (Sanagaon)	471
2. Harisiddhi	847
3. Dhapakhel	185
4. Saibu (Bhaisay Pati)	616
5. Chapagaon	228
6. Thaiba (Badaygaon)	395
7. Chhampi (Dukuchhap)	645
8. Sonaguthi	839
9. Thecho	148
10. Bishankhu Narayan (Badaygaon Bista Chhap)	941
11. Iele	144
12. Bungmati	1,184
13. Jharuwarasi (Badi Khel)	88
14. Godavari (Bista Chhap)	505
15. Sidhipur (Sanagaon)	149
16. Luvu	878
17. Tikathali	435
18. Lamatar	71
19. Lalitpur Nagar Panchayat	1,549
Total	10,320

*Source: Guthi Corporation, 1984.

Table A.10

GUTHI LANDS IN BHAKTAPUR DISTRICT*

Village Panchayat	Total Guthi Land (in Ropanis)
1. Nagadesh (Siddhi Ganesh)	73.8
2. Sirutar	184
3. Chapacho (Bhimsen)	106
4. Lohkinthali (Dibeshore)	630
5. Nagarkot	218
6. Sipadol	576
7. Balkot	273
8. Gundi (Tithali Gundi)	666
9. Sundol (Sughal)	650
10. Duwakot	426
11. Balkumari	223
13. Jhaukhel	733
14. Nangkhel	1,133
15. Bageshori	1,010
16. Bode (Nil Barahi)	800
17. Dadhikot	550
18. Changu Narayan	1,448
19. Katunje	948
20. Chitapol	2,698
21. Chhaling	2,027
22. Bhaktapur Nagar Panchayat	1,740
Total	17,965

*Source: Guthi Corporation, 1984.

Table A.11

LAND TRANSACTIONS IN KATHMANDU NAGAR PANCHAYAT IN 1980/81 & 1984/85*

Ward	Total Transactions 1980/81	Total Transactions 1984/85
1	97	195
2	112	80
3	120	131
4	115	156
5	110	112
6	306	236
7	287	188
8	434	359
9	237	188
10	430	555
11	74	51
12	176	99
13	403	486
14	252	228
15	509	356
16	170	369
17	118	205
18	96	110
19	97	218
20	107	191
21	98	223
22	122	216
23	123	286
24	137	238
25	122	231
26	208	96
27	148	106
28	240	223
29	313	260
30		253
31		217
32		197
33		277

*Source: Land Revenue Office, Kathmandu, 1985.

Table A.12

LALITPUR NAGAR PANCHAYAT

LAND TRANSACTIONS

Ward	1980-81	1982-84	1984/85
1	105	165	135
2	117	171	215
3	110	104	112
4	105	223	243
5	166	185	429
6	50	81	112
7	55	26	22
8	75	28	50
9	77	57	40
10	70	15	18
11	80	5	20
12	78	47	36
13	55	12	9
14	65	15	15
15	45	53	46
16	50	10	9
17	51	8	8
18	59	8	5
19	80	24	26
20	85	30	50
21	80	14	10
22	72	15	14

Table A.13

BHAKTAPUR NAGAR PANCHAYAT

LAND TRANSACTIONS*

Years / Wards	1982/83 2039/40	1983/84 2040/41	1984/85 2041/42
1	23	15	30
2	6	12	19
3	1	3	4
4	40	22	37
5	12	14	12
6	6	5	3
7	7	16	7
8	2	6	4
9	4	4	x
10	5	15	11
11	3	9	6
12	5	3	2
13	2	4	3
14	5	9	x
15	2	10	13
16	7	2	3
17	2	42	22
Total	132	199	176
Not-Classified	84	39	78
Grand Total	216	230	254

*Source: Land Revenue Office, Bhaktapur, 1985.

Table A. 14

LAND TRANSACTIONS IN KATHMANDU DISTRICT VILLAGE PANCHAYATS*

S/N	Village Panchayats	1980/81	1984/85
1	Alapot	20	36
2	Indrayani	35	28
3	Kapan	75	192
4	Kabhesthali	24	51
5	Koteshore	128	127
6	Khadka Bhadrakali	55	118
7	Gagalphedi	26	35
8	Gokarna	25	30
9	Goldhunga	50	68
10	Gothatar	20	54
11	Gongabu	110	184
12	Chapali	103	117
13	Chalnakhel	18	38
14	Chunikhel	10	53
15	Chithubihar	45	19
16	Chobar	60	35
17	Jitpurphedi	45	38
18	Jorpati	145	247
19	Jhor Mahakal	50	15
20	Tokha Chandeswari	30	44
21	Tokha Saraswati	26	48
22	Danchhi	75	53
23	Ramkot	32	35
24	Thankot	25	195
25	Dahachowk	20	31
26	Dharmasthali	15	31
27	Naya Naikap	26	18
28	Purano Naikap	32	29
29	Nayapati	25	50
30	Sankhu Phukulachi	15	26

*Source: Land Revenue Office, Kathmandu, 1985.

Table A.14 (CONTINUED)

S/N	Village Panchayat	1980/81	1984/85
31	Dhapasi	70	185
32	Paliphal, Kirtipur	37	30
33	Phutung	20	34
34	Balambu	25	47
35	Panga Balkumari	46	29
36	Balaju	60	256
37	Kirtipur, Bahirigaun	24	67
38	Baluwa	20	60
39	Bada Bhanjyang	25	30
40	Vishnugaon	75	140
41	Vishnu Devi	11	35
42	Bhadrabas	50	65
43	Bhimdhunga	19	19
44	Manamaiju	40	109
45	Matatirtha	21	35
46	Machhegaon	40	48
47	Mulpani	40	59
48	Layku	45	120
49	Satungal	32	39
50	Sakhu Salkha	25	35
51	Sangla	25	51
52	Seuchatar	19	52
53	Sakhu Sunatol	35	30
54	Sundarijal	39	71
55	Sinamangal	60	142
56	Sitapaila	55	137
57	Tinthana	30	25

Table A.15

LALITPUR DISTRICT
LAND TRANSACTION*

Name of Village Panchayats	Total No. of Transaction		
	1980/81	1983/84	1984/85
Chapagaon	152	122	152
Harisiddhi	43	37	29
Kitini	33	81	50
Chhampi	73	98	68
Sunakothi	64	40	78
Sanagaon	26	34	36
Jharuwarashi	68	53	72
Bhaisepati Saibu	156	90	117
Thaiba	20	26	37
Tikathali	5	28	31
Imadole	60	78	61
Lubu	8	52	51
Bungamati	45	26	37
Lamatar	1	52	75
Khokana	40	27	28
Badegaon	9	9	3
Godamchaur	20	32	33
Bistachhap	24	8	15
Thecho	67	63	133
Badikhel	28	15	31
Dhapakhel	83	66	69
Dukuchhap	15	28	34

*Source: Land Revenue Office, Lalitpur, 1985.

Table A.16

BHAKTAPUR DISTRICT*

TOTAL LAND TRANSACTIONS

S/N	Village Panchayat	1980/81	1981/82	1982/83	1983/84	1984/85
1.	Nagarkot	19	28	18	11	12
2.	Chhaling	51	43	37	35	22
3.	Changunarayan	28	27	33	21	38
4.	Jhaukhel	58	92	56	43	72
5.	Duwakot	72	76	36	30	56
6.	Nilbarahi (Bode)	49	59	107	66	43
7.	Siddhiganesh (Nakades)	28	29	38	26	34
8.	Bhimsen	42	42	51	43	41
9.	Balkumari	31	73	58	66	40
10.	Dibyashori (Lokanthali)	164	221	310	239	259
11.	Balkot	11	24	34	57	38
12.	Serutar	36	22	27	8	9
13.	Dadhikot (Gamcha)	69	107	64	55	90
14.	Gundu	21	33	22	26	20
15.	Katunja	92	113	119	84	126
16.	Nakhel	29	59	36	24	28
17.	Sipadol	69	73	87	54	77
18.	Chitpol	55	68	65	58	56
19.	Tathali	57	103	88	47	50
20.	Sundal	46	67	67	46	58
21.	Bageshore	58	56	60	38	36
	Total	1,016	1,342	1,326	1,023	1,128

*Source: Land Revenue Office, Bhaktapur.

Table 17a

KATHMANDU NAGAR PANCHAYAT

Ward	Total Houses 1984	Total Voters 1981	Total Population 1981
1	1,010	2,828	5,146
2	706	3,350	6,097
3	1,412	4,373	7,958
4	1,263	3,466	6,308
5	940	2,678	4,863
6	1,057	2,418	4,400
7	1,664	3,661	6,663
8	776	2,285	4,158
9	1,486	4,357	7,929
10	3,201	7,363	13,400
11	1,074	3,179	5,785
12	859	5,437	9,895
13	1,678	4,094	7,450
14	1,449	2,069	3,765
15	1,556	2,997	5,454
16	2,126	6,253	11,380
17	1,435	3,387	6,164
18	925	2,248	4,090
19	966	3,764	6,850
20	1,108	4,100	7,462
21	1,527	4,599	8,360
22	928	3,249	5,913
23	1,260	3,810	6,934
24	931	2,751	5,006
25	882	2,520	4,586
26	569	2,238	4,063
27	1,184	4,490	8,171
28	680	2,160	3,931
29	1,603	7,372	13,417
30	2,093	5,860	10,665
31	942	3,448	6,275
32	1,020	5,149	9,361
33	1,533	7,292	13,261
Total	41,843	129,245	235,160

Table 17b

KATHMANDU NAGAR PANCHAYAT

DENSITY

Present Ward	Area in Hectare*	1981** Population	Density Persons/Hectare
1	110.6	5,146	46.5
2	104.1	6.097	58.6
3	133.4	7,958	59.6
4	210.8	6,308	29.9
5	251.0	4,863	19.3
6	320	4,400	13.7
7	108	6,663	61.6
8	104	4,158	39.9
9	308	7,929	25.7
10	385	13,400	34.8
11	172	5,785	33.6
12	42	9,895	235.5
13	140	7,450	53.2
14	261	3,765	14.4
15	207	5,454	26.3
16	380	11,380	29.9
17	52.3	6,164	117.8
18	28.0	4,090	146.0
19	10.5	6,850	652.3
20	17.5	7,462	426.4
21	21.3	8,360	392.4
22	31.6	5,913	187.1
23	11.5	6,934	602.9
24	8.7	5,006	575.4
25	12.3	4,586	372.8
26	3.2	4,063	1269.6
27	6.8	8,171	1201.6

Contd..

Table 17b (cont'd)

Present Ward	Area in Hectare*	1981** Population	Density Persons/Hectare
28	9.5	3,931	413.7
29	101.8	13,417	131.7
30	20.5	10,665	520.2
31	86.0+	6,275	72.96
32	135.2	9,361	69.2
33	80.0	13,261	165.7

Source: * Kathmandu - Lalitpur Housing, Housing Section, Department of Housing, Building and Physical Planning, HMG, 1976.

** Election Commission Office, HMG, for Population of 1981. Based on total voter's list.

Table 18a

LALITPUR NAGAR PANCHAYAT

Ward	Voter List (1981/82)	Total Population
1	2,494	5,794
2	1,619	3,764
3	2,064	4,796
4	2,014	4,670
5	2,724	6,327
6	1,897	4,410
7	1,991	4,628
8	1,147	2,669
9	2,154	5,005
10	987	2,298
11	1,717	3,989
12	1,610	3,743
13	894	2,080
14	1,580	3,674
15	1,268	2,947
16	1,280	2,975
17	1,112	2,585
18	718	1,674
19	710	1,653
20	1,340	3,114
21	1,364	3,170
22	1,683	3,910
Total	34,367	79,875

Table 18b

LALITPUR NAGAR PANCHAYAT
DENSITY

Ward	Area in Hectare*	1971* Population	Density Persons/Ha	1981** Population	Density Persons/Ha
1	120.3	3,768	31.32	5,794	48.16
2	147.8	1,864	12.61	3,764	25.46
3	84.3	3,188	37.81	4,796	56.89
4	271.4	4,597	16.93	4,670	17.20
5	557.7	3,862	6.92	6,327	11.34
6	76.3	3,94 4	51.69	4,410	57.79
7	35.3	3,510	102.26	4,628	131.10
8	25.8	2,104	81.55	2,669	103.44
9	91.8	3,772	46.11	5,005	54.52
10	5.4	1,454	269.28	2,298	425.55
11	9.0	3,285	365.00	3,989	443.22
12	13.5	2,794	206.96	3,743	277.25
13	7.5	1,558	201.13	2,080	277.33
14	4.0	2,693	673.25	3,674	918.5
15	5.4	6,132	1135.55	2,947	654.88
16	4.5	1,622	360.44	2,975	661.11
17	2.8	1,776	634.28	2,585	923.21
18	4.8	1,132	235.83	1,674	348.75
19	10.6	1,238	116.79	1,653	155.94
20	25.6	2,085	81.44	3,114	121.64
21	6.0	2,671	445.16	3,170	528.33
22	29.8			3,910	131
Total	1559.0	59,049	37.87	79,875	51.23

Source: * Kathmandu - Lalitpur Housing, Housing Section, Department of Housing, Building and Physical Planning, HMG, 1976.

** Computed on the basis of voter's list, Election Commission, 1981.

Table 19a

BHAKTAPUR NAGAR PANCHAYAT

DENSITY

Ward	Total Voters 1981	Total Population
1	1,652	3,056
2	1,611	2,980
3	1,258	2,329
4	1,925	3,561
5	1,548	2,863
6	627	1,159
7	1,819	3,365
8	1,659	3,069
9	1,295	2,395
10	1,530	2,830
11	1,494	2,763
12	1,795	3,320
13	1,369	2,532
14	1,709	3,161
15	1,796	3,324
16	1,322	2,445
17	1,795	3,320
Total	26,204	48,472

Table 19b

BHAKTAPUR POPULATION DENSITY

Ward	Ward Area*	1971* Population	Density Per Hectare	1981** Population	Density Per Hectare
1	8.98	2,152	240	3,056	340
2	6.23	2,308	370	2,980	478
3	6.03	2,372	393	2,329	386
4	20.19	2,253	112	3,561	176
5	7.61	2,142	281	2,863	376
6	12.79	2,139	167	1,159	90.6
7	3.48	1.490	716	3,365	966
8	5.10	2,562	502	3,069	601
9	4.13	2,191	530	2,395	580
10	7.45	2,405	324	2,830	380
11	9.75	2,246	230	2,763	283
12	5.80	2,101	362	3,320	572
13	3,75	2,362	630	2,532	675
14	6.56	2,668	407	3,161	482
15	10.93	2,104	192	3,324	304
16	5.54	2,303	416	2,445	441
17	30.92	3,314	107	3,320	107
Total/ Average	154.12	40,112	260	48,472	314.5

Source: * Bhaktapur Town Development Plan,
Bhaktapur Development Project, 1977.

** Computed on the basis of voter's list, Election Commission, 1981.