

On the Occasion of the 56<sup>th</sup> auspicious Birthday of  
His Majesty King Birendra Bir Bikram Shah Dev LI-BIRD extends  
hearty greetings and pray for His Majesty's good health, happiness and long life.

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**LOCAL INITIATIVES FOR BIODIVERSITY,  
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**Introduction**

Local Initiatives for Biodiversity, Research and development (LI-BIRD) is a non-governmental organisation (NGO) established in October 1995. It is committed to capitalise on local initiatives for a sustainable management of renewable natural resources and improved livelihood of people in Nepal. Governed by Executive Board and managed by Executive Director. LI-BIRD has a team of well experienced and competent professional and support staff of various disciplines encompassing, natural resource management, biodiversity, in-situ conservation, plant breeding and agronomy, soil science, communication, extension, marketing, gender, socio-economics, social anthropology, environment, livelihood strategy analysis, GIS etc.

**Objectives of the organisation**

To capitalise on local initiatives in the conservation and utilisation of biodiversity for sustainable development through participatory research and development programmes.

To improve the quality of life of the resource poor through income generating activities and increased food security with an emphasis on equity, gender and environmental issues.

To create awareness, influence policy interventions and strengthen networking on the conservation and utilisation of biodiversity in Nepal.

To provide training and professional services to the actors involved in the area of biodiversity, research and development.



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## URBAN STRUCTURE AND ITS MODERN TRANSFORMATION IN KATHMANDU CITY

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### Abstract

Kathmandu, the capital city of Nepal, witnessed the most pronounced transformation in urban structure. The rapid growth of population together with the use of new building materials has caused a great impact on traditional structure of the city. With the change in way of life, standard of living, social and economic condition and even people's perception, the urban structure could not remain static and thus transformed gradually. The main attempt of this paper is to explore past and present city structure and its sequential changes. The study is based on historical record, aerial photographs, toposheet and field observation. The change in urban structure has been shown in three different periods: Historical period, Modern period and Recent period. The walled city developed by the Malla kings of historical period was characterized by compact settlement with towering temples, stupas and open spaces like Baha and Choks. The layout of housing units with open spaces clearly indicates a good planning of city structure in those days. The structural transformation started by the Rana (1768-1950) with the development of western style palaces. However, the heavy change in structural design of buildings and their layout came only after democracy due to the use of new technology and building materials. As a result, the traditional value of the city is in the verge of elimination and their conservation and preservation are thus necessary for maintaining the cultural urban structure of the city.

**Key words:** *Structure, transformation, cultural landscape, functional principle, social segregation, water spout (Lon Hiti), city core and succession*

### Introduction

The towns of the Kathmandu Valley built by the Newars are among the most beautiful indigenous settlements in the world (Hosken, 1974: 155). Within the valley Kathmandu,

capital city of Nepal is one of the most historical, cultural and commercial centres of Nepal. The Kathmandu Valley in the long historical past was a lake. The evolution of Kathmandu city from the lake bed to paddy agriculture and from it to highly urban society took millennia. It has witnessed the development of extremely urban civilization. It is the largest city in the country. However, Kathmandu is a very ancient city with its history of sequential urban growth. It has been a major urban area since the Lichhavi Period (100 BC to 1000 AD). Since then it has been growing physically and functionally. The rapid growth of population and increasing provision of infrastructures have caused a tremendous increase in the urban functions which accelerated the growth of existing urban structures and expanded over the new area. In spite of new urban development in the present century, the old city of Kathmandu has become a significant example as one of the preserved historical cities of Nepal. The new urban development has become alien to the old city structure and rapid urban development has caused a great impact on traditional structures. With the change in way of life, standard of living, social and economic condition and even the people's perception, the urban structure could not remain static and thus transformed gradually. Therefore, the sequential change in the urban structures has been an important characteristics of Kathmandu City. However, a detailed study on such changing pattern of urban structures has not yet been done. Though morphological development and spatial expansion of Kathmandu City have been studied by some scholars, no studies which directly deal with changing pattern of urban structures in the city have been attempted. Therefore this study will be its first kind which attempts to explore past and present city structure specially residential structure and fabrics and its sequential change.

This study is based both on primary and secondary information. The important tools used for the study are historical records, field observation, aerial photographs and toposheets. The analysis of urban structures has been done in three periods : Historical Period :100 B.C- 1768 A.D (Lichhavi to Malla Period:), Modern Period 1768 A.D- 1951 A.D (Shah and Rana Period) and Recent Period : 1951- A.D to-date (Period after democracy) .

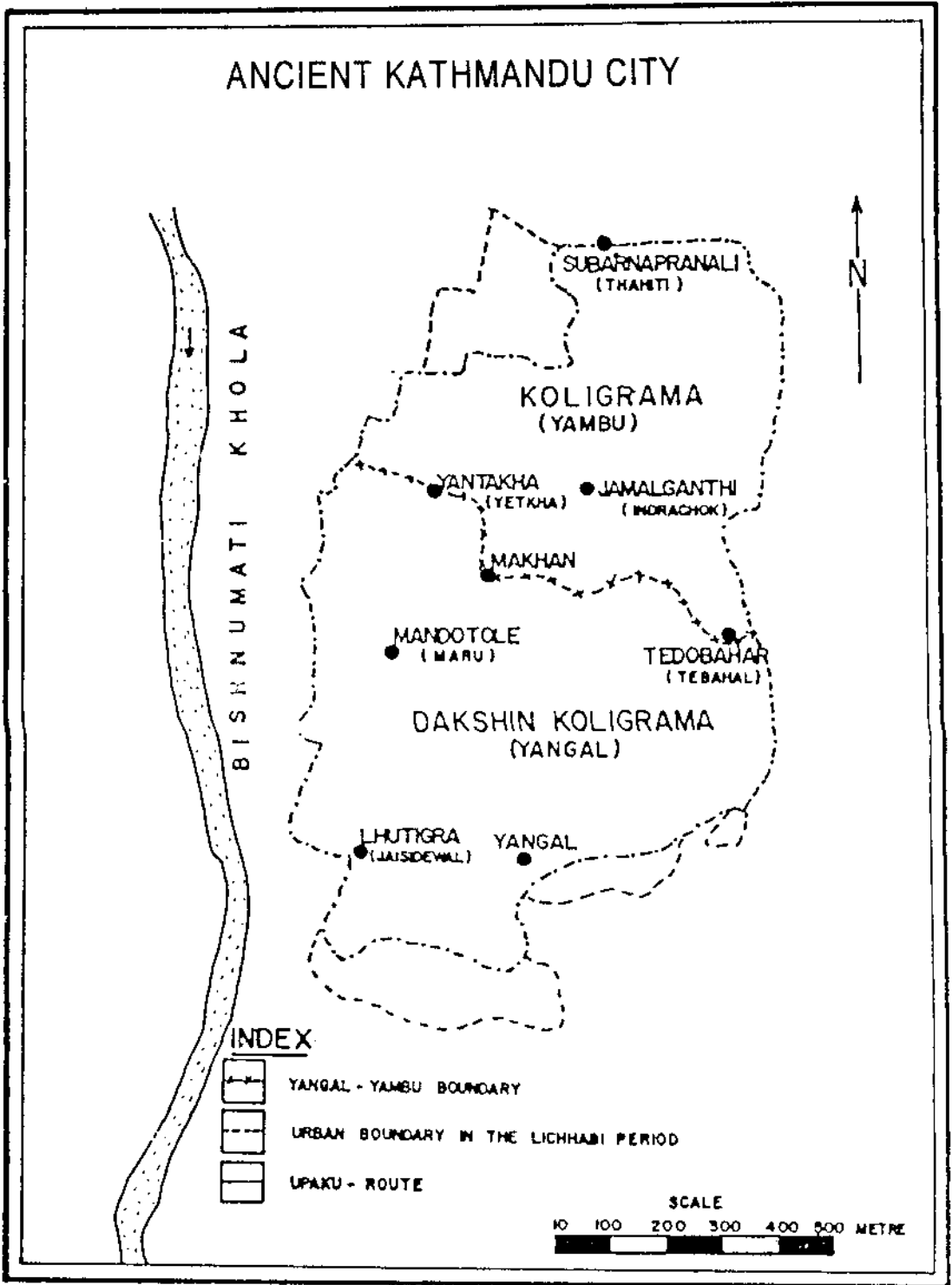
### Urban Structures in Historical Period:

Since the Lichhavi period (200 BC- 1000 A.D), Kathmandu has been existed as the most important urban centre in Nepal. Though Kathmandu town is believed to have existed even before this period, no evidence of town was available so far. The historical evidence shows that only in the Lichhavi period Kathmandu City came to exist (Malla, 1978). Before the Lichhavi period, specially in Kirati period, Kathmandu was believed to be a small village called 'grama'. But in the Lichhavi period, grama developed into commercial centre known as Drunga (Bajracharya, 2025 BC). However, the town was not developed in that period so far. Kathmandu City grew up into an urban settlement after the amalgamation of two gramas. In the north there was Koligram called Yambu which extended from present Makhan to Thahity Tole and the southern grama Yangal extended from Makhan to Lagan Tole (Ranjitkar and Manandhar, 1981 (Figure 1).

The development of Drunga later evolved into urban settlement as Kantipur in the 10<sup>th</sup> century (Malla, 1978). However, only in the 11<sup>th</sup> century, the commercial town came to exist as the capital city (Regmi, 1965). The old urban structure of the Lichhavi period grew into the walled city during the Malla period (1257-1768AD). The wall was constructed with 32 gates as the outer limit of the capital. The line of the wall resulted from observing a Newar religion rite known as Upaku Wanegu (Walking around the town) (Slusser, 1982). The dense compact urban settlement was developed on the high terracc for preserving the fertile low land areas and for protection from the enemies due to rivalry among the different Malla kings of the valley.

The structure of Kathmandu was developed in conformity with the social settings of the people. The urban design of the town, the relationship between the narrow streets and open spaces, the placement of the houses and the monuments present a remarkable understanding functional principles related to social needs (Hosken, 1974). The old city was characterized by compact residential settlement with towering temples and stupas. During

Fig. 1

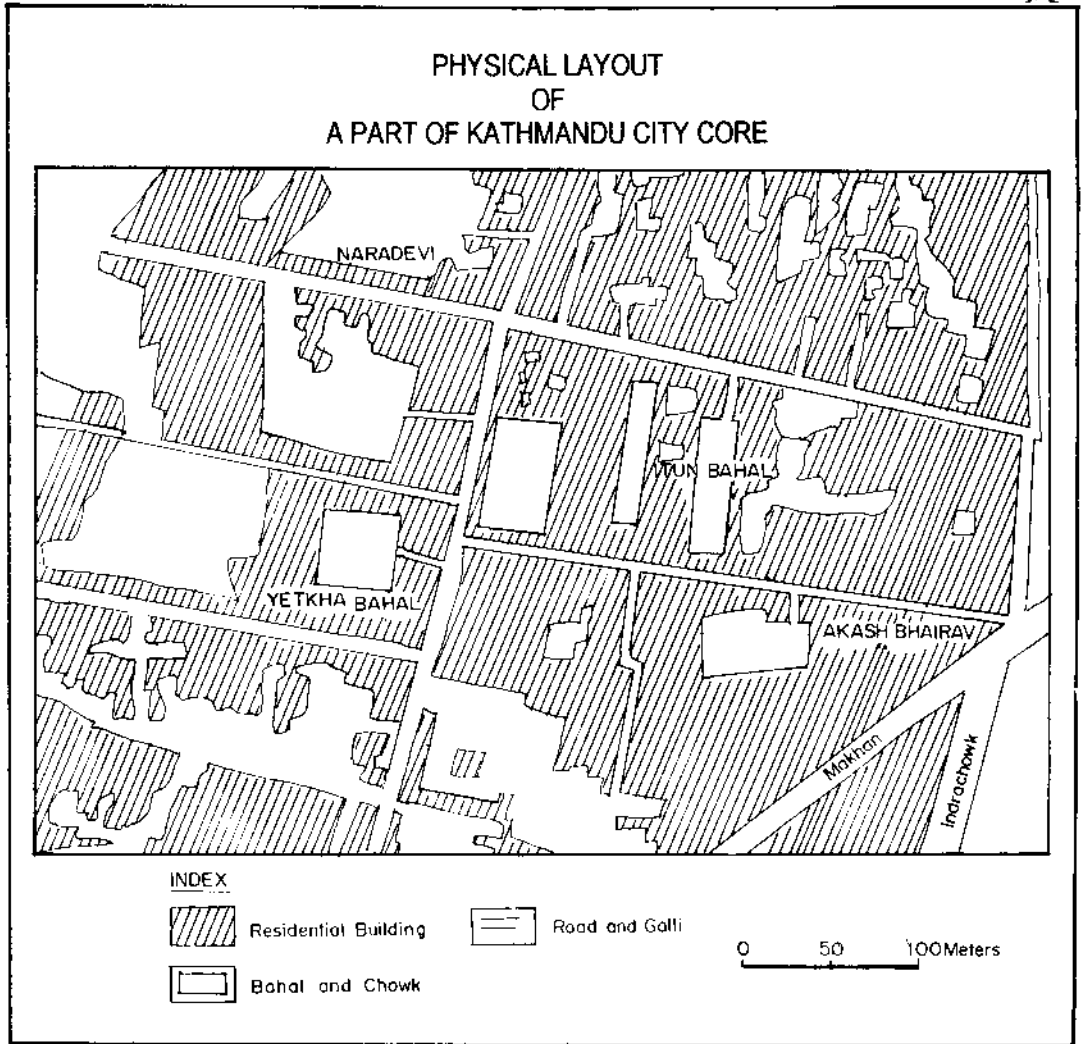


this historical period, other urban cultural landscapes like temples and Bahas were the major urban components of the city. The layout of housing units with open spaces clearly showed a good planning for housing. This indicates that the Malla period exhibited an extraordinary development in urban architecture, planning and design (Shah and Pant, 1998).

The residential areas developed into the rectangular blocks called toles separated by narrow streets and alleys. These streets were linked with narrow lanes and alloys, some through fare and some dead-end leading to the Bahas and Choks ( Figure 2 ). Behind the houses are the Bahas. In those days the streets and lanes were paved with bricks or stone slabs. The pavement throughout the city was of brick tile (Oldfield, 1974). Some of the stone paved street and lanes still exist in some parts of the city. The existence of lanes paved with stone slabs in some toles existed till 1960s. Danial Wright also mentioned small open space paved with brick and stone during 1870s Wright, 1983.

Bahas, Choks and Nani are the main urban components of the residential structure of the city. Baha is one of the oldest monasteries of traditional architecture. It is a place where people of Guthi or social institutes carry out seasonal festivals and conduct rites (Manandhar, 2000). Nani is the small open place and Chok is the private courtyard within the residential areas of the city. These are the common open spaces of the residential areas of the city. Bahas are mostly rectangular or square in form and paved with stone slabs or bricks. In most of the Bahas, a temple house of Buddhist god is stalled in one of the sides of the Baha. Some Bahas are pure Buddhist monastery which are two or three storied quadrangle representing a typical traditional architecture (Manandhar, 2000). In some Bahas pagoda like temples are stalled at the centre. These common Bahas, Nani and Chowks provide light and air. The major Bahas from north of the city are Bagban Baha, Etum Baha, Yatkha Baha, Jana Baha, Chhusya Baha, Mushya Baha, Kwa Baha, Jhhwa Baha Te Baha, Lagan Baha, Tah Baha and hundreds of small Bahas and choks. There are still Bahas to carry out the old traditions in the city as a whole. Such a urban residential area with a plenty of open spaces indicates that the residential planning of that time was environmentally sound.

Fig. 2



Unlike the Buddhist temples, the Hindu temples were developed in most of the toles of the city. These temples were the central elements of settlement in those days. The Hindu temples were generally placed near some of the principal through fares but the Buddhist temples were situated in the centres of the square or quadrangles of the Bahas. These Hindu temples were actually Newar style structures constructed on square plan, elevated on a stepped plinth and crowned with three roofs (Slusser, 1982). Tile, brass sheet and copper plate were the important roofing materials in the temples. In some of the temples the tile roofs are still existing at present. Most of the temples were built at the intersection of streets.

Other landscapes of the urban residential areas in the city were the Dabali and Pati. Dabali was the square plate form constructed at the corner or along the main roads in the city core for the cultural and religious dramas. Generally each tole along the main road had contained a Dabali. Such Dabalies are still existing in the city at Lagan, Jaisideval, Majipat, Chikanmugal, Maru, Basantapur, Asan, Nhankan Tole, Bangemuda, Thahiti, Kilagal, Indra chok, Masangalli, Indra chok and Akash Bhairaba (Demolished /lost).

Patis (Falcha in Newari) were the rest houses for the travelers who came to the town for marketing or other purposes. These Patis were constructed in most of the toles of the city. These Patis are still existed at present and used for Bhajan Kirtan (Religious songs) in the evening.

The residential structure in those period is found to be varied based on the social status. The location of the houses, type of the residential building and their structure and the building materials are found to be varied with the status of community groups. Touchable and socially untouchable were two distinctive caste groups in the city. Both these major community groups had different caste hierarchy and had special locations for residential buildings. Beside the untouchable community group, the people of all the caste groups lived within the wall of the city. Within the walled city, there was also a social segregation. The main centre of the city was occupied by the king's palace called Hanuman Dhoka and



Durbar Square and the commercial areas developed in the vicinity of the city heart. The palace of ruling group occupied a large central part. The high caste tended to cluster around this exalted nucleus, the lower progressively line further away and outside the wall was outcast untouchable community of Poda, Chyame (Sweeper) and Kasain (Butcher). Finally, well beyond the wall was the realm of the dead called Masan Ghats (Slusser, 1982). The untauchable community castes like Poda, Cyame and low caste Kasain were strictly forbidden to live within the city wall (Old Field, 1974).

Inside the wall of the core city, the housing style was traditional with artistic windows and doors. Houses were made of hand made bricks. All the houses of the core city consisted of mass of brick and roof tile structure. Mud mortar was the main feature of the housing lots in the city. The important building materials used for the housing construction were mud, tile, wood and straw which were locally found within the valley. The use of building materials was in conformity with the availability of local materials.. Geographically the Kathmandu valley is very rich in lacustrine soil which is the main raw material for the brick kiln. Another important building material was the wood which was also highly used for artistic structure of the houses. Perceval Landon also reported that wood was exquisitely treated as an adjunct to architecture in the city (Landon, 1987). However, there was only the use of soft wood called Sallo (coniferous tree) grown in the surrounding areas of the Kathmandu Valley from where woods were brought for housing construction. As there was no external linkage with the Tarai region of Nepal, the use of sal wood (hard wood of tropical forest) was not generally used.

Most of the houses in those days were not painted in general. However, the buildings of the higher class were elaborately ornamented with plaster and painting (Wright, 1983). The houses in general possessed large projecting wooden window or balcony. The height of the houses were controlled by the religious belief. It was believed that the houses should not be higher than the temple in the locality. In the second floor there were lattice windows called

Ankhejhal. The lattice windows and big wooden windows were placed in the first and second floor respectively. The use of Ankhejhal was mostly for the security from the thieves and secrecy of the bedrooms. In some houses the lattice was also used in the ground floor. Tile pitched roof were the main characteristic feature of the houses. Most of the houses have overhanging roofs providing shelter for used sidewalk from the rain. The houses were roofed with tiles called Jhingate which was the main roofing materials in those days. Even in the temples tile roofs were used. However, the wealthy rich people and the Malla kings replaced the tile roofs of the temples with the copper and brass sheet. Bhauga was a hole of a roof used for ventilation for the kitchen. The Newar houses had no chimneys. The many houses had terrace and balcony off the top floor. These are called Kausi where the family members used to wash plates and pots used in the kitchen. But in some localities as in Thamel tole, the construction of Kausi was prohibited for the sake of religious belief.

Storeys of the houses were assigned for different uses. The ground floor were generally vacant. If the houses belonged to the farmer community the ground floor of the house was used for storing the agricultural tools, agriculture by- products and livestock. If the house belonged to the skilled people, it was used for individual workshops and if it belonged to the businessmen it was used for storing the trading goods. Some family used the ground floor for latrine without flush and drainage. Facilities of the flush latrine and bathrooms inside the houses were completely absent in those days. The second floor was used for the bedrooms and the third floor was used for living room. The living room was generally large in size and generally used for common functions such as festivals and occasional dinner. The top floor was used for kitchen.

In case of the schedule castes, the building structure as well as the building materials were different. They could live only in one storey house. It is believed that the low class people mostly Kasain (Butcher), Poda and Chyame (Sweeper) were not allowed to construct the house more than one storey and the use of brick and tile roof was strictly prohibited

(Budhathoki, 2039 B.S.). They were allowed to build only one storey house with mud wall and straw roof

Saga was also the important characteristic feature of the urban residential structure in the ancient city. It was a space for disposing domestic wastes. The Saga was used for collecting and fermenting the green manure to be used in the agricultural field. The Saga was belonged to either individual house or common to a number of houses.

Lon Hiti (Water spouts) were an integral part of the urban structures of the city. The water-spouts made of stone, were the channalized spouts of water serving as taps with a shrine attached. It has existed since the last 15<sup>th</sup> century. According to the survey conducted by the Kathmandu Town Development Project in 1982 there were 117 Hitis (Pradhan, 1990). Most of these stone taps belonged to the Lichhavi and the Malla periods. During the medieval period, wells and fountains were the most distinctive sources of drinking water (Shrestha, 1996). Water spouts are called Gairidhara in Nepali and Gahiti in Newari . From the aquifer, water was brought through aqueduct and waterspout was made. It was constructed in a terraced pit and fountain was terraced in a diminishing stage each bricked and paved and traversed by one or more stairways down. These stone tap pits were generally rectangular or oval shape. Just near the outlet of the water, a very shallow small pond was skillfully designed. It is believed that the shallow water was collected for the breeding of frogs for which the snakes would frequently pass through the underground outlet drain. The frequent passing of the snakes would probably help keep underground drain open. The stone taps were developed not only in the city core but also in the outlying areas of the city core. However many of such Hitis have now gone to be buried, encroached or disappeared. Many are still showing testimony of their ancient life and still serving the local people. Location of the existing major stone taps developed in the historical past are located in the following places (Table 1 and Figure 3). Thahiti and Bhotahiti are the important water spouts disappeared and buried so far.

Table 1  
Location of Stone Water Spout in Kathmandu City

City Core		
1) Chasan, Pyaphal	2) Bhimsenthan	3) Maru Hiti at Kasthamandap
4) Damai tole	5) Dhoka Tole	6) Kohiti
7) Bhotahiti (Buried)	8) Thahiti	
At the Margin of the Core		
1) Nyhapucha, Lagan	2) Tamsipakha	3) Teku
4) Dhobidhara, Chhetrapati	5) Sundhara	6) Paropakar
7) Bhurankhel	8) Sorakhutte Pati	9) Kaldhara
Out lying Areas		
1) Kakancho, Chhauni	2) Dallu	3) Naksal Bhagabati
4) Bhat Bhateni	5) Ganabahal	6) North of Narayanhiti
7) Baudha, Alubari	8) Dilli Bazar	9) Tindhara Pathshala
10) Baphal	11) Narayanhiti	12) On way to Kumari Hall
13) Golkopakha	14) Bisalnagar	15) Naxsal, Nagpokhari
16) Bhuikhel	17) Gairi Dhara	18) Swoyambhu, Kindole
19) Kapurdhara, Lainchaur		

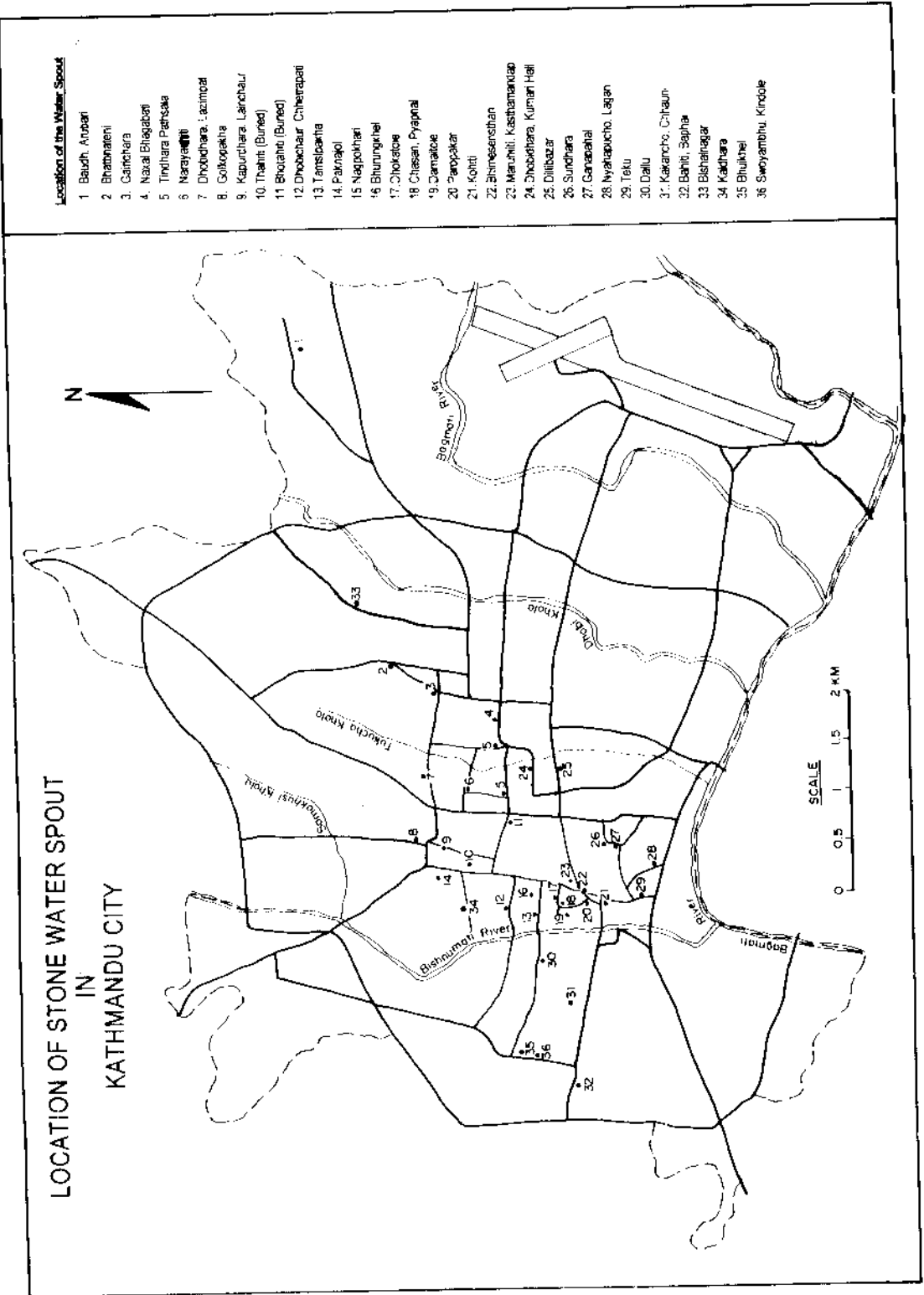
Source : Field Survey, 2000.

Beside the residential structure, some administrative and military installations were also confined to the city core. At Kampukot and Kumarichok there existed military and administrative units in this period. However, after the conquest of Prithivi Narayan in 1768 Tundikhil and Chhauni were used for military purposes which were completely outside of the city core.

### Urban Structures in Modern period (1846-1950)

The period of the Rana Government is considered as the modern period in context of development of new urban structures in Kathmandu City. In the early Shah period, soon after the unification of Nepal, Kathmandu was selected as the capital of Nepal. Gradual expansion of old Kathmandu beyond the wall took place in the Shah period. The construction of Dharahara (Tower) in 1826 and residential building at Lagan Tole and Chhauni (Present museum) by Bhimsen Thapa, and the construction of European style mansion Narayanhiti

Fig. 3



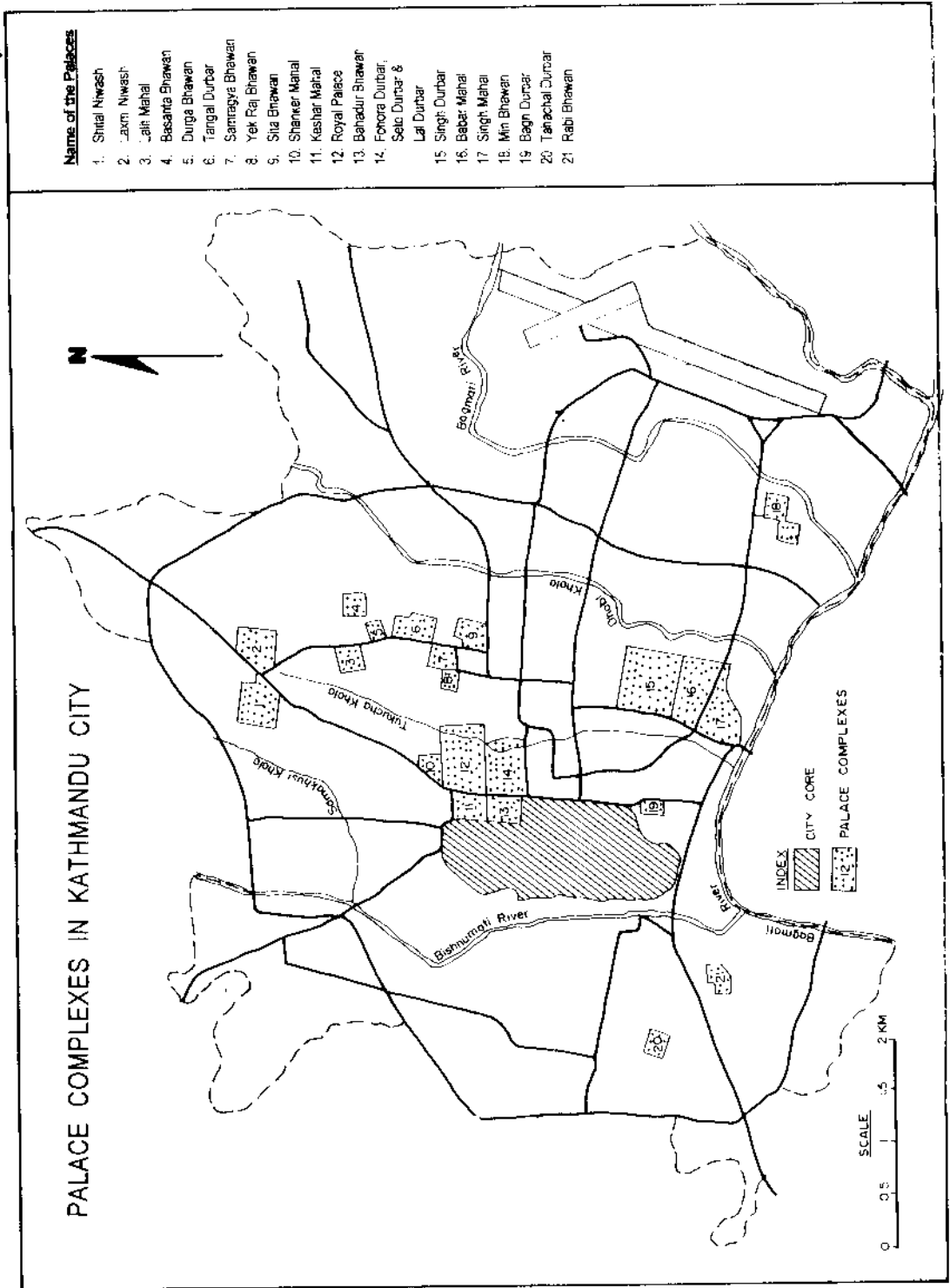
Royal palace in 1896 provided the Ranas with a key reference point in planning of important ambitious modern constructions (UDEL, 1995). This process was accelerated in the Rana period. This is the period when the high class Rana aristocrat family preferred to have high standard of living with huge western Neo-classical white stucco palaces in the fringes of the city as wide space for such large construction was not available in the congested city core. The construction of the European Style Versailles- Buckingham styled palaces with their enclosed gardens has thus brought about morphological change. This was actually the first stage in the history of structural transformation in Kthmandu city. These walled Rana palaces had covered about 25 acres to 38 acres of land where thousands of middle and lower class residential lots could be constructed in one Rana palace. These palaces were designed with streets laid out in chessboard plan (Figure 4). A number of roads were constructed to connect these palaces with the city core. The sites for the construction of these Rana palaces were chosen at higher terrace or far away from the flood level. Maharajganj, Lazimpat, Nexsal, Tangal, Bisalnagar, Min Bhawan, Rabi Bhawan, Thapathali and Gana Bhahal areas were selected for the establishments of Rana palaces. In all these palaces, imported materials were used in building construction. Corrugated iron sheets were mostly used for roofing purposes.

The great earthquake of 1934 brought about some changes in the urban morphology and structure in the city core. This earthquake divested thousands of houses in the city core. They were eventually reconstructed and restored to their original glory because the technology, building materials and skills virtually remained unchanged. The use of corrugated iron sheets for roofing for the public houses came after this earthquake event. During the Rana period some part of the core area was changed physically. Then the Rana prime prime\_minister Judha Shamsar started to modify the urban landscape of the city by creating wide through-fares in the city core. He constructed new road (Judha Sadak) and changed the residential area to commercial area by supplementing old trade road between Tibet and India at Asan and Indrachok after the great earthquake (UDEL, 1995). However, no remarkable change was noted in the housing structure of the general people in the city.

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Fig. 4





In this modern period, some residential expansion took place along the main routes radiating out from the core area specially at Kalimati, Dallu Dillbaazar, Baneshwar and Balaju. The people in these areas operated catering business like Bhatti (inn) for the people entering the city from outside (Ranjitkar and Manandhar, 1981). Some administrative, educational as well as military urban structures were also added in the city. Dillibazar Charkhal Adda (1903), Pani pokhari Adda (water supply office) and Bijuli Adda (electricity Authority office at Ratna park, 1911 Durbar high school, Tri-Chandra Campus and military barrack at Chhawani and Baneshor were other important urban structures in the city (Ranjitkar, 1983).

### **Recent Urban Structure (1950-1999)**

The dawn of democracy in 1950 has brought about a new impetus to economic, political and social changes in Nepal in general and in Kathmandu in particular. With the increase of population from 106,577 in 1954 to 421258 in 1991 (CBS, 2053 B.S.) and with the provision of many infrastructure, various urban functions such as commercial, industrial and administrative increased tremendously in the city of Kathmandu. The city opened to commercialization and the external influence and transformation began in the early 1960s (UDEL, 1995). As a result, the agricultural land has been encroached for urban complexes. Several urban patches have been consolidated into the dense population complex of Greater Kathmandu. The process of urban expansion in the city fringe and urban renewal in the city core continued in the city. As a result, there was a considerable change in the urban land and built-up area in the city. The urban built-up area (all non agricultural land excluding forest, grassland, water bodies) increased from 272.5 hectare in the Malla period to 1819 hectare in 1996 (Table 2).

Table 2  
Built-up Area in Kathmandu City

Period	Areas in Hectare
Malla (1200 A.D – 1768)*	272.5
Rana (1847 – 1951)	741.1
Present (1996)	1819

Source: Based on aerial photographs, Department of Forestry 1954 and Department of Survey 1996.

\* Estimation based on historical documents.

After 1950, the agricultural land areas surrounding the city core were encroached. However, the structural design of the new buildings and their layout were found to be quite different from the old traditional residential buildings of the core. The new buildings developed both in the core and also the fringe after 1950 did not conform to the traditional model of architectures in the city. A great change in the residential structure is noted recently in the core and of the fringe of the city. The type of house, use of building materials and their layout have been changed tremendously in the city leading to a considerable transformation of urban structure in the city.

Many old buildings within the city core have been continuously demolished and new ones were erected with modern style. Not only the residential buildings but some Bahas have also been disfigured by their modern style buildings. Old fabric of the core are being seriously eroded by new buildings and rapid degradation of physical environment occurred. The alteration of the historical core structure was due to (1) demolition of private and semi private historical structures by modern buildings (2) addition of floors to old buildings, (3) use of modern building materials and (4) construction of new houses in the space that have been left open.

Most of the houses in the fringe areas are of bungalow type. The people, who shifted to the fringe area have begun to construct the bungalows of bricks and cement. Brick and cement neighbourhood sprang out of rice fields in Baneshwor, Koteshwor, Lazimpat, Tahachal, Maharajung and everywhere in the city area. The development of concrete bungalows in the outlying areas represents a sharp break with the architectural and social traditions of Kathmandu (Slusser, 1982). The core area has more than 17 percent bungalow type houses at present. The vertical expansion of buildings increased rapidly. Because of high land price and population pressure on limited urban land, vertical expansion of residential buildings have become the normal process in the city at present. There are some regulations on the restriction of height of the houses in the city. However, there are hundred of evidences of violation of height regulation also in the city as a whole. About 30 percent of housing units have more than four floors. The increase of floors are noted both in old houses and newly constructed houses in the core.

There is also the considerable change in the use of building materials. About 54 percent of the total houses in the city have been built with cement wall. The use of the new building materials is noted to be higher in the fringe area than in the core area, as cement is used in 67 percent housing units in fringe area as against 33 percent in the core area (Sapkota, 1995).

There is also change in the type of roofing in the city. In the newly constructed buildings both in the fringe and core areas, flat-cemented roofs are found. However, new type of roofing with new building materials are found to be higher in the fringe areas than in the core area (Table. 3). The use of tile is very low in the city at present.

Table 3  
Type of Roofing Material (in percentage)

Type	City	Core	Fringe
RCC/RBC	50	21	65
Corrugated iron sheet	23	26	21
Tiles	26	53	13

NOTE: The areal extent of city, core, and fringe is discussed in Sapkota 1995.

Source: Sapkota, 1995

The present housing layout pattern shows that the housing density is increasing in both core and the fringe areas of the city. In the core area, the open space used for garden is being occupied for the residential buildings. It has created slums in the city core. Very few houses have boundary wall because of limited space while in the fringe areas 70 percent housings lots have boundary wall.

With the growing economic competition for scare urban land, land use succession has become an important norm of the city. After the fall of the Rana regime, most of the residential palaces of the Rana rulers were converted into the institutional complexes and residential lots of the people. Some Ranas left their palaces and handed to the government, some sold to the institutes and some sold to the individuals for their housing lots. These Rana places were rapidly filled with concrete buildings.

Some changes are also noted in the public land in the city. The government is also a responsible for the transformation of the public land. Most of the open areas used by public for recreation have been encroached by the government. The part of the Tundikhel and whole of the Chhauni have undergone for the military purpose. With the coming of the air transportation in 1949 the Gaucharan which was once the pastureland became airport. Ponds and open public fields were covered by individuals and government buildings. Dabalis and Patis once used for the resting places for the travellers and religious purposes were

encroached and succeeded for the tea stall and other retailing shops.

After the democracy, road structure has also been improved. Most of existing main roads have been converted into the pitched roads and new roads have been opened in different parts of the city. King Birendra's marriage in 1970 and coronation in 1975 introduced cosmetic changes in the street structure in Kathmandu and changed the city into a more metropolitan. The street lamp, smooth road and footpaths were added in the city (UDEL, 1995).

### Conclusion

Though Kathmandu City developed in the Lichhavi period, the core city with rich architecture was firmly established only in the Malla period. The old Malla Kathmandu now exists only as a core within the modern greater Kathmandu complexes. A considerable urban morphological change took place in the Rana period with the construction of large palatial buildings of western style structure.

The rapid growth of urban structure and the transformation of urban structure really started only after 1960s due to the development of infrastructure in the city. The road connections outside the valley with the Tarai region and the Indian border, greatly facilitated the import of new building materials and have caused the considerable changes in the city structures. As the physical structure of the city undergoes transformation, the traditional structures disappear.

The mixing of people of other ethnic groups from outside the valley with the indigenous Newar has recast the Nepal Valley into Nepali Valley. Traditional value of the city is in the verge of elimination. Hitis have been covered with refuse. Dabalīs have becoming tea stall and vegetables shopping sites. The old city structure stands out because of age and design. The conservation and preservation of traditional city structures is thus necessary for the needs of Nepalese people and foreign tourists.

## Reference

- Bajracharya, D. B. 2025 BS: Lichhabikalin Basti , *Purnima*. 2, 87-101.
- Budhathoki, C. B. 2039 BS: *Jaya Sthiti Malla Ko Sudhar*. Kathmandu: Sajya Prakashan.
- CBS, H.M.G of Nepal. 2053 /54 BS: *Four Monthly Statistical Bulletin*, Kathmandu: Department of CBS.
- Hoskin, F. P. 1974: *The Kathmandu Valley Towns*. New York: Weatherhill .
- Malla, U. M. 1978: Settlement Geography of Kathmandu Valley, *Geographical Journal of Nepal*.1, 28-36.
- Manandhar, S. 2000 BS: I Baha Bahi: A Budhhist Monastery, *Ancient Nepal*, No. 144, 1-8.
- Landon, P. 1987: *Nepal*, Kathmandu: Ratnapustak Bhandar.
- Oldfield, H. A. 1974: *Sketches From Nepal*, Delhi: Cosmo Publication.
- Oldfield, H. A. 1974: *Sketches From Nepal*, Delhi: Cosmo Publication.
- Pradhan, R. 1990: Dhunge Dhara: A Case Study of the Three Cities of Kathmandu Valley, *Ancient Nepal*, No. 116-118, 10-14
- Ranjitkar, N. G. 1983: *Change in Agricultural Land Use and Land Value in Urban Fringe of Kathmandu City*, Unpublished Ph. D, Dissertation, T.U.
- Ranjitkar, N. G. and Manandhar, M. S. 1980-81: Spatial Expansion of Kathmandu City, *Geographical Journal of Nepal*, vol.3/4, 25-35.
- Regmi, D.R. 1965: *Medieval Nepal*, Part I. Calcutta: P.L. Muckhopadhyaya.
- Sapkota, K. 1995: *Residential Land Use and Land Value Change: A Case Study of Kathmandu City*, Unpublished M.A. Dissertation, T.U.
- Shah, B. and Pant, D. 1998: *Svatha Choks Conservation and Development Project*, Souvenir.
- Shrestha, S. S. 1996: Tusa Hiti, *Ancient Nepal*, No.139, Department of Archeaology, 1-10.
- Slusser, M. S. 1982: *Nepal Mandala* , vol.1. New Jersey: Princeton University Press.
- Urban Development through Local Efforts Project (Udle). 1995: *Images of Century*, Kathmandu: Udle.
- Wright, D. 1983. *Nepal*. New Delhi: Cosmo Publication.