HOUSING DEVELOPMENT AT THE LAND POOLING AREA

[A CASE OF SINAMANGAL LAND POOLING PROJECT]

SUBMITTED BY

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Certificate

This is to certify that the thesis project entitled **"Housing Development at the Land Pooling Area; A Case of Sinamangal Land Pooling Project"** submitted by **Rina Devi Bajracharya** has been examined and it has been declared successful for the fulfilment of the academic requirement towards the completion of the Master of Science in Urban Planning of Tribhuban University.

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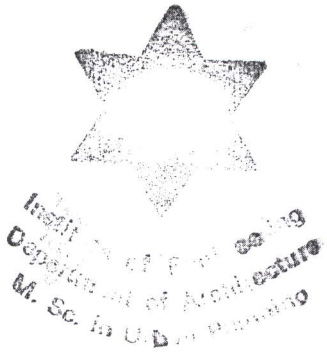

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Declaration

I declare that this dissertation has not been previously accepted in substance for any degree and is not being concurrently submitted in candidature for any degree. I state that this dissertation is the result of my own independent work/ investigation, except where otherwise stated. I hereby give consent for my dissertation, if accepted to be available for photocopying and understand that any references to or quotation from my thesis will receive an acknowledgement.

Rina

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Rina Devi Bajracharya

Jan 2007

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Abstract

In the context of rapid urbanisation of Kathmandu, the resulting growth of haphazard urban settlements without provisions of even basic amenities such as access road, sewage and drainage system, water supply, etc., numerous land pooling projects implemented in the past seems to be successful as it provides serviced plots with vehicular access to each plot. However, looking at the land pooling project with respect to the surrounding areas and in a wider city context in terms of broader development framework, the way land pooling projects are planned and implemented in the Kathmandu Valley have many shortcomings. Such land pooling projects are yet to address the broader concept of continuity of neighbourhood character, new urbanism and the built environment.

This Thesis project presents opportunity as well as challenges due to many reasons. It can utilise the lessons learned from the past experience of land pooling projects. This project prepares Housing Development at Land Pooling area focusing on the residential neighbourhood design through literature reviews of urban design. It proposes numerous land use activities, urban morphology, street network, open space system, building typology and other detailing. It reviews the literature and case study in a broader perspective to identify the salient features of good residential neighbourhood especially for the Land Pooling areas. It also proposes some guidelines for the development, management and implementation method without going into detail. In the land-pooling site, it is more concerned on planning, design and detailing rather than calculating each plot, which are for the return to the landowners. Nonetheless, this project aims to provide a new setting on Land Pooling area for urban expansion.

List of Abbreviations

BM: Bhaktapur Municipality

CDO: Chief District Officer

DDC: District Development Committee

DHUD: Department of Housing and Urban Development

DOB: Department of Building

DOR: Department of Roads

DWSC: Department of Water Supply Corporation

DWSS: Department of Water Supply and Sewage

FAR: Floor Area Ratio

GLD: Guided Land Development

KMC: Kathmandu Metropolitan City

Ktm: Kathmandu

KVDC: Kathmandu Valley Development Council

KVPDP: Kathmandu Valley Physical Development Plan

KVTDC: Kathmandu Valley Town Development Committee

KVTDPIC: Kathmandu Valley Town Development Project Implementation Committee

LAA: Land Acquisition Act

LCC: Local Coordination Committee

LPP: Land Pooling Project

LRA: Land Reform Act

LSGA: Local Self-Governance Act

LSMC: Lalitpur Metropolitan City

MLD: Ministry of Local Development

MPPW: Ministry of Physical Planning and Works

NDC: National Development Council

NEA: Nepal Electricity Authority

NPC: National Planning Commission

NTC: Nepal Telecommunication

OSR: Open Space Ratio

P/ha: Person per hector

PMSC: Project Management Sub Committee

S & S: Site and Services

TDA: Town Development Act

TDC: Town Development Committee

TDCC: Town Development Coordination Committee

TDF: Town Development Fund

TND: Traditional neighbourhood development

TOD: Transit-oriented development

TPIA: Town planning Implementation Act

TPPIA: Town planning projects Implementation Act

VDC: Village District Committee

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Chapter 1

Introduction

1.1 Background:

Nepal is a small developing country and the least urbanized among the developing countries of the South Asia. But Kathmandu Valley has been undergoing rapid urbanization during the last three decades resulting into haphazard sprawl growth. According to 2001 census, total population of Nepal is 23151423. 14.2 % of the total population is living in urban areas. The rate of urbanization is 2.08 % in national level, in which the contribution of major urban centre like Kathmandu Valley is obviously significant. The population of Kathmandu valley is 1571683, out of which 67 % is urban population. From the study of the past experience, the urban population in 1981 is 56%, in 1991 is 61% and it is expected to be 76% by 2021.

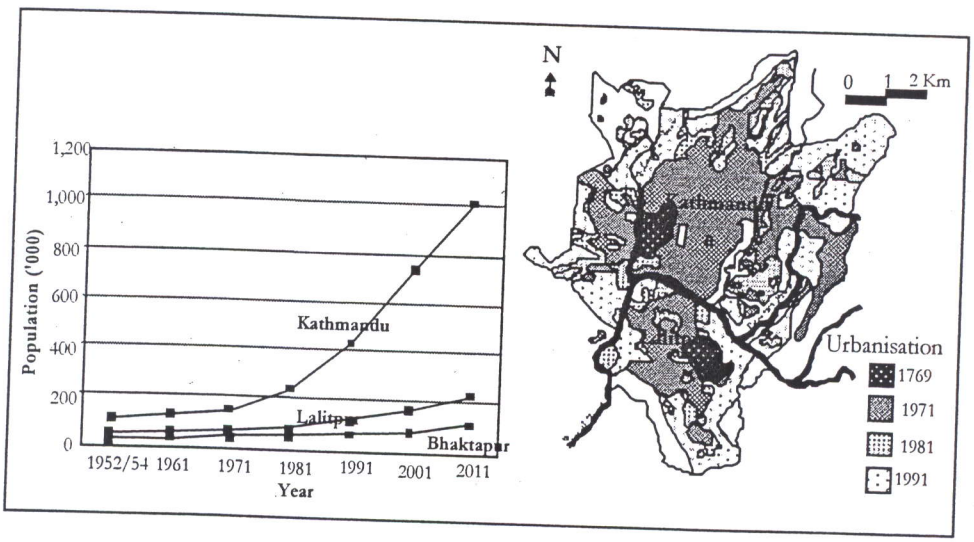


Fig. 1 Population growth (1952/54-2011) and urbanization in Kathmandu and Lalitpur

Housing has been a major challenge to meet the need of growing urban population of Kathmandu. There have been different approaches from government and private sectors for residential development. Since 1988, different land development techniques (site and services, guided land development and land pooling) in the valley have been applied by Kathmandu Valley Town Development Committee (KVTDC) as a government planning effort under 'Town Planning Act 1973'. Similarly private sector has been involved in residential development through different sectors, but they are not only ineffective but also weak in providing legible urban setting and addressing socio cultural needs of the inhabitants.

The land readjustment in Nepal was introduced in 1975 with the initiation of Chiple Dhunga Project (13.5ha) in Pokhara. Gongabu Project (14.5ha, 1988) had re-initiated the concept of land readjustment in Kathmandu and can be considered as a pilot project in the country. In 90's, 11 more projects were implemented in Kathmandu Valley covering total area of 360.65 ha, as this concept became quite popular and successful than any other land development techniques. The land pooling area is not only for land development activity but it is also for housing activity. There is no meaning of land pooling without housing development. Actually housing development is the second major step of the land pooling techniques. Land Pooling project is one of the most viable urban land management tool because of more advantages and provision of basic physical infrastructure i.e. roads, drainage, sewerage line, water supply etc. which are the life-line of the housing and for sustainable housing.

The research will mainly analyze Sinamangal Land Pooling Project basically on two aspects i.e. as a case study and as an implementation of Housing development. The study will also try to analyze other land pooling areas, which will be beneficial for the application in Sinamangal Land Pooling Area. The relative theories will be studied from literature review to establish housing development at land pooling area. Finally from the analysis, a conclusion and recommendations will be made for a comprehensive approach of planned housing development for future development especially at land pooling projects.

1.2 Need Identification

In the context of rapid urbanization of Kathmandu, the resulting growth of haphazard urban settlements without provisions of even basic amenities such as access road, sewage and drainage system, water supply, etc., numerous land pooling projects implemented in the past appears to be successful as they provide serviced plots with vehicular access to each plot. Moreover, the cost of re-plotting the land and of providing infrastructure is self financed borne by the sale of the reserved plot whereas the commercial viability of the projects is feasible due to increase of land value over the period of project execution. But many of the developed plots lay vacant and housing growth in these is slow. This fact has posed serious question over the effectiveness of the Land Pooling technique itself. The land pooling area is not only for land development activity but it is also for housing activity. There is no meaning of land pooling without housing development. Actually housing development is the second major step of the land pooling techniques.

According to the studies, the residential area increased by 13.7% in 1971 to 30.6% in 1981 to 46% in 1991 in greater Kathmandu (including Lalitpur). PADCO (1986), estimated that the residential land requirement in Kathmandu and Lalitpur is 3849 ha and 720 ha in 2001 as compared to 1569 ha and 378 ha in 1981. The deficit of Housing Unit even to cater present & future population growth of the Valley, 303665 Housing Unit would be required by 2001. However, the attempts by public sector towards meeting the demand could produce only 6% (280 ha) in two decades due to various limitations. In 1998, as 'Joint Apartment Act' was enacted with the need of apartment housing, private sectors are actively involved in producing planned residential development to build community housing.

Although planned development of housing efforts in Kathmandu Valley has been initiated since 1971, the problem of shelter has been the biggest issue every year. "Shelter for all" has been taken as an important component under 8th Five Year Plan (1992-97) and "National Shelter Policy 1996".

However, looking at the land pooling projects with respect to the surrounding areas and in a wider city context in terms of broader development framework and housing development, the way land pooling projects are planned and implemented in the Kathmandu Valley have many shortcomings. Such land pooling projects are yet to address the broader concept of continuity of neighborhood character type housing development.

Nonetheless, these limited efforts of land developments as land pooling and planned residential development for housing by government and private sector respectively need to be reviewed not only to identity the shortcomings in their planning process but also to propose policy and guidelines for new planned housing development to meet the identity of the city (Shrestha, B.K. 2005). Though there is 'Building standards and guidelines' which was formulated by KVTDC in 1975, to have a well planned and organized urban growth, it is not effective in controlling the haphazard development. This study mainly focuses on revision of land pooling projects and to find out the proper guidelines for housing development especially at land pooling area taking one example i.e. Sinamangal Land Pooling Project. This thesis work will be the initial step towards understanding the current state and the role of organized housing development at land pooling area. Understanding

the issues of such housing development is also relevant in understanding the future of the organized housing development in Nepal and that may be one of the options to provide the opportunity towards the development of housing and also the organized pattern of urban housing development in Nepal.

1.3 Assumption

Land pooling area being one of the planned areas (Developed with basic infrastructure) will be one of the suitable areas for the housing development as a second step of land pooling project.

1.4 Objectives

The goal and objectives of the proposed research would be to explore the possibility of a planned housing development in Land Pooling Area in Kathmandu valley.
The specific objectives of the study are outlined as below:

- To review the existing Land pooling project (LPP) and housing development.
- To review some of the literatures of good housing and neighborhood.
- To review the public sectors, policy and implementing LPP.
- To suggest policy measures and strategies for housing development in land pooling areas.

1.5 Scope and limitations

As mentioned earlier, there are several efforts from the government and private sector to solve the housing problem in Kathmandu. New urban spaces have been developing day by day. To have a better understanding on such development trend, the study focuses on revising the Land Pooling Projects completed in the Kathmandu Valley. Three land pooling projects will be studied, which will be selected so as to represent other projects of similar characteristics. Sinamangal Land Pooling area is studied in detail as far as possible. Nonetheless, this project aims to provide a new setting for planned area. The study is based upon the secondary data, published book, articles, papers, manuals and literatures.

1.6 Study methodology and organization

The study methodology used in this thesis can be divided into three broad parts. First, it will deal on identification of the issues and formulation of goals and objectives. Second, the literature review and formulation of an analytical framework comprises of theoretical part of organized housing development, derived from the study of numerous literatures

(books, journals, magazines, internet sources, photographs, maps etc.). Third, it will deal with the case study analysis, which consists of comparative study of different issues to identify numerous strengths and weaknesses of the case studies. A questionnaire survey is also carried out to check the response of the city dwellers. Finally, it proposes theoretical concept, planning and design guidelines for housing development at Land Pooling Area (Sinamangal Land Pooling Project).

Thus the thesis is organized in five chapters. The first chapter introduces the project brief and the needs of such projects in urban development context of the Kathmandu Valley including the scope and limitation of the thesis work. Moreover, it also comprises of the basic aims and objectives of the study including study methodology. The second chapter is the literature review of completed land pooling techniques and housing development. The third chapter mainly presents the review of completed land pooling projects with housing development through haphazard development and the comparative study of case study analysis based on the theoretical framework prepared in chapter two. Chapter four describes the planning and design guidelines for housing development at land pooling area and other detailing. The last chapter consists of conclusion and recommendations including some guidelines to implement the project.

1.7 Project area- Sinamangal Land Pooling

Sinamangal Land Pooling is located at Ward No. 35 in Kathmandu Metropolitan City. Though the total project area comprises of 933-11-3-3 *(ropani-anna-paisa-dam)* land, the *lalpurja* of that place shows only 905-11-3-3 land area. The area has 14-8-0-0 of Parti land and 9-11-0-0 is covered by road. After pooling the land, the total area will be 905-7-0-1 which will include 48-2-3-0 open area having one large open space of land 14 ropani and other two small open spaces of 6 ropani each, 23 ropani for treatment plant and Road having 184-4-2-0 area including 8m & 6m roads and existing roads.

After finishing the land pooling project, 623-7-0-1 land area will be returned back to the landowners, where the landowners will be able to do whatever they want to. They may either use the land for farming or for building construction or for the speculation of land. Rest of the area totaling to 44-5-2-2 will be kept as reserved plot from where the Project can benefit by selling the land in appropriate price.

At present, the first phase of the Sinamangal Land-Pooling Project has been completed. In the first phase, 707 ropanis of land have been developed whereas in the second phase, 256 ropanis of land will be developed. Sinamangal Land Pooling 7 "Gha" comprises of 226 ropanis of land. Sinamangal 7 ka, kha, ga & gha and present KMC-35 had faced problems of haphazard construction. Previous to Land Pooling Project, 20 houses without proper infrastructure and services were already present in the area. This scenario projected the possibility of unplanned and unmanaged development within the area making us realize that proper planning methods have be to adopted at this site.

Boundary of Sinamangal

East - Sinamangal 7"Gha" and Gothatar 8"Ka

West - Tribhuvan International Airport

North - Nhykati VDC

South - Boundary of Pepsi cola & way to Thimi

There is a plot description of all-together - 1707.

Household numbers -1074

Mohi numbers - 410

Unregistered plot - 43.

The land area consists of small streams, kulos and roads making the land visually bigger than it really is.

Plate1. Road

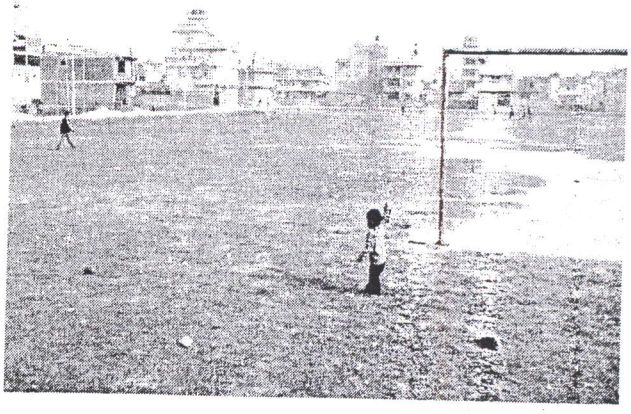


Plate 2. Football ground

Chapter 2

Literature Review

2.1. Urbanization and Growth Scenario (supply and demand of land and housing in Ktm valley):

Nepal opened to the outside world in the year 1950. However, the urbanization process got accelerated only in the last three decades starting with the early 1970's. The urban population, which was just 2.9% in 1952 and lived in the 10, designated urban which grew up to be 3.6,4.1,6.3 and 9.2% in the years 1961,1971,1981 and 1991 respectively and they were distributed among the 33 urban areas. Preliminary results of the population census 2001 shows that 14.23% of Nepal's 23.2 million populations live in 58 designated urban areas (Bhattarai 2003). The contribution of major urban centre like Kathmandu valley is obviously significant. The population of Kathmandu valley is 1571683, out of which 67 % is urban population. From the study of past experience, the urban population in 1981 is 56%, in 1991 is 61% and it is expected to be 76% by 2021.

The population of Kathmandu is escalating at tremendous speed with the growth rate of 6 percent per year. Due to ever increase in population more & more people need to be accommodated and there has been shortage of land & housing in the city. On the other side there has been haphazard & leap-frog development of the land in Kathmandu. Also, conversion of land from agriculture to urban use has been rapid. The residential area increased by 13.7% in 1971 to 30.6% in 1981 to 46% in 1991 in Kathmandu and Lalitpur only. PADCO (1986), estimated that the residential land requirement is 3849 ha and 720 ha in 2001 as compare to 1569 ha and 378 ha in 1981 in Kathmandu and Lalitpur. Deficit of Housing Unit even to cater present & future population growth of the valley, 303665 Housing Unit is required by 2001. Public sector housing is unknown in Nepal, since housing is still considered as an individual responsibility. However, the attempts by public sector towards meeting the demand could produce only 6% (280 ha) in two decades due to various limitations. It shows that majority of land supplied is through the informal sector which is of poor quality in terms of the provisions of basic level of infrastructure. The population of the valley with a growth rate of 1991-2001 in projected to increase roughly by 1000000 by next 20 years, which required tentatively a grassland development density of the valley is maintained not less than 300 p/ha. The land use trend of the valley reveals rapid decline of the agriculture land, which occupied 64% of total land in 1984, 52% in 1994, and les than 42% in 2000. Conversely, non-

agriculture land shows steep increase during the period, which grew from 5.6% in the 1984 to 15.2% in the 1994 to 27.6% in 2000. Between 1984 and 1994, total 7642 hectare of agriculture land was converted for urban use, with average annual conversion of more than 750 hectares. While from 1994 to 2000, total 5738 hectares of agriculture land was converted, with annual conversion of slightly above 950 hectares of land. This shows rapid conversion of the agriculture land is largely caused by residential sprawl. Problem of urban land for housing is becoming a common issue for general public and the planners as well.

Table 1. Required dwelling units for extra increased population by 2021

S.N	Particular	Extra pop	P/household	Required dwelling unit
1	Housing deficit till 2001	492774	5	98554
2	Extra housing needed from 2001-2011	448991	5	89798
3	Extra housing needed from 2011-2021	576564	5	115313
	Total required dwelling units till 2021			303665

Source: TDC

Table 2. Land required for housing between 2000-2021

S.N.	Year	Projected population increase (person)	Projected gross residential density (P/ha)	Gross land required (ha)
1	2000-2011	507224	300	1691
2	2011-2021	576834	300	1923
	Total	1084058		3614

Source: TDC

To cope with the rapid growth of urban population and to provide a planned urban space with provision of basic infrastructure and services, public agencies have launched several land development Projects: Site and Services (S & S), Guided Land Development (GLD) & Land Pooling (LP). Land pooling has become second name for development as the technique of the urban development in new areas in Nepal. Since 1988 eleven Land Pooling projects i.e. Gongabu, Dallu, Nayabazar, Gopi Krishna, Sinamangal, Sainbu, Lubhu, Bagmati phant, Kamal Binayak, Liwali and Sintitar have been launched within the Kathmandu valley and other thirteen projects are to take off in near future.

All the hard work and years' effort exhausted in attaining a planned area would be in vain if the development within the project area is slower to come by with development plots left vacant for long or used for agriculture purpose. And this is what many of the land pooling projects in Kathmandu are experiencing at present. Many of the developed plots lay vacant and housing growth in these is slow. This may be either due to high land value after planning making it unaffordable to those in need, holding land for price speculation, location of the project not being favorable, and so forth. This fact has posed serious question mark over the effectiveness of the Land Pooling technique itself.

So far much attention seems to have been paid in the initial stage of Land Pooling i.e. during design and implementation phase of the project. The work ended with the completion of re-plotting and laying out of physical infrastructures and services. Little or no attentions have been given on what is happening after that. The evaluation of Land Pooling projects after implementation is necessary so as to know how much the project has been successful in meeting its objectives of providing planned urban land in particular and controlling unplanned haphazard sprawl growth of the city in general, what are the problems and constraints in achieving those objectives and what future strategies should be adopted to ensure success.

2.2 History of Planning

Early Age (about 5th century): Before the industrial revolution there was much less problems of land use planning. In the later part of the 5th century an architect Hippodamus from Miletus has been credited with the origination of the idea of the "grid iron". On the very same principle, Athens, in the 4th & 5th centuries was planned with a population of 100,000 to 150,000 respectively. Likewise in Vedic period (up to 400 B.C.), the town planning was done on scientific footing. The principles of town planning are mentioned in some sacred books. In Vishwa Karmaprakash it is stated that "First layout the towns and then plan the houses."(G.K. Hiraskar, Fundamentals of Town Planning, 1997, 2nd Edition). This principle holds good even today. 'Mansara Silpashastra (Architecture by Mansara) deals with many aspects of town planning. Likewise Buddhist period (up to 320 A.D.), An "Arthashastra" wrote by Chanakya, a treatise on Town planning. It states the regulation of zoning depending on community; highways to be parallel to the main cardinal direction i.e. gridiron pattern.

Roman period: The Romans were calculating organizers, skilled engineers and city builders. They solved technical problems in cities. In the planning of public spaces much more attention

was given to the size and number of monuments. But neglect of living style of people, civilization descended in to the dark ages

Medieval age: This age was not so much good for the case of town planning. At that Dark Age, monasteries and churches served as heavens for the human being and were given maximum importance in planning. Then after there was gradual development of trade and commerce during 14th century

The Renaissance: In this time, the basic forms of the city did not change, but the structure was decorated with facades of classic elements. Planning change to create line system, every town and space had its central axis.

Beginning of the Industrial Era: At that period, residential settlements changed to factory towns, creating new problems. But during this period i.e. early day of both centuries, three theories about land use planning were evolved by three eminent (great) town planners.

a) Patrick Gaddes: He suggested the following three main points:

a) Comprehensive surveys before the plan. b) Improve the urban environment by clearing the defective parts rather than demolishing the entire area. c) Proposals for development should be formulated on the basis of a comprehensive approach, i.e. by studying its physical, economical and social aspects.

b) Ebenezer Howard: In 1898, brought in the concept of "garden city ". He propagated the concept of marriage between urban and rural life. He stressed that land use planning should be based on the merits of urban and rural aspects, by creating employment opportunities, provisions of community facilities and services on the one hand, and on the other having an open layout, a green belt between residential and industrial area.

c) Henry Wright and Clearance Stein: Henry Wright and Clearance Stein, in 1920, after taking inspiration from the "garden city " concept, planned a community of Redburn in New Jersey. It was based on a new concept of "neighborhood free from vehicular traffic". All the internal circulation was based on pedestrian paths.

Another giant was Charles –Edourd Jeanneret better known as Le Corbusier says," a city is a living organism ". He says, "Towns are biological phenomena, such as head, heart, limbs, lungs and arteries. Government building like high court, Legislative Assembly, Secretarial, Raj

Bhavan Constitute the head; city center with commercial buildings and shops represent heart; industries and educational institutions represent limbs; park, playfields, greenbelt are the lungs; roads footpaths are the arteries. "He advocated the following principles of town planning:

a) Core of the city should be decongested by removing the excess of population and should be inhabited at the outer countryside in satellite towns that are linked to the main city. b) Provision of speedy transportation. c) Provision of plenty of open spaces. d) Population control.

First World War: At that period, creation of land use became profit motive rather than public welfare. To control of land use, many countries of the world-started land use acts. At United States, zoning regulations started appearing.

Second Quarter Of The present Century (1983, R.G Gupta, planning & development towns):
Some outlines of the "theories at that period were given below:

I) A communication theory approach to (Richard L. Mier, 1961) urban growth.

After studying a lot, Mier concluded that one common element in all these perspectives is "human communication ". He developed a set of requirements for the communication process. According to him there must be (F. Stuart, Chapin, "urban land use planning)

a) A slender b) A message c) A channel d) A receiver e) An attention span on the part of the receiver f) A common language g) Time for the process to take place h) One or more purposes to be served

II) A Framework Emphasizing Human Interactions (Melvin M.Webber; 1964). Mr. Webber deals with the concept of "interactions" and divided into two groups one is, "place community" and the other is "non-place community", or "urban realm". Mr. Webber views the city in three perspectives. First, is a view of the city, in terms of spatial patterns of "human interaction." i.e. the flow of information, people, goods and so on; Second is a view of physical form of city – the space for human activities, the pattern of networks including channels of transportation; and third is the view of the city as an agglomeration of activities classified in different ways, may be by economic functions, social roles etc.

III) A Conceptual System Focusing On Urban Form (Lynch and Rodwin, 1958)

They divide the whole process into three parts:

1) In part one; system for analyzing urban forms, they have given 6 categories:

a) Element types: A category for differentiating qualitatively between basic types of spaces and flow systems;

b) Quantity: A measure of the size of particular types of adapted spaces and flow systems;

c) Density: (of people, facilities, vehicles) per unit of space or capacity of channel;

d) Grain or texture: How various elements of urban forms are differentiated and separated;

e) Focal organization: Spatial disposition and interrelations among key points in the city, like density peaks, dominant building types;

f) Generalized spatial distribution: Patterned organization of space as it might be seen from the air at a high altitude.

2) Part Two: Involves formulation of goals and utilizing the above analytical tools.

3) Part Three: The final aspect is concerned with the application of the goal form statements.

There are other concepts also, like Guttenberg develops a theoretical approach to urban structure and city growth that utilizes accessibility as an organizing concept – calls as "a community's effort to overcome distances. (Albert Z. Guttenburg, 1960)

IV) Concentric Zone concept (Earnest W. Burgess, 1925)

Burgess in the early twenties conceived the city as a series of five concentric zones.

a) Central Business District

b) Zone of transition

c) Zone of working men's home

d) Zone of better Residence

e) Commuter's Zone

V) Sector Concept (Homer Hoyt, 1939)

He gave a theoretical explanation of land use in terms of wedge-shaped sectors radial to the city's center along established lines of transportation. This theory holds that the different income group classes of a city tend to be found in district areas in terms of sectors of a circle from lower to higher income group.

a) Central Business District

b) Zone of transition

c) Zone of working men's zone

d) Zone of Better Residence

e) Commuter's Zone

VI) Multiple Nuclei Concept (Chauncy D. Harris and Edward L. Ullman, 1945)

a) Central Business District

b) Wholesale Light manufacturing

c) Low Class Residential

d) Medium Class Residential

e) High Class Residential

f) Outlying Business

g) Residential Suburb

h) Industrial Suburb

2.2.1 A New Approach to land use planning

For urban use," Land is a site, rather than a factor of production (Hans Blumenfeld, 1962).

If we see the land use in totality in this dynamic age, we find that it is not only either the 'use of the land" (Use of the land "means structure, from and stability of land (soil) which effects buildings, networks, etc.) Or "use on the land" (use on the land" means spatial pattern visible on the land) but a combination of both. There are five basis elements– man, nature, society, structures and networks within the existing and predicted constraints, via, physical, social, economic, administrative and political, is called land use.

Formulation of theory

1) Land use is formed by five basic elements - man, nature, society, structures and networks. The aim is to connect these five elements in such a balanced way (Balanced way – If we see hierarchy in elements, we find that man is primary element, as our main goal is to give him maximum satisfaction. Since man wants both nature and society to survive, so those are at secondary levels. Man and society created for themselves the need for structures and networks, so these are at tertiary level) quantitatively and qualitatively, that the resultant effect gives the man satisfaction to man, whether he is alone, in a family or in a group, in all activities, whether, living, working or enjoying.

2) Man has certain needs (Needs can be considered in many ways :) to survive and satisfy himself. These needs create some conditions/different needs create different condition e.g. for living places, houses, health, hospital, education etc.)

3) These needs and conditions create three types of forces (characteristics of different types of forces (i) Physiological (ii) Texture forces (iii) Directional forces etc.)

Planned shapes (formality in design) i.e. geometric forms of private and public open spaces are four types.

a) Radial Shapes- Radial shapes are generally formal. The scope for flexibility is less, as the radial road pattern is fixed and is not changed without a bold step.

b) Grid iron pattern- Gridiron pattern is derived from the principles of repetition of similar and equal elements (houses, buildings, plot etc.) here the flexibility is also limited, but more than in radial shapes.

c) Geometric shapes- Geometric shape, linear or curvilinear is the most common shapes and is different for different circumstances.

d) Composite shapes- Composite shapes can be made by combining any of the two or more.

2.2.2 The New Urbanism

The new urbanism is concerned with both the pieces and the whole. First it defined by its diversity, pedestrian scale, public space and structure of bounded neighborhoods. Secondly, the entire region should be "designed" according to similar urban principles. It should like a 'neighborhood' be structured by public space, its circulation system should support the pedestrian, it should be both diverse and hierarchical and it should have discernible edges. Neighborhoods are urbanized areas with a balanced mix of human activity. The center of each neighborhood should be defined by a public space and activated by locally oriented civic and commercial facilities. The neighborhood unit of the 1929 New York Regional plan, the 'quartier' identified by Leon Krier, the (1) traditional neighborhood development (TND) and (2) Transit-oriented development (TOD). Both share similar attributes.

The fundamental organizing elements of the new urbanism are

a) Neighborhood: - that are compact, mixed-use and pedestrian friendly.

b) Districts: - of appropriate location and character.

c) Corridors: - that are functional and beautiful can integrate natural environments and man made communities into a sustainable whole.

New Urbanism includes a) Neo- traditional town planning b) Pedestrian pockets c) Transit-oriented developments) Complete communities e) Lasting communities –Livable, Affordable, Safe, Transit-oriented, Inclusive, Neighborhood growing.

The Newsweek list, describes New Urbanism is;

a) Is to give up big lawns b) Bring back the corner store c) Make the streets skinny d) Drop the cul-de-sac e) Draw (urban growth) boundaries f) Hide the garage g) Mix housing type h) Plant trees curbside i) Put new life into old malls j) Plan for mass transit k) Link work to home l) Make a town center m) Shrink parking n) Turn down the lights (use more smaller street lamp rather than fewer larger ones o) Think green (don't pave the planet)*(Adler 1995)

2.2.3 Urban expansion – neighborhood

Neighborhood, one of the fundamental organizing elements of the New Urbanism is urbanized areas with a balanced mix of human activities (Andres and Elizabeth 1994). Neighborhoods are important places of socialization, which provide a basis for informal and formal education, beliefs and citizenship as a means of providing identity and security for people. They provide and foster a sense of community by being 'home' for people, where different experiences and social vales are shared. They are places of recreation where well-designed streets, parks, truly public squares, natural areas and school yards provide for play, stress reduction, and entertainment, while nurturing people's meaningful relationships with their place (Kalpan 1989). Neighborhoods are largely comprised of housing, the single greatest urban land use, and therefore are populated and vital places. They also tend to guide the fabric or pattern of cities and provide a basis for identity and socio-cultural sustainability in urban settings.

A good neighborhood design should have following attributes, viz (i) the neighborhood should have a center and an edge, (ii) the optimal size of a neighborhood is a quarter mile from the center to edge, (iii) the neighborhood has a balanced mix of activities – dwelling, shopping, working, schooling, worshipping and recreating, (iv) the neighborhood should have fine interconnecting network of streets defining building sites, and (v) the neighborhood gives priority to public space and to the appropriate location of civic buildings (Andres and Elizabeth 1994).

Others have emphasized on (i) size and scale (population shall range from 500 to 10,000 or minimum of 150 dwelling units), (ii) clear boundaries (boundaries created by major thoroughfares, distinct land uses, gateways and greenbelts), (iii) common land and resources (community gardens, community centers, parks, squares and schools, etc.), (iv) security (degree to which streets and open spaces are public, guided by density and land use character too), and (v) diversity (mixed land use allows people to interact with others and brings

sustained life and vitality). Neighborhoods should be compact, pedestrian-friendly, and mixed-use.

2.2.4 Urban expansion - housing standards

Housing: As Amos Rapoport (1969, p.28) has elaborated, "The house is an institution, not just a structure, created for a complex set of purposes. Because building a house is a cultural phenomenon, its form and organization are greatly influenced by the cultural milieu to which it belongs. ... if provision of shelter is the passive function of the house, then its positive purpose is the creation of an environment best suited to the way of life of people - in other words, a social and cultural unit of space."

The idea of a settlement as a social control mechanism, so strong in traditional cultures at least, may no longer apply with as much force in a society with the formalized and institutionalized control systems of today..... The link between culture and form is weakened due to the fast development of technology and widely application of them without particular concerns to a given context..... As a result, housing forms and patterns are internationalized, neglecting the local culture that has accumulated indigenous customs and habits. (Rapoport, 1969, p.22-44)

Housing standards are the recommended or mandated minimum levels of physical parameters or performance criteria that a style and decent housing should have in a given context. Standards imply certain means of quality control, and thus are "An established criterion or recognized level of excellence used as a determinant of achievement" (Bear, 1977:71) mood, outlines the objectives of the minimum housing standards to be "Necessary to safeguard the health and welfare of the occupants of the dwelling and the persons residing in the vicinity of the dwelling" (Mood, 1969:4). Housing standards may be operational through a varying combination of public policy instruments, such as land use, zoning, building codes, design standards and other forms of regulatory controls. Following table provides a view of various controls that generally make up the housing standards.

Table 3. Spectrum of controls covered by housing standards

Control	*Achievement target*	*Sample Indicator*
Subdivision		
Zoning	Overall living environment	Types e.g. residential
Street width/Intersection	Accessibility	Width, Turning radius
Utility easements	Provision of maintenance of	With, % of the project are

	infrastructure	
Overall layout & lot design	Efficiency, Economic	Depth/Width ratio, Block lengths, Nodes/ha
Land use commercial	Cross subsidy, Mixed use	% of Uses: e.g.,
Density	Adequate services	Persons or D.U./Ha
Floor area ratio (FAR)	Traffic generation, Infrastructure Adequacy	Pure number/total floor
Open space Ratio (OSR)	Light, Ventilation	% of plot Area
Set-backs	Lighting, Ventilation, Non-encroachment	Meters, Feet
Dwelling		
Design	Good urban design, Aesthetics	Samples, Proportions, Patterns, Scale, height
Occupancy rate	Health, Comfort	Area/Person
Structure	Safety	Codes
Light	Amenity	Set-backs, Openings
HVAC movement	Comfort, Amenity	Temperature, Air
Materials	Safety, Quality	Specifications

Source: Adhikari A, 1998, Urban and Environmental Planning in Nepal; IUCN Nepal, Kathmandu.

Characteristics of housing standards should be based upon the following fundamental criteria.

1. Health and safety. Adequacy and quality of space, proper hygiene and security from fire structural integrity.

2. Comfort and convenience and cultural validity, climatic effectiveness, accessible public facilities, culturally responsive spatial organization, pleasant environmental and dwelling aesthetics:

3. Realistic norms and economic efficiency

4. Affordability, feasibility, low cost.

So housing ensures health, safety, fire & earthquake security, and cultural amenities.

Following table comparative characteristics of different housing types compares the salient features between traditional and modern approaches categorized between institutionally planned and spontaneous (private, sometimes informal) housing in Kathmandu.

Table 4. Comparative characteristics of different housing types

Components	*Traditional*	*Planned*	*Spontaneous*
Subdivision			
Overall Density	400-1000 P/ha	150-300 P/ha	200-250 P/ha
Open Space	10-12%, But well linked	8% Centralized	< 5% Low
Layout	Non-linear, Courts, But orderly	Geometric, Detached	Irregular, Disorderly
Plot sizes & Shapes	Assembled, 100 m^2	Independent, 100-300 m^2	48-127 m^2, Unorganized
Orientation	To all sides, due to court	Arbitrary	Arbitrary, but mostly southern
Access	Pedestrian	Vehicular	Often uncomfortable
Infrastructure	Communal taps, No Sewerage	Sewer connection	Septic tank, Pit, Latrine
Dwellings			
Spatial Configuration	Vertically structured	Modern Style	Modern style
Appropriate habitable	80 m^2	70 m^2	20-60 m^2
Area			
Typologies	Court yard, Common wall	Detached, row	Detached
Style	Traditional	Modern	Modern
Floor	Timber, mud	Concrete, brick	Brick
Wall	Adobe brick	Brick on cement mortar	Brick on cement mortar
Roof	Clay tiles	RCC, CGI, Tiles	RCC, RBC, CGI
Openings	Timber	Timber, metal, Glass	Timber, metal, Glass
Insulation	Climatically effective	Climatically ineffective	Climatically ineffective

2.2.5 Theoretical Framework

Urban planning is not the new word introducing among us. It was started from very earlier age and up to now. But some of the principle may be varied. According to new urbanism, the fundamental organizing elements are a) Neighborhood b) District and c) The corridor.

New urbanism was more defined by the various elements of bounded neighborhood and it should like a neighborhood. Neighborhoods are urbanized areas with a balanced mix of human activity; Districts are areas dominated by a single activity; Corridors are connectors and separators of neighborhoods and districts;

A good neighborhood should be designed as

a) There should be defined edges (i.e. urban growth boundaries)

b) The circulation system should function for the pedestrian (i.e. supported by regional transit systems)

c) Public space should be formative rather than residual (i.e. preservation of major open-space networks)

d) Civic and private domains should from a complementary hierarchy (i.e. related culture centers, commercial districts and residential neighborhood)

e) Population and use should be diverse (i.e. created by adequate affordable housing and a jobs/housing balance)

There is some sound guidance on the issues in "Inner City Regeneration and Good Design", written for the Royal Fine Arts Commission in 1998 by Tony Aldus. Some of the principles are:

a) In relation to buildings, landscape and public places, a sound mechanism for maintenance is crucial to preserve both amenity and investment.

b) Landscape should be a key ingredient in the early preparation of a design framework for a development structure plenty can be the 'glue' that 'holds the cityscape or landscape together.'

c) Defensible space should be high on any design checklist. It is no use producing a good-looking building or landscape if it has pockets of indefensible that are an invitation to crime and vandalism.

d) Conservation should be regarded as on integral part of planning process, on a par, with, for instance, density-not as 'the cream on the top'.

e) Continuing public involvement is the pre requisite for good appearance and amenity, especially in housing poor communication is a recipe for disaster in urban regeneration projects.

But in practice, New Urbanism Means, (Gabon & Lewisburg 1997)

a) Designing communities with a connected and permeable public framework of street and open spaces as the main structuring element of the community.

b) Facilitating easy movement through all parts of the community by foot, bicycle, public transit and automobile, without favoring any particular mode.

c) Fostering community activity through ensuring the buildings enhance pedestrian comfort in the way that they relate to the public streets and thereby providing an attractive, safe and inviting public realm.

d) Accommodating and integrating a diverse and wide range of land uses, densities and building types within each neighborhood to include the full range of activities found in any healthy community, and to facilitate the provision of public transit.

e) Integrating he natural environment into the new community; and

f) Creating universally accessible public open spaces and community institutions that provide a sense of place and act as landmarks of community identity (Gabon & Lewisburg 1997)

Good city form (By Kevin Lynch)

There are five vital points for good neighborhood in brief:

a) Vitality (Diversity / lively) b) Sense (Sense of community) c) Fit (Surrounding communities fit) d) Access (Socially and Economically) e) Control

Aside these, there is another one is Efficiency and Justice.

Kevin Lynch (Image of the city)

There are five vital points as a network for good neighborhood in brief

a) Paths b) Edges c) Districts d) Nodes e) Landmarks.

First, paths are channels by which people move along in their travels. Examples of paths are roads, trails, and sidewalks. The second elements, edges, are all other lines not included in the path group. Examples of edges include walls, and seashores. Next, districts are sections of the city, usually relatively substantial in size, which have an identifying character about them. A wealthy neighborhood such as Beverly Hills is one such example. The fourth element, nodes, is points or strategic spots where there is an extra focus, or added concentration of city features. Prime examples of nodes include a busy intersection or a popular city center. Finally, landmarks are external physical objects that act as reference points. Landmarks can be a store, mountain, school, or any other object that aids in orientation when way-finding.

A well-formed city is highly reliant upon the most predominant city element, paths. Examples of well-designed paths may include special lighting and having clarity of direction (not being comprised of confusing or ambiguous turns). Similarly, edges, districts, nodes, and landmarks

are favorable contributors to imageability if they are meaningful, distinct, and not confusing. These elements, when placed in good form, increase human ability to see and remember patterns, and it is these patterns that make it easier to learn.

But features of the standard neighborhood often returned to as 'traditional neighborhood design', which include grid iron systems and narrower road widths, smaller lots, use of curbs and sidewalks and car access to houses from rear lanes (BCMMAH 1997)

In neighborhood "Greater emphasis is on the community rather than private or isolated values (Newman 1996).

To create a 'Sense of place' and foster connection among people, the physical characteristics of neighborhood must draw people together and encourage on atmosphere of peace, security, and pride among residents of a community. For thoughtful buildings design, clean streets, gardens and trees, and places to gather can create a village-like atmosphere even in inner-city neighborhood.

Closeness to nature and integration of ecology into community living means closeness to other people.

True and rich community is a mix of young and old, rich and poor, men and women of varying ethnicity and abilities sharing their lives.

Community facilities include Educational facilities like day-care center, nursery school, kinder garden schools etc., Religious facilities like church, temple etc., Social and cultural facilities like multi service center, health center, social center etc. Recreational facilities like neighborhood space, Community space, home-oriented space, playground, play lot, mall, plaza, etc, Recreation areas like Mini Park, Neighborhood Park, Community Park, neighborhood shopping etc.

In briefly, principles of Neighborhood planning occur;

a) Size: - The town is divided into self-contained units or sectors and further divided into smaller neighborhood unit.

b) Boundaries: - The unit should be bounded on all its sides by main road, wide enough for through traffic.

c) Protective strip/minor green belt: - These protect to neighborhood from annoyance of through traffic and to provide suitable facilities for developing parks, playgrounds and road widening scheme in future.

d) Internal streets: - It is designed to ensure safety to the people and the school going children in particular should circulate throughout the unit with easy access to shops and community center. No thorough traffic is allowed.

e) Layout of buildings: - To encourage neighborhood relation and secure social stability and balance, houses to suit the different income groups should be provided such as single family houses, double family houses, cottages, flats etc.

f) Shopping center: - Each shop should be located on the circumference of the unit, preferably at traffic junctions and adjacent to the neighborhood units.

g) Community center: - Each community will have its center with social, cultural and recreational amenities.

h) Facilities: - These include primary school, temple, club, retail shop, sport center etc. these should be located within 1 km in the central place so as to form a nucleus to develop social life of the unit.

Physical Form and spatial character

Streets and urban spaces are nonexclusive, available to all and held as community property. They can be defined by walls (building walls, trees along the pathway, etc), Floors (length and width) and ceiling as sky, framed by building lines.

To serve as outdoor room and to achieve sense of enclosure and human scale, there should be1500m (site) length of the street with open space (nodes) with intervals of 200-300m. Maximum distance for people to see other people or events is 70-100m (230-330 ft). Whereas the maximum distance for body gestures to be distinguished is 450 ft. The ratio of building height to the street (urban plaza) width should be 1:2(strong definition), 1:3.3(ok), & >1:5(sense of definition is lost). Similar buildings materials with similar façade detailing with uniform rooflines (building heights) contribute a greater sense of enclose. Narrow opening on the urban space from the street and having entry and close points in the streets are desirable.

As a social context streets and urban spaces are not only means of access (or path) but are the public places for multiple activities for different age groups. There should be required amenities such as benches, lighting, etc. with facilities such as transportation linking other places, food and beverage provision including emergency facility. Mixed land use, high density, configuration, etc enhance street users.

As a safety and comfort context, protection should be given for pedestrians from vehicular traffic, sun & rain and thefts, drug traffickers, etc.

Table 5. Physical dimensions as criteria which to study urban streets and spaces

Physical dimensions		
Volume	-Massing and enclosure -Dimensions -Shape and configuration	-Public space (open) -Public space (covered) -Semi-public space (enclosed) -Lines of enclosure
Ground plane	-Level changes -Subdivision of space -Finishes	
Overhead plane	-Definition of ceiling plane -Relationship of overhead plane to ground/vertical plane	
Vertical plane	-Building frontages -Walls and facades	
Permeability	-Physical -Visual	
Level of complexity and detail	-Variety in sizes of elements -Variety in detailing and material	

(Source: C.K. Chang and V. Chan, 2000)

Table 6. Microclimate as criteria by which to study urban streets and spaces

Microclimate	
Sun	-Solar studies -Glare -Natural lighting
Wind	-Wind path -Airflow/air changes -Natural ventilation -Mechanical ventilation -Spill-over cooling for air-conditioned spaces
Trees	-Shade
Water	-Evaporative cooling
Specialized shading elements	-Awnings -Umbrellas -Screens
Sound	-Noise levels
Smell	-Auditory stimulation levels

(Source: C.K. Chang and V. Chan, 2000)

Table 7. Amenities as criteria by which to study urban streets and spaces

Amenities		
Furnishing	-Fixed	-Seating -Tables -Telephones -Automated cash machines, etc
	-Semi fixed	-Shop displays -Stall-front glass cabinets
	-Non-fixed	-Dustbins -Pushcarts, makeshift stalls (cobbler station etc.) -Seating and Tables
Food and beverage provisions	-Stall/vender -Retail outlet	-Kiosks -Pushcarts -Survey counters -Dispensers
Covered pedestrian facilities	-Walkways	-Height and Width -Continuity -Weather protection

(Source: C.K. Chang and V. Chan, 2000)

Table 8. Activities as criteria by which to study urban streets and spaces

Activities		
Circulation	-Vehicular: primary, secondary, tertiary -Pedestrian: primary, secondary, tertiary -Main flow of traffic -Routes and connections -Main points of entry into the area	
Pedestrian use and activities	-Dynamic-active: main and secondary routes, intensive nodes -Passive-static -Types of activities	
Uses/activities	-Variety of different activities in each area	-Passive: standing, sitting, eating, talking, sleeping -Active: walking
Land use	-Land use at district level -Tenant mix: retail, commercial, parking and services, Institutional/public, food and beverage, office	-Number of types -Mix of use
Public/private nature of space/use	-Boundaries of public access	

(Source: C.K. Chang and V. Chan, 2000)

Analytical Framework

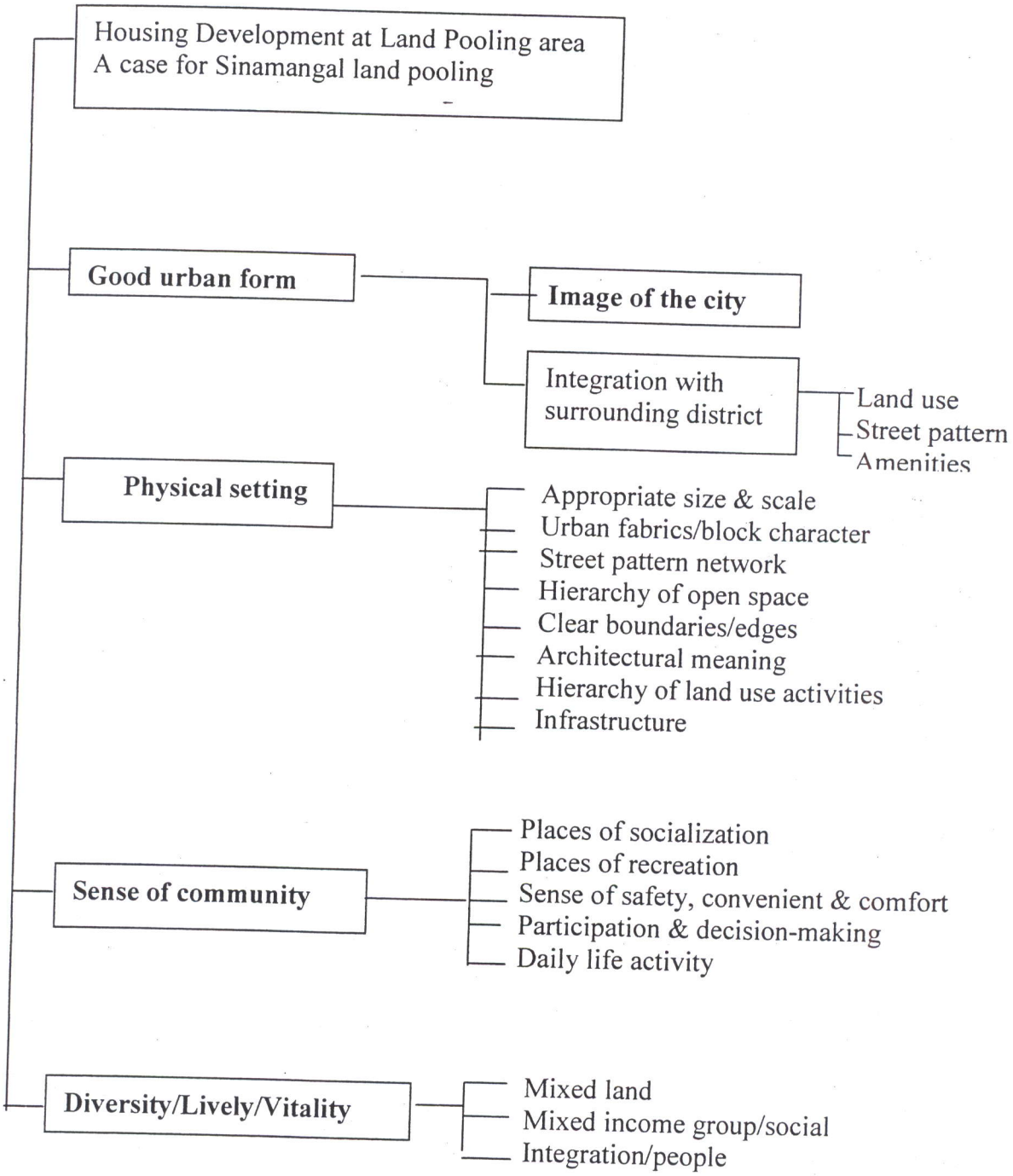


Fig. 2 Analytical framework of Housing Development

2.3 Land Development

Land is the primary pre- requisite for any planning scheme. Land development is a method of changing the current land use for other purposes. The land in Nepal is mostly private ownership.90% of the land for housing is still being supplied by private sector and hardly the remaining 10% is catered by public agencies through land development tools. Most of the private land development either organized or formal is limited only on land fragmentation and the selling of the divided plots without any planning framework.

2.3.1 Land Development Process in Kathmandu Valley

Land development process in valley and the rest of the country is carried out under two initiatives:

- Private sector

  Informal private sector –individual plots are bought and sold in which houses are built.

  Formal private sector- large chunk of land is bought and clusters of land developed
- Public sector

2.3.2 Land Development tools

Once development begins, the process is difficult to stop. Often the interests of those who have already constructed buildings are to defeat the efforts to introduce urban planning. As development proceeds these trends become more difficult to reverse and ultimately result in a very poor urban environment that is overcrowded, unhealthy, uneconomic and very expensive to service. Various methods have been developed to improve the ill effects of development, which are: a) Sites and Service b) Guided Land Development, and c) Land Pooling

2.3.2.1 Sites and Service

Site and Services refer to the process of assembling raw land and convert it into fully serviced plots before selling it to the beneficiaries with or without any subsidy. It was developed to provide the serviced plots for housing to low –income groups in developing countries. The government acquires publicly owned land or private land and provides the necessary infrastructure after replotting the plots. Three sites i.e. i) Kuleswor (26.5ha) ii) Dallu (17.5ha) and iii) Galfutar (11ha) were identified for this program. Kuleswor and Dallu projects were started simultaneously in 1977 while Galfutar was in 1982. However, due to the resistance

from the landowner, Dallu was later converted in land pooling. These projects were targeted to supply the housing plots for civil servants and employees of the government corporations who did not own a house in Ktm valley.

Table 9. Initial site & service

Project name	Total area	Household to be served	Project Start	Project Completion	Executing Agency
Kuleswor	26.5 ha	664	1978	1990	KVTDC
Galfutar	11 ha	511	1978	1990	KVTDC
Dallu*	17.5ha	779	1978	2001	KVTDC

Source: KVTDC

2.3.2.2 GLD

Guided Land Development (GLD) was formulated in Jakarta in 1970 for the development of urban fringes. It was devised as a technique to enable the government to guide the haphazard development of private land around Jakarta. It is a process in which landowners participate in the land development process by voluntary contribution of the part of their land as per prior agreed upon layout plan for road and other public facilities. The government becomes a facilitator and provides a technical support and construction of infrastructure e.g. Road, drain, water supply, electricity etc. GLD is the appropriate tool for the urban fringes having potential for urban expansion but lacking access roads. It is basically applied for widening the roads. About 118 km. roads have been opened in Kathmandu, Lalitpur and Bhaktapur by this program out of 472km of design.

2.3.2.3 Land Pooling

Evolution of Land pooling in the world and Nepal:

The concept of land readjustment (land pooling) was used by President George Washington when he formed an agreement in 1971 with the landowners of the site where the city bearing his name was to be developed. A legal framework was first introduced with the Lex Addickes in Frankfurt-am-Main, Germany, in 1902. Different forms of land readjustment exist in many countries including Germany, Japan, Taiwan Province of China, Republic of Korea, Western Australia (land pooling), India (plot reconstruction) and Indonesia. In Japan, about 30% of the

urban land supply has been developed by land readjustment whereas, in the city of Nagaya, 77% of all habitable land has been developed by this method (UNCHS, 1987).

The land readjustment in Nepal was introduced in 1975 with the initiation of Chiple Dhunga (13.5ha) project in Pokhara. Gongabu Project (14.5ha, 1988) was re-initiated the concept of land readjustment in Ktm and can be considered as a pilot project in the country. In 90's, 11 more projects were implemented in Ktm. valley covering total area of 360.65ha with an average of 30ha/project.

Components of Land Pooling:

1. Consolidation of separate landholdings with the consent of majority of landowners and leaseholders
2. Re-plotting design of land into building lots with the provision of road networks, open spaces as prescribed by the specific rules and regulations
3. Construction of roads and public utilities networks and selling plots to recover the development cost.

Land pooling; one of the most Viable Tools:

Land Pooling project is the one of the most viable urban land management tool among the other two types i.e. Site & Services and guided land development in Nepal because of following merits.

- The project is completely community oriented and implemented with the coordination of the community.
- Huge amount of initial fund for land acquisition for project is not required as land is freely contributed for necessary roads, open spaces and other community.
- It is run by the fund arranged by selling reserved service plots contributed by the community.
- The indigenous people will not be displaced and will be benefited from the project.
- Social structures will not change provided that they do not sell their plots to other community.
- The project is transparent to the community.
- Government acts as facilitator.
- Optimization utilization of urban land.
- It helps to supply improved plots for housing in the market.

- Plots can be made available for low-income group also.
- Urban services and facilities are equally available to all in the project area.

Completed land pooling projects in Kathmandu valley:

Eleven Land Pooling projects i.e. Gongabu, Dallu, Nayabazar, Gopi Krishna, Sinamangal, Sainbu, Lubhu, Bagmati phant, Kamal Binayak, Liwali and Sintitar have been launched within the Ktm valley and other thirteen projects are to take off in near future. LP area is given below:

Table 10. Salient features of land pooling projects in Kathmandu valley

Project	Location	Duration					Land Use (%)					Plots by size		Management Com. Headed by	Remark and Legal basis
		Start	Complete	Area (ha)	No. of holding	No. of plots	Open Space	Circulation	Commercial	Contribution	Residential	Min. (m2)	>min. (m2)		
Gongabu	KMC Ward 29	88	96	14.3	376	406	5.2	17.5	6.9	29.6	70.4	80.0	varies	Mayor	TDC Act 1988
Sainbu	Lalitpur District Sainbu VDC	91	03	27.6	536	611	12.9	22.8	20.3	56	44.0	126	"	DDC Chairman	Land Acq. In 1976 & TDC Act 1988 6% for O.S & 6.9 % for school, market & office area
Lubhu	Lalitpur District Lubhu VDC	93	96	13.5	207	243	4.4	17.9	9.0	31.3	68.7	80	"	DDC Chairman	TDC Act 1988
Libali	Bhaktapur Ward no 1&2	95	98	33.9	667	794	2.8	23.6	7.1	33.5	66.5	126	"	Mayor	" "
Dallu	KMC Ward no 15	91	03	19.80	455	698	7.0	25.0	8.0	40.0	60.0	80	"	Mayor	S&S Proj. in 1977 TDC Act 1988
Kamal Vinayak	Bhaktapur Ward no 4	91	95	7.3	170	205	4.2	21.5	6.8	32.5	67.5	80	"	Mayor	TDC Act 1988
Gopikrishna	KMC Ward no 7	95	02	8.9	242	259	3.8	22.7	7.00	33.6	66.4	80	"	Mayor	TDC Act 1 988
Nayabazar Khusibu	KMC Ward no 16&17	95	03	44.3	1569	1312	4.0	22	4.00	30.0	70.0	80	"	Mayor	TDC Act 1988
Sinamangal	KMC Ward no 35	95	03	35.1	964	660	5.3	20.3	7.00	32.6	67.4	80	"	Mayor	Do
Sintitar	MT Municipality Ward no1&3 (Bode)	96	03	26.5	812	871	3.4	18.8	10.0	32.2	67.8	126	"	Mayor	Do
Bagmati Corridor	LSMC Ward no 10	92	01	9.8	239	258	-	19.0	2.70	21.7	78.3	80	"	Mayor	Do

Source: KVTDC. As of March 2003

Table 11. Land Pooling Projects on Pipe Line

S.N.	Area	Area (Ha)	Plot no	Present stage
1.	Nayapati, VDC, Ward.no.4&6	30.5	1600	Reserved
2.	Gothatar,Kathmandu	53	2850	Feasibility study completed
3.	Kamal Binayak,Bhaktapur	28.5	1600	Feasibility study completed
4.	Harishidi Satelite Town,Lalitpur	827	40,000	Preliminary planning report completed
5.	Tusal, Kirtipur, Ward.no.8	51	2800	Reserved
6.	Ichangu VDC, Ward.no. 6,7,8 &9	142.5	6000	Preliminarily planning started
7.	Nepaltar,Manamaiju VDC	25.5	1400	Feasibility study completed
8.	Kapantar,Kapan VDC Ward.no. 2	14	800	Reserved
9.	Bagamati First Stage,Kath,Ward no. 6 & 8	51	2800	Preliminary planning going on
10.	Kamerotar,Madhayapur,Thimi	46	2520	Consultant being appointed for Preliminary
11.	Chamati, Kathmandu	73	3170	Preliminary planning going on
12.	Dhumbarahi South Area,Kath,Ward no. 4,5 & 7	39.5	2160	Preliminary planning going on
13.	Chikhu Hanuman Ghaat,Kirtupur Municipality	5	280	Preliminary planning going on
14.	Manahari, Madhayapur,Thimi Bhaktapur	98		Preliminary planning going on

Source: Land Pooling, Ministry of Physical Planning and Works, Department of Urban Development and Building Construction, Babarmahal, Kathmandu

Comparison of Urban Financing between Government Budget and LPP Investment:

Table 12. Salient Features of Land pooling Projects in Kathmandu Valley

	Land Pooling Projects	Area (ha)	Length of		Area For Open Space (ha)	No of Residents Plots (Units)	Contribution	Projects
			Road (km)	Drain (km)			%	Cost Recovery (NR) as of July2002
1	Gongabu*	14.33	5.941	10.3	0.716	406	14-46	6,98,29,599.00
2	Lubhu*	13.50	3.705	6.0	0.580	243	18-32	1,81,61,345.00
3	Kamal vinayak*	7.32	3.200	4.90	0.304	205	28	86,40,000.00
4	Bagmati corridor*	9.80	9.410	2.50	-	258	18-33	95,89,772.00
5	Liwali *	33.95	9.503	9.503	1.17	794	12.5-38	5,77,29,056.00
6	Sintitar **	26.50	8.834	8.834	0.635	871	12.5-38	8,74,92,325.00
7	Sainbu*	27.6	7.22	7.22	0.65	611	44	27,09,22,938.00
8	Dallu*	19.8	8.415	7.90	0.70	698	40	12,70,.06,281.00
9	Nayabazar*	44.25	17.10	23.00	1.64	1,312	16-24	27,77,78,835.00
10	Chabahil *	8.85	3.385	3.385	0.16	259	12.5-54	4,18,00,000.00
11	Sinamangal **	35.07	11.657	10.00	1.65	660	12.5-37	10,91,29,818.00
Total		240.97	88.37	93.542	8.205	6,317		1,07,80,79,900.00
Equivalent in US$ (1 US$=78NR)								US$13,821,538.00

Source: KVTDC, *Completed, **Being Completed

Table 13. Some Characteristics of the Land Pooling Projects:

Particulars	Value
Total Area of land contribution for physical infrastructures	62.658 hectare
Total Project cost	US$ 13,821,538.00(100%)
Project management cost	US$1,382,153.80(10%)
Infrastructure Development Cost	US$ 12,439,384.00(90%)
Value of land Contributed (@US$112,676/ha or NR 80,00,000/ha)	US$ 7,060,280.00
Total value of land Contribution by land owners and tenants	US$ .21,408,417.00

Source: KVTDC

Resource Mobilization on land pooling:

Within the project areas of 242.0 ha, the projects succeeded in mobilizing resources to finance;

- 90.39 km. of road of various categories
- 107. 67 km of drainage, water supply networks, electricity distribution lines
- Other community needs Viz as open spaces, community building
- Total Finance = 1119 million Nepali Rupees (NR)
- Average contribution for open space = (0-7 %)
- Average % plot returned back = 70.0 %

Initial Impacts of land pooling:

- The projects initiated in early nineties were successfully completed in 1996 and onwards
- The projects helped to improve the urban environment by discouraging the sprawl growth
- Providing infrastructure and services in the most economic way of controlling the design of the living environment within the project area.
- It increased the access of the people, including the poor, to serviced land for housing ensuring social justice
- Good to recapture the unearned income and offered an alternative to finance urban infrastructure.
- Speculative tendency looking for a better financial return hindered partnership formation and timely provision of infrastructure and services
- Instead of ensuring planned development of the valley with the timely provision of infrastructure and services the haphazard development continued to grow.
- The government line agencies were not keen in providing services to these projects on time.

Lessons learned from land pooling:

- Has a potential to planned provision of urban infrastructure
- Contribute to the improved living environment for the people by increasing the supply of urban land without external investments

- Public policy needs to be improved to speed up the supply of urban lands
- A more explicit policy on privatization, partnership building, and procedures for negotiation are required for smooth management of the project.
- Such projects would be more useful if infrastructure within the project could be tied up with the city level networks.
- The density of such projects depends upon the government efforts on infrastructure network and economic activities outside the project.
- Eleven Land Pooling Projects were initiated eighties and early nineties.
- Some of the projects were completed in late nineties.
- Limited investment in urban infrastructure in Kathmandu Valley prior to 1988
- Land readjustment as a financing tool for infrastructure provision in the Valley was undertaken in 1988 –1989
- Covers 242 ha of land

2.4 Government Policies and Role in Urban Land Development

The urban development effort is largely dependent upon the Government policy in coping with the increasing rate of urbanization. In Kathmandu valley also, Government policy in regard to urban land development has been the decisive factor for providing adequate supply of land to growing population. This section briefly discusses the existing policies in terms of its favorable provisions in land development activities. For this purpose, provision as spelled out in five years periodic plans, legal, institutional in urban land development is reviewed and analyzed. The findings made in this analysis will form a critical background based upon existing policy context within which the involvement in urban land development can realistically argued.

2.4.1 Government Policy

The Constitution of the Kingdom of Nepal (1991) under article 26-1 provided a guiding provision for the land development related policy, which implies that the state need to pursue a "policy of raising the standards of living of the general people through the development of infrastructures such as education, health, housing and employment of the people of all regions". The Article 26-3 obligates state to adopt a policy of mobilizing the natural resources

and heritage of the country in a manner that shall be suitable, useful and beneficial to the interest of the nation. A close observation of such policies reveals that the government has to pursue the policies, not only in the context of usual development, but also in the context of urbanization and urban development in terms of development of infrastructure (especially education, health, housing and employment opportunities). The national policies in regard to land management as spelled out in the each plan (1992-1997), clearly stressed for resolving the problems encountered in the planned development of the urban settlement and urban environmental protection, involving communities, NGO'S and private sector in the process of urban sector development.

The policy suggested in ninth plan, clearly mentions "encouraging the involvement of communities, non-government institutions and private sector and strengthen the role of government as facilitator and initiator in the promotion of urban sector and making local government institutions (especially Municipalities) fully responsible for urban management including the housing development." The policy also admits the need for promoting support for the infrastructure development in municipalities and towns with enhanced institutional co-ordination.

The current national policy as spelled out in 8^{th} and 9^{th} plans in regard to private sectors involvement in urban land management, however, has to be viewed within the framework of existing urban development policy regarding the legal, institutional and financial provisions.

2.4.2 Urban Planning Policy

Kathmandu valley does not have any specific urban land policy, important essentials of urban planning process. The growth is still organic in nature defying the past planning efforts in incremental basis. Apart from the land use plan prepared in 1973 within the framework suggested in 1968 KVPD Plan, no legally recognized land use planning document is available despite the preparation of number of planning documents by different institutions. Similarly, land administration, another important institutional aspect in the urban planning and implementation process, to a large extent, is still guided by land reform act of 1964. The urban Kathmandu has undergone tremendous development pressure in terms of residential and

commercial land use since then. The lack of legally recognized planning document has resulted into:

- Inefficient use of land (Poor living conditions, haphazard development pressure due to ever increasing urbanization)
- Difficulty in direction the planned development: Declaring or opening up in new town planning area resulting into difficulty in land Market Assessment and difficulty in extension and new provisions of network land trunk infrastructures
- Inconsistency in land subdivision practice in terms of quality and efficiency
- Difficulty in enforcing planning norms and byelaws.
- Overall urban development effort planning

2.4.3 Legal Policies

The legal policies for urban development are translated into various legislation and acts. Among these also, acts that directly influence the urban land development are of three broad categories:

Acts Related to Land Administration:

Government of Nepal enacted Land Reform Act in 1964 to administer all kind of lands in the country according to which "land buyers and landowners are not only the participants in the urban land market in greater Kathmandu but also the land tenants." Since most of the land owned under private land or Raikar ownership, which according to Karki (1991), covered 94% of the cultivated land area or 76% of the valley area, it makes extremely difficulty to resolve issues while getting access to land due to the dual ownership pattern. This provision still exists while the conversion of land forms agriculture use to urban use has been rapid since the promulgation of this act in 1964.

Acts Related to Land Acquisitions:

There are mainly three types of acts, which influence land acquisition process. The first being the Town Development Committee Act (TDC) 1963 which under Sections 6 and 7 empowers Town Development Committees (TCDs) with" quick take authority" for any type of public land acquisition. It contains the important provision dealing with the power to prohibit

construction and transaction activities on acquired land with the help of provision made under Section C; Clause 2(c) of the same act.

The second and perhaps the important act through which land is expropriated by public sector in Nepal is The Land Acquisition Act (LAA), 1977. This act empowers the Government to purchase land for "any public purpose". Between 1977 and 1984, the Government acquired 123 hectares of Land in Kathmandu for various public purposes, including land for housing projects and road extension programs (Chhetri, 1986).

Any HMG agency is authorized to acquire land, and an officer of any HMG institution my initiate a land acquisition proceedings generally under the authority of Chief District Officer (CDO). The process involves the suspension by land revenue officer of any further transactions concerning land after the detail investigation and the compensation of expropriate land is determined by the compensation fixation committee.

The third act that empowers public sector to acquire or requisition of any immovable property within the town planning project area (TPI Act 1973: Section 5) is Town Planning projects Implementation Act (TPPIA) 1973. Section 5 of this act makes engagement on any property transactions, build any structures or tamper with natural cultural resources illegally after this act is made active. This is an important law as it has served as the basics for some of the important institutional structure for urban planning the Kathmandu Valley.

Acts with Directives for Urban Land Development:

There are various acts and legislation related to urban development including infrastructure development, preservation of heritage, solid waste management and resource mobilization, transportation etc. Among them, Town Development Act 1988 and Local Self Governance Act are important for the reasons that they have the direct bearing on urban development in general and land development in particular of town areas in the valley.

Town Development Act (TDA 1988): TDA promulgated in 1989, besides being a comprehensive act for the planned urban development in urban areas, it is also the most important act to date regarding urban land management. The main objectives of this act are to carryout the physical development, redevelopment and of existing town area, establishment of

new towns, preparations of land use and comprehensive plans and enforcement of planning norms and regulations.

The act under Section 3, gives power for integrated physical development of city in reconstruction, further development in any parts of Nepal. The act under Section 12 empowers the Town Development Committees for the initiation and implementation land development for urban housing and development through Guided Land Development, Site and Services and Land Pooling. Under Section 16, it has provision to make use of existing Land Acquisition Acts for the public land acquisitions. The act has guiding provision for the involvement of various actors of urban land development process.

Local Self-Governance Act (LSGA) 1999:

Central government has promulgated LSG Act in 1999 as a policy of decentralization, which entails the spirit and intent to develop local bodies such as municipalities as self-governing autonomous urban local bodies thereby enables them to play effective role in the context of overall urban development in general and improving the living conditions of the town dwellers in particular.

This act has made provision for local government especially municipalities in urban areas empowering them to initiate land development activities. The sub-section (2) of section 111 of the Act, mentions that while formulating periodical and annual development plans of municipal area, the Municipality shall, as per necessity, have to launch plans such plans such as land-use, land pooling and guided land development for making the development of the municipal area balanced and planned.

However, the function of control of unplanned settlement within the municipal area and undertaking land development activities does not include in the functions and duties to be performed by Municipality mandatory rather include in as optional functions only (Sub Section 2d & 2e of Section 96). The land development work as optional function may not get due priority in municipal plan of action (Uprety, 2002).

Town planning Implementation Act (TPIA) 1973:

This Act actually applies only to regional development centers. It is designed for different project areas rather than the whole city areas. However, it has been proved as an important

legislation, as it has served as the basis for one of the important institutional structure for urban planning and urban development in Kathmandu valley.

This Act empowers the public sector to acquire or requisition of any immovable property within the town planning project area. Section 5 of this act makes engagement in any property transactions, build any structures or tamper with natural cultural resources illegal after this act is made active.

In 1976 under this act HMG adopted Kathmandu Valley physical Development plan and formed Kathamandu Valley Town Development Committee and Kathmandu, Lalitpur and Bhaktapur town plan Implementation Committee. Later KVTDC acquired land at three places Kathmandu Valley and launched sites and services for housing development.

Land Acquisition Act (LAA) 1977:

Perhaps the most important act through which land is appropriated by public sector in Nepal is the land Acquisition Act of 1977. This act empowers the HMG and its agencies to purchase land for public purposes and entitle tenants to a 25% share of compensation. Public land acquisition is entrusted to the Chief District Officer (CDO) and a Compensation Committee, which engages in negotiations with landowners. Between 1977 and 1986, the government acquired 123 hectares of land Kathmandu for various public purposes, including land for housing projects and road extension programs (Chhetri, 1986).

However, due to the problems like 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 specified time, the public land acquisition.

Land Reform Act (LRA) 1964:

Government of Nepal enacted Reform Act in 1964 to administer all kinds of lands in the country according to which "land buyers and landowners are not only the participants in the urban market in greater Kathmandu but also the land tenants". Since most of the land is owned under private land or Raikar ownership, which according to Karki (1991), covered 94% of the cultivated land area or 76% of the valley area, it makes extremely difficult to still exist while conversion of landform agriculture use to urban use has been rapid since the promulgation of this act in 1964.

Land Use Regulation:

Until now there is no land use or zoning laws and subdivision regulations for Kathmandu Valley. In fact, there is no systematic legal control over land use although laws do exist covering land registration, land surveying, transfer and taxation. Policies related to land use planning have not been translated into workable programmers.

In 1973, a land use map of the valley, titled 'Kathmandu Valley physical Development plan", was prepared. Then in 1976, the Kathmandu Valley Town Development Committee prepared a series of documents including zoning proposals dividing the urban areas of the Valley into broad land use categories based on the 1969 and 1973 work with the title "Kathmandu Valley Town Development plan". Similarly another attempt was made in 1984 by Kathmandu Valley Town Planning team, with title "Kathmandu Valley physical Development Concept". This report includes land use zoning map of Kathmndu (area only within the ring road) with this title "Proposed Land Use ' and in 1988, Kathmandu Valley (chitrakar, 1999).

In 1991, Halcrow Fox and Associate were appointed as a consultant by Asian Development Bank to prepare a comprehensive plans and programmers for urban development of Kathmandu. It prepared a huge volumetric report incorporating problem identification to recommendations on wide range of urban development issue. Though the document lack comprehensive land-use zoning plan and has not acquired formal approval, some of the new urban development worked in Kathmandu have been initiated in compliance with the recommendations made in this report, such as Naya Bazar Land pooling, Bishnumati corridor development). However, all these land use plans and programmers in the lack of legal backing has not been effective and of any significant use. Hence till now no legal use plan for Kathmandu exist.

National Shelter policy 1996:

In the constitution 1990 of the kingdom of Nepal, the fulfillment of the shelter needs of all the families is taken as a basic need. And accordingly National shelter policy was formulated in 1996. In the face of ever increasing housing need and the cost of acquiring it, the shelter policy basically seeks to facilitate production of dwelling units which is affordable, promote effective mobilization of financial resources, protect the interest of the lower income or shelter-less groups and clarify the role of the government, non-government and privates in the fulfillment of shelter needs.

The shelter policy envisage to increase the availability of dwelling units of proper and suitable value and increase the supply of serviced lands through the implementation of land development programs such as Land Pooling among others. The action packages of the implementation strategy too include initiation and extension of urban land development programs. Increasing the necessary infrastructure services and facilities and expanding the through better coordination between agencies involved participation of private and local people, improved cost recovery mechanism is another important policy measure outlined. The shelter policy also highlights the need to promote mobilization and allocation of financial resources through mobilization of land housing credit delivery mechanisms and development of the process of cost recovery of public investments in land, physical infrastructures and other services. Besides safeguarding the interest of low income group the shelter policy also emphasizes the importance of public and private partnership in achieving its objectives.

2.4.4 Legal Provision for Land Readjustment (pooling) in Nepal:

There is no separate land readjustment law in Nepal. However, Town Development Act 1988 has made provision for the land development programs. Under section 12 of the act (12.1.2) it demands the consent of at least 75% of landowners or tenants to arrange the services and facilities which need to be in harmony with the Town Planning programs by making by selling the developed housing plots and return the remaining housing plots to the original landowner or tenant on proportional basis.

The minimum size of the project to be undertaken as land readjustment is the area where 50 families can be accommodated. The act stipulates to prohibit subdivision, physical changes in the property for a maximum period of two years. The authority is also given to Town Development Board to withhold the transfer of title, through land registration department, for the period not exceeding one year, after all land parcels have been converted into a single plot. The minimum housing lot, 80 sq.m. is fixed for redistribution. The individuals who would have less than the minimum required area after contribution is required to pay the money according to the valuation set by the implementation sub committee. In case, where the landowner is unable to pay, the amount equivalent to his site has to be paid by the committee.

The current legal provision is that the formal land readjustment programs can be launched or implemented by the government body only i.e. town development committee or municipality through the guidance from town development committee. There is no such restriction from the

government or the approvals from the governments is required if the individual or private developers wish to develop the land owned by them.

Analysis of Legal Acts:

An analysis of aforementioned land reform act, land acquisition acts and acts having directives for urban planning in particular revēals various constraints and implication in regard to the urban land development.

Inconsistency of TDCA 1988 and LSGA 1998:

LSGA and existing TDCA contradicts each other on many occasions in regard to the urban land development mainly because both the acts have provision for the initiation of land development programs.

Provision for local government for urban land development as per TDCA, 1988: Under sub Section 12C of TDC Act, local authority can initiate land development program; "if the local body is to operate land development program, it has to obtain recommendation, of the board in place where the board has been constituted and get such programs approved by His majesty's Government." This indicates that the land development plans and programs prepared by local governments needs to be recommended by the board constituted under TDC Act but local government need not necessarily do so as per LSGA 1999.

Provision for local government for urban land development as per LSGA, 1999: Local authorities especially municipalities in urban areas are empowered to initiate land development activities as implied in LSGA 1999, " in formulating the plans, the municipality shall have to launch plans such as land-use, land-pooling and guided land development with or without external consulting services in consonance with directives of National Planning Commission, DDC and suggestions from Ward Committee (LSGA 1999: P16)."

The land development plans made under this act does not need prior approval of TDC creation the confusion as to who will approve them. The LSGA in regard to land development program by municipalities contradicts with LSG Regulation (2000), " special stress for the implementation of guided land development (GLD), land pooling, land use schemes by the municipalities have been given in clause (111) (2) of the LSGA while same functions have

been categorized as optional in clauses 96 (2) (e) (Pradhan, 2000). The land development work as optional function may not get due priority in municipal plan of actions."

The provision made for both the authorities in initiation land development has created legal confusion over functional aspects and legal jurisdiction. The empowerment of municipalities to initiate land development programs within its jurisdiction has implicated the existing role of TDCs' within the municipal domain; which may result into functional overlapping deficient coordination.

The enactment of LSGA has also implicated the institutional arrangement for the urban development sector with the empowerment of local government. The implication in central level institutions is prominent in terms of lack of coordination between Ministry of Physical Planning and Works, responsible line agency of TDCA and Ministry of Local Development, responsible line agency for LSG act. At local level, TDC under TDC Act is responsible for initiating land development within and beyond the municipal area whereas LSG Act also empowers municipality to initiate land development activities within its municipal domain only.

2.4.5 Existing Institutional Arrangements

In the lack of specific government policy in regard to the urban development in general and land development in particular, land development activities have been exclusively carried out by informal private sector. Public sector is also involved in land provisions. The institutions related to urban land development could be broadly categorized into two categories: they are

- Institution Related to Planning and Implementation and
- Institution related to land administration

2.4.5.1 Planning and Implementing Institutions

Within the present setup, land development activities by public sector are largely carried out by TDCs under the Kathmandu Valley Town Development Committee (KVTDC), formed in 1976 under TPPIA, 1973 Act. These implementing committees are co-coordinated by central level institutions like Ministry of Physical Planning and Works and Department of Housing and Urban Development Table provides the name and functions of the institutions directly related to urban development.

Table 14. Institutions with direct responsibility and Highlights of their functions

Institutions	Highlights of functional agendas
Ministry of Physical Planning and Works (MPPW)	To deal with the formulation of policies, planning and their implementation in the areas of physical planning, infrastructure development, urbanization, town development, drinking water and sewage, storm water drainage, road (with the exception of mule tracks) and bridge (with the exception suspension bridge)
Ministry of Local Development (MLD)	To deal with the formulation pf policies, planning and their implementation, monitoring and supervision in the areas of decentralization, local governance, local development and coordination among local government institutions.
National Development Council (NDC)	To provide policy guidelines to the National Planning Commission in the context of all development sectors (including urban sector) and approve national development plan and review the implementation of such plan.
National Planning Commission (NPC)	To prepare annual and periodical national plans, monitor and review plan implementation.
Kathmandu Valley Development Council (KVDC)	To reduce pressure upon Kathmandu valley by: • Developing satellite/small towns • Strengthening TDC's • Introducing integrated approach in term of sector, program and rural-urban linkages to streamline urbanization process.
Department of Housing and Urban Development (DHUD)	To deal with housing and physical planning activities in the context of urbanization process.
Department of Water Supply and Sewage (DWSS)	To deal with the development and management of water supply and sewerage
Department of Roads (DOR)	To deal with the construction and maintenance of different categories of roads (with the exception of mule tracks)
Department of Building (DOB)	To deal with the activities of Building construction.
Town Development Fund (TDF)	To provide the facilities of loan and grants to the Municipalities.
Town Development Coordination Committee	To coordinate the activities of Town Development Committees.

Source: Urban sector strategy, 2000

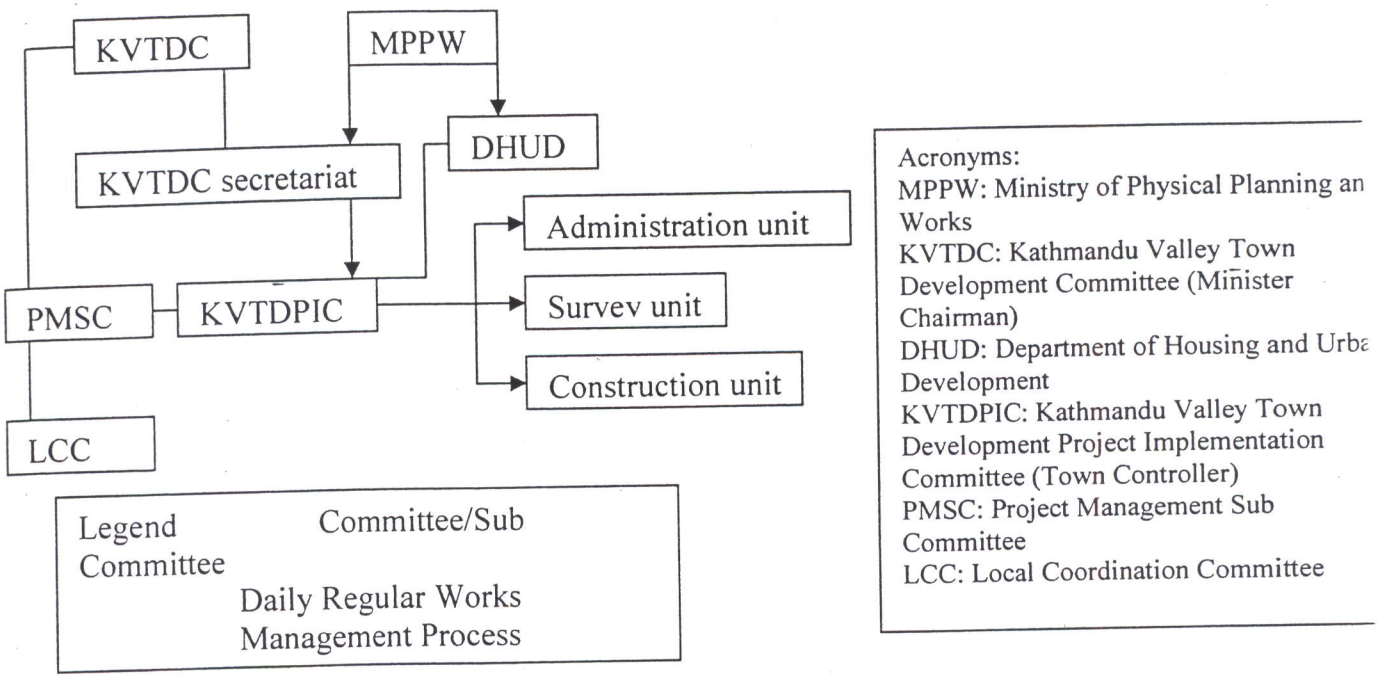


Fig: 3 Existing Organizational Structures for the Land Development Projects

Actors	Policy Provisions	Policy Instruments
• Central Government • Local Government • Land Administration Authorities • Urban Administration Authorities • Private Developer/Corporate • NGO/Cooperatives	• Legislative policy provision • Planning oriented provision • Development related provision • Operational policy provision • Regulatory mechanism	• Joint periodic development plans/legislative system • Master plans/Land use plans, structural plans • Land use regulations • Registration system • Land tenure system • Public interventions, developments & acquisitions • Land taxations/punishment to violators

Private sector's involvement in LDP

Public sector's enabling mechanism through policy provision & instruments

The Outputs: Adequate supply of serviced land for the overall planned development

Fig: 4 Urban Land Development: Actors, Policy Instruments & Outputs

Above Figure shows the organizational structure for the land development projects through land pooling, GLD and Site & Services in Kathmandu Valley within the existing setup. A Project Implementation Committee (PIC) is formed in TDC under the ministry of Physical Planning and Works. The Project Management Sub Committee is then formed under the chairmanship of mayor. The PMSC along with the support committee of the landowners makes the decision and PIC implements it.

The central body, KVTDC secretariat is headed by the member secretary as government appointee and at implantation level, Kathmandu Valley Town Development Project Implementation Committee is headed by town controller/ project manager usually form DHUD.

2.4.5.2 Institution Related to Land Administration

Department of survey and District Land Revenue Offices largely carry out Land administration, which includes cadastral record keeping and land taxiing.

Department of Survey (Napi Bibhag):

Important functions like preparation of cadastral, aerial, topographic and related spatial maps fall within this department's jurisdiction. The department had carried out cadastral survey in 1964 and this map is still used for the land readjustment projects. Another cadastral survey was carried out in 1988 and latest maps including the changes since 1964 were prepared. However it is not still made available to the public use.

This latest survey is expedited to be efficient in terms of details form the land planning and development point of view since the 1964 survey had been carried out mainly for collecting revenues related to land.

Department of Land Revenue (Malpot):

The District Land Revenue Offices still administer a large volume of land subdivision with the assistance from District Land Cadastral Record Maintenance Office. The department is responsible for registration of land and getting revenue form the land registration and tax. The revenue generated s used by central government without municipalities' having any authority over using them.

According to Chhetri (1986), traditionally, land taxation in Nepal has been used exclusively to generate revenues along with the additional purposes including the establishment of claims to land ownership, as most cadastral records; are outdated. Records of land tax payments help verify the property titles for land transfers. There are three types of land taxes used in Nepal:

Land Tax or Revenue Tax:

This tax is levied on both rural and urban land. In rural areas the tax is governed by the productivity and quality. Land is graded according to soil quality and access to irrigation facilities, with different standards for upland and lowland systems. In urban areas tax is assessed on the basis of the proximity to a hierarchy of roads, paths and lanes including access to other infrastructure facilities. The study of annual revenue form land in Greater Kathmandu shows very small collection mainly due to the fact that land holding below one hectare is totally or almost totally exempted from taxation. This one hectares exemption involves the majority of private land holding in the valley.

Urban Property Tax:

The urban property tax is levied on private properties in the urban area. A property subject to this taxation include a house, a parcels of land on which house is constructed. This is levied in an annual basis. A valuation committee is responsible for overseeing the administration of tax in each urban area. The revenue collected from this taxing is very low as the administration of this taxing is very weak. The tax is collected by the Tax Department of the Financial Ministry.

Land Registration Tax:

The land registration tax is levied in almost all land transfers except some exemption on public sector transaction. This tax generates the greatest amount of revenue nationally of the three types of land taxes used in Nepal. The taxation in levied as a percentage of the selling price of the land parcel. At present, the registration tax is levied at the rate of the 4% on total selling price. Both the selling and buying parties shave to pay the registration tax.

Thus the Revenue Department, on one hand, has crucial engagement in collection revenues in the form taxes and fees and on the other hand it has to look after the land transactions by keeping the land records, revenue documents up to date. Thus it had to assume additional responsibility of keeping land record to ensure the ownership and land transactions

constraining its resources in terms of quality especially favorable for the land development by formal public or private sector. "In an average 80% land transactions are carried out through Kathmandu District Land Revenue Office and 20 to 30 transactions in Lalitpur District Land Revenue Office (source; respective District Land Revenue Office, 2000)."

Land Reform (Bhumi Sudhar):

The Ministry of land reform' was conceptualized in order to enforce the land act of 1964. So the primary function of this ministry up to date remains as an authority to set the policies regarding the land taxation, land ceilings, landowners/ tenants relationship and etc. Approval by Bhumi Sundhar is required to remove the double ownership rights on a land property and to establish an absolute property right. A present it is the responsible authority to look after over all land policy in Nepal.

Guthi Sansthan (Guthi Corporation):

Guthi Sansthan is responsible for managing the government Guthi land all over the country. Both institutions, Bhumi Sudhar and Guthi Sansthan, play major roles in land readjustment when land parcels of project area have dual ownership or having Guthi land.

2.4.5.3 Analysis of Institutional System and their Functioning:

The institutional arrangements and their efficiency for undertaking land development activities b different sector has been constrained due to various reasons. These reasons could be defined as confusion due to the legal inconsistencies in planning legislative, inefficient functioning of land and cadastral information system.

Incompatible Planning Legislations and its Constraints:

The present set up of planning and implementation institutional arrangements of for urban development in general and land development in particular has been subject of critical review especially in the light of he conflicts arising from the two planning legislations, TDC Act 1989 and newly enacted LSG Act 1999. The LSGA and its rules have empowered the Municipalities to formulate their annual and periodic plans following the participatory bottom-up planning approach; while TDCA and KVDA Act has authorized the TDCs and KVDA to formulate their respective plans for the physical development of a town, reconstruction, extension and

development of existing towns., determining areas for land use purpose an providing services. The authority to approve plans under the Town Development Act and KVDA Act lies with central government, while the Municipal Council is empowered to approve plans in the case of projects to be implemented with the support of its own resources and central grants.

The present inconsistency in planning legislation has seriously put the question mark on the use and significance of role of municipality and TDCs in planning and implementation of land development process.

Similarly, the lack of coordinated function between planning/ implementing and land administration institutes has resulted into operational difficulty in land sub-division process. Under the present planning legislation, a private developer can carryout land subdivision in area not declared as town planning area reaching land revenue and survey department only. Thus many private developers land subdivisions project do not fall within the institutions mainly responsible for planned development of the valley.

Inefficient Cadastral and Land Information System:

Land information system perhaps is the most important factor, which could impede the process of land development in the absence of vital information regarding the ownership, land tiling and land area. According to Jones and Ward (1994), "the major problem in cities in developing countries is the inefficiency and bottlenecks in the supply of land, and particularly with regard to fully serviced land."

The cadastral and land information system of Kathmandu Valley, if viewed within aforementioned strategic framework, has remained obsolete. This is mainly because of the dependence on cadastral survey of 1964, which was primarily carried out using unskilled manpower for the land revenue purpose and, as a result, it lacks the scientific system of land registration, titling and taxation with special reference to land development. The 1964 cadastral maps are inaccurate and ineffective because of the possibility of error due to high fragmentation of land.

The high rate of fragmentation of land in informal land market has also made it impossible to keep accurate land record including the land title, registration and tax records. There have been cases of arbitration while collecting revenues, as the areas in the land title documents do not correspond to the actual ground areas (Source: District Officer, KDLRO, 2000).

"In case of public as well as government sector as prospective purchasers face dilemmas before buying or acquiring land in terms of ascertaining the seller is rightful owner, there 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 pre-commitments; 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" (PADCO, 1986).

2.5 Land/Space:

Land is a very important component as it is the land on which the house is built. In the context of element of housing, land comes into first position, so it is very important as well as critical also. In the urban areas, a small plot of land costs as much or the construction of a house or more. In Ktm. valley, one can't buy land less than two anna two paisa and land more than 25 ropani i.e. the land sealing is 25 ropani. In the earlier, land has no value. But after introduction of economical activities, land has become a valuable day by day. Though the city or downtown decay is occurred, the land value is not decreased.

In the housing process, land is the prerequisite for housing because it is after all the land on which the house is constructed. In the case of government/ mass housing and site & services process, land comes as first element whereas popular/spontaneous housing, it comes into 2nd step. In Nepal, mostly the land has to be bought by the person with the landlord. But nowadays, many estate companies also have started to sell the land in a slightly more planned manner.

Land is also one of the means of the place for infrastructure. Facility of infrastructure makes the land value high before taking housing project. So we mean "Land development is also one of the "controls of development". It is easy to provide infrastructures layouts after land developments. Land development project should be done in the 1st phase for the resource mobilization. Land development develops both housing and land as well.

Several years ago, a survey has shown that seven years of saving is required to buy the land for a Nepali family. For family size 6, 30 sq. m. house area and 40 sq. m. land is needed. On the circulation point of view, there is a land of one hectare for 200 people (1986-2000). But in the Vision plan, there are 300 people per hectare. But later after increasing the price of land, 16 years is needed to buy land if there is Rs. 2570 income per month and 9.8 years is needed to

build house (1991). Likewise 90 sq. m. land and 45 sq. m area is needed for semi Pakka house dwelling (1991).

In the basic housing plan 1986 also, there is a provision of "Urban land supply and access to land for housing." In shelter delivery systems also, there is a point about land i.e. "Insuring access to land."

Land available or not, land vacant or not, By-laws, land management, land constraints all have to see for land assessments. Formal urban land development should be increased and lots of housing should be produced. There should be plans for other activities towards land i.e. economic productive activities rather than land speculation. In most of the context, mixed land use should be developed i.e. residential, commercial, institutional, recreational etc.

2.6 Housing

Housing for shelter is one of the basic needs of human life. Housing provides security, rest and satisfaction to the human beings. Housing has been accorded topmost priority in any society. The term housing means the household or family accommodation in dwelling units, its structure type and facilities such as electricity, drinking water, cooking fuel, toilet etc. So, it is the main indicator of human well being and level of development. A country without proper housing facilities cannot rise to higher level of development.

Housing is more popularly described as shelter having reasonable privacy with sufficient space provided for different activities. It should have proper security, lighting and ventilation and should be accessed with necessary infrastructures.

Housing has many components: mainly physical, social and cultural and there are many benefits of housing for the benefit of the nation. There are many approaches to housing like the private approach, community approach, public approach and the government approach. There are various housing needs according to the demand and the supply of the houses in the country. There are mainly formal and informal types of housing in Nepal but most of them are mainly informal housing.

Housing is an important indicator of a nation's economic level, developmental stage and the general social well being. More developed societies are better housed, and have more efficient housing market, where the developed stage of housing finance contributes towards the formation of wealth, increased personal mobility and enhanced individual productivity. An efficient and modern housing production technology at work is evident in such societies. In a

very early stage of housing development, Nepal today is facing severe housing crisis especially in the towns of the Kathmandu Valley (Adhikari 1998).

Public housing was started in the countries like Hong Kong and Singapore in sixties and seventies. The successful history of public housing has been changing their concept of not involving directly on the production of public housing whereas providing institutional setting and financial facilities.

After the 'Joint Apartment Act 1998' there are growing private companies to provide housing along with planning of the whole area. In this practice, people buy a house along with its surrounding provided by the housing estate.

Housing condition in Nepal:

According to survey conducted by the Ministry of Housing and Physical Planning in 1991, there are approximately 3 millions housing in Nepal. Three hundred thousand houses are located in municipal areas and 2.7 million in the rural areas. 50% consists of rural huts, 41.7% semi-permanent constructions and remaining 8.3% permanent structures (HMG, PNC 1992; 8TH plan, 1992-1997). Although the majority of the families in cities areas own houses, it is estimated that about 25% of the city dwellers live in rented houses. Estimate is done about 7% of families live in unauthorized settlements.

In order to meet the growing housing needs of the people, some 23000 houses in the urban areas and 124000 in the rural areas need to be constructed annually during 8th five year plan period. 10500 houses in urban areas and 111000 houses in rural areas estimated to be constructed annually for five years. Since mostly the houses were owner built and there were no programs to do housing scheme in large scale by Government, it has to depend on the people's tendencies.

Table 15. Housing demand, supply and shortage in Nepal, 1991-2006

Particulars	Urban Nepal	Rural Nepal	Nepal
Annual Increase in household	17500*	59800*	77300
Annual production of dwelling units	10465*	11670*	122135
Gross short/surplus (units/yr.)	-7035	51870*	44835
Annual units required for replacement	2300*	65280*	67580*
Net deficit (units/yr)	-9335	13410*	-22745

Net housing shortage before 1991	-9335	13410*	-22745
Housing required by 1996	406238	3310913	3717151
Natural production housing by 1996	350228	3230433	3580661
Net housing shortage before 1996	-56010	-80480	136490
Net housing shortage before 2006	-149360	-214580	-363940
Natural production housing by 2006	456975	4375050	4832025
Housing required by 2006	606335	4589630	5195965
Net additional dwelling units required (1991-2006)			2195965

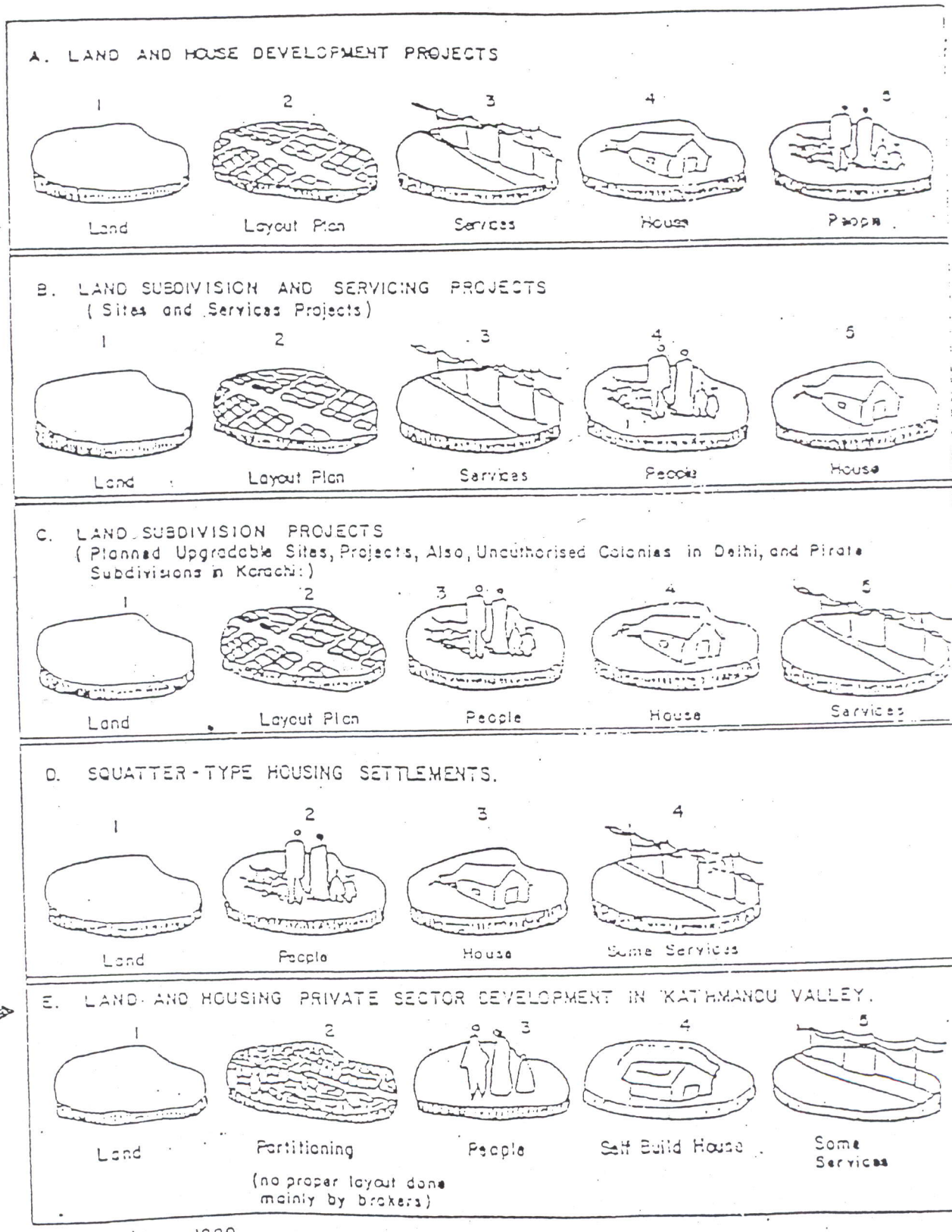
Source: *Nepal shelter sector background report, CEDA, and March 1992 & Gurung, Indiber, et al.,(Dec.30,1997);"Housing situation in Nepal and possible options for improvement"

Shortage of housing will be fulfilled by constructing houses annually by owner itself in available land near the city boundary and in-fill area without any plan that will cause urban sprawl, so the urban land management will be necessary to be implemented to supply improved quality of land for housing. In present situation, Land pooling is flourishing in Ktm valley. But it is not only the solution, it is just the 1st stage, another step that is Housing has to be come with successful, then only Land Pooling Project will be successful in actual. Supposing one house will need minimum average of 4 annas (127 sq.m), then total land required for housing shortage in Nepal will come to nearly 27939 ha within the year (1991-2006) according to above table shown.

Housing process:

In different countries, there are different housing processes according to their culture and their capacity. In Nepalese context there is a tendency to build houses by individuals. However the government needs to do Housing Schemes to meet the housing shortages in Nepal. For planned development at least Land Subdivision project type of development is preferable. Land pooling projects are also similar in nature but it is approved and few services are provided. The housing processes in Kathmandu valley are of E type as shown in fig. below. It has been shown that different types of subdivision process followed in Delhi and Ktm valley for housing. In Ktm valley and other parts of urban areas of Nepal, generally E type of development to provide in such unplanned settlements areas than in planned developed area. Figures are given below.

Land & Housing Development Sequences Compared To Kathmandu Valley's Sequence of Development



Source: Archer, 1989

2.6.1 Three Urban Design Theories:

To clarify the generic pattern of housing and to explore its urban characteristics, three urban design theories could be utilized: (1) figure-ground theory; (2) linkage theory; and (3) place theory. (Trancik, Finding Lost Space - Theories of Urban Design, 1986) These theories differ significantly from each other, but taken together can provide with comprehensive understanding of integrated spatial design of a built environment.

I) The Figure-ground Theory: Roger illustrated in his book, that, *the figure-ground theory is founded on the study of the relative land coverage of buildings as solid mass (figure) to open voids (ground)... Each urban environment has an existing pattern of solids and voids, and the figure-ground approach to spatial design is an attempt to clarify the structure of urban spaces and the generic patterns of mass and voids in a city or district...* He also added that, *the figure-ground drawing, a two-dimensional abstraction in plan view, is a graphic tool in revealing these relationships* (p.97).

II) The Linkage Theory: Roger explained about Linkage Theory: *Unlike the figure-ground theory, which is primarily based on patterns of solid and void, the linkage theory tries to organize a system of connections, or a network, that establishes a structure for ordering spaces* (p.97). These linking elements can be streets, pedestrian ways, and linear open space, etc., that physically connect the parts of a city. It places emphasis on the circulation diagram rather than the spatial diagram of the figure-ground theory.

III) The Place Theory: The *place theory goes one step beyond figure-ground and linkage theories in that it adds the components of human needs and cultural, historical and natural contexts* (Roger, 1986, p.98). It gives physical space additional richness by incorporating unique forms and details indigenous to its setting. In place theory social and cultural values, visual perceptions of users, and an individual control over the immediate public environment are important principles.

Each of these approaches has its own values, but is interrelated. Combining the three, it can give a comprehensive evaluation on various facets of particular structures within a built environment - the mass-void relationship, organization pattern, and its sensitivity to human needs.

2.6.2 Four community design principles

Reviewing prominent urban design theories in recent years, the "Four Principles of Community Design" by Sherwin Greene has encompass the broad range of design considerations involved in evaluating the quality of places and the quality of living. They represent distinct and vital attributes, significant enough to have universal application to all environments, and broad and flexible enough to be utilized and explored in any given condition (Sherwin, 1992, P.180). Following is a brief outline of the four concerned principles associated with its corresponding qualities or sub-criteria.

FUNCTION requires that the design work effectively for the convenience and comfort of all its users.

1) Linkage 2) Security 3) Comfort 4) Diversity

ORDER assures that users can become oriented to the environment and understand it.

1) Coherence 2) Clarity 3) Continuity 4) Balance

IDENTITY denotes a visual image of the environment that reflects special or unique qualities.

1) Focus 2) Unity 3) Character 4) Specialness

APPEAL characterizes a design that gives pleasure to its users over time.

1) Scale 2) Appropriateness 3) Vitality 4) Harmony

2.6.3 Building Regulations in Existing Residential Development:

Kathmandu city has its own building regulations based on its type of residential development assessing low rise, medium density. For the effective application of the regulations, the whole Kathmandu City has been designated with different land use zones. There are different land use regulations to have controlled development. The controls are classified as:

Road Width:

In order to provide adequate infrastructure development and emergency services, the development should provide sufficient of road network. In the regulatory provision has planned the width according to its length and character. The provisional length and width is depends on the accessibility to major road network. According to which:

Access road width to be provided	Based on length of the road
2m	50m
4m	200m
6m	1000m
8m	2000m
11m and above	more than 2000m

(Source: Building Bye Laws 1993)

Plot size:

According to the planning regulation, appropriate minimum plot size has been defined as 2.5 annas. The idea is based on providing the residential environment that encompasses infrastructure, services and the plot of land. It is an important part of housing standards. It is a way to affect the housing density, to control cost, and to suggest the building location and its envelope on the plot. Selection of plot size affects unit cost of housing, influencing both the cost of land and that of infrastructure (Adhikari 1998).

Density:

It is a function of occupancy standards, which is defined by persons per room. It relates to the recommended habitable space per person. Floor Area Ratio (FAR), Open Space Ratio (OSR) and height limit are mainly directed in regulating the density of residential development. In Kathmandu, a high density in the range of 1,000 p/ha has been achieved in traditional housing with three and four-stories buildings. From the study it has been found that gross density of approximately 500 p/ha is economically optimum level. This level of density is achievable with buildings of one to three stories, and is feasible in the present technological context of Kathmandu (ibid).

Floor Area Ratio:

It is defining factor of building density in the residential development. It is again defining factor for the open space to be created for amenities and infrastructures. According to the planning regulations the maximum FAR has been defined as 4.5 for residential in core area infill development where as in new residential development, FAR ranges from 1.25 to 1.75 depending on plot size and zone. In the formulation of FAR, the percentage ground coverage also counted in new residential development which is permitted maximum use of 40% to 80% .The percentage of site coverage decreases with the increase of the plot size. These two factors of FAR and site coverage controls the building height however, the maximum height for

residential is 45 feet or story in core area where as in new development solely depends on FAR (Building Bye Laws 1993).

Open space:

Open space in city core exhibits a unique form of open space management, which is different from this generally, found in present day new development. The open spaces in city core areas are based on religious as well as social and cultural focal point. Those are often defined with temple squares; Palace Square and surrounding open space of stone water conduits.

In new residential development, unless it is planned there is no such provision of providing open space. The settlement development with individual garden space of residences, which doesn't look coherent in, built environment. Those open spaces are defined by site coverage as mentioned above. The minimum open space in development is found only in street junctions, which is forced to plan, and outcome of building setback.

2.6.4 Key issues for planned residential development guidelines

From the above study, in order to achieve comprehensiveness, the built environment should be maintained accordingly through the implementation of proper infrastructure, services, and amenities. The development should functions a mix use-planning concept so as to bring vibrant and legible built environment. The legible urban setting functioned with proper accessibility, permeability, building edges and treatment of open spaces. It should also draw the richness of the urban tradition of city core and utilize the potential provided meeting the present needs.

Development Pattern:

The new development should follow or linked through the major corridor of the city provide easy accessibility and connectivity. The internal layout can be different however the urban fabric should reflect the legible urban setting through proper composition of neighborhood. The composition of blocks and the hierarchy of open space should be provided according to the present need. The issue of sizes is defined with proper building standard to meet the medium rise building density. The existing natural corridors such as river, green belt, hill etc. are to be maintained and enhanced to create vibrant public activities. The visual corridor should lead towards those natural elements so that it gets higher permeability.

Infrastructure:

It is the physical facilities such as buildings, roads, landscape, parks etc., which are provided

properly to operate the community creating quality built environment. It is important to create the value of the physical development of infrastructure facilities that are necessary.

The proper infrastructure facilities directly relate with the built environment providing the sense of place. By means of transportation, amenities and other services enhance the implementation of infrastructures. It is a tool which emphasis the efficiency of the occupants achieving better living environment. A person is not provided with proper infrastructure facilities, naturally, tends to leave the particular place and look for the better place or tries to enhance those things by self-motivation.

Accessibility and permeability:

The quality of physical environment has to be maintained through proper accessibility and permeability in new development so that inhabitants live conveniently. The community facilities and open spaces should maintain easily accessibility. The built environment should be permeable so that it can be easily accessed.

Building Density (Mass and Void):

It is the relationship between the open space and building mass that is so arrange to create the quality built environment. It is one of the important factors of controlling the quality of development in terms of the building density and site coverage. Equally, it is also the relationship of view corridor with respect to the building height forming the skyline of the development. The proper building density is achieved through two types: one is from the planning phase locating the open spaces in proper location contributing t the built environment and another is defining the development parameters in site coverage so as to create adequate open space for the quality built environment.

Open space (Amenities):

Open space and playgrounds should meet the socializing needs of the inhabitants providing adequate size along with easy accessibility. There should be hierarchy of open spaces. Individual residents should contribute for the formation of good open space. Other open spaces are designed to enhance the built environment. It should the adequate size for different age groups and equipped with minimum facilities.

Chapter 3

Case study

3.1 Selection of case study projects

Of the eleven land pooling projects (Gongabu, Dallu, Nayabazar, Gopi Krishna, Sinamangal, Sainbu, Lubhu, Bagmati Phant, Kamal Binayak, Liwali and Sintitar) implemented till date in Kathmandu Valley, five of them are located in Kathmandu and three each in Lalitpur and Bhaktapur. The physical characteristics in terms of the layout design and the services and facilities provided therein show little variation. However, given the location of these projects the difference in post project development characteristics is clearly visible. Therefore, careful selection of few LP projects for the purpose of this study, which focuses primarily on the post project development, becomes important.

Broadly the land pooling projects implemented so far can be classified into three different categories depending upon their location which respect to the city built up area as those:

- Located at the city periphery (Naya Bazaar, Bagmati Phant and Kamal Binayak)
- Location in the urban fringe (Gongabu, Dallu, Sinamangal, Gopikrishna, Sainbu & Liwali)
- Located beyond the fringe area (Lubhu and Sintitar)

Following important aspects were considered as criteria for selection of the LPP.

- Location of the LP projects as mentioned earlier showing different characteristics.
- Projects initiated at different time period, including, completed as well as ongoing.
- Projects at different level and nature of development after their completion.
- Implementation agency, as those implemented by KVTDC or Municipality.

Based on these criteria three LP schemes were selected for the purpose of the case study. The projects selected are Sinamangal, in Kathmandu, Sainbu in Lalitpur and Liwali in Bhaktapur. Among these three cases only Sinamangal LPP is studied in detail and remaining two are studied in surface. But here all 11 LPP are mentioned in brief, which will be beneficial for this thesis. Of the three case study projects, questionnaire survey was carried out only in Sinamangal. The questionnaire survey has been prepared basically to extract information about the residents living in the respective planning area which in turn will help and understanding on the characteristics of development and at the same time get response of these people to the service provided.

3.2 Brief introduction of completed LPP

i) Dallu Land Pooling:

Project: Dallu

Location: KMC Ward no 15

Duration: 12yrs

Start: 91

Complete: 03

Area (ha): 19.80

No. of holding: 455

No. of plots: 698

Open Space: 7.0

Circulation: 25.0

Commercial: 8.0

Contribution: 40.0

Residential: 60.0

Min. (m2) plot size: 80

>min. (m2) plot size: varies

Management committee Headed by: Mayor

Legal basis: S&S Proj. in 1977 TDC Act 1988

Figure 7

Map of Dallu Land Pooling Site a) before the project, b) after the project

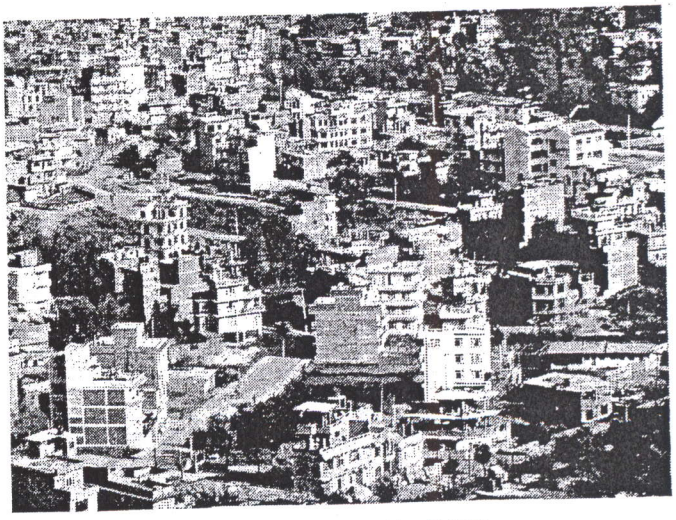


Plate: 3 Dallu LPP

ii) Gongabu Land Pooling:

Project: Gongabu

Location: KMC Ward no 29

Duration: 8yrs

Start: 88

Complete: 96

Area (ha): 14.3

No. of holding: 376

No. of plots: 406

Open Space: 5.2

Circulation: 17.5

Commercial: 6.9

Contribution: 29.6

Residential: 70.4

Min. (m2) plot size: 80

>min. (m2) plot size: varies

Management committee Headed by: Mayor

Legal basis: TDC Act 1988

गोंगबु जग्गा एकीकरण आयोजना

Figure 3

The layouts of the Land pooling projects before and after the project implementation.

स्थान :- वडा नं. २९ का.म.पा.
क्षेत्रफल :- २८८ रोपनी
घडेरी संख्या :- ४०६
सडक :- ७.९४७ कि. मि.
कुल :- १०.३ कि. मि.
खुला क्षेत्र (पार्क) ७४ रोपनी
लागत :- रु. ६ करोड ९८ लाख

Figure 3: Map of Gongabu Land Pooling Site a) before the project, b) after the project

Plate: 4 Gongabu LPP

iii) Gopikrishna Land Pooling:

Project: Gopikrishna, Chabahil

Location: KMC Ward no 7

-Duration: 7yrs

Start: 95

Complete: 02

Area (ha): 8.9

No. of holding: 242

No. of plots: 259

Open Space: 3.8

Circulation: 22.7

Commercial: 7.00

Contribution: 33.6

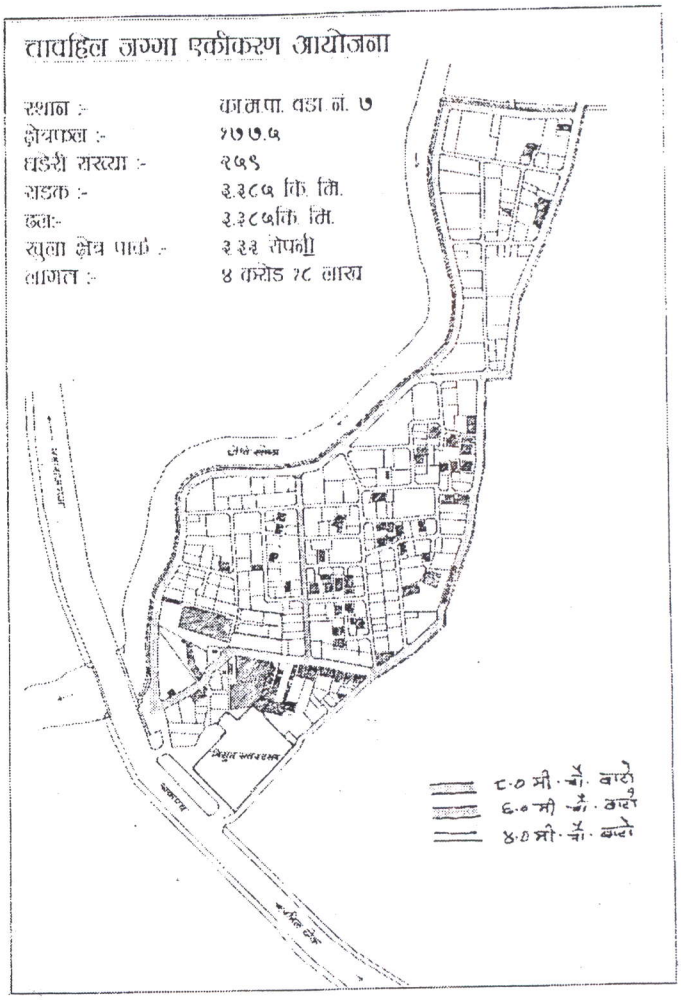
Residential: 66.4

Min. (m2) plot size: 80

>min. (m2) plot size: varies

Management committee Headed by: Mayor

Legal basis: TDC Act 1988



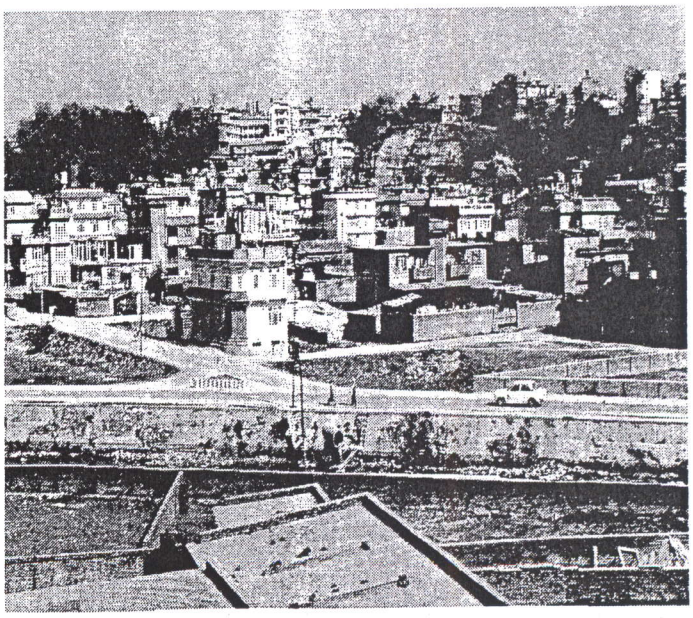


Plate: 5 Gopikrishna LPP

iv) Nayabazar Land Pooling:

Project: Nayabazar, Khusiboo

Location: KMC Ward no 16 & 17

Duration: 8yrs -

Start: 95

Complete: 03

Area (ha): 44.3

No. of holding: 1569

No. of plots: 1312

Open Space: 4.0

Circulation: 22

Commercial: 4.00

Contribution: 30.0

Residential: 70.0

Min. (m2) plot size: 80

>min. (m2) plot size: varies

Management committee Headed by: Mayor

Legal basis: TDC Act 1988

Map of Naya Bazar Khosiboo Land Pooling Site a) before the project ,b) after the project

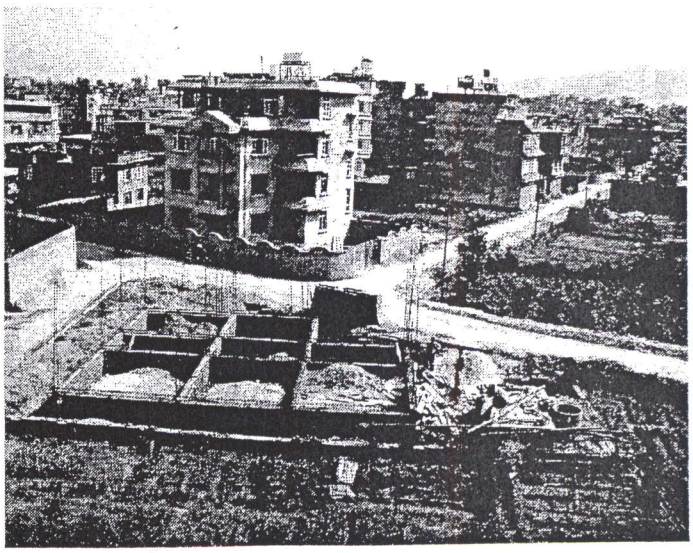


Plate: 6 Nayabazar LPP

v) Bagmati Phant Land Pooling:

Project: Bagmati Phant

Location: LSMC Ward no 10

Duration: 9yrs

Start: 92

Complete: 01

Area (ha): 9.8

No. of holding: 239

No. of plots: 258

Open Space: -

Circulation: 19.0

Commercial: 2.70

Contribution: 21.7

Residential: 78.3

Min. (m2) plot size: 80

>min. (m2) plot size: varies

Management committee Headed by: Mayor

Legal basis: 1977 TDC Act 1988

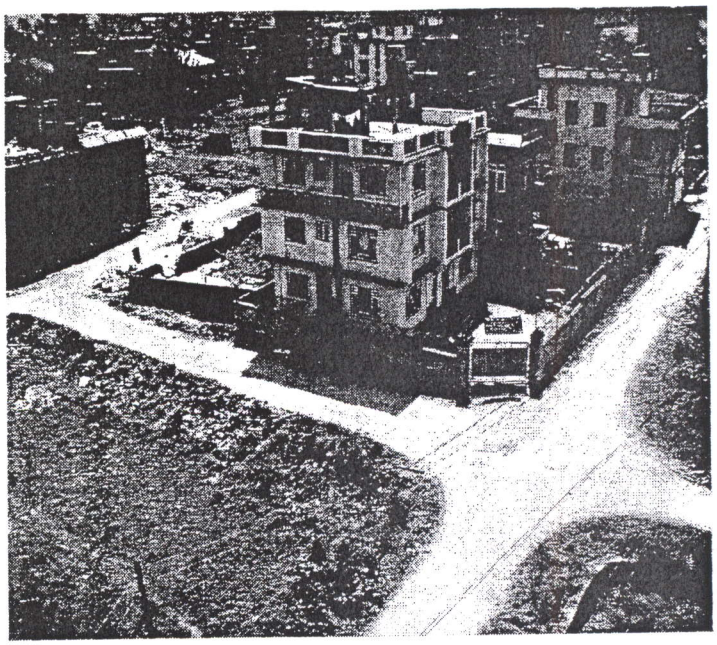
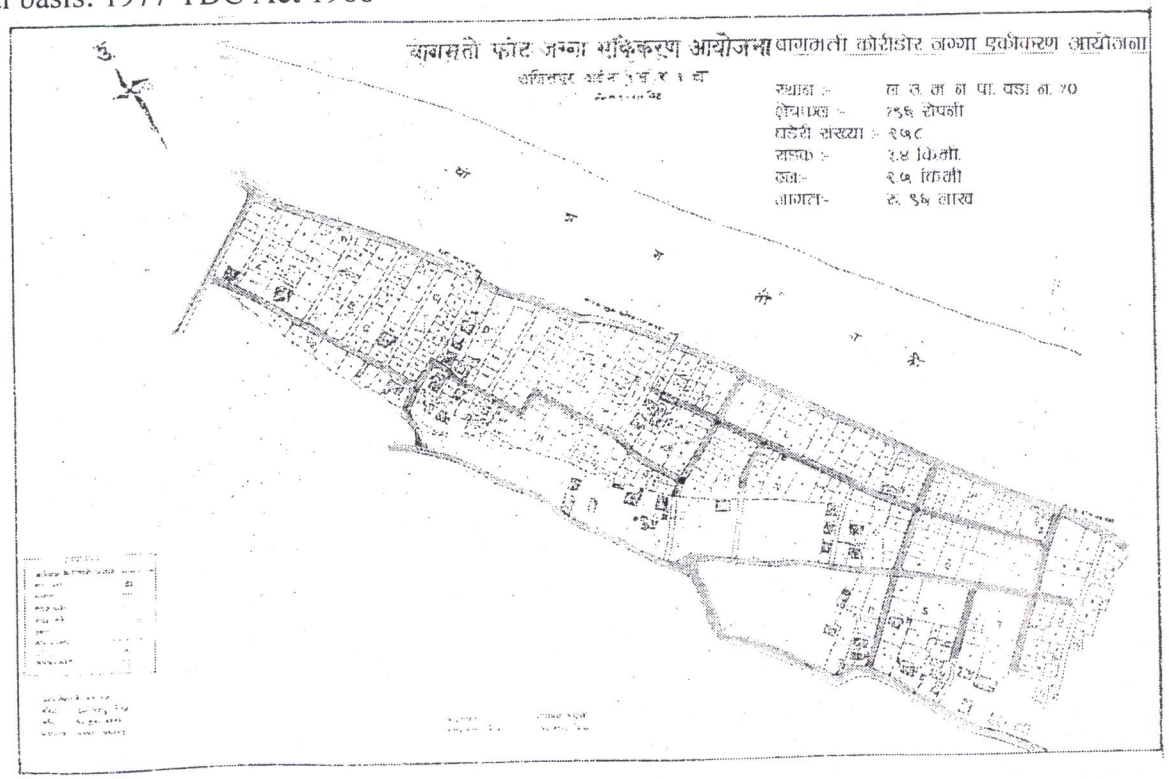


Plate: 7 Bagmati Phant LPP



vi) Lubhu Land Pooling:

Project: Lubhu

Location: Lalitpur District, VDC

Duration: 3yrs

Start: 93

Complete: 96

Area (ha): 13.5

No. of holding: 207

No. of plots: 243

Open Space: 4.4

Circulation: 17.9

Commercial: 9.0

Contribution: 31.3

Residential: 68.7

Min. (m2) plot size: 80

>min. (m2) plot size: varies

Management committee Headed by: DDC Chairman

Legal basis: TDC Act 1988

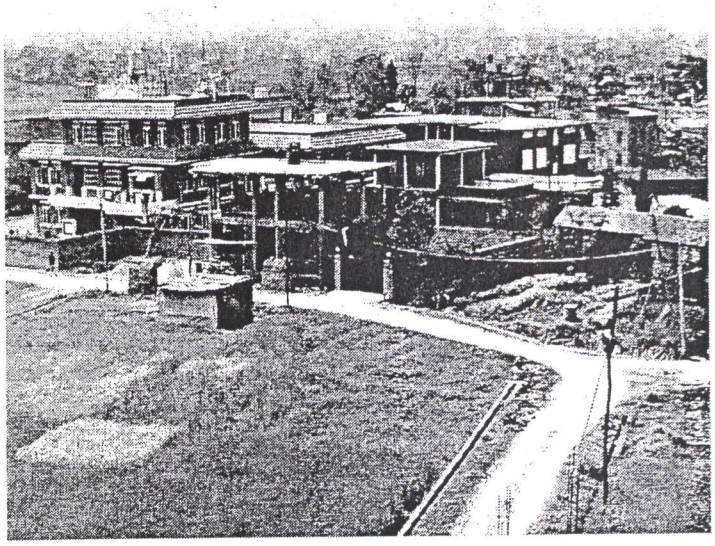
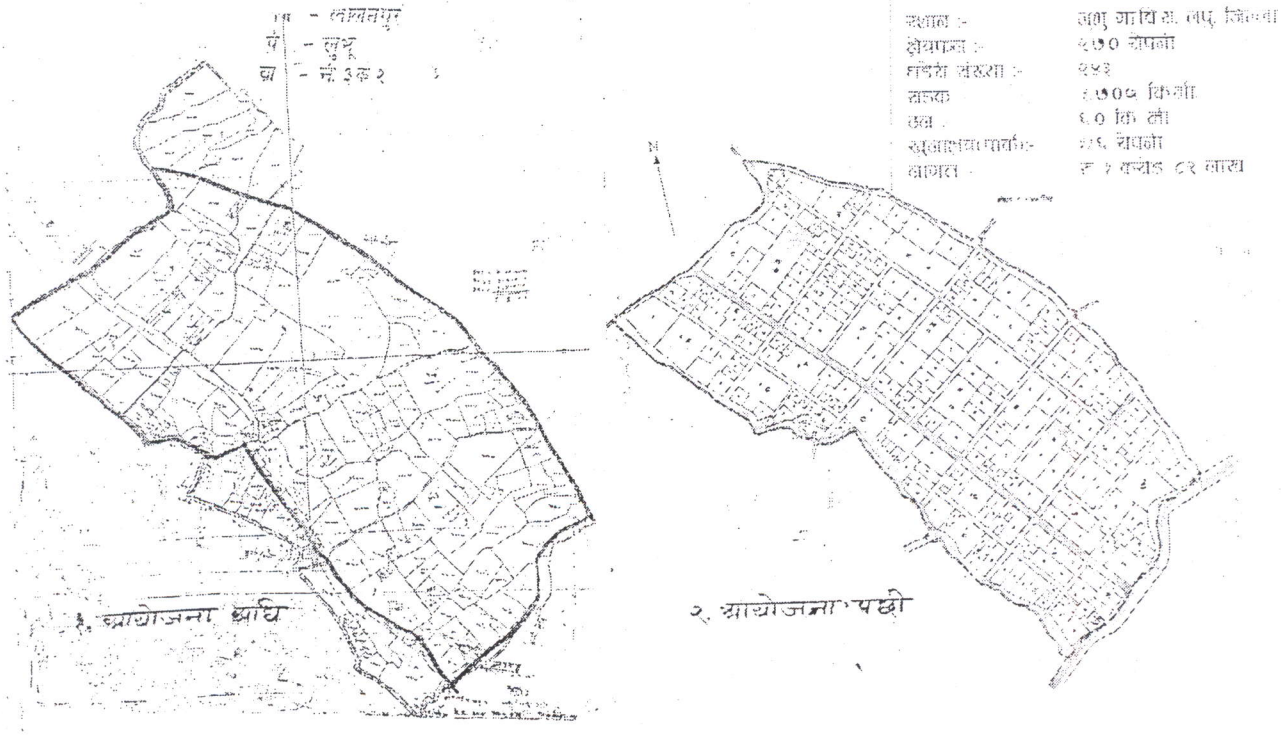


Plate: 8 Lubhu LPP



vii) Kamalvinayak Land Pooling:

Project: Kamalvinayak

Location: Bhaktapur Ward no 4

Duration: 4yrs

Start: 91

Complete: 95

Area (ha): 7.3

No. of holding: 170

No. of plots: 205

Open Space: 4.2

Circulation: 21.5

Commercial: 6.8

Contribution: 32.5

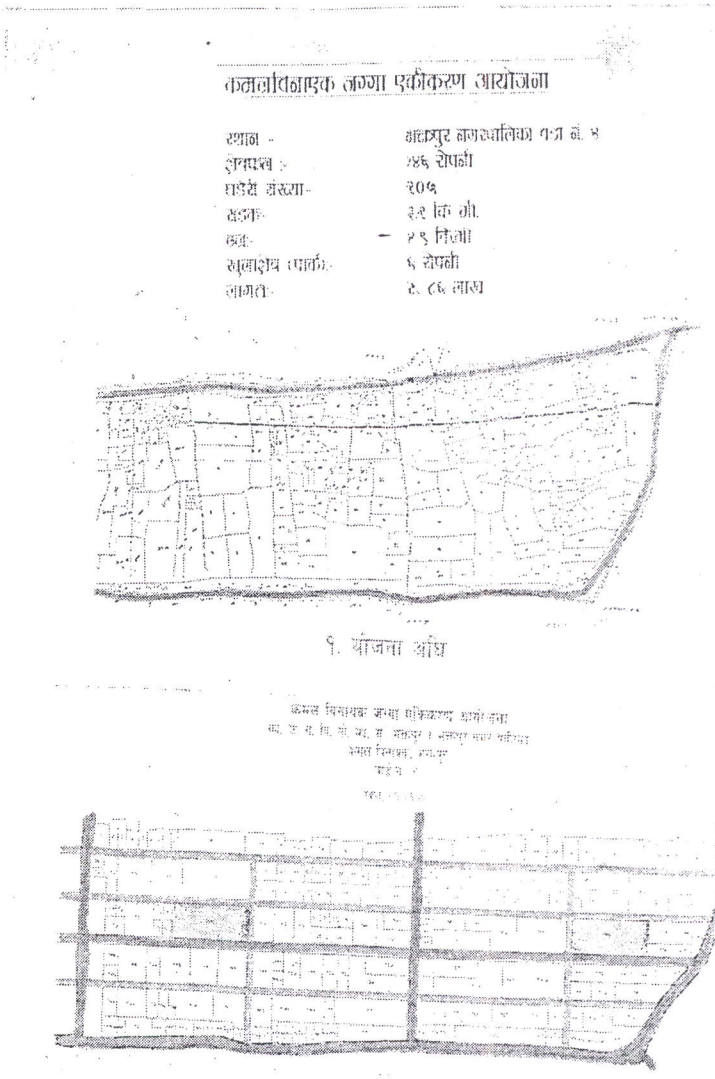
Residential: 67.5

Min. (m2) plot size: 80

>min. (m2) plot size: varies

Management committee Headed by: Mayor

Legal basis: TDC Act 1988



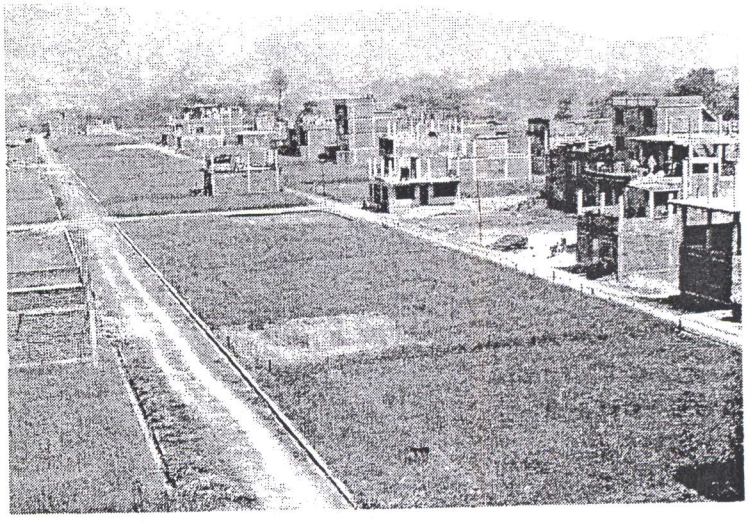


Plate: 9 Kamalbinayak LPP

viii) Sintitar Land Pooling:

Project: Sintitar

Location: MT Municipality Ward no1&3 (Bode)

Duration: 7yrs

Start: 96

Complete: 03

Area (ha): 26.5

No. of holding: 812

No. of plots: 871

Open Space: 3.4

Circulation: 18.8

Commercial: 10.0

Contribution: 32.2

Residential: 67.8

Min. (m2) plot size: 126

>min. (m2) plot size: varies

Management committee Headed by: Mayor

Legal basis: TDC Act 1988

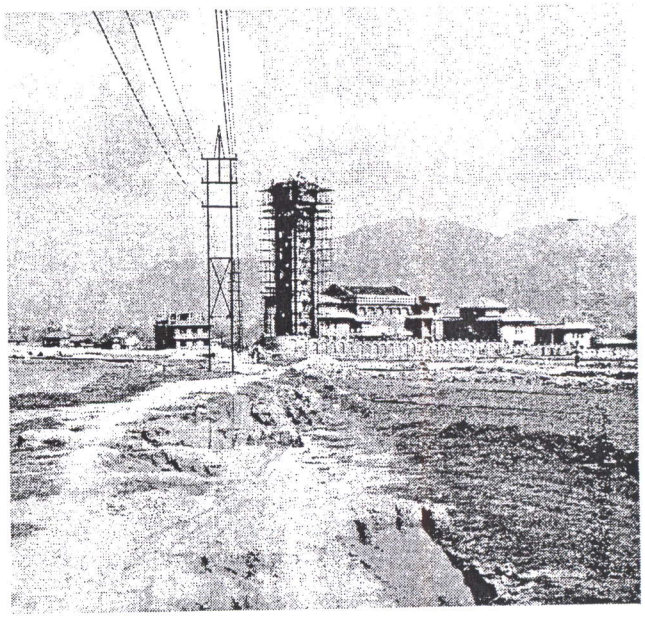
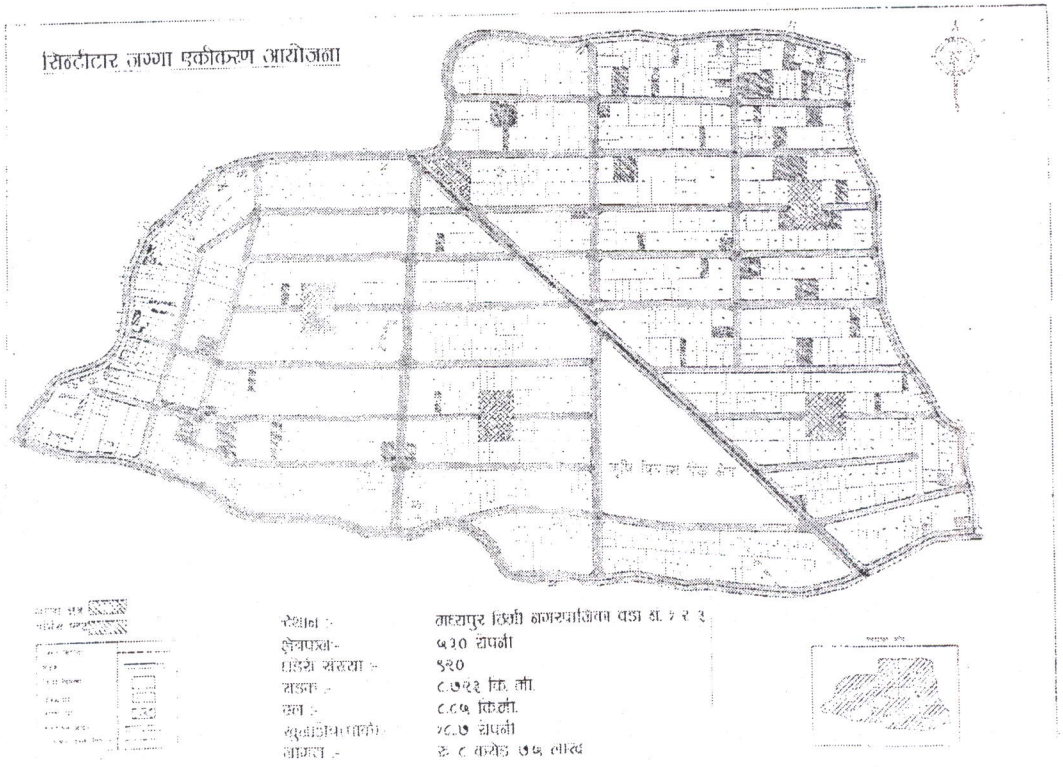


Plate: 10 Sintitar LPP



ix) Liwali Land Pooling:

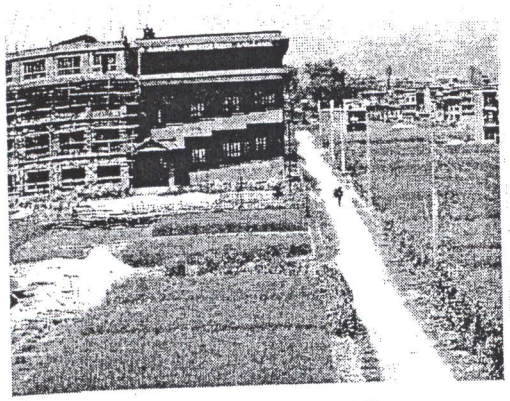
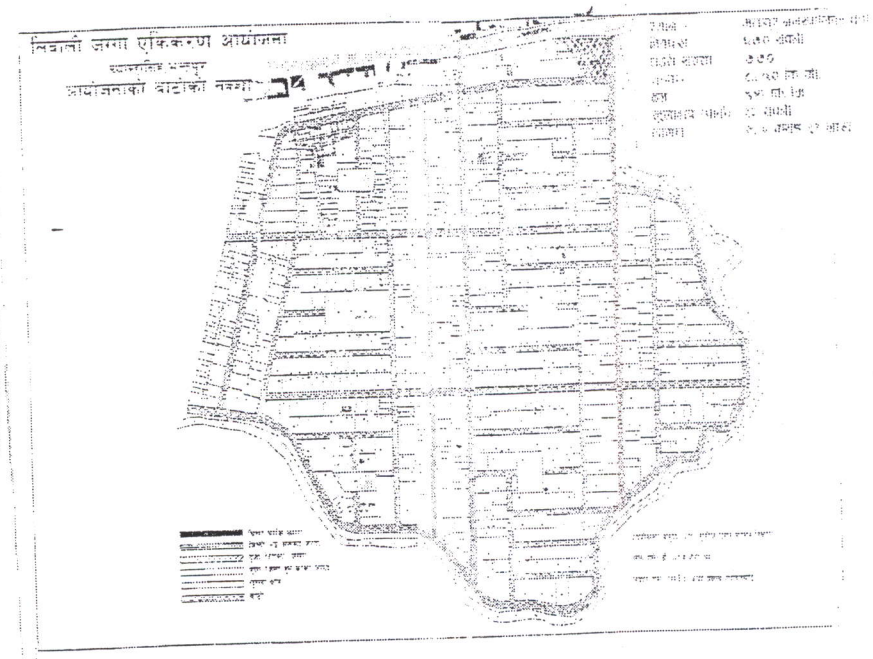


Plate: 11 Liwali LPP



Project: Liwali

Location: Bhaktapur Ward no 1&2

Duration: 3yrs

Start: 95

Complete: 98

Area (ha): 33.9

No. of holding: 667

No. of plots: 794

Open Space: 2.8

Circulation: 23.6

Commercial: 7.1

Contribution: 33.5

Residential: 66.5

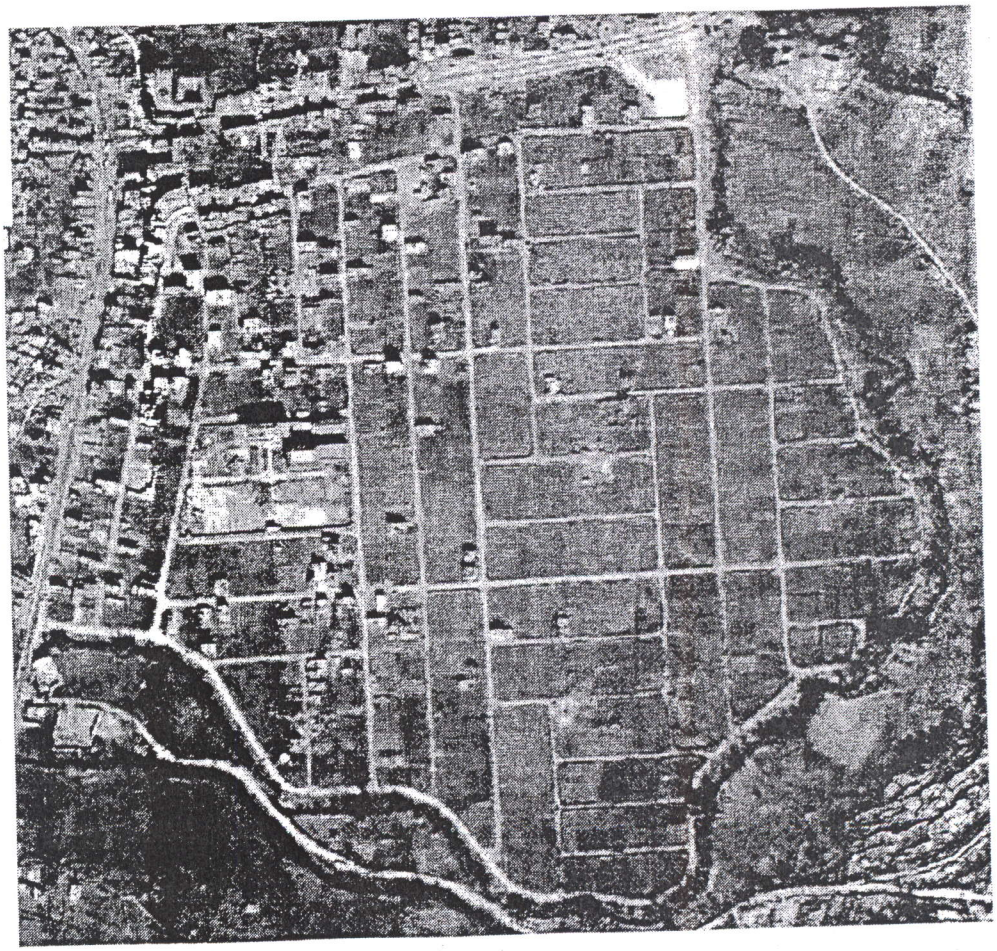
Min. (m2) plot size: 126

>min. (m2) plot size: varies

Management committee

Headed by: Mayor

Legal basis: TDC Act 1988



Liwali LP Project:

The town of Bhaktapur, which houses the Liwali Project, is situated near the eastern rim of the Kathmandu Valley, about 12km east of Kathmandu. The town itself is a densely populated built-up area clearly delineated from the agricultural land surround it.

Bhaktapur Municipality initiated Liwali Land Pooling Project in the year 2053 to absorb population of about 11,200 with technical assistance of the Kathmandu Valley Development Project. The project was completely funded by Bhaktapur Municipality. The estimated cost was around 6.69 crore, out of which 5.77 crore has already spent.

The main objective of the Liwali project is to guide the urban expansion in Bhaktapur in a planned area with provision of basic infrastructure and services.

Project Boundary

East: Brahmayani Khola

South: Brahmayani Khola

West: Pasikhel Road

North: Chyamansingh- Brahmayani Road

Project Area: 678-8-1-0 ropani (34.54 ha) and Whole project area divided into 52 small blocks

Contribution of the people: 32.5% (ranging from 25 to 40%)

Open space: 2.7%of total area (6.nos of open spaces distributed all round the project area)

Space for Greenery: 2.26% of the total area (15-5-2-0 ropani), provided along the riverbank

Space for Bus Park: 0.67% of the total area (4-9-1-2 ropani)

Infrastructure services

Road: 10m, 9m, 7m, 5m, 4m 2.5m (Total road length: 8.85 km and no black topped only up to gravel)

Drainage: Provision of surface drainage as well as sewer

Water Supply: Proposed to be implemented with the surplus money

Electricity: Proposed to be implemented by NEA

Telecommunication: Proposed to be implemented by NTC

Financial mechanism: Funded completely by Municipality

Estimated Project Cost Recovery: NRs 6.34 crore

Expected Cost Recovery: 6.69 crore

(NRs 2.0 crore earned from selling service plots till date)

No of houses: 100 (till 2062/63)

Vacant plot: 694 (87.41%) till 2062/63

As the rate of development in the planning area is too slow, around 3% in Liwali, the infrastructure and services put in place are severely underutilized as well as misused. Much of the developed housing plots are still cultivated. The road, even the footpaths are being used for farming activities at few places of these planning areas. Grasses in the lack of proper road surfacing cover the roads at places, because of which the whole planning area virtually looks like one being farmland divided into regular plots.

Though the projects have been successful in providing basic infrastructure and services together with regular developed plots prior the haphazard expansion in Liwali area, the present condition of the services like road and drainage suggests that the slow development has resulted in their underutilization and misuse. If this situation continues it won't be long when these will be rendered useless, requiring up gradation and improvement once again costing scarce resource to all. Further the poor condition of the infrastructure and services could decelerate the rate of growth in these areas and the practice of acquiring land for speculation could rise.

Land use of Liwali (Before and after land pooling):

Table 16. Description of land use before land pooling

S.n.	Land description	%
1	Residential use	0.92
2	Agriculture	94
3	Other	5.08
	Total	100

Table 17. Description of land use after land pooling

S.n.	Land description	Area (R-A-P-D)	Area (sq.m.)	%
1	Residential use	434-13-2-2	221225.98	64.93
3	Open space	23-9-1-2.8	12000.58	3.52
4	Road	152-9-1-2.7	77627.65	22.78
5	Bus park	5-1-0-2.5	2580.10	0.76
6	Sale plot	50-10-1-1	27292.32	8.01
	Total	669-11-3-3	340726.63	100.0

Land value of Liwali LP Projects:

This table shows the price set by the Liwali LP Projects for selling the reserve plots of different categories through auction. The cost varies with the width of the road, which the land is adjacent to. The corner plots have higher price as they have more commercially viability. The highest price is for land adjacent to the 20m Pasikhel roads, which forms the western boundary of the planning area.

As discussed in earlier sections the housing development in Liwali is extremely slow and still extensive farming prevail in much of the developed land. From the discussion with the official of the municipality and some locals, the land transaction in the area is negligible. Though the land value has increased after the implementation of the project, the increase is not as high as seen in Sinamangal LP Projects. Even the project, have been able to sell reserve land worth 2 crore from it. At present the selling of these plots have been halted for some unknown reasons. As compared to KMC and LSMC, Bhaktapur Municipality however has comparatively lesser demand for residential plots.

Several other factors also have influenced the land value and the land market in this planning area. Dependency of majority of landowners in agriculture for the livelihood is one important influencing factor. Furthermore, the land market is biased as the project has a policy of selling the reserve plots only to the indigenous Bhaktapur people. Also there seems to exist a deep socio- cultural cleavage amongst the Bhaktapur residents. Because it is learnt that the people from the western part of Bhaktapur are residents. Because it is learnt that the people from the western part f Bhaktapur are reluctant to move to the eastern part where the Liwali LP projects

is located for settlement. This division amongst residents from two parts of the same city also gets revealed during the famous Bisket Jatra, when people from the eastern and western part quarrel each other for taking the chariot procession through their areas.

Table 18. Land appreciation of Liwali LP Project:

Land adjacent to road (m)	Rate/Ro.in NRs. (block 2 nya 4,6)	Rate/Ro. in NRs. (block 2 nya 1,2,5)	Rate/Ro.in NRs. (block 2 nya 3,7,8)
5 m road	9,50,000	9,97,500	9,02,500
7	11,50,000	12,07,500	10,92,500,
9	12,50,000	13,12,500	11,87,500
10	13,50,000	14,17,500	12,82,500
20	18,00,000	18,90,000	17,10,000
10/7	14,50,000	15,22,500	13,77,500
9/9	14,75,000	15,48,750	14,01,250
9/7	14,25,000	14,96,250	13,53,750
9/5	13,90,000	14,59,500	13,20,500
7/7	14,00,000	14,70,000	13,30,000

Table 19. Land type and their price

S.N	Land type	Total amount
1	Sale for household	799938/84
2	Addition of land to house	1798231/31
3	Return land to get minimum land i.e. 2.5 anna	63422/16
4	For sale	54470948/24
5	Addition of land	9937314/98
Total		66943011/21

x) Sainbu Land Pooling:

Project: Sainbu

Location: Lalitpur District Sainbu VDC

Duration: 12yrs

Start: 91

Complete: 03

Area (ha): 27.6

No. of holding: 536

No. of plots: 611

Open Space: 12.9

Circulation: 22.8

Commercial: 20.3

Contribution: 56

Residential: 44.0

Min. (m2) plot size: 126

>min. (m2) plot size: varies

Management committee Headed by: DDC Chairman

Legal basis: Land Acq. In 1976 & TDC Act 1988

6% for O.S & 6.9 % for school, market & office area

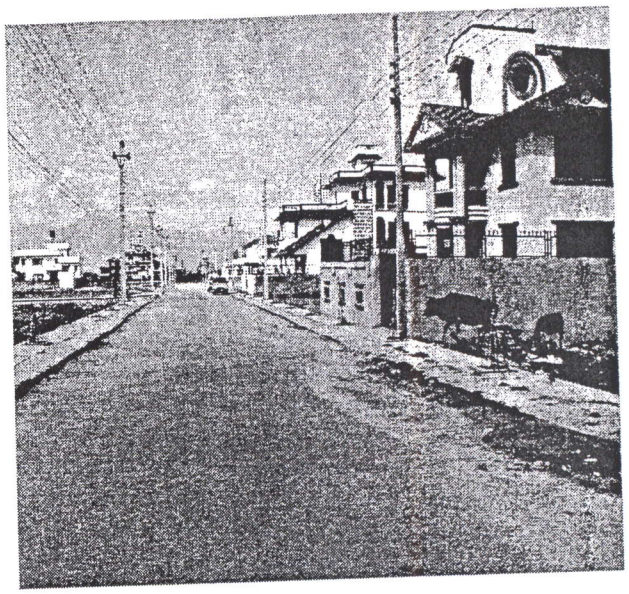
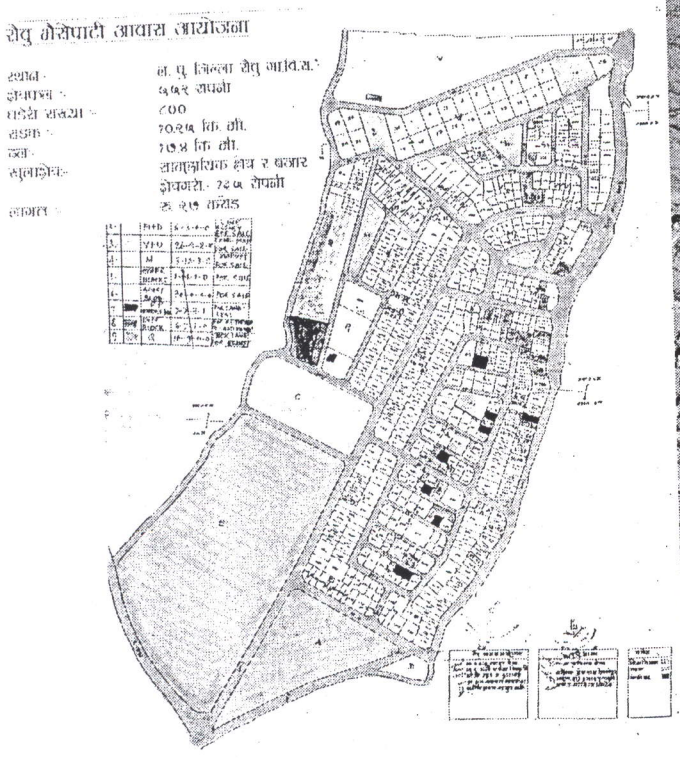
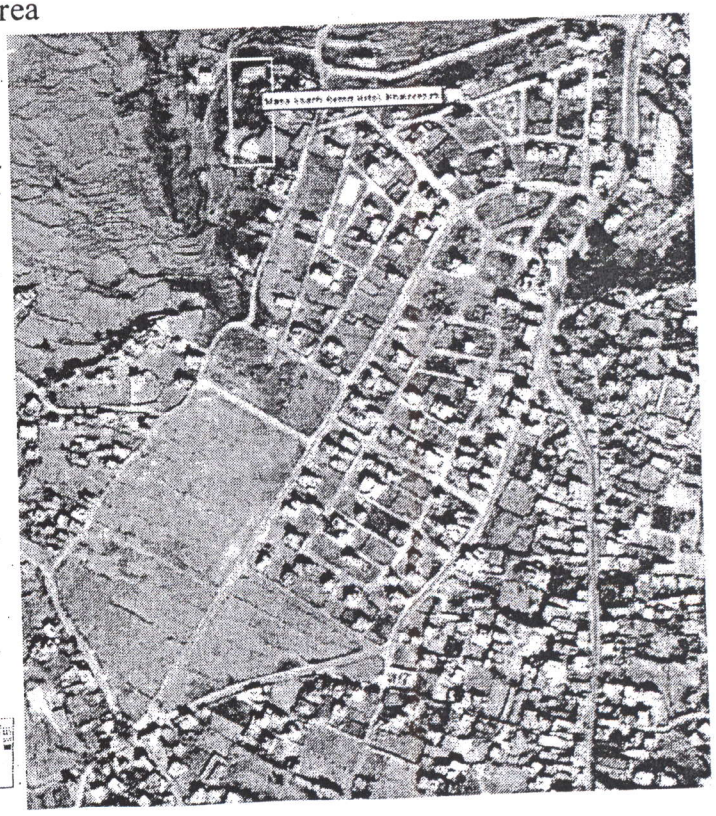


Plate: 12 Sainbu LPP





Sainbu land pooling project:

Sainbu land pooling project, Sainbu is situated at Sainbu VDC ward no 4 and 9 in Lalitpur district of Bagmati zone. This site is 10 km away from Kathmandu in south Lalitpur, 3 km away from Jawalakhel and 1.5 km away from Ring road to the south. This project lies to the right side of the metalled road to Bungmati. Every plots have the infrastructure and Facilities in the project that are Black topped roads, Drain, Water supply, Electricity, Telephone, School, Open spaces and park, Community area and Commercial area.

Objectives of Project are to provide planned housing plots and to implement the concept of flat system (Condominium) to accommodate more people in few lands.

491-5-1 ropani (25 ha) of land was acquired by Home ministry to construct central Jail which was published at gazet at B.S 2031/11/19 (3 March, 1975) and it included land of Sainbu VDC ward no 4(ka), 4(ga), 4(gna) and 9(kha). The central zail construction project was later shifted to Nuwakot district due to some reason.

Then government decided to launch Housing Development Project in the acquired area and all the concerning papers were handover to Ministry of Housing and the notice was published in gazet at B.S 2046/8/9(23 Nov 1989). Suggestion was give n to Kathmandu Valley Town Development Implementation Committee, Lalitpur to collect required data for the project with the help to District Administration office, Lalitpur for planning purpose. According to available data 65% of landowner/tenants had received compensation and 35% of landowners/tenants had not received compensation. The remaining landowners/tenant did not agreed to receive old compensation rate. Government decided it to change to Land Pooling Concept for rest of land to be taken for the housing purpose and meeting was held with and landowners/tenants to decide developed land percentage as compensation. The meeting decided to give 25%of development land as compensation. Former Prime minister Marich Man Singh inaugurated the Housing Development Project art B.S2046/8/13 (27Nov 1989). The project had already completed in B.S 2056 (1999 A.D). This area is now developing as VIP AREA. Many bungalows have come in different places in the project site

- Household: 611, Assumed family size: 5.6, Assumed population: 3421.6, Assumed density:123.97p/ha
- No of houses: 130 (till 2062/63), Vacant plot: 481(78.72%)
- Road categories:20m,11m,8m,6m,5m&

- Total road length: 7.22km & drain:7.22km
- Water Supply: DWSC
- Electricity: NEA
- Telecommunication: NTC
- Project Cost Recovery: NRs 27.70 crore (unto 2062)

Data shows that sale price of land is increasing that means people moving towards that area

- for peaceful houses

Land use of Sainbu LPP

Table 20. Description of land use of Sainbu land pooling

S.n.	Land description	Area (R)	%
1	Residential use	214.67	38.87
2	Open space	14	2.54
3	Road	116	21
4	Use for parliament	123	22.27
5	Mixed residential use	30	5.43
6	Commercial use	18.56	3.36
7	Parking	1.25	0.23
8	Institutional use	18.75	3.4
9	Office area	12.6	2.28
10	Community area	3.4	0.62
	Total	552.23	100.0

Source: Housing Development Project, Sainbu's Booklet

Table 21. Land value of Sainbu

S.n	Place	Area	Minimum Price	Sale price
1	Bazaar	15-4-0-4	2,74,79,782/28	4,34,71,940/73
2	20m road	4-12-0-0	99,09,375/00	1,74,96,817/64
3	11m road	17-13-0-1	2,84,81,250/00	3,62,64,863/87
4	8m road	45-8-3-3	10,10,10,031/55	14,40,18,325/10
5	6m road	11-15-2-2	1,39,05,468/76	2,60,09,240/49
6	5m road	6-8-1-0	65,15,625/00	98,16,411/54
	Total	101-13-3-3	18,73,01,532/59	27,70,77,599/37

xi) Sinamangal Land Pooling:

Project: Sinamangal

Location: KMC Ward no 35

Duration: 8yrs

Start: 95

Complete: 03

Area (ha): 35.1

No. of holding: 964

No. of plots: 660

Open Space: 5.3

Circulation: 20.3

Commercial: 7.00

Contribution: 32.6

Residential: 67.4

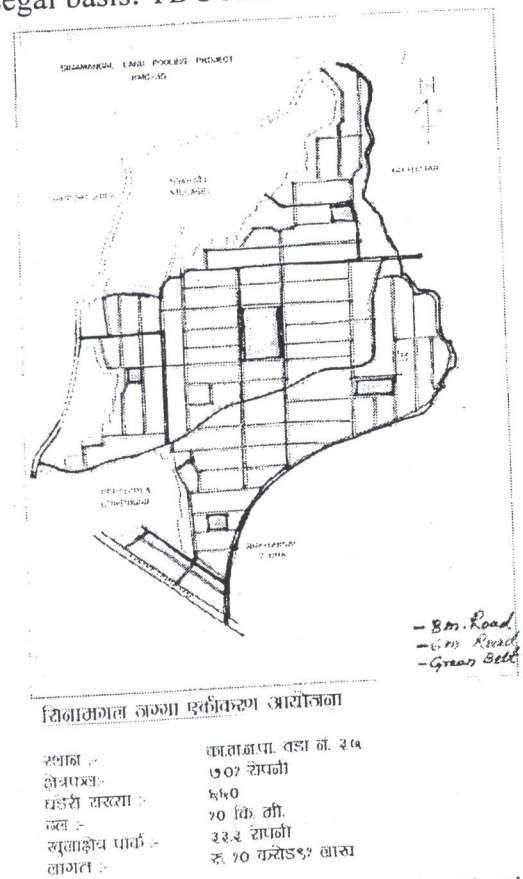
Min. (m2) plot size: 80

>min. (m2) plot size: varies

Management committee Headed by: Mayor

Legal basis: TDC Act 1988

Plate: 13. Sinamangal LPP



3.2.1 Sinamangal land pooling project:

Sinamangal Land Pooling is one of the land pooling for land developed which is located at ward no. 35 in Kathmandu. Metropolitan City. The project area, comprising the total area of 933-11-3-3 but according to lalpurja there is area of only 905-11-3-3 (ropani-ana-paisa-dam). Among these areas, Parti land is 14-8-0-0 and road is 9-11-0-0. But after pooling the land, total area is 905-7-0-1 which occurs open land of 48-2-3-0 area including one large open space of land 14 ropani and other two small open spaces having 6 ropanies each, Treatment plant area having 23 ropani, Road having 184-4-2-0 area including 8m & 6m roads and existing roads.

Boundary of Sinamangal

East - Sinamangal 7"Gha" and Gothatar 8"Ka

West - International Tribhuvan Airport

North - Nhykati VDC

South - boundary of Pepsi cola & way of Thimi

Plate: 14. Sinamangal Open space

- Plot description of all together - 1707.
- Household numbers-1074
- Mohi numbers-410
- Not registered plot-43.
- Assumed household: 1074, assumed family size: 5.6, assumed population: 6014.4, assumed density: 171.49p/ha
- No of houses: 425 (till 2062/63), Vacant plot: 235 (35.61%)
- Minimum plot size: 2.5 anna. (80 sq. m)& maximum plot size: 6-4-3-3.97
- Open spaces: 5nos (5.3%)
- Road categories: 8m, 6m, 4m, 2.5m, 2m & 1.2m
- Water Supply: Proposed to be implemented after completion of Melamchi project
- Electricity: NEA
- Telecommunication: Proposed to be implemented by NTC
- Cost Recovery: NRs 12.17 crore (upto 2062)
- 1st phase completed on 707 ropani
- 2nd phase on 226 ropani.

3.2.2 Purposes of Sinamangal Land Pooling Project:

- To control the increasing unmanaged urbanization
- To fulfill the ever increasing housing demand

- To develop housing plots with proper services by the minimum investments of the HMG
- To make the local public aware and active in the process of modern urbanization
- To make planned development possible in modern urbanization.
- To create healthy and hygienic housing environment
- To propose uniform development within certain area.
- Indirectly help in the employment of the local people.

3.2.3 Land use of Sinamangal (Before and after land pooling):

Table 22. Description of land use before land pooling

S.n.	Land description	Area (R-A-P-D)	Area (sq.m.)	%
1	Residential use	6-7-0-0	3276.69	0.91
2	Agriculture	507-11-3-3.35	258443.26	71.79
3	Vacant	176-12-3-3.75	89997.07	25.00
4	Road	9-11-0-0	4930.93	1.37
5	No man's land, stream, rajkulo etc.	6-9-0-0	3340.31	0.93
	Total	707-3-3-3	359988.26	100.0

Source: KVTDC; Sinamangal land pooling report 2003

Table 23. Description of land use after land pooling

S.n.	Land description	Area (R-A-P-D)	Area (sq.m.)	%
1	Residential use	519-15-2-1	260453.89	74
3	Open space	34-0-1-2	74846.38	5
4	Road	147-0-2-2.8	74846.38	21
	Total	701-0-2-1	356644.63	100.0

Source: KVTDC; Sinamangal land pooling report 2003

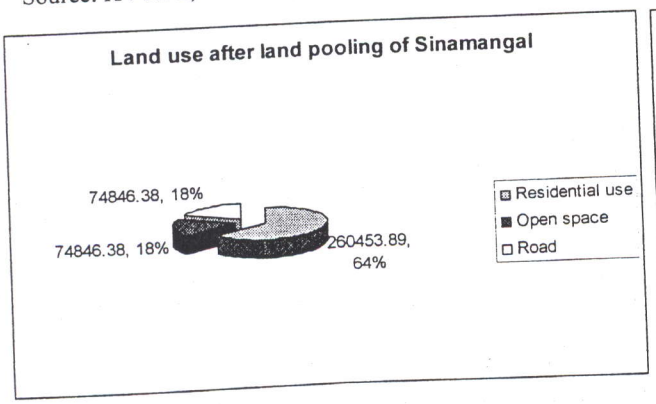


Chart 1. Land use after LP of Sinamangal

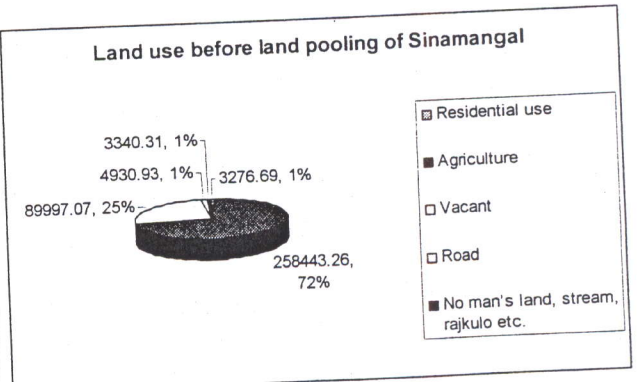


Chart 2. Land use before LP of Sinamangal

3.2.4 Open Spaces:

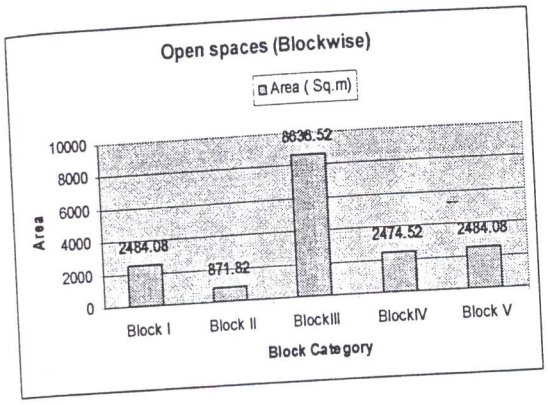


Chart 3. Open spaces

Table 24. Open Spaces

Block	Area (ropani)	Area (Sq.m)
Block I	4-14-0-2	2484.08
Block II	1-11-1-3	871.82
BlockIII	16-15-2-2	8636.52
BlockIV	4-13-3-1	2474.52
Block V	4-14-0-2	2484.08
Total	33-5-3-0	16970.81
Public Taps in Block I and II	0-5-1-1	168.66

3.2.5 Developed residential land according to Area

Table 25. Plot areas

S. N.	Area	Nos
1	0-2-2-0	146
2	>0-2-2-0 & < 0-4-0-0	441
3	0-4-0-0	4
4	>0-4-0-0 & < 0-8-0-0	378
5	>0-8-0-0 & < 1-0-0-0	196
6	>1-0-0-0	86
	Total	1251

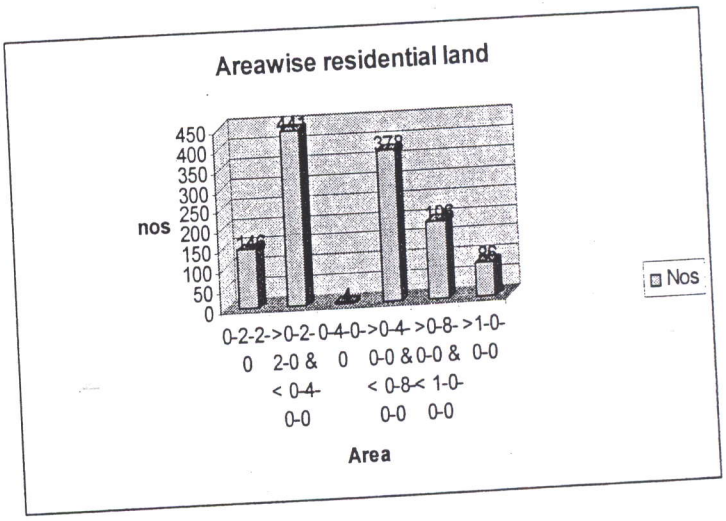


Chart 4. Area wise residential

According to Nagar Bikas record, there is a maximum residential land of 6-4.3-3-3.97.

- Maximum plots are provided between >0-2-2-0 & < 0-4-0-0 that is suitable for small to medium housing in the case of Sinamangal LP.
- In the case of Liwali LP, maximum nos of about 110 nos of plots are provided under 2.5 anna which is also suitable for small residential building assuming 5.6 family size.
- In the case of Sainbu LP also, maximum nos of about 156 nos of plots are plotted under four anna for medium style residential building.

3.2.6 Roads

Table 26. Roads

Width of road	Area (Ropani)	Area Sq.m)	Length (m)
8m	44-11-0-4	22742.27	2842.78
6m	100-1-1-1	50915.73	8485.96
4m	1-15-0-0	985.68	246.41
2.5m	0-2-2-1	81.44	32.59
2m	0-0-1-1	9.94	4.97
1.2m	0-1-3-3	61.61	51.34

3.2.7 Price of the Land,

Many years ago, there is not so much high price of the land of Sinamangal. Only after the pooling of the land i.e. after construction of some of the necessary infrastructure, land price is become high at that place.

Table 27. Price of the land

S.N	FY	Land addition	Sales plot	Loan	Total
1	2057/58	28,68,419/19	86,11,088/65		1,14,79,507/84
2	2058/59	1,06,15,552/26	4,09,42,884/23		5,15,58,436/49
3	2059/60	85,01,939/25	1,51,53,234/95	50,00,000	2,76,55,174/20
4	2060/61	45,58,689/44	1,47,30,076/00	30,00,000	2,22,88,765/44
5	2061/62	29,22,989/55	43,88,699/00	15,00,000	88,11,688/55
	Total	2,94,67,589/69	8,28,25,982/83	95,00,000	12,17,93,572/52

Data shows that it is recovering the cost of Sinamangal LPP i.e. 12.17 crore in 2006 which is more than that of 10.91 crore in 2002

Table 28. Price of the land according to Nagar Bikas

S.n	Road length	Road Type	Price in 14th Bhadra 2056 upto 2058	Price in 16th Phalgun 2059	Price in Mangsir 2061
1	4m	Graveled	10 lakh/r	15 lakh/r	20 lakh/r
2	6m	Graveled	13 lakh/r	20 lakh/r	25 lakh/r
3	8m	Graveled	18 lakh/r	25 lakh/r	30 lakh/r
4	11m	Pitch	24 lakh/r	30 lakh/r	35 lakh/r

Recently at the side of 8m road according to local people the land has a value of 4.5 to 5 lakh per ana and as well as at the side of 6m road, land has a value of 3.5 to 4 lakh per ana.

Thus price of land is also increasing which indicates more possibility of housing development at land pooling area. (Normally Landowners benefited from 60% to 100% increase in land value after the project and enjoyed a better road network and more efficient plot layouts (Karki, 2001).

3.2.8 Existing situation and future development of Sinamangal:

Most of the planned areas land price becomes high after provision of the infrastructure. The road is main factor among the other entire infrastructure because other most infrastructures like sewerage and drainage system, water supply, electricity, telecommunication also comes after construction of the road. Once the road provision is made, 50% problems are solved simultaneously. But recently, there is provision of drainage and electricity as well as wireless telecommunication on road. There is a still problem of water supply and wired telecommunications.

Talking about Byelaws, there is provision of 1m set back and FAR of 2 while construction of building. There should be registered at Nagar Bikas while building maps are passed.

All the new buildings are constructed within recent two years (2060/2061 B.S.). There is still lots of vacant lands are remained and some of the residential buildings are being constructed. It seems most of the buildings are residential. One room approx. 10x12 ft is about 1000 Rs. and shop is about Rs. 2500 on lease. Likewise one flat takes about Rs. 4000-5000. There is provision of only few schools i.e. 8-10 primary & 1 lower secondary school, small medical shops, small daily need goods shops and recently small hardware & construction related shops are increasing at the main roadside. While talking about recreational area, three open spaces are provided using large open space as football ground and other small one as minibus parking area. Besides, there are not other necessary activities like commercial, institutional, industrial etc. It seems lots of lands are being speculated because of land value are increasing day by day.

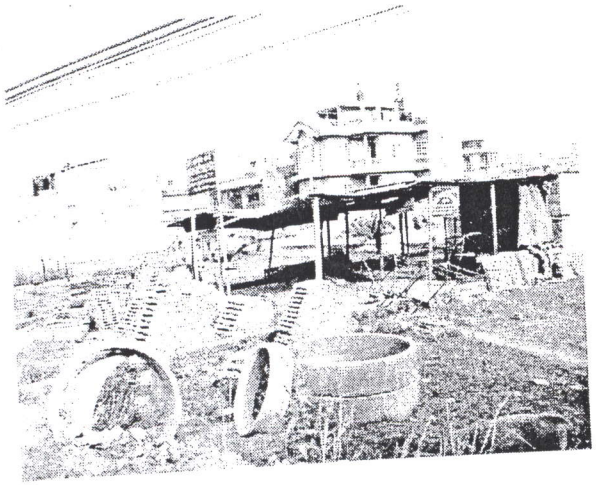


Plate: 15. Construction related shop

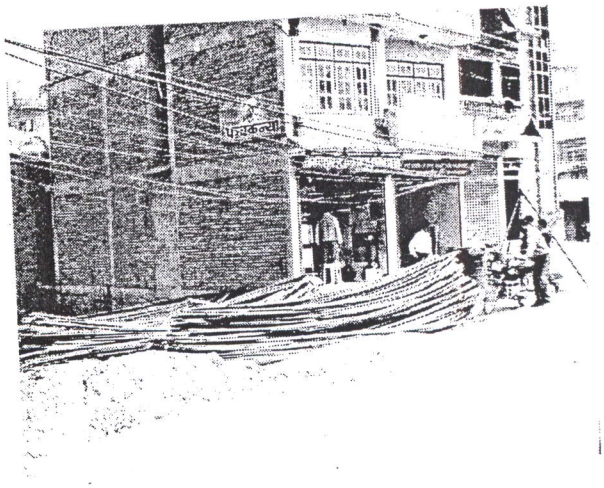


Plate: 16. Construction related shop

Plate: 17. Bus Park

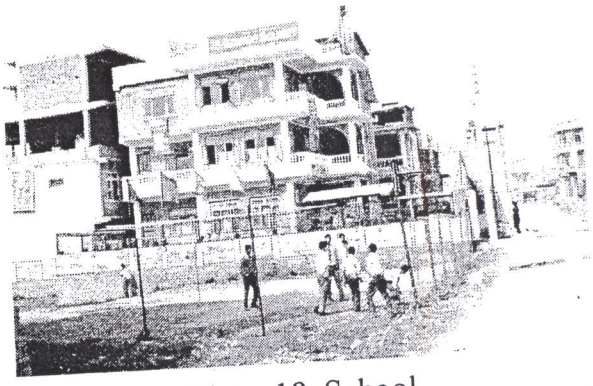


Plate: 18. School

But landowners and other land developers should think plans for economic productive activities towards land rather than land speculation. In most of the context mixed land use should be developed like more residential, commercial, institutional, recreational etc. in proper manner, then only such land pooling area can be developed and more succeeded. Activities could be introduced using lands in various techniques like using land by constructing housing, departmental stores, community housing/buildings, health centers, recreational centers, office complex, parking areas, bus parks, etc. Besides, parti land could be utilized for necessary infrastructures like water supply in the form of well, water spout, underground tanks, sewerage treatment plan, necessary boxes for electricity & telecommunication etc. Again large vacant land could be benefited giving lease to the municipality or other developers in the form of huge trade centers, hospitals, financial centers etc.

3.2.9 Infrastructure of Sinamangal LPP:

Followings have been dealt in the study of the Sinamangal Land pooling Area-

i. Transportation
ii. Access road
iii. Drainage
iv. Sanitation
v. Water supply
vi. Energy

i) Transport

Nepal Yatayat with around 30 buses run from area and provided a great help to the residents. At the moment the traffic volume is not significantly high in the all the roads but with the increase in the housing stock it is sure to increase.

ii) Access road

The project area has roads of different widths-6m, 8m and 11 meter. Till now the road is all graveled. Due to the flow of the heavy and large vehicles the environment nearby the roads are dusty. Similarly we can make pavements and street lighting and traffic management. This will enable easier development planning of the land pooling area and nearby.

iii) Drainage

There is storm water provision from the project in the land development area. House owners are required to build septic tank for the toilet waste collection so that they could not discharge the sewer to the drainage. The project has envisaged building reed bed filter plant in the 23 Ropani of land in the south -eastern sector of the project. But as the cost of the land is very high it has decided to abandon the project in favor of the mechanical treatment plant that occupies relatively smaller space.

iv) Sanitation

The solid waste is collected by privately run solid waste disposal company. It utilizes cycle driven vehicle for collection from door to door and average charge for this is about rate Rs. 100 per month. The waste is separated into sellable items and dumping items. People in the

area can contribute by reducing the waste volume and managing the biodegradable waste for manure formation (like using compost bin) thereby contributing towards the environment protection. Similarly banning the use of thin plastic bags in the area can contribute towards the solution of sewer clogging by bags.

v) Water supply

Main objective is to provide a reliable supply of water in sufficient quantity and adequate quality, which is readily accessible to consumers. In the area there is no provision of the piped water. According to the project office the water supply will be available only after the completion of the Melamchi project. The people of the area use underground water through boring and well for domestic use. Some use the stone waterspout.

Recently a proposal from the water supply corporation has demanded 1 Ropani of land free of cost from the project for deep boring to supply water in the area. To this proposal there has not been any concrete decision from the project office.

Considering the density 200 person per hector as envisaged by the project, the total water demand will be around 1 million liter per day taking account on the basis of 70 liter per capita per day. It will cost lot of money, as there is need of treatment of and lying of distribution pipelines. At the moment the density of 200 people per hector is not seen in the project so we can supply extra water top the other place through the main water trunk. The water derived from the system has to be integrated to the municipal infrastructure system such that excess water can be sold and deficit water can be brought. Similarly the rain water harvest on each household can solve the water supply demand to large extent .As Kathmandu has more than 1300mm of rainfall annually it is feasible option.

vi) Energy

For the purpose of the lighting and heating there is supply of electricity from the Nepal Electricity Authority. For this purpose the project has take cooperation from the NEA. Till now there is no provision of the streetlight. In some houses solar energy has been utilized for heating water by using solar panels.

3.2.10 Findings of detail of questionnaire survey in Sinamangal

10% i.e. 40 nos of household were surveyed randomly in Sinamangal LPP. About 29 questions were taken in which respondents' answers are shown below.

Urban form

In Sinamangal more than 90% people take football ground as memorable place and some people prefer bus park and temple.

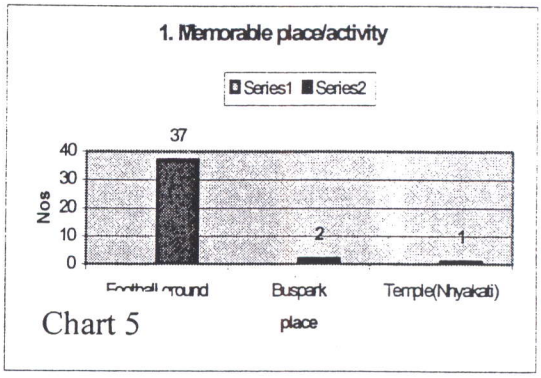


Chart 5

Around 70% people feel that neighborhood are found to have better and close relationship But some are very crude about neighborhood and it could be due to the fact that the place is dominated by migrant population from all 75 districts of the country.

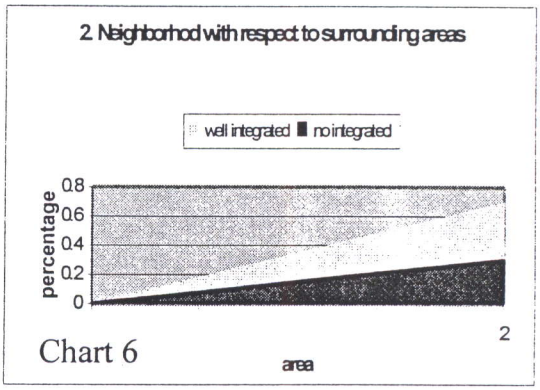


Chart 6

Physical setting

Building block size in the planning area is almost suitable in modern period

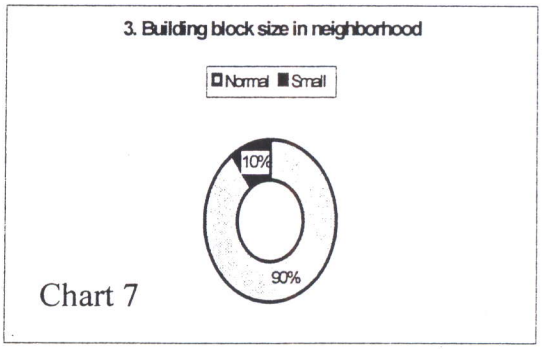


Chart 7

Street network is convenient and o.k. It is o.k. in the sense that it is also confusion about roads having more than 3,4 roads for same location.

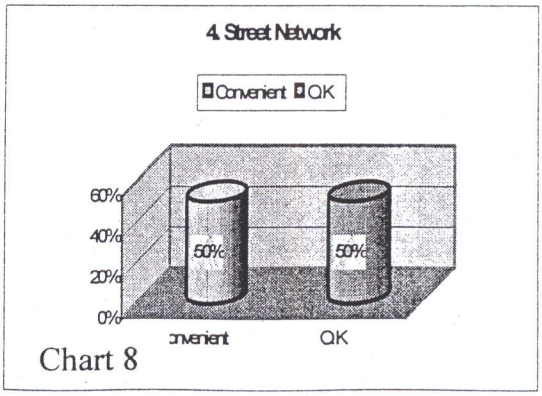


Chart 8

Every LPP has made provisions of open spaces for various public uses through contribution of certain portion of land by the landowners. Children and other young people for playing games mostly use it. 100% people are satisfied having sufficient open space in planning areas.

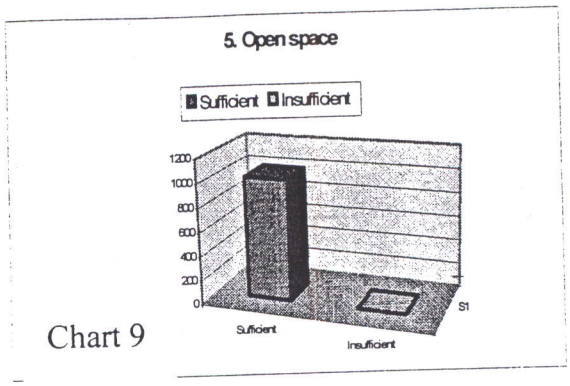


Chart 9

People are feeling mostly commercial activities lacking in the place. They also felt lacking of institution, office and housing.

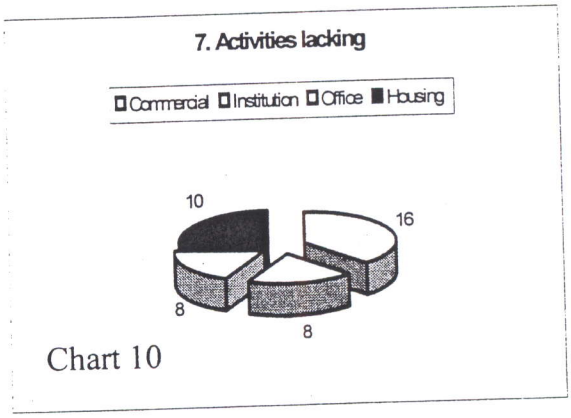
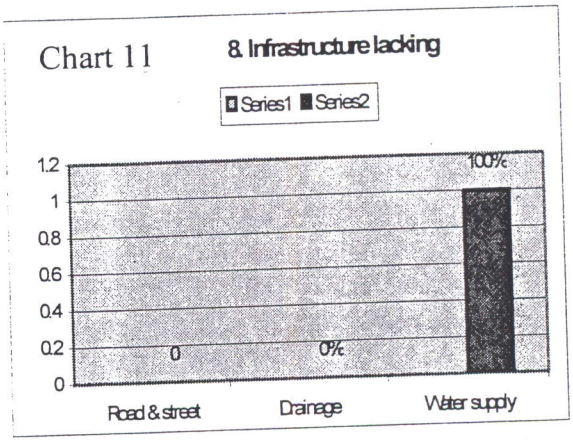


Chart 10

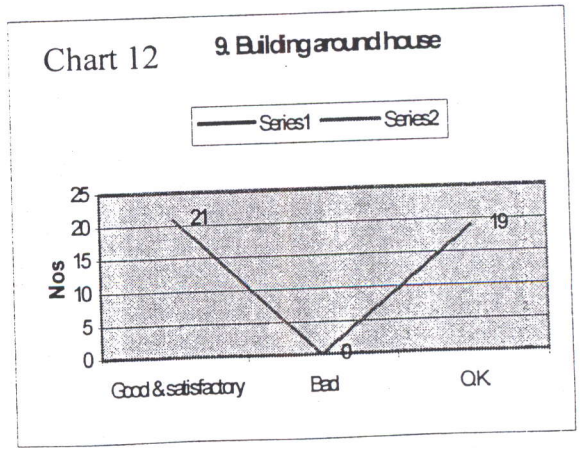
Among various infrastructures, water supply is lacking 100%. But 25% have their own plant in the house.
Residents surveyed complain about the difficulty of obtained water supply line for a newly constructed building, as a result of which they have to resort on underground water from wells, water spout and hand pumps.

Chart 11



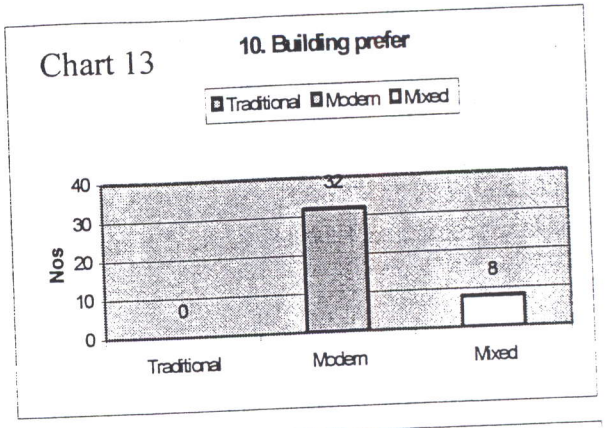
Existing building around house seems good and satisfactory.

Chart 12



More than 80% people prefer modern building and remaining like mixed type of building.

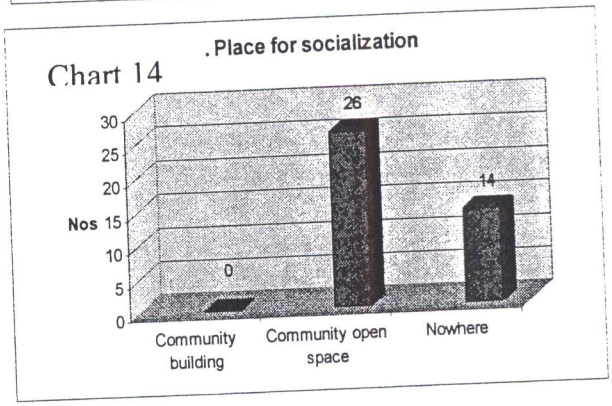
Chart 13



Sense of community

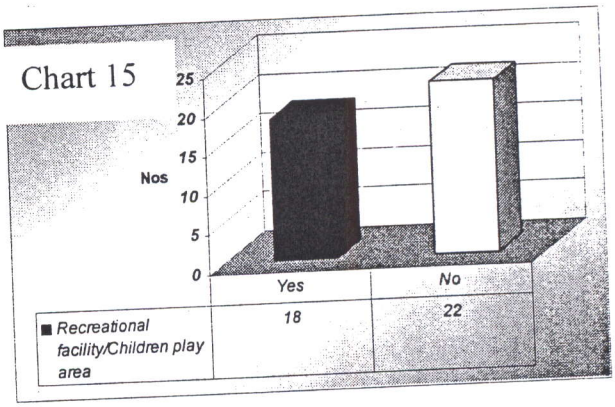
There is no any type of community building in that area. So 26 households among 40 go to the community open space for socialization.

Chart 14



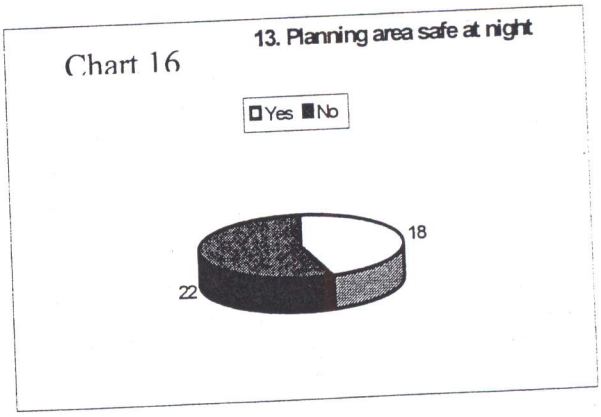
22 nos of household are positive having recreational facility/children's play area and 18 nos are in negative.

Chart 15



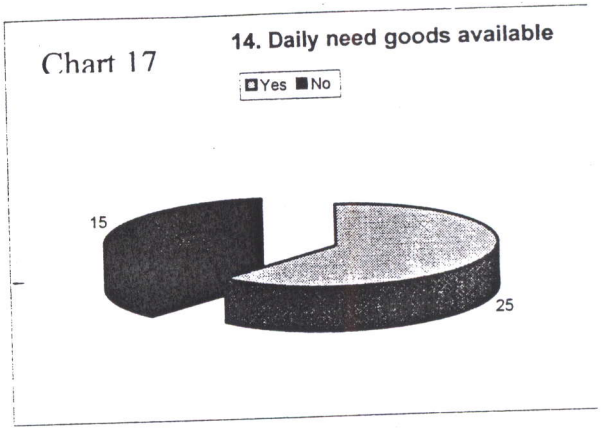
22 nos of household feel safe at night whereas 18 nos feel security need.

Chart 16



25 nos that are very near at pepsicola side have convenient day to day market and find daily need goods whereas 15 nos find difficult to get them. They get their necessary things from pepsicola chowk, Koteshwor and Manohara bridge. So people prefer either to market in the planning area or in the surrounding areas where there better market.

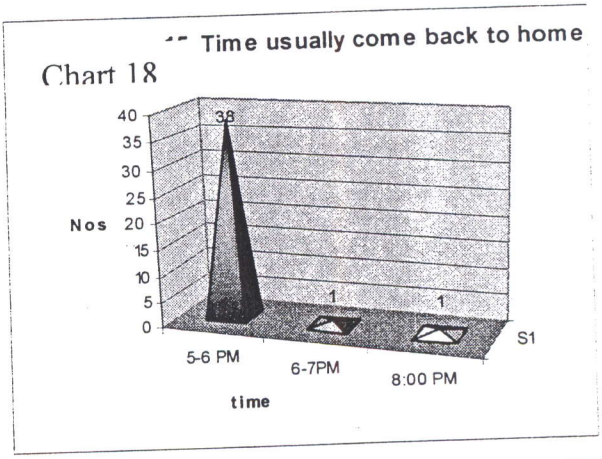
Chart 17



Diversity/Lively/Vitality

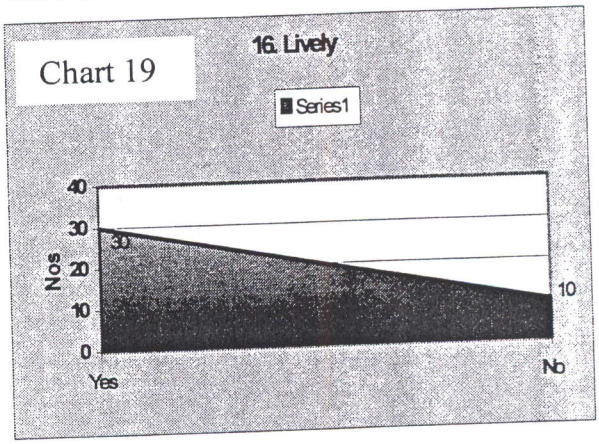
More than 90% people come back to home at 5-6 pm. whereas few people only come back home within 8 pm. This indicates that most of the people are jobholders.

Chart 18



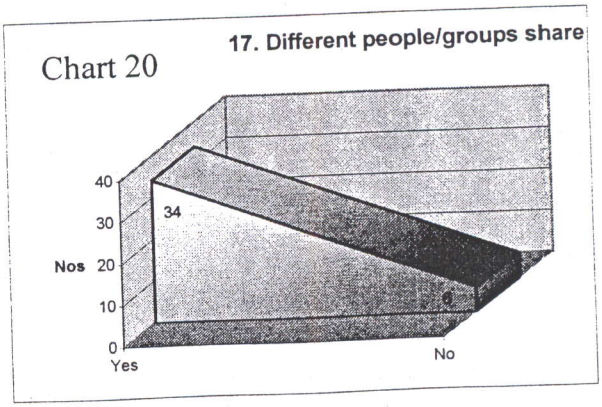
More than 70% people feel that their place is lively but remaining feel like dead city. At evening most of the people meet and gather at open spaces. But at the daytime it is almost like lonely.

Chart 19



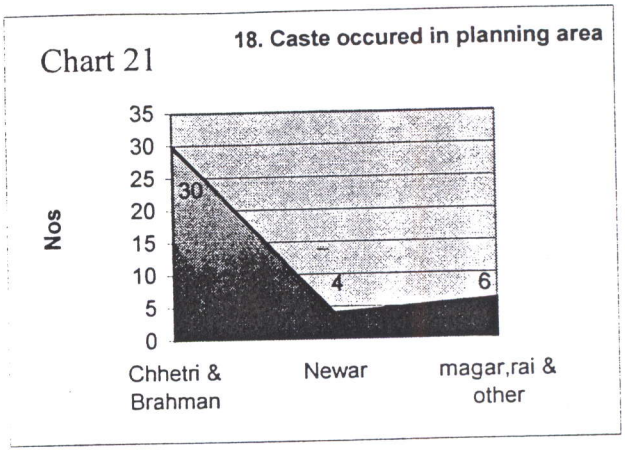
85% share different ethnic groups/people whereas 15% do not like to share with other people.

Chart 20



There are different caste occur in the planning. Among them majority are Brahman and Chhetri that is 75%, Newar 10% and remaining 15% include Rai, Magar % other castes.

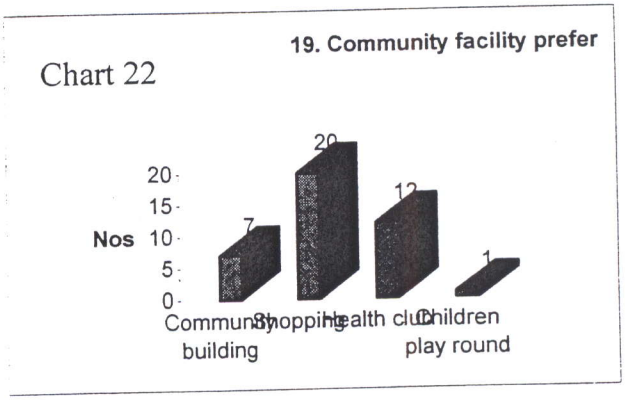
Chart 21



Community center and facility

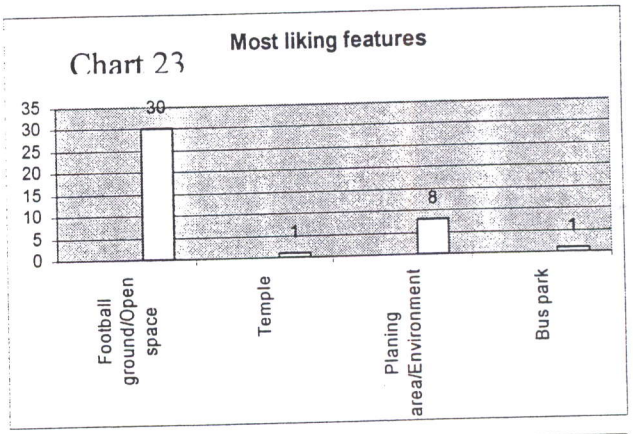
There is still lacking many community facilities. Among them 505 prefer to develop shopping/market area, 30% prefer health club, 19% prefer community building and 15 prefer for children play ground.

Chart 22



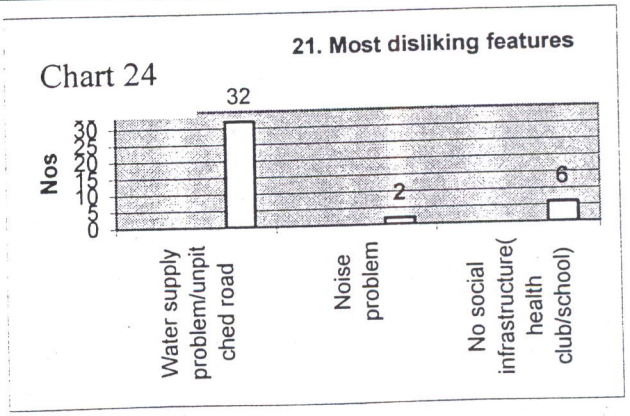
There are different features existing in the planning area. But in Sinamangal 75% people like large open space also known as football ground, 20% like environment /planning area/open space, 2.5% like Nhykati temple and 2.5% like bus provision.

Chart 23



Among different features, people's most disliking features are water supply problem and unpitched road (32 nos), noise problem (2), no health club & no school/college (6). Among them one of the problems will be solved in very near future i.e. from the ending of the year, the main road is being gone to convert into pitch road joining Mulpani.

Chart 24



Family structure is almost seemed good and satisfactory for residence. 90% household has 4-6 family nos whereas 10% has big family i.e. 8-10 nos

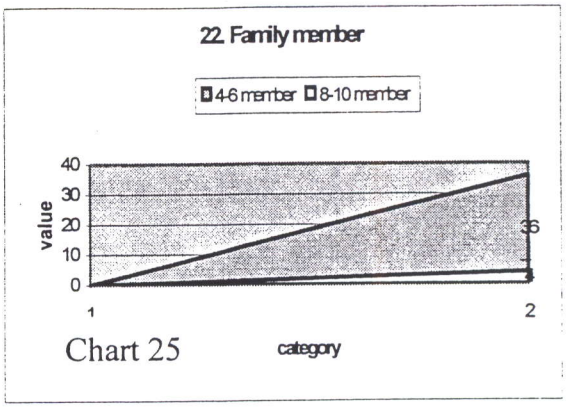


Chart 25

Most people have their own motorcycle (60%), Car/van (20%), and other remaining having other vehicles and not having vehicles.

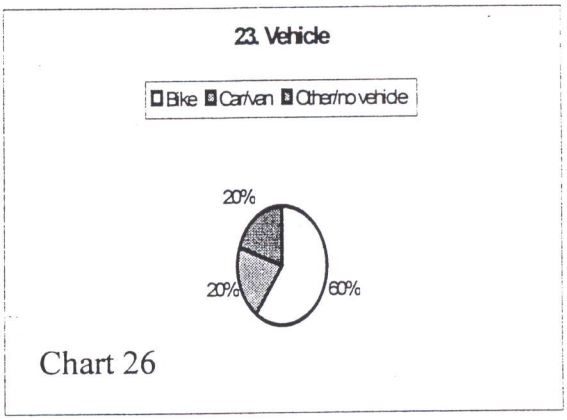


Chart 26

Majority of the residents (60%) were migrants having their origin virtually from all parts of the country. 40% people are indigenous. According to local people more than 10% of people are migrated from Sindhuli. But from random survey, it is found that Sindhuli(11 nos), Kavre(4), Surkhet(2), Palpa(2), Jhapa(2), Butwal(2) and Saptari(1). The dominance of migrated population in Sinamangal signifies that many original landowners must have sold their land to the migrants who are more in need of housing plots in the city, probably because of the hike in land value after land pooling.

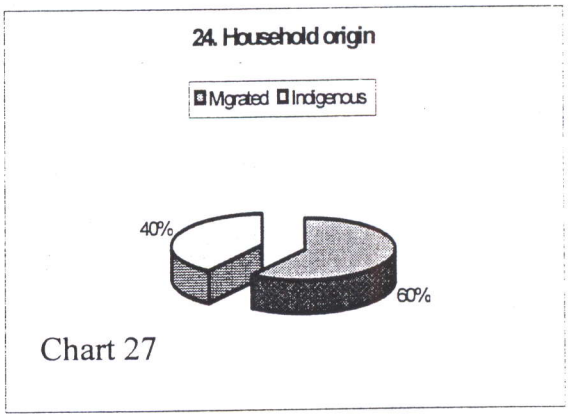


Chart 27

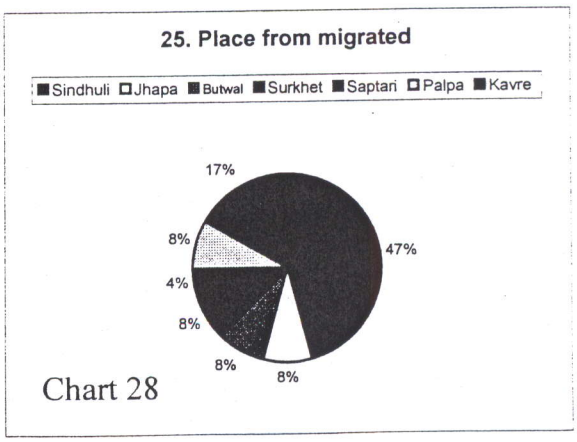


Chart 28

Income level of people coming to live in the land pooling projects is an important aspect to look into. This help to assess the class of people currently having access to these planned area. From survey it was found that 50% having 5-10 thousand rupees, 35% having 10-15 thousand rupees, and 15% having more than 15 thousand. Among them 90% people of category A (5-10 thousand) have the expenditure of 5-11 thousand rupees 10% people save the money. 70% of people of Category B (10-15 thousand) have the expenditure of 10-20 thousand rupees and 30% save money. All from category C (more than 15) save the money from their income.

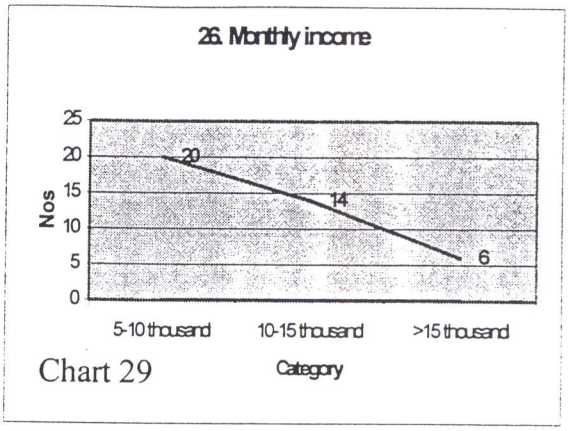


Chart 29

Lack of fund was the reason of 75% respondents. Whereas, no immediate need of housing was the reason of 10% respondents and 15% wants to get the land speculation. Majority people of this area is migrant, who could have first acquired land and have had to wait few years till enough fund is collected for building the house. And about 50% people are living in the rental space.

Because of the most of the migrant people, 85% prefer to develop the housing at that place whereas remaining does not want to build the housing because they do not want to get the congested area.

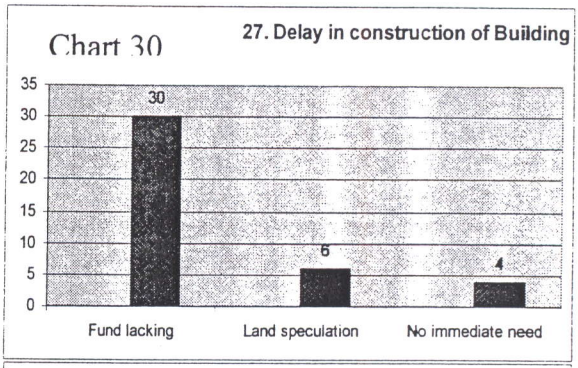


Chart 30

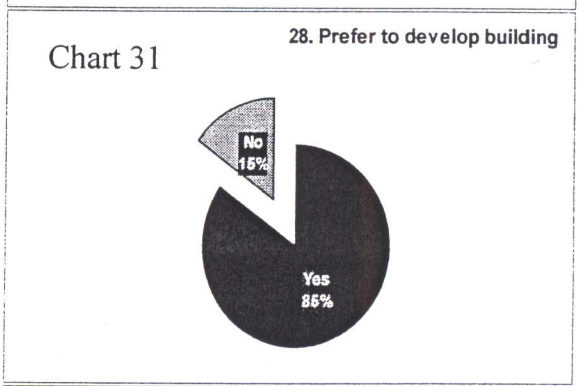


Chart 31

Due to nearer at the Airport area, it is seemed like noisy area. But according to respondent people, there is not so much noise pollution. 29 nos said no problem and 11 said just problems but it will become used to later.

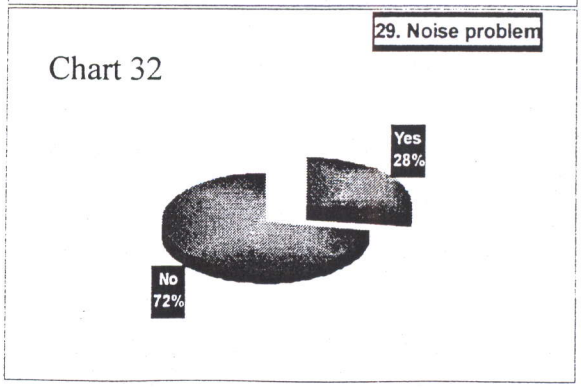


Chart 32

Chapter 4

Analysis and findings

Eleven land pooling projects have been implemented in Kathmandu valley. They all have little variation in their nature and features, which can be seen in below.

Table 29. Salient features of eleven land pooling projects in Kathmandu valley:

Project	Location	Duration					Land Use (%)					Plots by size		Management Com. Headed by	Remark and Legal basis
		Start	Complete	Area (ha)	No. of holding	No. of plots	Open Space	Circulation	Commercial	Contribution	Residential	Min. (m2)	>min. (m2)		
Gongabu	KMC Ward 29	88	96	14.3	376	406	5.2	17.5	6.9	29.6	70.4	80.0	varies	Mayor	TDC Act 1988
Sainbu	Lalitpur District Saibu VDC	91	03	27.6	536	611	12.9	22.8	20.3	56	44.0	126	"	DDC Chairman	Land Acq. In 1976 & TDC Act 1988 6% for O.S & 6.9 % for school, market & office area
Lubhu	Lalitpur District Lubhu VDC	93	96	13.5	207	243	4.4	17.9	9.0	31.3	68.7	80	"	DDC Chairman	TDC Act 1988
Libali	Bhaktapur Ward no 1&2	95	98	33.9	667	794	2.8	23.6	7.1	33.5	66.5	126	"	Mayor	" "
Dallu	KMC Ward no 15	91	03	19.80	455	698	7.0	25.0	8.0	40.0	60.0	80	"	Mayor	S&S Proj. in 1977 TDC Act 1988
Kamal Vinayak	Bhaktapur Ward no 4	91	95	7.3	170	205	4.2	21.5	6.8	32.5	67.5	80	"	Mayor	TDC Act 1988
Gopikrishna	KMC Ward no 7	95	02	8.9	242	259	3.8	22.7	7.00	33.6	66.4	80	"	Mayor	TDC Act 1 988
Nayabazar Khusibu	KMC Ward no 16&17	95	03	44.3	1569	1312	4.0	22	4.00	30.0	70.0	80	"	Mayor	TDC Act 1988
Sinamangal	KMC Ward no 35	95	03	35.1	964	660	5.3	20.3	7.00	32.6	67.4	80	"	Mayor	Do
Sintitar	MT Municipality Ward no1&3 (Bode)	96	03	26.5	812	871	3.4	18.8	10.0	32.2	67.8	126	"	Mayor	Do
Bagmati Corridor	LSMC Ward no 10	92	01	9.8	239	258	-	19.0	2.70	21.7	78.3	80	"	Mayor	Do

Source:KVTDC. As of March 2003

Table 30. Some important salient features of eleven land pooling projects in Kathmandu valley:

Project	Duration			Distance from ringroad in km							Plots by size		2062/63Land value(major roadside)lakh /ropani	Land value (local rate) lakh /ropani
	Start	Complete	Area (ha)	inner	outer	House built	Vacant plot no	Vacant plot %	No. of holding	No. of plots	Min. (m2)	>min. (m2)		
Ktm														
Gongabun	88	96	14.3	0		350	56	13.79	376	406	80	varies	32	160
Dallu	91	03	19.80	1		500	198	28.36	455	698	80	"	32	192
Chabahil Gopikrishna	95	02	8.9		0	165	94	36.29	242	259	80	"	42	160
Nayabazar Khusibun	95	03	44.3	0.3		600	712	54.26	1569	1312	80	"	28	192
Sinamangal	95	03	35.1		3	425	235	35.61	964	660	80	"	24	80
Lalitpur														
Sainbu	91	03	27.6		1.5	130	481	78.72	536	611	126	"	10	64
Bagmati Phant	92	01	9.8	5		150	108	41.86	239	258	80	"	24	80
Lubhu	93	96	13.5		5	50	193	79.42	207	243	80	"	6.51	32
Bhaktapur														
Kamal Vinayak	91	95	7.3	3 from Arniko highway		150	55	26.82	170	205	80	"	10	32
Libali	95	98	33.9	2		100	694	87.41	667	794	126	"	10	32
Sintitar	96	03	26.5	3.5		40	831	95.40	812	871	126	"	9	24

Source: Ktm,Lalitpur,Bhaktapur TDC as of 2062/2063

4.1 Nature and pace of development

Land pooling schemes in the Kathmandu valley has been launched with a prime objective of providing developed plots with adequate provision of basis infrastructure services such as roads, drainage, water supply, open space among others, in other to realize a planned urban expansion discouraging sprawl development. Thus one expects for timely and orderly development of communities in such area and failure to achieve it within certain reasonable time frame has to be considered a set back toward achieving the goals and objectives of the project.

Thus it is necessary to assess and have an understanding of the present nature of the development-taking place in the land pooling areas. In this regard the number of buildings built in the project areas after their completion and the character of the community to live in the place will be helpful.

There are many indicators, which show the housing development trend in the land pooling areas. Among them some indicators are shown below.

a) Location
b) Number of buildings, Vacant plot
c) Level of services

-Physical Infrastructure

-Social Infrastructure

d) Land value
e) Area and Plot size

4.1.1 Location:

There are 11 land pooling projects completed in Kathmandu valley. Among them five LP projects are situated in Kathmandu, three of them are situated in Lalitpur and remaining three of them at Bhaktapur. Good location especially close to the city area will be one of the best places of rapid development of housing.

Kathmandu

1. Gongabu: South, 0 km.distance inside from ringroad. (Attached ringroad)
2. Dallu: East, 1 km.distance inside from ringroad
3. Gopikrishna, Chabahil: North- east, 0 km.distance outside from ringroad
4. Nayabazar, Khusibun: East, 0.3 km.distance inside from ringroad
5. Sinamangal: North-east, 3 km.distance outside from ringroad

Lalitpur

6. Sainbu: South, 1.5 km.distance outside from ringroad
7. Bagmati Phant: West, 5 km.distance inside from ringroad
8. Lubhu: South, 5 km.distance outside from ringroad

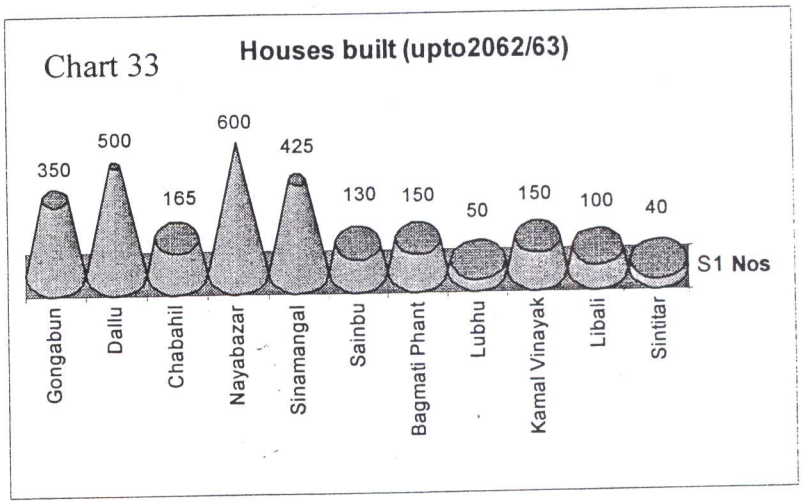
Bhaktapur

9. Kamal Vinayak: North, 3 km.distance from Arniko highway
10. Liwali: North, 2 km.distance from Arniko highway
11. Sintitar: North, 3.5 km.distance from Arniko highway

4.1.2 Number of buildings and vacant plot

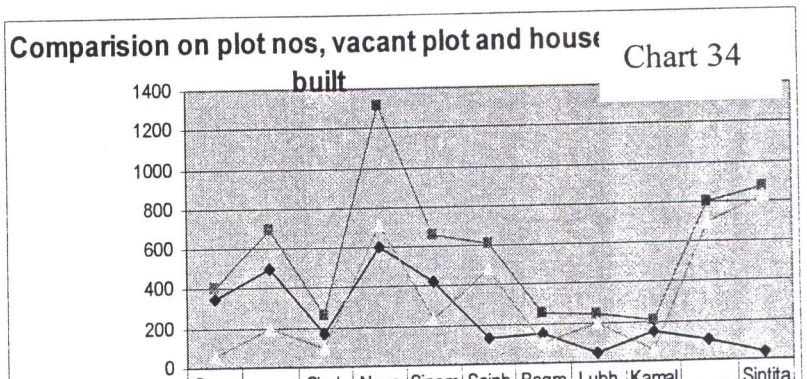
In the chart, more buildings i.e. 600 buildings constructed in Nayabazar till 2062/63.then come Dallu as 500 and Sinamangal as 425 buildings built.Among 11 LPP, Nayabazar has a great rate of building construction being located adjacent to the Kathmandu city core and in vicinity of the Thamel, a flouriest tourist hub.

Chart 33

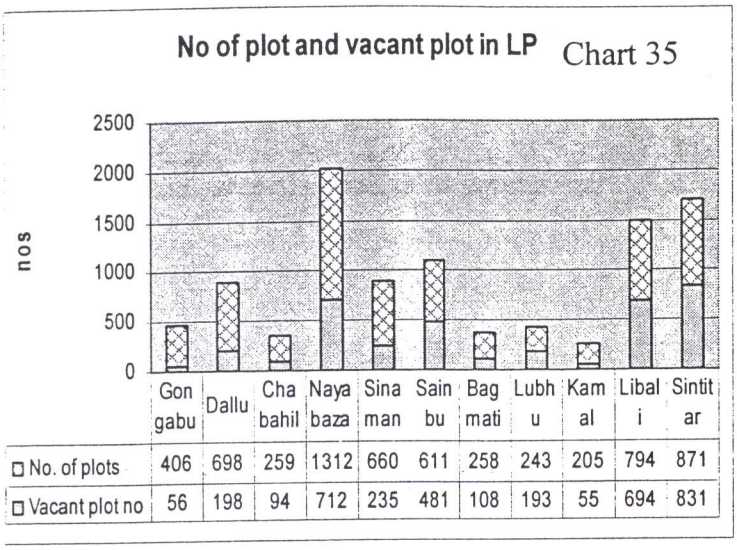


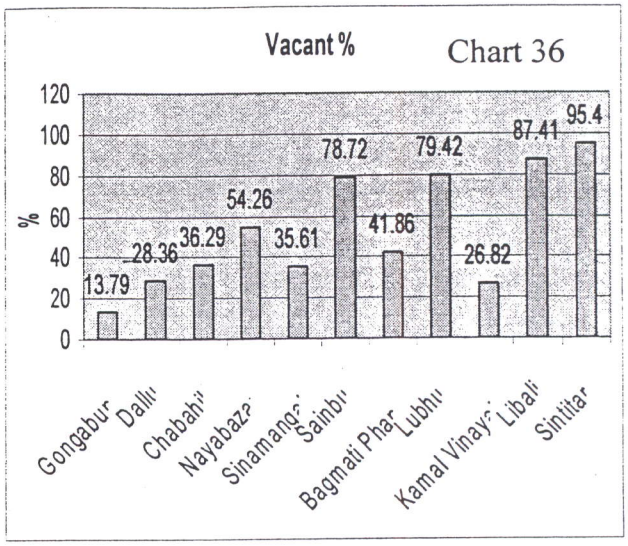
According to ratio of plot numbers and vacant plot numbers, it is seemed that Gongabu has the highest development rate of building construction. There are 350 houses built among 406 plots. That means there are left only 56 vacant plots giving 13.79% vacant places. Then position comes Kamalvinayak (26.86), Dallu (28.36) and 4th Sinamangal (35.61 vacant %)

Chart 34



	Gongabun	Dallu	Chabahil	Nayabazar	Sinamangal	Sainbu	Bagmati	Lubhu	Kamal Vinay	Libali	Sintitar
Houses built	350	500	165	600	425	130	150	50	150	100	40
No. of plots	406	698	259	1312	660	611	258	243	205	794	871
Vacant plot no	56	198	94	712	235	Nos	108	193	55	694	831





4.1.3 Level of Services

Table 31. Physical Infrastructure

	Land Pooling Projects	Road width	Road type	Road %	Tele Commu nication	Electric line	W/S line	Surface Drain	Sewer line	Foot path	Open space
	Ktm										
1	Gongabun	8,6,4	pitch	17	X	√	√	√	X	X	5.2
2	Dallu	10,7,5	pitch	25	X	√	√	√	√	X	7
3	Chabahil Gopikrishna	8,6,4	pitch	24.5	X	√	√	√	√	X	3.8
4	Nayabazar Khusibun	20,14, 8,6,4	pitch	16	X	√	√	√	√	X	4
5	Sinamangal		pitch	25	X	√	X	√	X	X	5.3
	Lalitpur										
6	Sainbu	11,8,6,4	pitch	23	√	√	√	√	√	√	12.9
7	Bagmati phant	20,11, 8,6,4	Gravel	20	X	X	X	√	X	X	-
8	Lubhu	8,6,4	pitch	17	X	X	√	√	X	X	4.4
	Bhaktapur										
9	Kamal vinayak	8,7, 6,4	Gravel	21.5	X	X	√	√	X	X	4.2
10	Liwali	10,9,7,5	Gravel	23	X	X	X	√	√	X	2.8
11	Sintitar	10,9,8,6	Gravel	20	X	X	X	√	√	X	3.4

Among all physical infrastructure, road is the main indicator that fulfill all other requirements that are needed for development of new places because road is all about in which all pipe lines are laid out. In this case, Nayabazar has more length of road (17 km.) and drain (23 km.) line. That's why the land price of Nayabazar LPP is rising day by day.
In this way Sinamangal area is developed with more road (12 km) and drain line (10) %) giving high opportunity for living environment for people.

Chart 37 **Road and drain ratio**

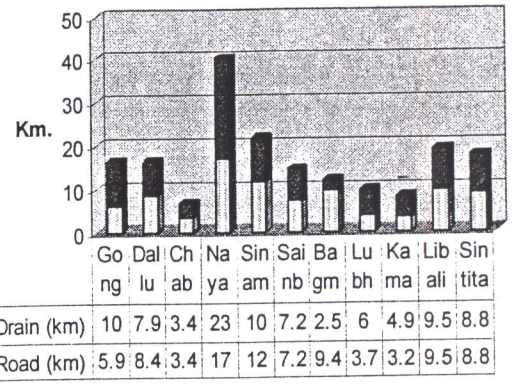


Table 32. Social Infrastructure

	Land Pooling Projects	Open space	Community building	School area	Shopping area	Other
	Ktm					
1	Gongabun	5.2	√	X	X	X
2	Dallu	7	√	X	√	X
3	Chabahil, Gopikrishna	3.8	X	X	X	Flood control
4	Nayabazar, Khusibun	4	X	X	X	X
5	Sinamangal	5.3	X	X	X	X
	Lalitpur					
6	Sainbu	12.9	√	√	√	X
7	Bagmati phant	-	X	X	X	Flood control
8	Lubhu	4.4	X	X	X	X
	Bhaktapur					
9	Kamal vinayak	4.2	X	X	X	X
10	Liwali	2.8	X	X	X	X
11	Sinti Tar	3.4	X	X	X	X

Among all, Bagmati Phant has more percentage of residential land having 19% road. Likewise more % of road is laid at Liwali LPP having 66.5% residential areas.

In this way Sinamangal area is developed with 20.3% road, 67.4% residential uses and 5.3% open spaces. In an average it is suitable for housing development.

Chart 38

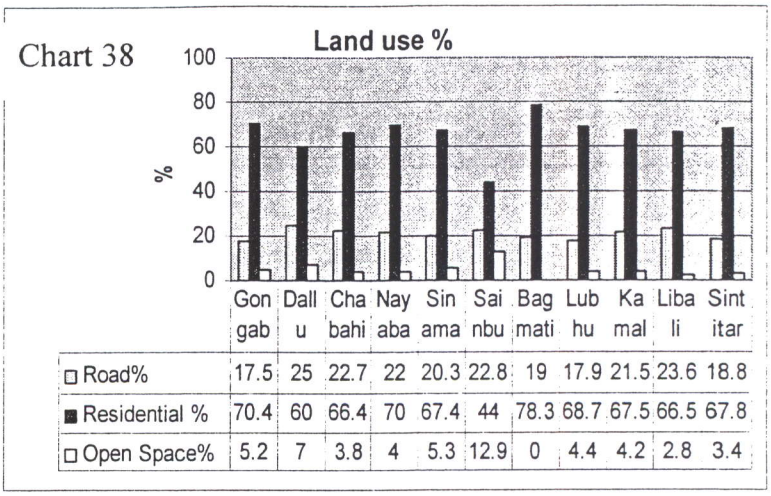


Table 33. Land use of 11 LPP

LPP	Road%	Residential %	Open Space%
Gongabun	17.5	70.4	5.2
Dallu	25	60	7
Chabahil	22.7	66.4	3.8
Nayabazar	22	70	4
Sinamangal	20.3	67.4	5.3
Sainbu	22.8	44	12.9
Bagmati Phant	19	78.3	0
Lubhu	17.9	68.7	4.4
Kamal Vinayak	21.5	67.5	4.2
Liwali	23.6	66.5	2.8
Sintitar	18.8	67.8	3.4

4.1.4 Land Value and Land Market:

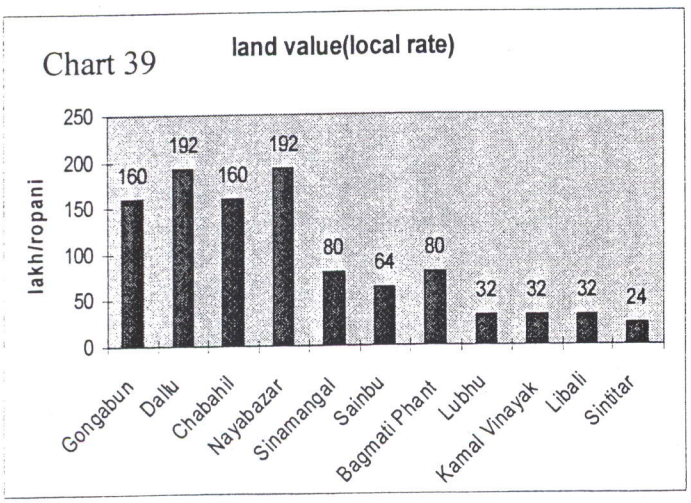
Given the scale of urbanization in Kathmandu valley the land availability suitable for urban use has become more and more limited, forcing the expansion of cities to the surrounding fields. The demand for residential plots is rapidly increasing whereas supply is rather sporadic and inefficient. Because of the dominance and shortcomings of informal land supply

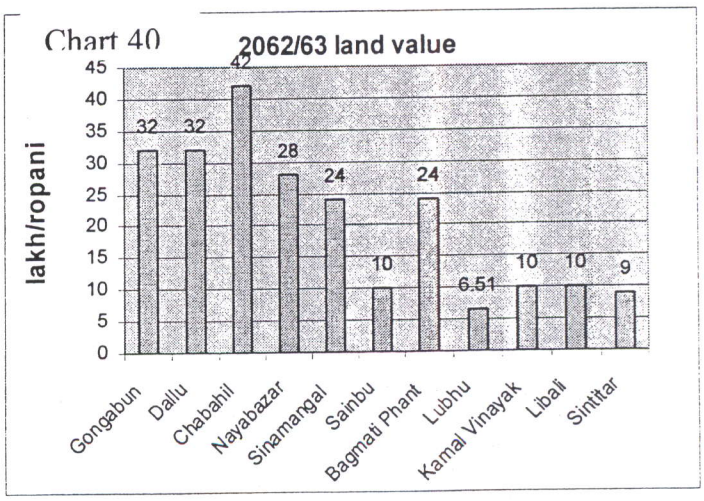
mechanism in the land market, there is large shortage of suitable land for housing, which pushes land value dramatically up. Thus land in Kathmandu valley has become a commodity affordable to selected few.

Land development through land pooling as carried out in Kathamandu valley aims at planned urban expansion and delivery of housing plots with provision of basic infrastructure and services. The value of land and the land market operation after land pooling is crucial for achieving its objectives.

Hike in land price has been as essential feature of all the land pooling schemes in the Kathmandu valley. Landowners benefited from 60% to 100% increase in land value after the project and enjoyed a better road network and more efficient plot layouts (Karki, 2001). Benefit in terms of increase in land value and better infrastructure and services in a planned environment is what is actually promised to the landowners by the project during implementation for convincing them the participate in the process.

However, do the multi fold increase in the land value and the way the land market operates help achieved the objectives of land development in general and land pooling in particular is important aspect to be considered while assessing the performance of such projects. Thus this section looks into the present situation of land value and land market operation in the case study projects.





The land value is taken only nearby the main roadside of LPP.

In the chart, it is seen that the highest price of the LPP is in Chabahil (42 lakh per ropani according to 2062/63 government rate. According to local rate also the place of Chabahil (192 lakh/ropani) comes high and Nayabazar also come at same rate. It is so, because of the location nearby the city core. And Dallu area where rate of development is high and there are only few lands remained, that's why price of land is little bit low than Nayabazar according to government rate. The rate at Sinamangal seems at mid rate of all 1 LPP. Which means more people can afford the land at Sinamangal LPP and suitable for middle-income group people.

4.1.5 Area and Plot size

Of the 11 LPP, Nayabazar LPP is one of the big projects in area wise (44.3 hectar), then come Sinamangal (35.1) and Lubhu (33.9). After Nayabazar LPP, it is suitable at Sinamangal LPP for housing development due to more area still has to be fulfilled within average year 1.

Except Sainbu, Liwali and Sintitar LPP, remaining all have minimum plot size of 80 sq.m (0-2-2-2), which is very much suitable for residential building. But three have minimum plot size of 126 sq.m.

It shows Sinamangal LPP is appropriate for housing development.

Chart 41

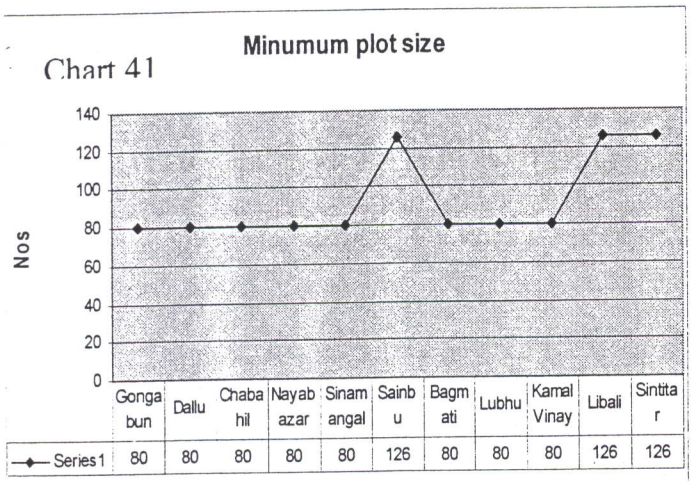


Chart 42

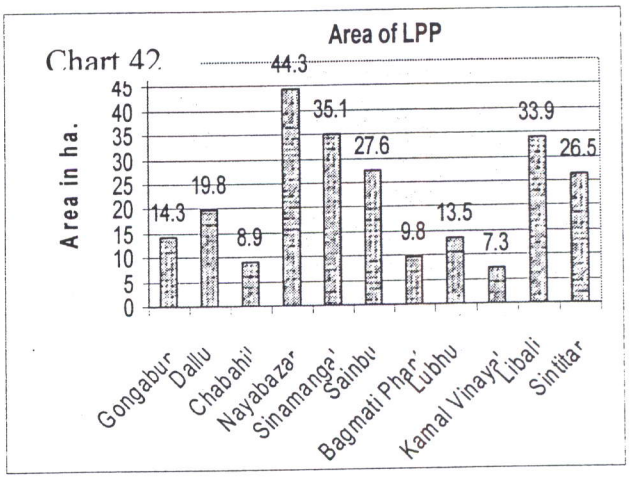


Table 34. Rate of Housing Development and Estimated Time to Completely Fill up

LPP	Yrs of completion	Yrs since completion	No of buildings	Avg. rate of development/yr.	No of plot	Yrs to fill completely
Ktm						
Gongabun	96	9	350	38.88	406	1.44
Dallu	03	2	500	250	698	0.79
Chabahil Gopikrishna	02	3	165	55	259	1.70
Nayabazar Khusibu	03	2	600	300	1312	2.37
Sinamangal	03	2	425	212.5	660	1.10
Lalitpur						
Sainbu	03	2	130	65	611	7.4
Bagmati Phant	01	4	150	37.5	258	2.88
Lubhu	96	9	50	5.55	243	34.77
Bhaktapur						
Kamal Vinayak	95	10	150	15	205	3.66
Liwali	98	7	100	14.28	794	48.59
Sintitar	03	2	40	20	871	41.55

Of these 11 projects, Dallu has the highest development percent and it has required only 0.8 years filling up the place. It may be so, because of its location; just 1 km inside the ring road not so far from Kathmandu city core, better transportation facilities, closeness to the city bus park.

Likewise Sinamangal has also the second highest development percent and it has required only 1.1 years to fill up the place. It may be so, because it is located at the little bit far from KTM city core but it is the place suitable for new comers i.e. migrants and there are also 60% migrants living (according to random survey)

LPP located at Kathmandu has almost the high rate of housing development and required low year to filling the place. It is happened due to the capital city and the urban annual growth rate of Kathmandu is 5.65% (CDR, 2001) compared to 3.53% in Lalitpur and 1.98% in Bhaktapur. Again the building permit issued by the BM is 2000 in KMC. (Source BM)

The slow development of Lubhu, Liwali and Sintitar project can also be contributed to the location of these projects. However in the case of these projects, the landownership pattern is more influential. Majority of the original landowners in these areas come from indigenous farmer community, for whom agriculture is the major source of livelihood. Therefore many people are farming in these LP projects.

There is also no immediate pressure of urbanization as in Kathmandu. Liwali, eastern part of Bhaktapur core was identified by Bhaktapur Development Plan as the expansion area for population spillover from the city core. But the urban development in Bhaktapur is not as significant as in Kathmandu. Urban annual growth rate of Bhaktapur municipality was 1.98% during 1991 to 2000 and building permit is also 200.

Again Lubhu LPP is a relatively small traditional settlement growing slowly and urban expansion of Lalitpur is yet to make significant influence in this area.

Morever, development has already begun and taken a good momentum in these LP schemes, which will help mere development at such LPP. The gradual development of services like markets, transportation facilities, and schools/colleges apart from already available infrastructure services within these LPP could add impetus for further development. And more important there exist a community like environment, though small and growing, which could provide a sense of security that people often seek in a new place.

On the other hand Liwali, Lubhu and Sintitar LPP is expected to take around 40 years to fill up the developed plots, which is quite longer period. The location of the LPP, land ownership pattern dominated by farmers and the low pressure of urbanization in and around these areas is some major reasons for slow development.

However, it is possible that these areas will be more influenced by urbanization and growth of the cities in and around after constructed Outer Ring road. The rapid urban population growth, urban expansion closing in towards the LPP, increase in commercial viability of land, change in occupational structure of the farmers etc. will all put pressure for gradually development.

In Bhaktapur, LPP located at Kamalvinayak and Liwali are probably the most appropriate for absorbing its future expansion. Though at present the fewer people are moving out from the

city area, the figure is likely to increase not just because of the increase in population and the housing needs, but also because of the changing uses of buildings from residential to commercial as result of expanding tourism sector in the city. In this regard, however discouraging the present development rate in Liwali LPP may be the future holds good for this area. Kamalvinayak LPP, the first completed in 1996 in Bhaktapur is gradually starting to see some form of development. Then obviously other two LPP will also develop preventing haphazard development. In Lalitpur also, the growth and development is taking place at Gwarko and Imadol area on the way to Lubhu, which will soon make it better.

Therefore, the time projected for Liwali, Sintitar and Lubhu LPP to completely fill up may not remain as high as it seems to be.

4.2 Sinamangal as an urban form

4.2.1 Spatial Features - Studying Sinamangal in the Figure-Ground Theory:

Reviewing the general plan of a Housing settlement, it can be seen that the building coverage is denser than the open space, thereby giving shape to the public opening - in other words, creating positive voids, or "space-as-object" (A term used in Finding Lost Space, p98)

The open space in a Sinamangal settlement has a well-defined shape. The open space are the space containing human beings social activities, represent the tension between the individual and the collective. They also represent transitions between the public and the private, and arenas for discourse and interaction. A predominant field of solid (mass housing) and voids (open space) created in this way are often called as urban fabric (Roger, 1986, p.99). This relationship of solids to voids can reveal the generic spatial pattern of a Sinamangal settlement. To further clarify the spatial pattern of housing settlements, several types of solids and voids have to be examined. The solids in Simamangal housing is formed by a mixed pattern of mass determined by their usage, in which commercial (some various types of small shop) mass take the street front and residential mass occupy the internal urban block, with appropriate bulk and vertical dimension.

By using figure-ground theory, we can identify the basic spatial pattern of a Sinamangal settlement in a few mass-void relationship and integrated urban fabric. In Sinamangal, mass and voids tried to be structured more in balance. With the large land coverage of housing mass, open space left out are still enjoyable and meaningful.

4.2.2 Organization Pattern- Studying Sinamangal in the Linkage Theory:

In linkage theory point of view, the basic linking elements in Sinamangal settlements are their networks of main lanes and other lanes. They form the circulation and primary organization structure of this settlement. A basic house form resolving upon the linking elements generates the settlement form.

The main lanes are usually placed in the center or busy location of a site, with their intersection with commercial streets as entrances of Sinamangal. They are usually 8m wide, allowing vehicles and bicycles to pass. Varying in numbers, they form the first level of circulation network, introducing the public space of a city into the semi-public space of a settlement.

The other small width lanes are to link the main lane. There are several types of side lanes - one connects the main lanes on both ends. The hierarchical order of organization network from public to semi-public, to semi-private, and to private, can not only maintain a circulation efficiency on main lanes, but also ensure the children' safety, and protect the intimacy of dwelling life on side lanes. This hierarchical pattern of circulation network decreases the disturbance of trespass traffic, and helps to establish a sense of order, or unit identity (e.g. unit number), for all houses within the settlement. There is variety of lanes but it cannot be found footpath at the sides, which is one of the essential element for Linkage theory.

4.2.3 The Sense of Place - Studying Sinamangal in the Place Theory:

In abstract, space is a purposeful void with the potential of physical contents. It only becomes a place when it is given a contextual meaning derived from cultural or regional background (Roger, 1986, p.112). While types of space can be defined by categories or typologies based on physical properties, each place is unique, taking on the character of its history and surroundings. A place is a space which has a distinct character, and a stable system in which people can develop their social, cultural and political values and behaviors (Roger, 1986, p.113). In order to give space an emotional content - a presence that is more than physical, some aspects need to be taken into account in spatial design: the local history, the feelings and needs of the populace, the tradition of craftsmanship and indigenous materials, and the political and economic realities of the community.

There is not found such social, cultural and political values and behavior in Sinamangal but there is a temple named Nhykati temple still exists and some of the traditional waterspout can

be found. There could be found that all over the people from 75 districts are living at Sinamangal as a new land pooling area showing a human unity. Local vitality based on a mixed pattern of urban land-use, and small business springing up in and around the settlement, activates residents' lives. The inherited human scale, usable open space for each family, and safe ground for children and elderly, all add up to the feeling of being at home.

4.3 Sinamangal as a Community:

4.3.1 Four Community Design Principles

The study of Sinamangal housing is about a pattern of urban form in which interplay of physical, social and economic forces had come to form and shape the places. In order to address the comprehensive design issues involved in generation of this urban form, or to examine the livability of the settlement environment, one must first consider the interaction between two essential components of community - the physical environment and the user. Only by adopting an interdisciplinary system in evaluation and by examining both components, can we achieve a comprehensive understanding of the functional, environmental and psychological living qualities within the built structure of the settlement.

4.3.2 The Quality of Living in Sinamangal Settlements

Linkage

The linkage of Sinamangal to its urban setting is established towards Pepsicola area, Nhykati VDC, Gothatar VDC and recently connected towards Mulpani area. An entrance is not so well defined but the main 8m wide roads define as entrance having some commercial units at street front and other places are also linked through 4 and 6m road.

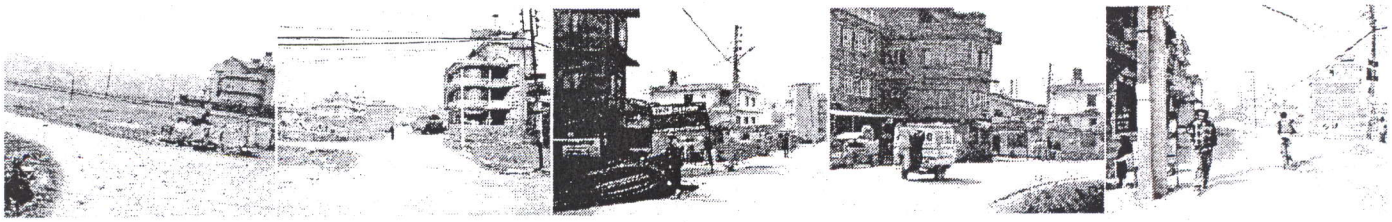


Plate 19. Different linkages (roads) of Sinamangal

Security

Actually there is not strong bond of security in Sinamangal. Police bit and street light is not seen within the area. As a result there is often occurred theft at the night and even in the day also.

Comfort

Once stepped inside the entrance of Sinamangal, one will be impressed by internal peace. There is no such traffic pollution and noise and the place is located a bit outside of ring road and busy city. The place suffers for noise because of airport located nearby. Visual comforts are little bit good having five open spaces, greenery, parks (future) and modern buildings. There is a large open space, which is very much useful for the children and even for social gathering and party. However, the quality of comforts and visual ease is not well achieved in Sinamangal settlements

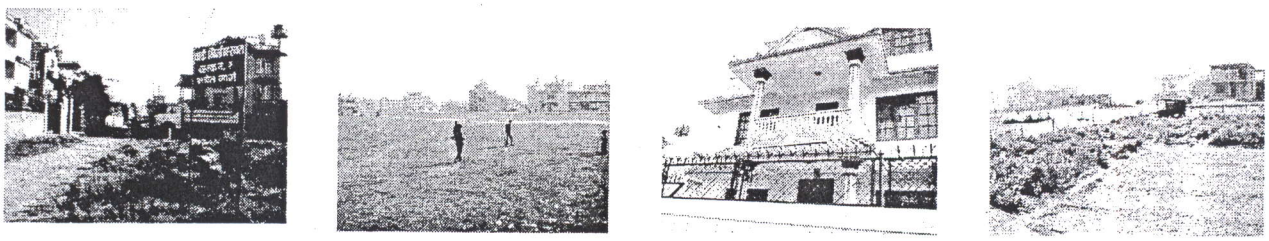


Plate 20. Open spaces, roads, modern building etc feeling some of the comfort ness

Diversity

Dwelling activities are based on two environments. One is physical environment, consisting of physical form, building type and structures; the other one, is social environment, comprising amiable atmosphere of community, relationship between neighbors, shopping conditions, education & health-care facilitates, and public service convenience, etc. (Bao, 1992, p.59). The first one may contain the "standard of living", but the second one represents the "quality of living", which is more fundamentally appreciated and increasingly pursued by modern dwellers.

People living in the city habitually go to food market early morning. For them, they have to first purchase daily food necessity such as meat, vegetables and fruits before going to work. Hence the shopping conditions must be made favorable to them in a good settlement but according to survey; there is not enough market available inside.

Preschool education and health-care is another consideration for families. Kindergartens, elementary schools and hospitals should be a short distance away, or easily accessible, since parents normally have to send their kids to kindergartens or schools on their way to work. But it is seen that only few primary and secondary school are running in the residential purpose building, so preliminary education can be easily pursued in adjacent areas of Sinamangal. There is no such health care and hospital inside.

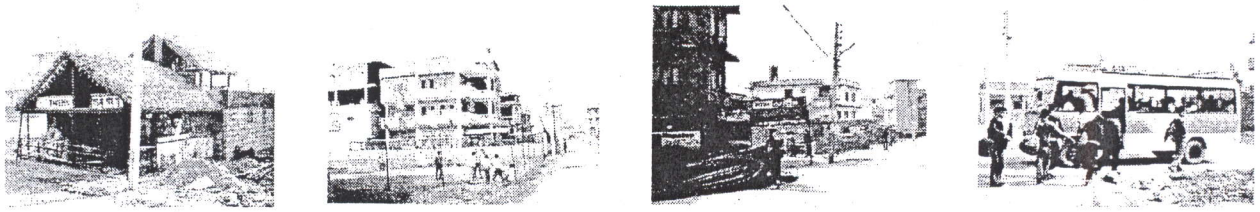


Plate 21. School, Bus Park, bus, restaurant-giving feeling of diversity

The broadest possible mix of residential, commercial, social and cultural variety, promotes city vitality. The street-life created by the built structures is something that can make a city identifiable and exciting. Jane Jacob has commented that: *"City streets must constantly be active and controlled by people who live, work, and relate to them in housing and employment buildings."* (David R. Hill, Jane Jacob's Ideas on Big, Diverse Cities) For her, the hustle and bustle of crowded sidewalk life in the corridor streets generates the excitement, interaction, and beauty that form the essence of what makes central areas of great cities around the world so appealing.

Within the built structure, "functional integration is matched by a degree of social integration." As Kevin Lynch has stated, this quality is *"surely a legitimate feature of good settlements, within which one can organize politically when the need for control arises. ... For certain age groups, particularly the young and old, a place-based social community is quite important in maintaining self-protection and self-consciousness* (Lynch, 1981, p.248-249).

In short, this type of settlement, decreases the noise and danger of fast traffic, and increases the possibility of local organization and control, all without major cost (Lynch, 1981, p.248).

Apart from that, the fact of being in an identifiable settlement which has quiet, safe internal lanes, easily accessible daily services and vital street-life in close proximity, has make the living so pleasurable. Everyone is aware of the diversity around him or her, and is in visual contact with other ways of life (Lynch, 1981, p.303).

Clarity

Clarity is, *in a small place the sense of how its parts fit together, and in a large settlement the sense of orientation* (Lynch, 1981, p.134). Applying to Sinamangal it has very little clarity.

Balance

The urban space of Sinamangal is conceived horizontally rather than vertically, having appropriate land coverage following building Byelaws. Its solids (building mass) consisting of primarily low-rise buildings, spatially define a series of intimate scale urban voids (internal open space). The shape of space carved out of the mass are clear and identifiable, hence appropriate usage in them can be assumed. This relationship between the dominated mass coverage and positive use of open space help to establish a sense of spatial balance within the built structure.

Identity

"Identity is the extent to which a person can recognize or recall a place as being distinct from other places - as having a vivid, or unique, or at least a particular, character of its own (Lynch, 1981, p.131)." Sinamangal settlement does not seen to have its own identity because of being a new settlement area. Its main identity is the place for all residents who are from all over 75 districts.

Focus

A focal point as a place of assembly, or social intercourse, is very important in community design. It is noticed that a fixed object acts as a magnet to movable objects (Gordon, 1961, p.103). In the case of human settlements, meaningful or functional fixed elements can attract the most movable objects - human beings. A tree provides shade and shelter; a bench allows people to sit; a shop solicits people to linger; and a newspaper-board attracts people to stay and read. People themselves, for different reasons, also need anchorage in their various outdoor activities of trade, recreation and social life. Hence lands of greenery, pieces of sitting area, groups of shops, and nodes of public service, turn the dissociated stream of people into groups, and become identifiable rallying points. These all features have not found in Sinamangal but few features like social and play area, which is in the form of large open spaces, Nhykati temple, and waterspout exists.

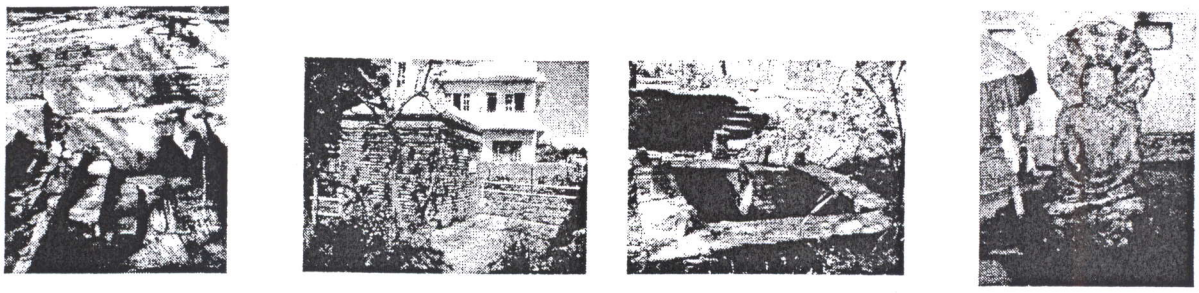


Plate 22. Focus point i.e. Nhykati temple, statue, waterspout etc.

Scale

Appeal is an intuitive human feeling response to aesthetic appreciation of objects. Whilst cultural factors have a profound influence upon the manifestation of aesthetic perception, the fundamental mechanisms seem to be universal which transcend time and culture. It (appeal) may deal with pattern of rhythm, state of balance, degree of harmony, and sensitivity of scales, etc., - to include all, the pleasure of sensation, especially the visual, authentic and emotional pleasure received in the process of experiencing the objects. Scale is also an attribute of the "Appeal". Human scale can make a space inviting and friendly and thus arouse a person intense sense of familiarity and comfort while walking through it. In the case of Sinamangal it is hard to find such environment.

Only by understanding the houses or settlements are not only physical containers of a group of dwellers but also psychological embodiments of dwelling activities, dweller's culture and religious belief, etc., which are more fundamentally rooted in life than the architectural forms, can humane and appealing residential environment be constructed. The study of Sinamangal as an urban form aims at, apart from clarifying its design concepts and ideas, exploring its positive factors, which have made this pattern of dwelling pleasurable and appealing. This thesis wish to contribute to a comprehensive understanding of real qualities of urban dwelling (even though not fulfilling all those qualities) and to heighten their sense of social responsibility in making our cities and dwelling environment, not only physically but also socially, culturally and environmentally, more livable.

Chapter 5

Conclusion & Recommendation

5.1 Conclusion

From the perspective of housing, there are lots of things that are lacking in the planning area. First of all government need to make proper rules and regulations for Urban Planning. Rules and regulations should be revised more clearly to attain better town planning. In our country, there are constrains in smooth implementation of land pooling project as an important step of town planning. One of the main reasons for the controversies in the land pooling projects is the inability of all the stakeholders: landowners, local representatives and political workers to fully understand the project benefits. Therefore, wider awareness campaign is required to get their full support. To ensure minimum level of standards and uniformity in project infrastructures, common planning norms and standards are essential. The provisions of tree plantation and landscaping should be an essential element of all the land pooling projects. Not only that, there should be well defined guidelines and facilities that are needed for good neighborhood such as community centre, commercial area, residential area, institution area, parks and playgrounds etc. These facilities should consider five vital aspects that are

1. Vitality 2. Sense 3. Fit 4. Access 5. Control and 6.Efficiency and justice.

All above aspects are equally needed in all planning cases for achieving planned area. Before planning to undertake the urban designing, it is necessary to identify the essential elements for a good and responsible urban planning. Review of numerous literatures on planning and design help to develop a theoretical framework for a good urban planning. The creation of better and meaningful lively mixed urban planning can be achieved by considering the continuity of history while respecting the surrounding environment and technology at the same time.

5.2 Recommendation

Nonetheless, a number of problems and issues have been identified from the study and analysis made. Following recommendations are given in the form of policy strategy, in order to enhance the post land pooling development and to guide them in the realization of their goals and objectives.

Development and Management

I) Promote proper development within LPP

- Introduce appropriate rules and regulations, norms and standards.
- Vacant land tax to discourage speculation and encourage building.
- Access to finance for construction of buildings in LPP. This will be very helpful for the landowner of Sinamangal LP area because lack of fund was the reason of 75% respondents of that people according to random survey.
- Introduce appropriate land-use and building regulations so as to achieve a better living environment and good urban form within the LPP.
- Development of facilities and services essential for urban community in LPP; such as market place, security, transportation facilities, and social institutions like community center, parks and playgrounds, hospitals, nursing home, elementary school, secondary school, colleges, health club etc.
- Convincing the landowners in making contribution of land in LPP.

II) Ensure efficient and effective use of infrastructure services provided

- Phasing of infrastructure development
- Involve public agencies for operation and maintenance for infrastructure services
- Create special maintenance fund from project income and with participation of the residents and public agencies for regular maintenance work and staff.

III) Promote land pooling as an effective tool for planned urban expansion area.

- Need for a valley wide legally approved land use plans and programs in compliance with which land pooling schemes could be taken up & implemented.
- Future LP should be particularly guided in infill areas within ring road or in its periphery to increase the land use efficiency.
- Discourage land pooling in environmentally sensitive area including prime agriculture land.

- Location of LP in areas identified as future urban growth and expansion area or urban reserve area.
- Encourage development within LP schemes with optimum density through appropriate design considerations for greater economies of scale in the infrastructure provision and land use efficiency.
- Promote LPP at VDC through community/private sector/NGO to know the advantages of LPP through technical and financial supports.
- Give preference to Community LPP including facilitator.
- Promote pre phase of big LPP making only trunk road at fringe area so that it can be divided into proper shape for the next phase in future.

IV) Promote land pooling for the provision of Infrastructure facilities through public-private partnership.

a. Make provision for extension of infrastructure services to adjacent areas during placing of LPP.

- Reassess and change the policy of free of cost infrastructure provision in unplanned areas.
- Impose development tax for making provision of infrastructure services in unplanned area in order to recoup the cost of its development.

b. Promotion of public participations in infrastructure development.

- Provide regular maintenance of infrastructure services as a reward for public participation and contribution in its development.
- Provide subsidy in the form of investment in certain infrastructure service if not all as a token of compensation for their participation and contribution in its development.

c. Explore possible ways to extend infrastructure services to the adjacent areas during planning and designing.

d. Location of LP conforming to infrastructure availability and capacity.

- Location of any land-pooling must be in conformity with the availability and capacity of existing infrastructure services or at least in conformity with the approved future

service provision of the area, so that the proposed development doesn't reduce the quality of basic services in the area after actual implementation.

V) Increasing the supply of serviced housing plots for all and promote housing development through LPP.

a. Increase the access to the developed plots for the lower income group

- Develop the cross-subsidy mechanisms within land pooling schemes to make the target classes of low-income group accessible to land at a cheaper rate
- Develop appropriate policies to increase access to building plots for low-income groups, by allocating certain service plots (Encourage group housing or low income apartments)
- Develop some plots for low-income group through profits from service plot.

b. Pool service plots into larger plots and encourage private developers to build group housing or apartment buildings. This step would be more successful in LPP. For this, concerned organization should be allocated minimum of 10% service plot.

c. Encourage commercial banks and other financial institutions to float loans for housing. For this, there should be carry out seminar through TDC and concerned organizations to create awareness.

VI) Planning and Design Considerations

a. A separate urban land pooling authority or institution.

b. Creation of a separate organization solely dedicated to planning, implementation and monitoring of land pooling in Kathmandu valley.

c. Preparation of elaborate land pooling manual incorporating the procedure, planning and design standards to ensure consistent application all over.

d. Enact a separate legislation for land pooling.

e. Enact a separate individual Bye laws by each LPP.

f. Establishment of strong monitoring system.

g. Develop the planning guidelines as mandatory for housing development at Land Pooling area as the second step of Land Pooling scheme. Then only those LPP will be successful in reality. (Here housing development is not considered as private housing. It means, the housing development should be done with appropriate consistency in

residential building, appropriate Commercial use, Institutional use, Community center, parks and playgrounds, Official use, Open spaces, Proper physical and social infrastructure. If possible, Private housing for high, middle and low-income group at Service Plot area should be launched and place for urban poor in land pooling could be addressed.)

h. Create focal point/factor in LPP so that people can be pooled at that area.
i. Make policy to allow passing of drawing of buildings at LPP only after making of re-cadastral map
j. Ensure strict adherence to the project objectives and implementation duration.
k. Reassess and reduce the legal provision of mandatory 75% landowners' involvement necessary for initiation LP projects in order to carry out such schemes where the planning authority strongly feels the need for it.
l. Carry out Pre-feasibility and feasibility study of LP projects during its planning stage.
    - Location analysis
    - Area to be covered and the level of development
    - Land use and physical condition of the area
    - Land transactions and Land value at present and after development
    - Availability of physical and social infrastructures
m. Carry out impact study of LPP
    - Socio-economic as well as environment impact assessment should be made mandatory and obligatorily in the planning phase.
n. Incorporate development and management aspect during planning and designing to ensure better livable community development.
o. Carry out regular post implantation monitoring and evaluation (at least once a year).

Bibliography

1. A.C. Hall (1996), "Design Control; towards a new Approach".
2. Adhikari, A, (1988), "Urban and Environmental Planning in Nepal." IUCN Nepal, Kathmandu.
3. Albert Z. Guttenburg, "Urban structure and urban growth", Journal of the American Institute of Planners, May 1960, taken from Chapin, "Lord Use Planning" P. 84)
4. B. Gallion, Faia, Simon Eisner, Aicp, "The Urban Pattern; City Planning and design," (4th and 5th edition), CBS publishers & Distributors.
5. Bajracharya, Rina D.; B.Arch Thesis (Urban Expansion Towards The Riverfront: A case for Sinamangal land pooling", PU. 2004
6. Basnet, Saroj; MSc. Thesis, "Land readjustment as a planning tool for urban development (Comparative Analysis of land readjustment system of Nepal and Japan)", TU 2000
7. Bhagat, Radhe Shyam; Thesis "Comparative study of Organized Housing"
8. C.K. Chang and V. Chan, "The making of successful public: a case study of People's park square", Urban design international, volume 5, No.1, Macmillan Publisher Ltd. Stockton Press, June 2000.
9. Chhetri, Ram Bhandari; MSc.Thesis "Housing and Land Management through Corporate Concept" TU
10. Chhetri, Padam B.; Shrestha ,B.K; 1992, "Documentation and review of Sites and Services, Guided land development and Land pooling projects in Nepal", Department of housing and urban development, Ministry of housing and physical planning, UDLE
11. Chhetri, Padam B.;"Urban land use in the KTM valley".
12. DHPP - Department of Housing and Physical Planning (1969), the physical Development plan for the Kathmandu Valley, His Majesty's Government of Nepal.
13. Dongal, Purna Krishna; MUD Thesis "Comprehensively Planned Residential Development: An alternative approach to land pooling and isolated housing in Kathmandu", the university of Hongkong, 2005.
14. G.K. Hiraskar (1989) "Fundamentals of Town Planning",1997, 2nd Edition
15. Hans Blumenfeld, "The Conceptual Framework of Land Use," Ekistics, Vol.14, 1962, P. 259

16. Josepa De Chiara (1984), Time Saver Standards for Housing and Residential Development, McGraw - Hill. Inc.
17. Joshi, Jibgar; "Housing and Urban development in Nepal: analysis and design of participatory development process, rev. ed. KTM: Lajmina Joshi, 1999
18. K. Lynch and L. Rodwin, "A theory of human Form;" journal of the American institute of planners, November, 1958.), Ibid, p.87.
19. Kansakar, V.B., Ph.D, "Urbanization, Housing and Growth of squatter settlements".
20. Karki, T. K. (2004), 'Implementation experiences of land pooling projects in Kathmandu Valley, Habitat International, Vol. 28, PERGAMON, pp. 67-88.
21. Karki, T. K., Course manual of Msc. Urban planning," Urban land management,"2000
22. Kathmandu Valley Town Development Committee. "Sinamangal Land pooling Project report", 2003.
23. Katz Peter (1994), "The New Urbanism: Toward an Architecture of Community"
24. KVMP Ward Profile (2058 B.S.) Kathmandu metropolitan city
25. KVTDC (1999), Status of comparative project features, unpublished working chart prepared by the Kathmandu Valley Town Development Committee.
26. Land policy, published by ministry of physical planning and works; Department of Urban Development & building Construction, supported by JICA.
27. Lynch Kevin (1981): "A theory of good City Form", Cambridge, M.A: MIT
28. Lynch Kevin: "Images of good city"; Cambridge, M.A. MIT.
29. Pokharel, J.R.; Course manual of Msc. Urban planning, "Housing", IOE, 1999
30. Pradhan, U.M.(2005); Nayabazar land pooling project-case study
31. R.G.Gupta (1983), "Planning and development of towns": Oxford & ISH publishing Co.
32. Sahari Bikas, (2060 B.S) Special issue of World Live day, ministry of physical planning and works; Department of Urban Development & building Construction (Nepali Version)
33. Sangachhen, S.B., Gorkhaly, G.P., Miyazaki, N.; "Land pooling manual",2003
34. Shakya, Rabi Ratna; MSc.Thesis "Land pooling practices in Nepal for urban land management", TU 2001
35. Sherwin Greene; "Four Principles of Community Design", 1992
36. Simonds, John Ormsbee, (1994), "Garden Cities 21, creating livable urban environment": Mc Graw - Hill Inc.

37. Sinamangal Land Policy Project, ward 35 (7 Ka, Kha, Ga), Yojana Prativedan (Nepali Version), KVTDC
38. Singh, Prashant Man; MSc. Thesis "Post Land Development Evaluation", TU 2003
39. TDC report; "Land development technique" 2063 B.S
40. Thapa Kishor (2003), 'Experiences in the land pooling process in Nepal,' Engineers in Social Transformation, 8th National convention and FEISCA regional meet, 3-5 April (20-22 Chaitra 2059), Kathmandu, Nepal Engineers' Association (NEA), pp. 342-352
41. Town Development Committee; Report; "Land Development Technique", 2063
42. Trancik, "Finding Lost Space - Theories of Urban Design", 1986
43. Upreti, Sanjay; SONA Publication; "Private Sector and Urban Land Developments in Kathmandu Valley: Review of Policy Paradoxes", June 2006
44. Upreti, Sanjay; MSc.Thesis "Options for private sectors involvement in urban land development; a case of greater Kathmandu", TU 2002
45. Vikas, a journey of development vol. 19, no 1, (2056 B.S) (Nepali Version)

Appendix

Questionnaire Survey

This questionnaire survey is part of MSC Urban Planning course and the information collected will be used only for academic purpose. Your cooperation by filling up this from will be of great contribution to my research work.

1. Urban form

1.1 Which function/ place in your locality (Neighborhood) is memorable?

a).....b).....c).....

1.2 How do you find your neighborhood with respect to your surrounding areas?

a) well integrated b) no integrated c) other

1.3 How do you find in building blocks in your neighborhood?

a) Convenient b) inconvenient c) o.k. d) other

1.4 Existing open space is useful or not?

a) Yes b) no

1.5 Which activities (land use) are lacking in the neighborhood?

a) Housing b) commercial c) institution d 0 electricity & telephone e) other

2.9 Which infrastructure are lacking in your neighborhood?

a) Road & street b) drainage c) water supply d) electricity & telephone e) other

2.10 How do you find the buildings around your house?

a) Good & satisfactory b) bed & not satisfactory c) o.k. d) other

3.1 Whether do you go for socialization in your neighborhood?

a) Community building b) community open space c) nowhere / no facility

d) Other

3.3 Are there any recreational facility/ children play area in your neighborhood?

a) Yes b) no c) other

3.4 Do you find your neighborhood (locality) safe at night?

a) Yes b) no c) other

3.5 Do you have daily need goods (vegetable/ milk /medicine etc.) available in your Neighborhood ?

a) Yes b) no c) other

4.1 Usually what time you come back to your home?

a).....b).....c).....

4.2 Do you find your neighborhood lively?

a) Yes b) no c) other

4.3 Do you think your neighborhood share people of different ethnic groups/ castes from different parts of the country ?

a) Yes b) no c) other

4.4 Which castes are generally occur in your neighborhood?

a).....b).....c).....

5. Community center and Facility

5.1 What type of community facilities do you prefer in your neighborhood /

a) Community building b) shopping c) health club d) children play ground d) other

6.1 Please write down thee most liking features of your neighborhood.

a).....Why?

b).....Why?

c).....Why?

7. How many family members in your home?

8. Which vehicle do you have?

a) Bike b) car/van /jeep c) other

9. Household origins:

a) Indigenous b) migrated, if migrated from where.....

10. Monthly income: NRS ..... Monthly Expenditure: NRs.....

11. Why delay in building house?

a) No immediate need b) fund c) land speculation d) agriculture

12. Do you prefer to develop housing in this Sinamangal area?

a) Yes b) no

13. Do have noise problem being near at airport?

a) Yes b) no

Thanking you very much for your kind cooperation

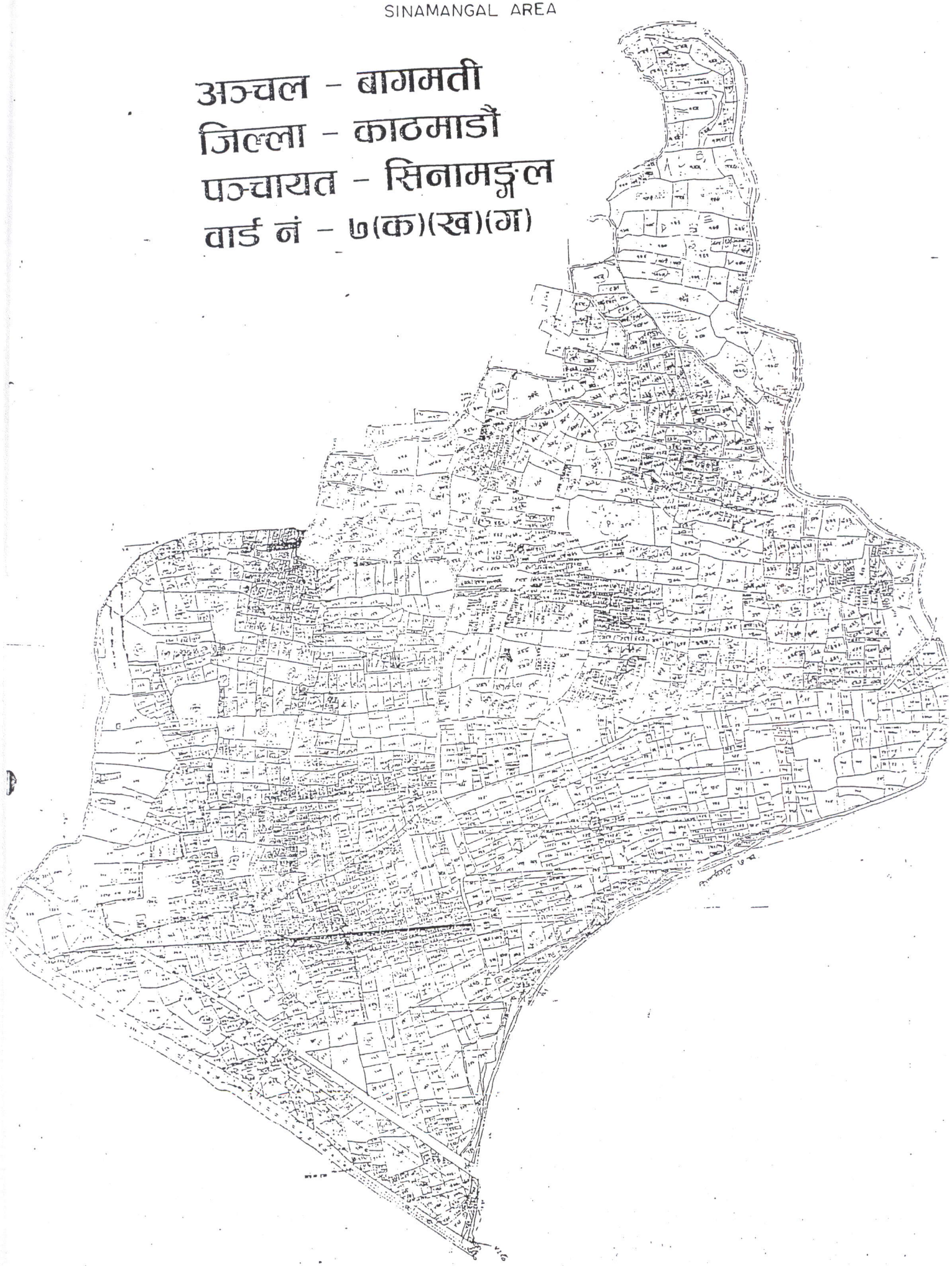
Reena

Email;khmc@wlink.com.np

ANNEX I
LAND POOLING AREA OF KTM VALLEY

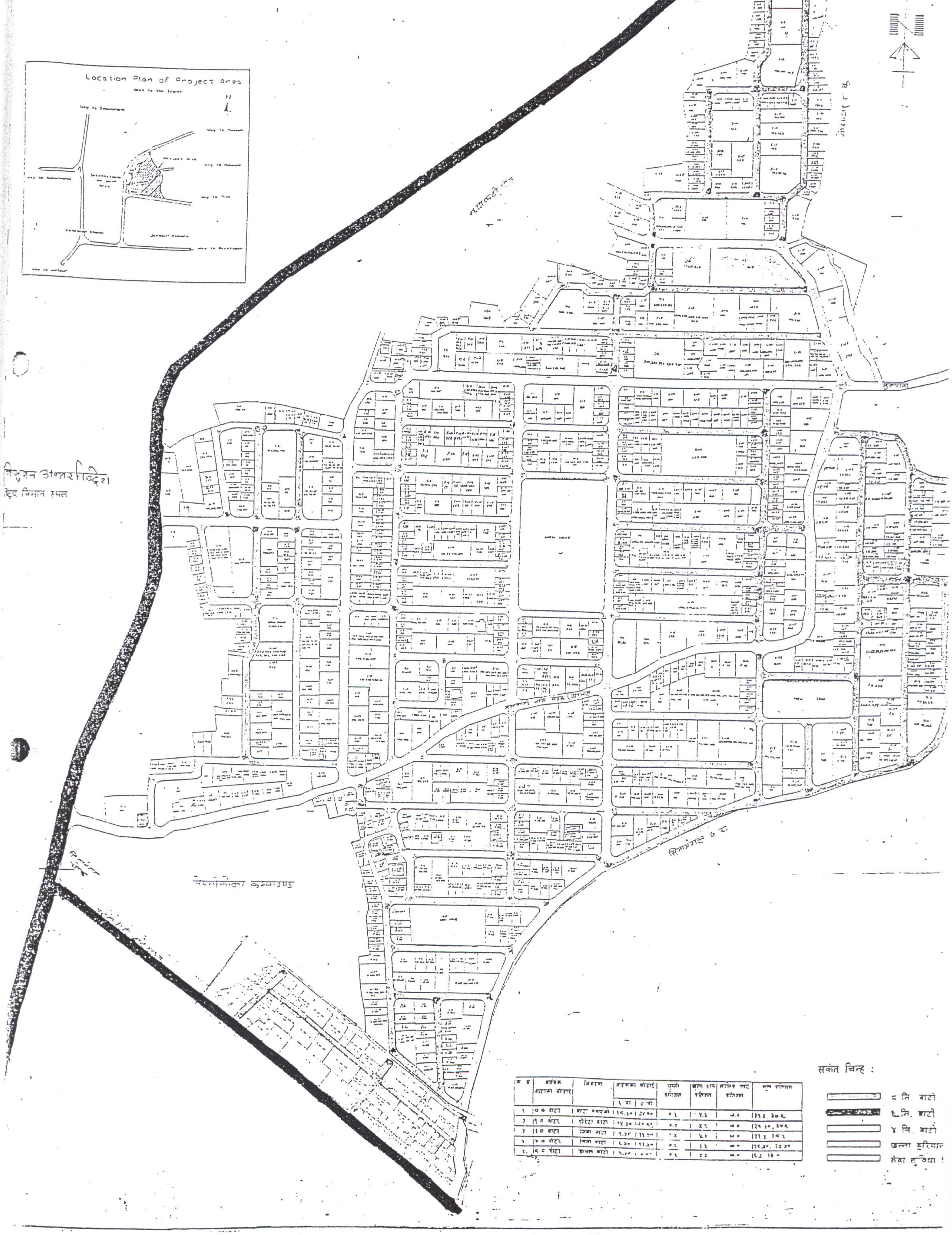
संरचनाहरु उपत्यका (जग्गा एकिकरण आयोजना क्षेत्र

ANNEX 2
SINAMANGAL AREA



ANNEX 3
SINAMANGAL LP AREA

सिनामंगल जग्गा एकीकरण आयोजना



ANNEX 4

AERIAL PHOTO OF SINAMANGAL

ANNEX 5

AERIAL VIEW OF SAINBU

ANNEX 6

AERIAL VIEW OF LIWALI