TRIBHUVAN UNIVERSITY

INSTITUTE OF ENGINEERING

PULCHOWK CAMPUS

THESIS NO: 074/MSU/015

**DETERMINANTS OF LAND VALUE: A CASE OF KAPAN IN
BUDHANILKANTHA MUNICIPALITY**

by

Sajana Lamichhane

A THESIS

SUBMITTED TO THE DEPARTMENT OF ARCHITECTURE

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE

DEGREE OF MASTER OF SCIENCE IN URBAN PLANNING

DEPARTMENT OF ARCHITECTURE

LALITPUR, NEPAL

SEPTEMBER, 2020

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The undersigned certify that they have read, and recommended to the Institute of Engineering for acceptance, a thesis entitled "**Determinants of Land Value (A case of Kapan in Budhanilkantha Municipality)**" submitted by Sajana Lamichhane (074/MSU/015) in partial fulfillment of the requirements for the degree of Master of Science in Urban Planning.

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Abstract

This research is based on the approach to evaluate the determinants of land value and analyses certain variables affecting land value considering the approach of land valuation from Nepal government, commercial bank, land valuator, brokers, and land buyer. This research presents the results of an empirical study of urban land values in the Kapan, a case of Budanilkantha Municipality.The urban growth rate of Kapan is 12.6 percentages. In rapidly growing areas where there is a strong pressure on serviced urban land, the distribution of population densities and land prices are expected to show basic differences. The data sets are organized at different levels of aggregation: i) the ward level comprising a total of 9 wards within the boundaries of Kapan that has been categorized into 3 clusters i/e Cluster A, Cluster B, and Cluster C according to the areas set by the government. The study focuses on the tendency toward agglomeration for consumers of each land use as measured by the impact on land values in the central business district, suburban nodes, and other employment concentrations. The results provide insight into several influences on urban land value and offer evidence that office land derives greater benefit from agglomeration than does commercial land. This paper shows the differences in land prices that can be obtained according to the width and quality of roads. Urban policy and planning may be improved by a better understanding of the determinants of urban spatial structure. Characteristics of the site such as i.) Location, ii.) Quality and width or road, iii.) Proximity to infrastructures, IV.) Proximity to the commercial and market areas v.) Distance from CBD, VI.) The future expansion projects were found responsible in an increase in land values. Different determinants of land values of various variables and their capacity to explain the spatial structure of a small area over a while has been shown in this research.

Acknowledgments

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Abbreviations

ADB- Asian Development Bank

DUDBC - Department of Urban Development and Building Construction

GON - Government of Nepal

CBS - Central Bureau of Statistics

MoUD- Ministry of Urban Development

SPSS- Statistical Package for the Social Sciences

BTR- Black topped road

CHAPTER 1   INTRODUCTION

1.1.   Background

Land is defined as an area of ground that is used for a particular purpose such as farming or building. In traditional societies it is a common good and cannot be isolated nor sold. In a modern free-market system land is a commodity that is desired and can be exchanged; its value and price are commanded by offer and demand and by the underlying perception of potential benefits that can be derived from it (Barmelgy, 2014).

"Land Value" and "Land price" are often used interchangeably, there is difference between these two terms as investor Warren Buffet puts it "Price **is what you pay, Value is what you get**". It means if we buy a good, the price for the goods is what we pay but if we get the same good as a gift then it is valuable for us i.e. what we get. Therefore, value is subjective depending upon individual choices and preferences whereas price is objective. However, when a transaction happens, "land value" and "land price' can be used interchangeably. Land value depends on two factors i.e. emotional attachment which prevents transactions and land price (including market price, land speculation, landholding, and land-use intensity).

The price of land is determined by its production potential, and by the present or future services it incorporates; in modern times it has also become an object of speculation (Verheye, 2007). Speculation is a practice of engaging in business to make quick profits from fluctuations in prices, as opposed to the practice of investing in a productive enterprise to share in its earnings. Land speculation is a "financial activity that involves the purchase of real estate with the hope that the price will increase". Most land purchases can be better referred to as real estate investment since land tends to appreciate over time due to factors such as scarcity. Land Speculation also accelerates the rise in land value.

Land value is the difference between economic and non-economic value of land and the complex collection of other characteristics that make up a broader concept of 'value'. 'Value' as a cultural, historical, aesthetic, environmental, and spiritual concept is independent of 'market' value. Value as a non-economic concept is not fixed in time, and it's multiple, autonomous are mutable, as social views and understandings change. The land value is determined by the economic value of the highest and best use of land which produces the highest net return over a period. It is determined by the specific character of the land such as land use, location, accessibility, aesthetics, etc. Factors affecting Land Value are of significance to analyze or estimate land prices and are physical attributes, accessibility to economic activities, neighborhood amenities, present, and future land use, location and transport linkages, and demand and supply. Lastly, in modern societies the exchange value is usually related to price. Price is thus, a parameter to express the exchange value of an object or property, and in this respect it is usually accepted means to compare values in a market.

Kathmandu valley has been experiencing very rapid urbanization in the past decades. This is largely due to rapid urban growth associated with natural population growth and rural-urban migration driven by the establishment of infrastructures in the country. The difference in the value of land varies significantly. This has caused scarce availability of land plots in the valley. On the other hand, the speculation of land has confused in determining the value of land. It has also raised questions over the affordability of housing to a certain class of people. Consequences such as housing availability to the rental population are decreased due to which they are obliged to live in a highly densified space but still have to pay a huge amount of rent. Unaffordable land price increment in the Kathmandu valley is the prior reason resulting in the huge status gap between the rich and poor ones. Therefore the rental populations are more affected than the local ones from an economic perspective. There are the chances of increment in the squatter settlement too. And also, it is difficult for the business sector to invest in such a high price land which can be an

obstacle in the development.Land tenure in the context of Nepal is expressed as the mode of holding the land property in the form of freehold, leasehold, mortgage, or occupancy and recognized as the major determinant of the land/property tax base (Acharya, 2008). Though land tenure and security existed without land registration and cadastral survey in the earlier years, over time land tenures were gradually developed as customary tenures such as Raikar, Birta, Jagir, Rakam, Guthi and Kipat (Regmi, 1961). However, most of the customary land tenures have been abolished since 1951 and the present land tenure systems comprise: (a) private land with absolute ownership (can be held by the owner or maybe leased or mortgaged), (b) public and government land (public land belongs to the government but is used by the public or community whereas government land is handled by itself) and (c) Trust land or Guthi land (different types of Guthi land such as Rajguthi, Nigiguti, Chutguthi, Guthi Tainati, and Guthi Adhinastha) (Acharya, 2008). Private land acquisition for real estate is growing fast (Upreti, Breu & Ghale, 2017).

In the past decade the commercial banks are investing large portions of their lending to the real-estate sector (NRB, Nepal Rastra Bank, 2011) and the situation is similar in the case of investment of cooperatives in the real-estate sector. Further, a large portion of remittances is invested in land and housing. Nepal is one of the highest recipients of remittances (as a percentage of GDP) in the world (Seddon, Adhikari & Gurung, 2002), having great significance both at micro and macro levels (Pradhan, Upadhyay & Upadhyay, 2008). Its utilization and the impacts on economic growth have both positive and negative effects (Dahal, 2014). However, one of the criticisms of the massive inflow of remittances to unproductive sectors like housing and land (Sapkota, 2013) is that once productive land is occupied for the construction of buildings and other infrastructures financed by remittances, it will lead to further reduction of agricultural productivity and consequently increased food insecurity.

This research is being carried out in Kapan of Budanilkantha Municipality.

1.2. **Problem Statement**

Urbanization in Nepal is dominated by a few and medium cities with an extreme population concentration in Kathmandu valley. The population of Kathmandu valley is about 1 million (World population review, 2019) with about 4 million people living temporarily. The urban population distribution is uneven across the country. High urban growth is occurring in the Kathmandu Valley. According to the Nepal Land and Housing Development Association (NLHDA), land prices raised by 300% since 2003 (Ishtiaque, Shrestha & Chhetri, 2017) in Kathmandu valley. Land price was on the rise in 1999 (Mathema, 1999) and tripled from 2003 to 2008 (Shrestha, 2011) in Nepal. With more than 1 million people, (220,000 households) the Kathmandu Valley is the urban center of Nepal. One-third of its residents live in slum dwellings and 18,000 people are squatting (without land rights). (KVTDC, 2005) c.f. (Hada and Ganapathy, 2012).This is due to rapid urban growth associated with natural population growth and rural-urban migration driven by rapid socio-economic changes and insurgence in Nepal. The pace of growth and increment is however a different matter. Nepal observes enormously high land valuations and here comes the speculative buying. Therefore, through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets, and opportunities for value addition and non-farm employment. This caused concern that the real estate market was overheated, as the commercial banks invested in about 20% of their lending portfolio inland business only. Therefore, Nepal Rastra Bank (NRB), the central bank of Nepal, finally imposed a limit on loans in the real estate sector, on the banks and financial institutions in December 2009 (Thakur & Choi, 2012).

The main problem is in the lack of an integrated system to guide the functional and spatial change in land uses and the absence of controlling regulations for the land to its optimal use, primarily in the case of ignoring the land value as a significant variable affecting the spatial change of uses resulting in the unmanaged settlements. This is largely due to very rapid urban growth associated with natural population

growth and rural-urban migration driven by rapid socio-economic changes and internal riots in the country. Growth has not been matched with the real-time provision of adequate services/infrastructure and resource development. Thus, the significant rise in population, number, and size in the valley has led to the acute shortage of land units, resulting in overcrowding, unmanaged settlements, land-use change; affect the livelihood of people, their living conditions, and deteriorating built environment. Hence, there is a need to pay attention to impacts on land value change by the development of infrastructure. So, the repeated failure to solve the problems, faced by the urban tenants.

The urban land market functions to allocate land to buyers. It does so through adjustments to prices, the quantities supplied, and the quantities demanded. In many countries, policymakers are worried that the urban land markets are not operating efficiently and that land is in short supply, land prices are high, or combinations of both. Unlike other markets, where supply and demand determine the dynamics of market operation, land markets are not driven by perfectly competitive forces. Land is not uniform; each parcel is unique, having a particular set of locational, physical, and neighborhood characteristics. The land market is diverse and has divergent objectives, potentials, and strategies. In some cases, only a few buyers and sellers may participate in particular land markets, and an individual land sell or buyer can greatly influence market outcomes. Besides, land market features, such as ease of entry and exit, are closely controlled by local and national government policies and by public decisions about infrastructure investment, which is not the case in other markets.

The demand for land is therefore consequent from the demand for the product or service produced on the land. The demand for residential land is consequent from the demand for housing; the demand for housing, in turn, is determined by demographic and economic factors such as the rate and level of household formation, household income, savings, and interest rates. The demand for land is also exaggerated by the number of people wanting to hold land as an investment. These factors, also apply to the demand for commercial and industrial land.

- **Factor for an increase in demand for land:**

❖ Land is greatly valued for prestige purposes, and to provide a sense of security.

❖ Some landowners hold vacant land off the market in speculation (Mathema, 1999).

❖ National policies

On the supply side, the extent and price of land depend on the spatial pattern of infrastructure, the physical development the ability of land, the willingness of current landowners to sell, and government-imposed limitations on how land may be used. The level of physical infrastructures -such as roads, municipal water, and sewage determines whether the land can be developed, to what extent, and in what physical direction. In rapidly growing cities, the infrastructure capacity is frequently inadequate and therefore obstructs land development and helps inflated land prices.

1.3. **Research Questions**

Land value (defined in this study in terms of land price) can be an indicator of direction, scale and pace of future urban growth. So, its determination is important for urban planning but as studies have shown it is not an easy task.

▪ **How does land value differ even within a relatively small area in a city and what are the factors that influence land value?**

The research questions are addressed by taking the case of former Kapan VDC(which is now restructured as ward 10,11 and 12) of Budhanilkantha Municipality.

The **research objectives** are:

- ▪ To identify key factors that defines and influence land values.
- ▪ To analyses the change in land values (expressed in terms of land prices) across location and time.
- ▪ To analyses the impact of land value on development (Spatial land-use intensity).

1.4.   **Need of the Research**

The urbanization and the number of people living in Kathmandu valley have increased through the years and this trend is increasing as the time passes by. The impact of evolution has led to pressure on available land. This research adds to existing information on land values. It also increases the transparency of land markets and could support policy-making concern land value capture. It establishes an outline for continued recording of land value trends into the future, setting out the limitations of the approach. Better information on land values is needed for market study and, especially in the case of housing land policymaking. The land values in certain areas have increased rapidly over recent years. As a result, the land has become a significant store of wealth for individuals and corporate entities. This creates interest in how commercial and residential land values in different cities and regions change through time and how land values have been affected by macroeconomic conditions and policy decisions.

Since, none of the research had been done regarding the land price fluctuation in a small area. Therefore, this research is carried out for finding the basis for fixing the land value. Since different agencies have their way of evaluating the land value. Government evaluates land value with certain guidelines provided whereas bank evaluates on their way comparing the government and market value. Due to land speculation, the price of land varies drastically. Several newspaper articles, professionals, buyers, and sellers have been talking about the speculations over time but lesser-known research is published. Nepal's real estate business is trembling since 2010 particularly after the central bank imposed a cap on the loan exposure of banks and financial institutions to this sector. Therefore; this research is also carried out to know the determinants of land value and the land price issues fluctuation in Kapan.

1.5. **Importance of the research**

This study attempts to examine the parameters of land value changes. With this understanding, policymakers can adequately plan land uses, housing, enforce strict adherence to planning regulations, and provide effective neighborhood facilities that will increase the living condition of the tenants and make the environment more livable and reduces the unmanaged settlement in the urban area.

The research can be important to the planners, policymakers to determine land development and project initiation concerning land type and value. Private/ public sectors can confidently invest in development projects. The research can guide buyers to invest in their future in the form of land. This research can act as a catalyst to understand the whole new perspective of land price in neighborhood determination in certain areas.

The study may help to shed light on problems that have been going among tenants in the case of Kathmandu valley. Also it may assist in understanding parameters of land-use changes that may make an attractive physical environment and develop the economic condition of an urban area. This study may assist in realizing the need to land with a provision and a decent environment and draw the attention of government and other concerned bodies.

This research provides information for the basis fixing of land values that helps land revenue offices for evaluating the minimum land value of any area.

1.6. **Research Purpose**

Nepal is also urbanizing at a very fast rate like other developing countries. The rate of expansion in land prices is not keeping pace with population growth in the urban areas. Therefore, the purpose of this research is to know the determinants affecting land values.

1.7. **Validity of research**

The urbanization and the demand for land have been increased in certain years. These results in haphazard urbanization, deteriorating the cityscape, government, and stakeholders must pay particular attention to this sector. There is no research being carried out. This research adds different agencies i.e. government and banks to do a land valuation. Therefore, this research deals with the land price fluctuation over relatively small areas. The basis that needs to provide a broad justification for the determinants that affect the land prices, which required undertaking this study.

1.8. **Expected output**

The factors that are responsible for land value changes in a small area i.e. Kapan. Thereby, suggesting the policy measures that can be developed and directed regarding land value change and its impact on development intensity.

1.8.1. Scope

The scope of research is used to find the determination of land price, minimum Valuation of government used as proxy which will be further compared with market price with limited samples and also the minimum valuation is done from Fiscal Year 2011/2012, 2012/2013, 2013/2014, 2014/2015, 2015/2016, 2016/2017, 2017/2018, 2018/2019 and 2019/2020.

1.8.2. Limitation

The study is focused on finding the determinants of land value and thus, it is limited to use the government minimum valuation of land as a proxy for the market land value.

1.9. **Future Works**

The research in future can be carried out to know the determinants of land value in (horizontal and vertical) land use intensity.

CHAPTER 2   LITERATURE REVIEW

This chapter will present a review of the existing literature. This chapter includes definitions, theories, concepts, and issues of land value. The existing literature or studies on factors affecting land values in Nepal and International context is also looked upon.

2.1. Introduction

Land is a special good which is considered as one of the essential factors inducing the pattern of urban development. Land has special characteristics compared to other economic goods: the supply of land is fixed (except land reclamation), every parcel of land has a fixed area, which is a unique property, and the use of a parcel of land affects the use and value of adjacent parcels. The spaces in the city are used for various purposes. The limited spaces within the city grow space requirements significantly for various purposes that outline the framework of the struggle for the land by different interests for different purposes. Land value is the value of a piece of property comprising both the value of the land itself as well as any improvements that have been made to it. This is not to be confused with site value, which is the reasonable value of the land assuming that there are no leases, mortgages, or anything else present that would otherwise change the site's value. Land values increase when demand for land exceeds the supply of available land or if a particular piece of land has a fundamental value greater than neighboring areas (e.g., a diamond can be found on the land). Land value is not the same as a site value. Therefore it is made by a third party, benevolent evaluator.

Understanding Land Value

Land value is determined by the property owners how much to charge other parties for its use. For example, an individual who rents out several acres of farmland to ranchers for grazing cattle will determine an amount to charge by looking at the market value of the land compared to land taxes and the capitalization rate. In other words, the value may be determined by real estate evaluations conducted by third

parties. An evaluator's assessment can be crucial to an owner's decisions on offering to finance a prospective buyer or refinancing for a property holder.

The position and location of the land can have a direct influence on its value. For example, a remote parcel of land may have limited value because it does not have access to amenities, utilities, transportation, or other resources that could make the property convenient. The value of the land might rise if the property is located near a popular destination such as a city, entertainment venue, or services that are in demand. Land that is in a region that aspects environmental risks could lose some of its value. For example, if a property is located in an area prone to flooding, mudslides, or earthquakes, those hazards might prevent potential buyers from taking a concern in it. The potential for frequent destruction would make it a challenge to maintain a safe and reliable presence on the property. Any increases made to the property could be lost in a resulting environmental calamity. The risk to residents and employees who may be present at such a site could outweigh any gains from using the land. Even if the land is located in a prime place and has access to desirable resources there could be mitigating circumstances that prevent the land from being developed or used to its fullest potential.

Types of values

There are certain types of values that need to be considered while determining the substance of any asset: exchange, real, and sales values.

The **exchange value** is commonly associated with a price and is expressed in money because this is the only generally accepted means to compare values (Verheye, n.d.).

The **real value** is a balance between offer and demand. If the offer exceeds the demand, then the value decreases; in the opposite case, it increases (Verheye, n.d.). While real value corresponds to a commonly accepted value for everybody, the opportunity value involves the personal appreciation of one or more individuals. It helps build sales value, which is varying in space and time.

The **sales value** of an asset is highly influenced by the personal appreciation, needs of the buyer, and willingness of the owner to sell. These values help in determining the price of land.

Price is the amount of money given or set as consideration for the sale of a specified thing or the quantity of one thing that is exchanged or demanded in barter or sale for another. Price is the monetary value of a good assigned during a transaction. Price, expressed in money, is the generally accepted means to compare values in a market. The price of land is the value of ownership of stipulated rights in perpetuity and is equal to the estimated present value of the expected future appropriations of rent. There is a fundamental difference between value and price. Value is the actual worth of an asset while price is the money in which transaction takes place. So land is a commodity that is desired and can be exchanged and the price of land is determined by its production potential and the services it incorporates. Certain theories help in determining how the price of land deviates along with factors like accessibility from the market, availability of infrastructures, and amenities.

According to the theory of agricultural model by Heinrich von Thunen, this model explains the effort to analyze the special character of economic activity. The cost of transportation governs the use of land. Therefore, the price of land is determined by the earnings from the productions sold at the market. This fig shows that farther the distance from the market (Central City), more is the transportation cost for production and less is the value of the land.
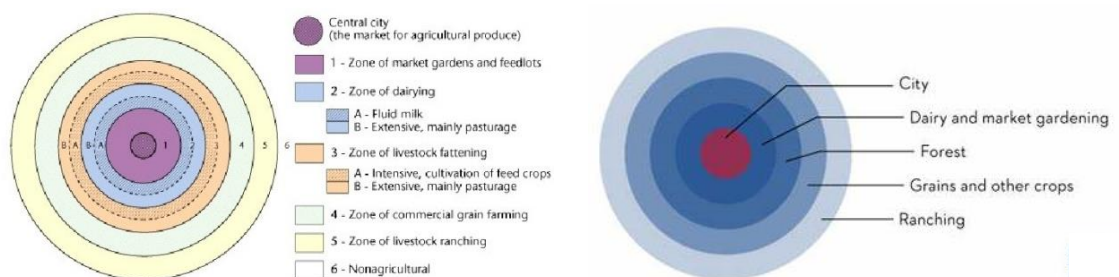
Figure 1 Von Thunen's Model of Land Use

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After industrial revolution, this theory became less functional due to change in occupational activities of people. This bid rent theory of agricultural location was modified by William Alonso to the theory of the urban land market. It states about the maximum rent per unit of land that the household can pay for residing at a certain distance while enjoying a fixed utility (Alonso, 1960). The rent decreases as the distance from market and non-land based consumption increases and vice-versa. Another theory is based on interpretations by William

Alonso, Richard Muth and Edwin Mills in which land becomes more expensive closer to the CBD, living in the city becomes more expensive but closer to work, while at a far distance, larger plots of land at low costs are developed (Kulish, Richards and Gillitzer, 2011). The later model has been more significant in determining how the land prices are assigned near to the core of the city and in peripheral areas. The Alonso-Muth-Mills model help in understanding the contemporary land values and pricing to a greater extent. The availability of land plays an important role in determining the price of land. In a central business district (CBD) that has received its optimum potential of land use and no unoccupied land is available for the transaction, the price of land may not increase as in areas outside the CBD where development is booming and the land is available. But, at the same time, land transactions in the CBD can occur at a much higher scale than previous transactions due to the need of the buyer and lack of availability of land.

Land has always been a natural commodity and the value of land has been there from ancient times to modern times. Several traditional societies still believe in the value of land and its use and do not allow the transaction of land. But, the concept of providing price to land has been established to hold ownership of the land for agricultural purposes. Earlier, the price of land used to be determined by how close it was to the marketplace. According to Von Thunen's theory of agricultural location, 1964, it was guided by the transportation cost from the market to the land which meant that farther the distance from the market, lesser is the value of the land. The definition of the

marketplace has changed over time with the shift in economic activities of people from agricultural production to trade and industry. The migration of people to urban areas has greatly guided the redefinition of land prices. This has created land for housing in urban areas and subsequent developments to cater to people's need, which have further created huge businesses and central districts. The industrial boom with employment has attracted migration of people as incomparable to the times when agricultural activities guided migration. Thus, the indicators determining the value of land have changed over the past few decades.

Land has value that gives rise to tangible and intangible earnings. These earnings provide exchange value to land in the functional market, which is expressed in terms of monetary transactions. The urban population has risen from 29 percentages in 1990 to 49 percent in the late 2000s (Rafferty, n.d.). Although the population has increased in urban areas, the land footprint has not relatively increased providing support to the fact that people are more willing to stay near to the core of the urban area than in peripheral regions. The attractions of opportunities in urban land along with environment and neighborhood have assisted to raise land prices in such areas. These types of attractions can also be seen in the Nepali context in the case of Kathmandu. There has been an urban boom and sprawl in the past decades. According to the Nepal Population Report (2011), there had been a maximum increase in the population of Kathmandu district with a growth rate of 3.17 and 4.71 percentages in the period 2001-2011 and 1991-2001 respectively. The annual growth rate of the country had been 1.35 and 2.25 respectively in the same period (Population Division, 2011). The population had always been willing to invest in land for multiple purposes from residential to commercial uses. Due to soaring land prices, investment in land has been a profitable return and people are buying land with intent to resale it after a period, thus creating a virtual scarcity of land in the market. These are some of the factors that have guided the escalation and demotion of land prices in Kathmandu, in the context of Nepal.

2.2.   **Economic Theories on Land Price**

Urban economic theory mainly focuses on land. In economic terms, land is a complex object competent with dual characteristics. First, land is a commodity in the usual economic sense. But, second, unlike other commodities, land is completely immobile. Hence, each piece of land is associated with a unique location in geographic space. These dual characteristics of a land induce strong no convexity in consumers' preferences. The spatial characteristics, the externalities, and the intervention analyze the land market rather complicated.

The attention of land in economic theories has changed over time. The theory of economic rent was first propounded by the English classical economist David Ricardo (1773-1823). David Ricardo in his book "Principles of political economy and taxation" defined rent as that: "portion of the produce of the earth which is paid to the landlord on account of the original and indestructible powers of the soil, Ricardo in his theory of rent has emphasized that is a reward for services of land which is a supply. Secondly, it arises due to unique qualities of land which are indestructible". The primary indestructible powers of the soil include natural soil, fertility, mineral deposits, climatic conditions, etc. All the units of land are not of the same grade. They differ in infertility and location. The application of the same amount of labor, capital, and other cooperating resources give rise to differences in productivity. This difference in the productivity of the surplus which arises on the superior units of land over the inferior units is an economic rent. The main results of the economic theory have unified in terms of the bid rent functional approach. The origin of this approach is quite old. Indeed, Von Thunen 1826, created his original model of agricultural land use, which stands as a cornerstone of land use theory, using this approach. But surprisingly, the approach is closely related to the duality approach of modern microeconomics. Consequently, by employing it, one can develop a modern land use theory in a manner that is not only intuitive.

2.2.1. Bid Rent Theory

The bid rent theory is based on microeconomic theory and was developed in the context of urban land uses and urban land values. In 1960 William Alonso completed his critique which extended the von Thünen model to urban land uses. His model gives land use, rent, the intensity of land use, population, and employment as a function of distance to the CBD of the city as a solution of economic stability for the market for space. The bid rent function in the theory explains the relationship between urban land uses and urban land values. In a very simplified view, households and
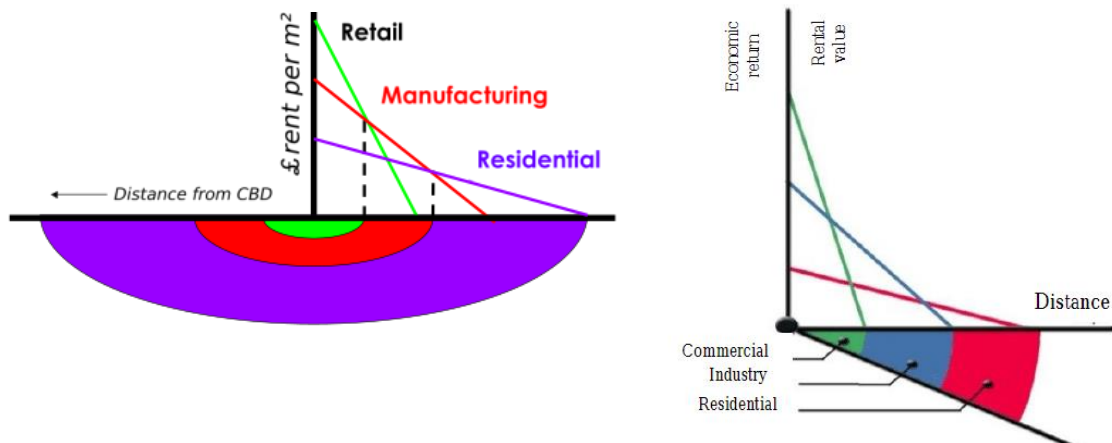
Figure 2 Bid Rent Curve

Companies make a tradeoff between land prices; transportation costs and the amount of land they use. This output in a convex land price curve with the highest land prices close to the city center. The derivation of agricultural and rural land values in the bid rent theory owes more to Von Thunen's theory than the work of Alonso. The crop that produces the maximum revenue at a particular location will be able to make the highest bid and then will be cultivated on that parcel. The land is sold to households, or firms in case their bid is higher than the bid of agriculture; this situation which defines the limits of the city.

The bid rent theory is a geographical economic theory that refers to how the price and demand for real estate change as the distance from the central business district (CBD) increases. It states that different land users will contend with one another for land nearby to the city center. This is based upon the idea that retail institutions wish to maximize their profitability, so they are much more willing to pay more for land near to the CBD and less further away from this area. This theory is based upon the reasoning that the more nearby and area (i.e., the greater the concentration of customers), the more profitable.

Land users, whether they are retail, office, or residential, all compete for the most available land within the central business district (CBD). The amount they are willing to pay is called bid rent. This can generally be shown in a "bid rent curve", based on the reasoning that the most accessible land, generally in the center, is the most expensive land. The large department stores and chain stores are willing to pay the greatest rent to be located in the inner core. The inner core is very valuable for these users because it is traditionally the most accessible location for a large population. This large population is essential for department stores, which require a considerable turnover. As a result, they are willing and able to pay a very high land rent value. They maximize the potential of their site by building many stories. As one travels farther from the inner core, the amount that commerce is willing to pay declines rapidly. Industry, however, is willing to pay to be in the outer core. There is more land available for factories, but it still has many of the benefits of the inner core, such as a marketplace and good transportation linkages. As one goes farther out, the land becomes less attractive to industry because of the reducing transportation linkages and a decreasing marketplace. Because householders do not rely heavily on these factors and can afford the reduced costs (compared with those in the inner and outer core), they can purchase land here. The farther from the inner core, the cheaper the land. This is why inner-city areas are very densely populated (with, e.g., terraces, flats, and high rises), while suburbs and rural areas are more sparsely populated (with semi-detached and detached houses).

2.2.2. Location choice

Location choice models, based on discrete choice theory, can help decision-makers understand the changed trade-offs urban agents make in their process of selecting where to locate. That is, what do urban causes value most when choosing a location? And, equally important given the competitive nature of urban real estate markets, which agent would be willing to pay the most for a certain location characteristics. The theory of location choice mostly carries out the pull and push factors for the consumer's choice on residential, firm location, and agglomeration economies.

2.2.2.1. Residential Location

Residential location is the decision made by consumers to relocate the residents to a new area which is the purpose of push and pull factors. Push factors are the ones that make a location inadequate for a household. These factors often refer to changes in the structure of the household related to lifecycle stages. Other push factors contain changes in career or workplace or change in a household's income level or social status. Pull factors refer to basics that attract households to a specific location, such as the quality of the unit or the built space in the neighborhood.

2.2.2.2. Firm Location and Agglomeration Economies

The spatial dissemination of employment in a metropolitan area is a main feature of a city's structure. Early models of the spatial distribution of activities and urban equilibrium, such as Alonso's monocentric city model, assumed the urban structure as exogenous. Jobs were concentrated in the city center and this structure determined residential land use distribution and rent and density gradients. But urban structure results from a competition for space between firms (and households) with different inclinations and subject to different constraints. Subsequent urban equilibrium models have tried to explain more complex urban structures with different degrees of attainment.

Like households, firms can be assumed to be utility-maximizing agents: more specifically, profit-maximizing agents, with the choice of where to locate motivated

by a desire to maximize profitability. Location-specific factors that can affect a firm's profitability include the cost of land, transportation costs for production inputs and outputs, labor costs, costs of utilities, and property and income taxes. Some of these factors are in turn a function of the location of other agents. That is, relative proximity to other firms may matter, due to economic spillovers (externalities). Positive economic externalities result in "agglomeration" (i.e., agglomeration economies). Spillovers can also be negative (i.e., "agglomeration diseconomies"), such as where relative proximity creates congestion or another crowding of infrastructures and services.

2.2.3. Urban Land use Models

There are 3 urban land use models i.e. Burgess (1925) Concentric Zones Model; Hoyt's (1939) Sector Model; and Harris and Ullman's (1945) Multiple Nuclei Model, that is also known as ecology model helped to explain the morphology of the city. Burgess's concentric model explains different locations were defined in the form of rings around the core urban area around which the city grew. According to this model, the social mobility and geographical mobility go hand in hand and moving up is to move out. The morphology of this model anticipates the bid- rent theory of urban land uses and captures very well the form and character. 2017). Moreover, the concentric model was modified by Homer Hoyt who also has used the central business sub-district as the center of development but rather than following the ring model, the Hoyt model or sector model assumes that city tends to grow in wedge-shaped pattern or sector pattern. The main assumption in the sector model is a higher level of access results to higher land values as the transportation network is capable of providing higher coverage and a cheaper fare on a particular land area. Geographers and economists have developed more complex models of the city such as Harris and Ulman's (1945) multiple nuclei model that envisions the growth of a new downtown core that serves growing. The model describes the layout of a city. It says that even though a city may have begun with a Central business district, or CBD, other smaller CBD's develop on the outskirts of the city near the more valuable housing areas to

allow shorter commutes from the outskirts of the city. This creates nodes or nuclei in other parts of the city besides the CBD thus the name multiple nuclei model. This model is much more focused on outer skirts then CBD, move away from concentric zone notion In the largest city and also has a tendency to develop several nuclei which serve as focal points for agglomerative tendencies, some more important than others.

2.3. International Context

The study of international literature is done about journal articles that are related to land value and variables. The main objective of this international literature is to identify different variables that are responsible for the determination of land value.

A study was done in the Bangkok metropolitan area; article "case study on transport policy" regarding the transportation issues and land values. The hedonic pricing model was used to assess market land values. In this paper, the assessed price data and the offering prices for sale data of Bangkok are analyzed with the use of the regression framework through the hedonic pricing model. The spatial non-stationarity to examine the variations of the implicit effects to property value is also included bases on the geographically weighted regression (GWR) technique. The results show that the determinants of property value are many and varied over space. (Sathita, Atsushi, Varameth, Vasinee, 2018). The research also says that the Market values of land lots within 1.5 km of stations are expensive nearly 3 times higher than the other areas. A short walk to stations can significantly add worth to the land value so location and accessibility are the major factors in determining the land value.

In the article "relationship among land price and the environment, economic and social factors in the value assessment of japan cities", used a regression model to generate the findings. These studies analyze the land-Price function with explanatory variables i.e social, economic, and environment. This study found that the social and environment has a positive impact on the land price. The study also shows the areas around large cities in Japan have been benefitted more from entrepreneurship and social vitality then have the areas small and mid-sized cities. The improvements in

transportation conditions through road construction may increase the price of land nearby and if the construction work worsens environment problems, land prices may fall. So not only road, but environment qualities should also be observed for land value increment. Land prices rise in response to transportation improvements that occur along the shortest path routes connecting individual homes to the region's CBD or local shopping center, in general, however, prices fell as a response to nearby transportation-related construction. But in the end, enhancements in the urban transport system are typically associated with large benefits.

As an example, a new transit line can reduce travel times between various pairs of locations and free up commuting time for which there is better use – be it for work or leisure. Moreover, the additional bulks may reduce congestion and increase the comfort of journeys not only along new sections but also along the entire network. The areas close to new infrastructure benefit the most. There is plenty of evidence that the opening of new metro rail stations significantly increases property prices in the adjoining neighborhood. This is because buyers value the infrastructure and, all else being equal, are willing to pay higher prices. Owners of properties that receive a better connection to a transport network, thus, not only benefit from improved access to transport services but also an increase in the value of their typically largest asset: their property.

According to the bid rent theory we can observe that the farther we move away from CBD, the less is the value of the land. The theory is also revealed in Kathmandu valley. As we move away from the main CBD, that land price varies accordingly. Therefore the article, journal shows the various parameters that affect the land value.

2.4. Factors Affecting Land Values

The land value is determined by the economic value of the highest and best use of land which creates the highest net return in any term, over a period. The property value is reliant on the structural attributes, land rates, land use, and the location of the land. It is determined by the specific character of the land such as land use, location,

accessibility, aesthetics, etc. Factors affecting Land Value are of importance to calculate or guess land prices; understanding of these factors will provide a more accurate cost of land. These factors affecting Land Value do not essentially give the exact amount but are helpful in comparison. According to Gwartney (2014), the factors affecting land values are:

- Physical attributes

  Legal or government forces (type and amount of taxation, zoning, and building bye-laws, planning and restrictions)

- Social factors (population growth or decline, changes in family size, typical ages, attitudes toward law and order, prestige and education levels)
- Economic factors (value and income levels, growth and new construction, vacancy and availability of land)

2.5. Institutional Setup, Relevant Acts

2.5.1. Institutions Involvement

There are various organizations involving for Land management and valuation in Nepal. The major organizations and their role are mentioned in the following sections.

S. No	Institutions Involved	Activities and Responsibilities
1.	Ministry of Land Management, Cooperatives, and Poverty Alleviation	Land administration and management activities which ensure efficient and effective administration and sustainable management of available land resources throughout the country.
2.	Survey Department (Survey offices)	Preparation and updating cadastral plans and land registers of all the districts of the country as a when a land transaction takes place.

		Preparation of topographical base maps, administrative and land resources maps,
		Develop necessary surveying mapping professionals; carrying out.
		Surveying and mapping; co-ordination of surveying and mapping and GIS activities nationally and internationally.
		Maintaining a central archive of land information
3.	Land Revenue offices	Taxation which is the revenue for the government during land registration, Administration of Value Added Tax, Income Tax, and Excise Duty. Optimizing the inland revenue through a fair, efficient, and effective tax system.
4.	Local Development Organization (Municipalities, Rural Municipalities)	Collection of tax during the construction of structures by minimum valuation method and cost method based on local self-governance Act. The committee subdivides the area into various land use zone and use knowledge of sales

		comparison as well as minimum valuation provided by the land revenue office.

2.5.2. Land Acts

S. No	ACT	Responsibilities
1.	Land (Survey and Measurement) Act 1962	New Survey and Registrations provided
2.	Guthi Sansthan (Trust Corporation) Act 1971 (Ammended four times)	Manage state Guthi, and bringing rent and ceiling restrictions into line with other hand
3.	Nationalization of grazing Lands Act 1973	Allowing VDC management and fee collection
4.	Land Acquisition Act 1976	Upholding rights of landowners to claim compensation if land taken for public purposes.
5.	Land Revenue Act 1977	Setting up a developed system of taxation and administration in District land revenue offices and also declaring all unregistered land to be public or government land.
6.	Forest Act 1993	Extending of 1900 Birta forest to all forest and providing for community forests to enable local access and management.
7.	Contrasts Act 1998	Exempting leased lands from ceilings.

8.	Land use Act 2019	Gateway to amalgamate sectoral interests and better land-use practices.

2.5.3. Legal Provision for Land Valuation in Nepal

There are various legal provisions for Land valuation and compensation in Nepal. The major laws for the provision of valuation are mentioned as follows.

- The Constitution of Nepal 2014
- Land Revenue Act (Malpot Ain)
- House and Land Tax Act (GharJagga Kar Ain)
- Property Tax act (Sampati Kar Ain)
- Land Related Act (Bhumi Sambandhi Ain)
- Land Acquisition Act (Jagga Prapti Ain)
- Cooperative Act (Sahakari Ain)
- Agriculture Development Act (Krisi Bikash Ain)
- Commercial Bank Act (Banijya Bank Ain)
- Local Government Operation Act 2016

(Source: Ghimire, 2015)

2.5.4. Land Revenue Regulations 2036 (1980)

These regulations fall under the Land Revenue Act 1978. The regulations provide criteria for minimum land evaluation. The regulations have been amended seventh times in different periods and are shown below:

- Land Revenue (First Amended) regulations, 1984

- Land Revenue (Second Amended) regulations, 1995

- Land Revenue (Third Amended) regulations, 1998

- Land Revenue (Fourth Amended) regulations, 1998

- Land Revenue (Fifth Amended) regulations, 2014

- Land Revenue (Sixth Amended) regulations, 2015

- Land Revenue (Seventh Amended) regulations, 2018

The minimum land evaluation is done by a group of committees formed where it is headed by a CDO (Chief District Officer) along with the other 5-6 different committee members. The decisions' were made accordingly as follows:

- Chief District Officer, District Administration Office
- Members:
- District Development Committee
- Chief tax officer, Internal Revenue office
- Survey Officer, Survey office
- Land Revenue office, officer

Previously there were certain criteria for evaluating the land price and they are as follows:

- Land classification with the indicators such as roads quality, land suitable for housing (Ghaderi)
- Land use
- Present Land value
- Fiscal Year
-

After the 7th amended in regulations of the minimum evaluation, the committee shall prepare certain documents for the minimum land evaluation. They should either follow the above criteria for evaluation or can add or evaluate themselves.

2.5.5. Review of Minimum land valuation done by government

The minimum land evaluation is done by a group of committees formed where it is prepared by a CDO (Chief District Officer) along with the other 5-6 different committee members. The decisions' were made accordingly as follows:

- Chief District Officer, District Administration Office

Members:

- District Development Committee
- Chief tax officer, Internal Revenue office
- Survey Officer, Survey office
- Land Revenue office

Land Revenue Office carries out functions like tax, fund Collection, and land Administration. There are 6 land revenue offices in Kathmandu Metropolitan City and are as follows:

- Land Revenue Office, Dillibazar
- Land Revenue Office,Chabahil
- Land Revenue Office, Kalanki
- Land Revenue Office, Tokha
- Land Revenue Office, Sankhu
- Land Revenue Office, Manamaiju

The areas covered by these Land Revenue Offices are shown in Table (9.1-9.6) in Annex 9.

According to the Land Revenue Act 1977, the purpose of a land valuation is for taxation which is the revenue for the government during land registration. The minimum valuation is provided by the committee and valuation is updated yearly or within 2-3 years. The basis for evaluation is governed by certain criteria and is listed below:

- Land classification with the indicators such as roads class, land suitable for housing (Ghaderi)
- Land use
- Present Land value
- Fiscal Year

CHAPTER 3   METHODOLOGY

This chapter will present the methodology of the research work. Methodology simply refers to procedures, approaches, and methods used by a researcher in research in achieving the research objectives. The different methods used to carry out the thesis work. The choice of research methods will be described at first which will be followed by methods of data gathering and technique and rationale for selecting the case study area. It involves the process in which various stages of collecting data are discussed and explained. This aspect of the study is concerned with data types and sources of information, (primary and secondary), arrangement for data collection, sample size and sampling procedures, method of data collection, and analysis. The various processes through which data for this study were collected and analyzed are discussed below.

3.1.   Conceptual Framework and Research Methodology

Research is carried on the paradigm in which the topic can be fully achieved and an appropriate paradigm is considered that is best fit to explain the research. A paradigm is a set of theoretical framework which influences the way information about a particular subject is studied and understood.

The research is based on an explanatory research approach. Explanatory research is an attempt to connect different ideas and to understand the different reasons, causes, and effects. It is also an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not evident. The choice of explanatory research approach for this study was influenced by the goal of the study; which is to seek a determinant of land value in the Kapan area. The less expensive nature of the application and the ease of use in research like this contributed significantly to the choice of this approach. The total reality can be generated and the output of the study of social phenomena can be universal so the study is in the scope of the positivist paradigm. Therefore, this research falls under positivist paradigm. Some social related questions were asked

during interview which includes choice of location so this research falls under the post-positivist paradigm where multiple truths can be generated. The one truth is that the "factors affecting the land price "can be generated.

As the study would be based on quantitative and qualitative methods, exploratory research is carried out. Quantitative data may be utilized in a way, which supports or expands upon qualitative data and effectively depends on the description.

The research Strategy that has been carried out is the Case Study Approach. Robert K. Yin (1993) says the case study is but one of several ways of doing social science research. The case study allows an investigation to retain the holistic and meaningful characteristics of real-life events such as individual life cycles, organizational and managerial processes, neighborhood change, international relations, and the maturation of industries. The analyst's objective should be to pose competing explanations for the same set of events and to indicate how such explanations may apply to other situations.

3.2. Research method

The research method includes the identification of a problem, planning, and execution of questionnaire surveys, implementation of fieldwork, sample size determination, and data management.

3.2.1. Identification of study area

The main reason for selecting Kapan for the research is that this area has been experiencing a rapid pace of urbanization with people migrating from other parts of the country for cheaper land, employment, and economic activities which has led pressure on available land and unmanaged settlements faced by the city dweller. For the problem identification, observation, interview with landowners, brokers, and renters was conducted as well as a review of land valuation done by bank and governments were also carried out.

3.2.2. Planning and Execution of Surveys

Planning of surveys

A few steps of preparations were done to obtain well managed and desired output which was done beforehand survey was conducted on the real site.

- Objectives of the survey

From the beginning of the research project, it is really important to spell out the objectives of the survey; a brief objective has been formulated. The sole purpose of the survey was to find the land value changes (in terms of land price) and its key players for the case of a particular area by getting information from government, banks, brokers, and users' perspectives. The information required includes factors that determine the land value changes.

- Study Area

The general idea about the site was known before surveying. The urban growth rate of Nepal is 3.38% (CBS 2001-2011) but the growth rate of Kapan is 12.19% (CBS 2001-2011), therefore the research is being carried out in such a small area.

- Research Design

The importance of the research design to this study is that it helps in defining the research purpose, tackling research problems within the context of the targeted population, sample size, and the problems encountered on the field. Closed questionnaire format, Key Informants Interviews, and field observation was adopted in carrying out this research.

To get a theoretical base and understanding of various aspects related to land value, a literature review is carried out. It includes a theoretical review of research materials like journals articles and relevant materials under similar topics for understanding its issues, problems, and prospects associated. Report related legislation is also reviewed. Various indicators and variables are prepared for developing a set of questionnaires.

- Data Types and Source of Data

The data needed for the study was collected through a literature review and field survey, which will be from secondary and primary sources respectively. A literature study helps to gain knowledge about the existing studies that have been done and written about land values to gain ideas for the rest of the research.

- Primary Data Collection

Primary data for this study were primarily gotten through the use of structured questionnaires, interviews, and field observations. The primary data collected includes data on the landowners and renters in the study area information about land price, rental price certain period; data on physical, social and economic condition, risk-sensitive areas, market center, infrastructure development in the neighborhood and locational factors. Primary data were obtained directly from brokers, landowners, renters through questionnaires and both structured interviews. The primary source of data is firsthand information relevant to a study of this nature.

- Secondary Data Collection

The secondary sources included data collected from sources such as published books, articles, journals, websites, and government minimum land valuation books.

- Method of Data Collection

This study specifically made use of a questionnaire form to gather the necessary information. One sets of questionnaire were administered. The first set was for residents in the study area. The questionnaire contained a set of questions structured in line with the variables under consideration, to elicit vital information from respondents. On the whole, the first set of questionnaires was segmented into four parts with a total of twenty-four questions.

Section A contains information on socioeconomic characteristics such as Location (Cluster (A, B, C)), landowner or renters, period of stay, land bought or inherited. Section B tries to provide information on previous and present land price and rental

price, land use previous and present time, and present rental value of room and land. Section C captured information on reasons for selecting land (the physical, social, economic, and religious), period of land bought. While section D sought to provide information on risk-sensitive land areas for land prices and means for investing inland. All of the questions are close-ended. Photographs of important details were taken during a field survey. This is to enable us to capture in detail all important features and spatial organization of economic activities. For easy assessment of detailed analysis, the entire study area was segmented based on clusters. The data was collected with a sampling survey and key informants interview. The household survey was carried out directly on-site through personal interviews and direct observations. The questionnaires were prepared and the form was made with the help of the Kobo toolbox. The response rate of interviews was high so there is a greater possibility of collecting the statistical information. A general observation regarding the situation was also carried out.

• Questionnaire design

According to Ng (2006:1), a questionnaire is a very convenient way of collecting information from a large number of people within a period (Dzangmah, 2012). In the research, formal and informal interviews and questionnaire was used. The questionnaire consisted of both open and closed-ended questions, based on the objectives of the research to accommodate all the views of the respondents.

The first part of the questionnaire covered: the general information of respondents (location, origin, duration of stay in that location, land inherited or bought, cost of land previous and present, land-use changes, rental value previous and present, etc). After the inquiry on general information, the second part of the questionnaire was related to situation, risk-sensitive areas, investing in land, and factors affecting land values. The structural framework was comprised of a series of questions related to the land price, rent, land size/ rental size with prices. The participants were provided with a closed questionnaire. Then, it briefly inquires about the previous and present land price, availability of services/infrastructures and the rent charges, trends on land

value. This initial questionnaire design was consulted with the supervisor, pre-tested and some adjustments were made before going to the field.

3.2.3. Implementation of fieldwork

The sample was selected through random sampling initially where this sampling permits every single item from the universe to have an equal chance of presence in the sample. The researcher identified willing landlords and renters to participate in the study. Then the sampling continued through area sampling; it deals with a subdivision of environment that represents clusters of units that centered on terrestrial location. The different clusters of Kapan area were divided and samples were taken

3.2.4. Sample size determination for household surveys

The target population of the study was made up of landowners

Table 1 **Households by ownership of house/housing unit in use**

VDC	Total Households	Ownership of house/housing unit			
		Owned	Rented	Institutional	Others
Kapan	12324	5028	7091	127	78

Source: CBS, 2011

The projected population for 2020 of different clusters is Cluster A: 123323, Cluster B: 18952, and Cluster C: 3373.

The household size according to CBS 2011 was 3.25.

Similarly, the total number of households is calculated by dividing the total projected population with household size and the results of different clusters are: Cluster A is 123323/3.25: 37946, Cluster B is 18952/3.25: 5831, and Cluster C is 3373/3.25: 1038 number of households.

Total number of owned house: 40% of 37946: 15178, 40% of 5831: 2333, 40% of 1038: 415.

33

Assume that number of owned houses = Number of plots with houses=15178, 2333, 415.

Formula For Sample Size Determination= Nx z^2 x px (1-p)/e^2 /N-1 + (z^xpx(1-p)/e^2) , Assume that there is only one house in a plot= N=15178, 2333 and 415.

Particular	Value(A)	Value(B)	Value(C)
Population Size (N)-	15178	2333	415
Critical Value (90% confidence level) (Z)	1.65	1.65	1.65
Margin of Error (e)	0.15	0.15	0.15
Sample Proportion (p)	0.5	0.5	0.5
Sample Size(n)	30	30	28

Therefore, Total Sample: Cluster A: 30, Cluster B: 30 and Cluster C: 28

The total samples that were collected during a survey were **88**.

3.2.5. Data management:

Collected data will be analyzed as qualitative and quantitative way, by synthesizing the theoretical data and literature collected and by processing and calculating the statistical interpretation of data using SPSS and EXCEL.

- Data Interpretation and generalization

A combination of both qualitative and quantitative methods was used in Data Analysis. Quantitative data is utilized in a way; it supports upon qualitative data and effectively deepens the description.

3.2.6. Conclusion and recommendation

The conclusion will be drawn from the analysis and interpretation of the collected data. The final research will be presented in the form of a proposal for determining the factors affecting land value.

Table 2 Research Strategy

Data needs	Data sources	Data collection method	Technique of data analysis	Expected research Outcome
To identify key factors that define and influence land values in the Kapan area.				
Current land price trend, Accessibility Infrastructure & services	Landowners, renters, broker's	Questionnaire, observation, photography	Statistical package (SPSS), Excel, Descriptive analysis	Factors affecting land values.
To analyze the change in land values (expressed in terms of land prices) across location and time. *To review the land valuation of the Land Revenue Office and bank.*				
Government minimum land valuation book of different locations and different periods, bank valuation, current land price trends.	Discussion with Experts of Land revenue office, survey office, secondary data, Landlords, Broker's	Key informant interview Questionnaire, observation, photography	Statistical package (SPSS), Excel, Descriptive analysis	Change in land value(land price) across location and time
To analyze the impact of land value on development (land use intensity).				

Current trend,	Primary, Secondary literature, Observation	Desk study, observation, photography	Descriptive analysis, Excel,	Impact of land value on development (land use intensity)

CHAPTER 4   STUDY AREA

4.1.   Profile of the Study Area

The study area is of Kapan Vdc (ward 1-9) previously which is now Budhanilkantha municipality ward 10, 11, and 12. For this study's purpose, the study area is divided into three clusters i.e Cluster A (Kapan Ward 1,3 -Budhanilkantha Municipality ward 10, 12) and Cluster B and C (Kapan 2,6,8 and 4,5,7,9) -Budhanilkantha Municipality-ward 11).

4.2.   Site Selection

Budhanilkantha Municipality: Ward 10, 11 and 12 (Kapan Ward 1-9)

The urban growth rate of Kathmandu valley is 3.38% per annum (CBS 2001-2011) but Kathmandu Valley VDC's have experienced more than 6% growth rate. The annual growth rate of the Kapan VDC area is 12.19% (CBS 2001-2011). There is no study being made in the Budhanilkantha Municipality ward 10, 11, and 12. Therefore, Kapan of Budhanilkantha municipality has selected the site for study.
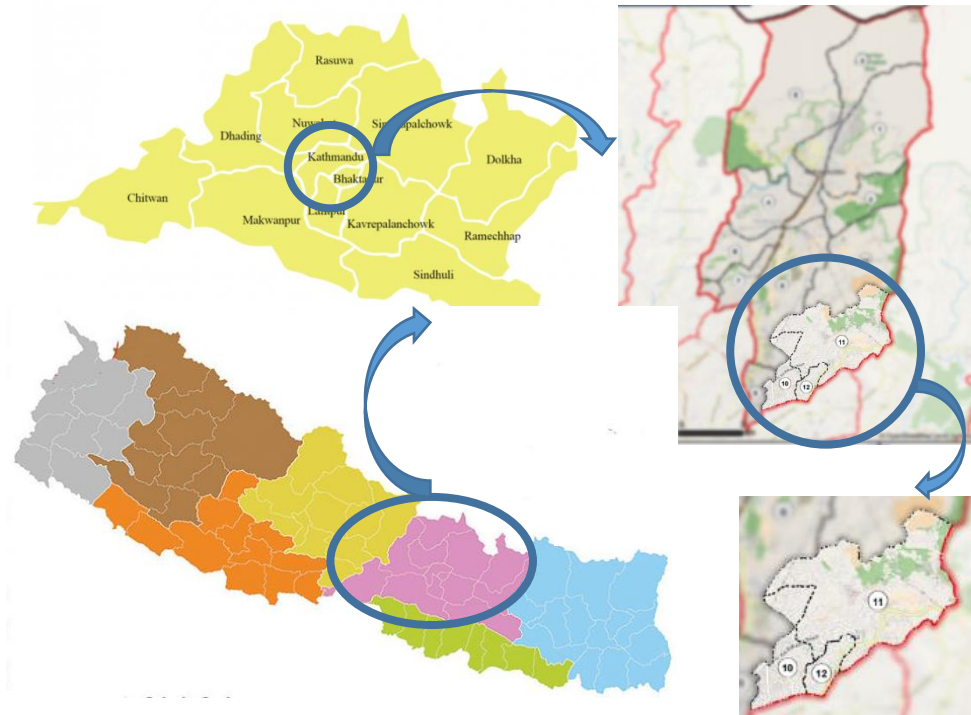
Figure 3 Study Area

Budhanilkantha a municipality in Kathmandu District in the Bagmati Province of Nepal that was established on 2 December 2014 by merging the former Village development committees Chapali Bhadrakali, Mahankal, Bishnu, Chunikhel and Kapan. The city is situated at the foot of Shivapuri hill. Previously, the drawing of buildings in Kapan was easily approved in VDC as a result of which construction of buildings were found easier and higher and settlement started to grow. Budhanilkantha municipality has 13 wards. The boundary is as follows:

- Gokarneshwor municipality in East,
- Tokha In west,
- Belkotgadi municipality in north
- Kathmandu metropolitan city in the south.

Budhanilkantha Municipality: Ward 10, 11 and 12 (Kapan Ward 1-9)
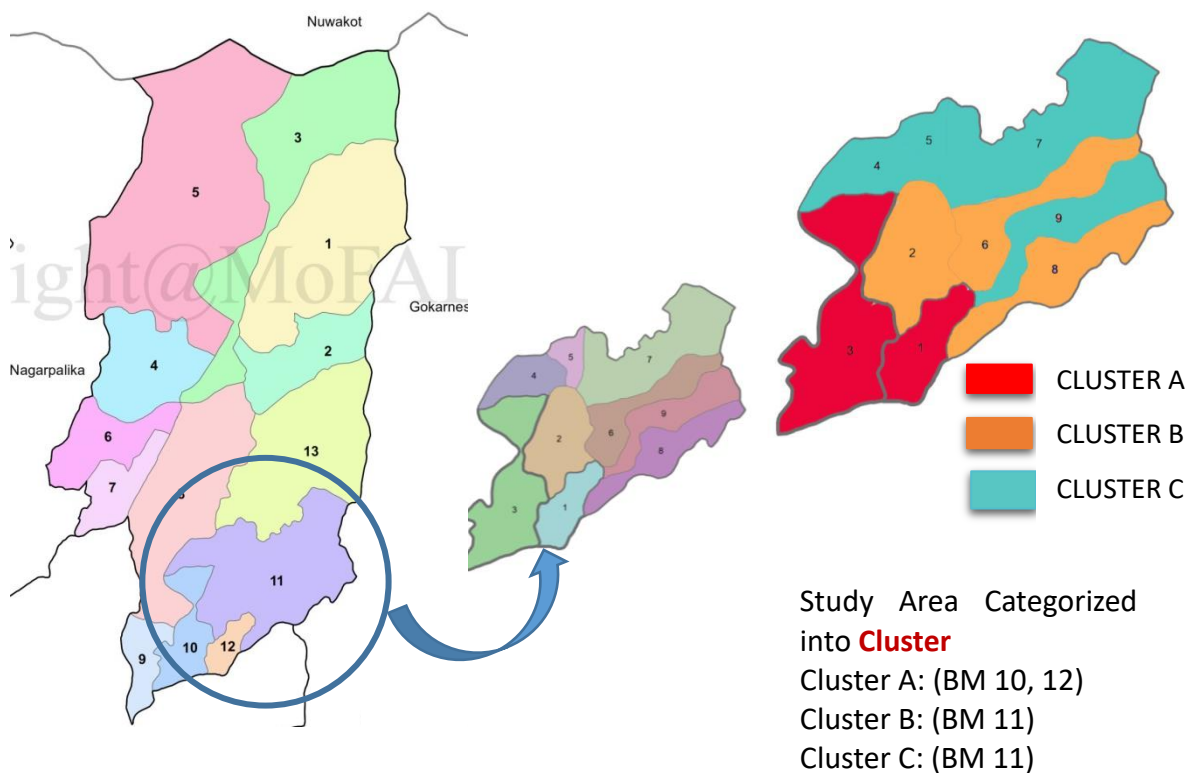
SOURCE: Mofaga.gov.np

Figure 4 Cluster Study Areas

4.2.1. Location

Cluster A is near to the ring road area (Chabahil and Sukedhara) which has a distance less than 1 km whereas cluster B is near to Boudha and Jorpati area and cluster C is near to Budhanilkantha area and Jorpati area.
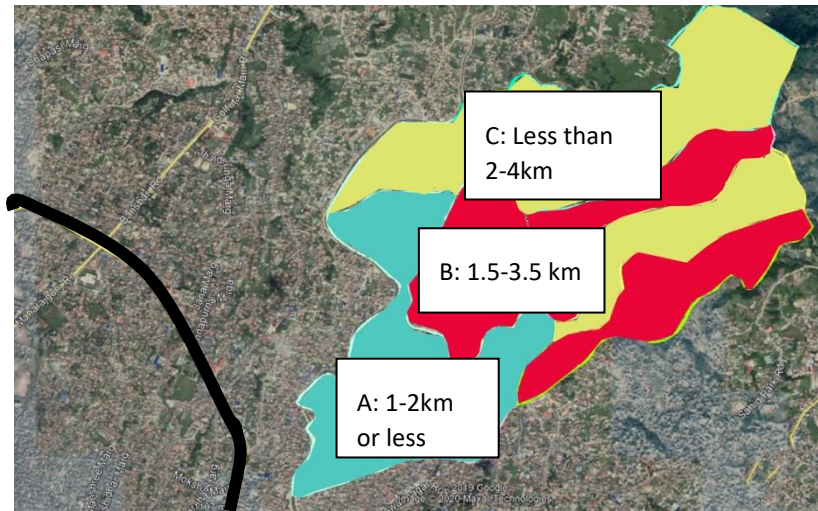
Figure 5 Location Map of Study Area

4.2.2. Topography

Cluster A has less slope and is ease for development so demand is high here whereas high slope is seen in the area of cluster B then cluster C.
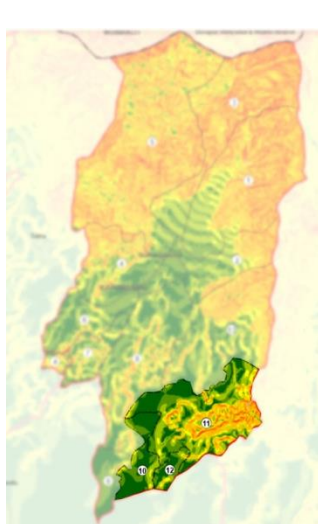
Figure 6 Slope map of Budhanilkantha Municipality   **Figure 7 Slope map of Clusters**
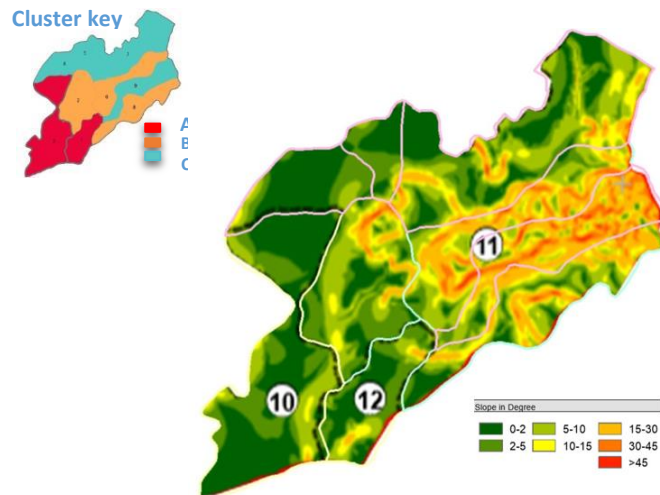
39

Image 1 Cluster A

Image 2 Cluster B

Image 3 Cluster C

4.3. **Population and Households**

4.3.1. **Kapan VDC Year wise Population**

The population of Kapan VDC in 1991, 2001 and 2011 are as shown below:
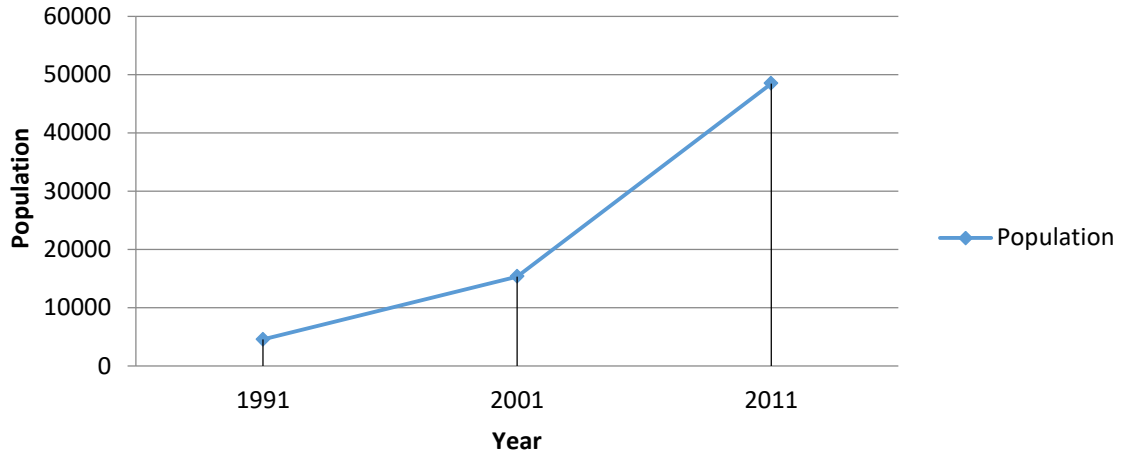
Year	Population	Increment in Population		No of population increased	
1991	4567	1		4567	
2001	15340	3.35	1	15340-4567: 10773	
2011	48463	10.611	3.15	48463-4567: 43896	48463-15340: 33123

SOURCE: National Population and housing census 1991, 2001 and 2011/Kapan vdc

4.3.2. **Kapan VDC Yearwise Households**

The household of Kapan VDC in 1991, 2001, and 2011 are shown below:
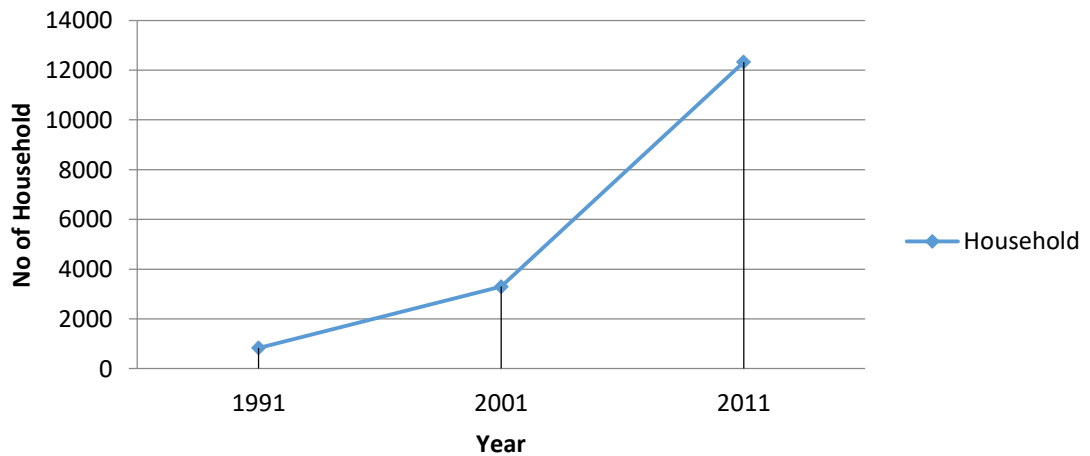
Year	Households	Increment in Household		No of household increased	
1991	833	1		833	
2001	3293	3.95	1	3293-833: 2460	
2011	12324	14.79	3.74	12324-833:11491	12324-3293: 9031

SOURCE: National Population and housing census 1991, 2001 and 2011/Kapan

4.3.3. Kapan Ward Population and household Comparison: 2001 and 2011

The table shows the comparison of total population and households in different periods i.e. 2001 and 2011.

Ward	Household		Household Increments		Population		Population Increments	
	2001	2011	2001	2011	2001	2011	2001	2011
1	1212	4067	1	3.35	5646	15984	1	2.83
2	152	689	1	4.53	788	2866	1	3.63
3	1403	6246	1	4.45	6110	24050	1	3.93
4	60	93	1	1.55	316	451	1	1.42
5	100	212	1	2.12	526	907	1	1.72
6	123	279	1	2.26	655	1158	1	1.76
7	83	104	1	1.25	418	412	1	0.98
8	77	499	1	6.48	441	2008	1	4.55
9	83	135	1	1.62	440	627	1	1.42

SOURCE: National Population and housing census 2001 and 2011/Kapan vdc

The table shows the population distribution of Kapan VDC in 2001, 2011. Ward 3 has the highest population followed by ward 1 in 2001 and 2011, similarly, ward 4 has the lowest population in 2001 and ward 7 has the lowest population.

The table shows the household and population maximum increment inward 8 whereas the least increment in ward 7.

4.3.4. Total Population comparisons of 2001 and 2011

The total population is seen higher in ward 1 and 3 whereas the lowest inwards 4 in 2001 and inward 7 in 2011.
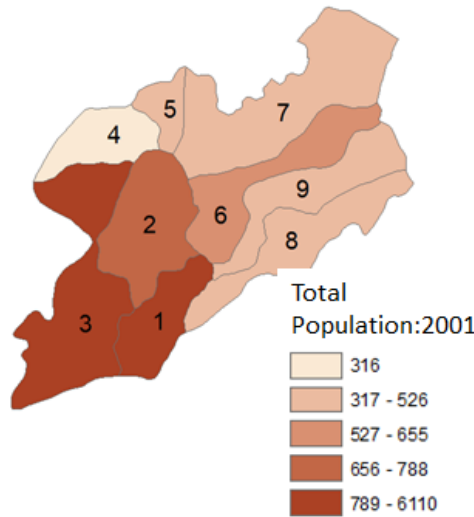
| Figure 8 Total Population 2001 | Figure 9 Total Population 2011 |
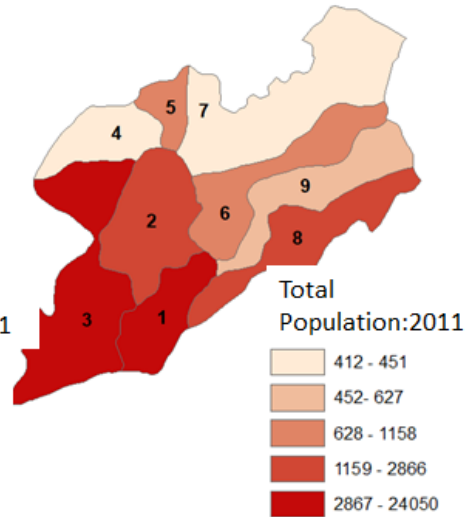
4.3.5. Total Households comparisons of 2001 and 2011

The total household is seen higher in ward 1 and 3 whereas the lowest in ward 4.
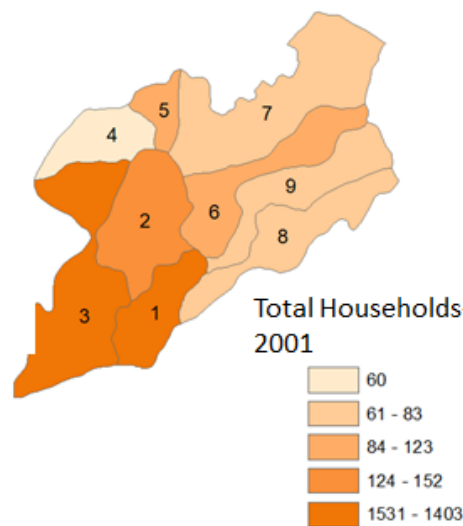
| Figure 10 Total Households 2011 | Figure 11 Total Households 2001 |
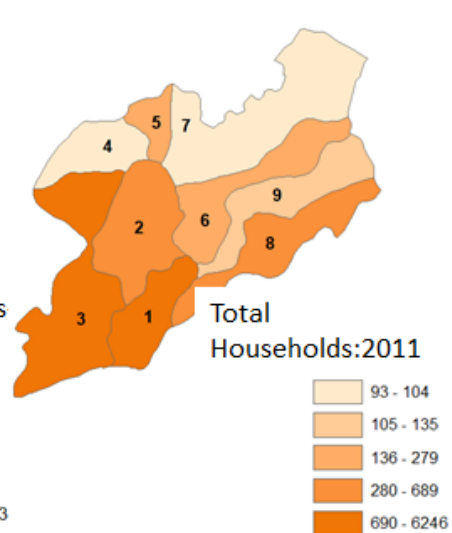
4.3.6. Total Population and Households Comparison: Cluster wise

Clusters	Household		Household Increment		Population		Population Increment	
	2001	2011	2001	2011	2001	2011	2001	2011
Cluster A	2615	10313	1	3.94	11756	40034	1	3.40
Cluster B	352	1467	1	4.16	1884	6032	1	3.20
Cluster C	326	544	1	1.66	1700	2397	1	1.41

Cluster Wise Population comparision : 2001-2011
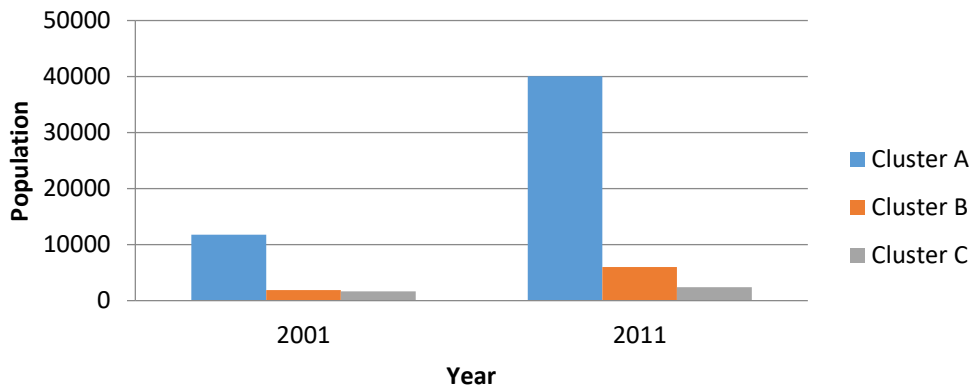
Cluster Wise Household comparision : 2001-2011

The table and graph show that the population and households in Cluster A are higher than in other clusters.

4.3.7. Ward wise Revenue Comparision
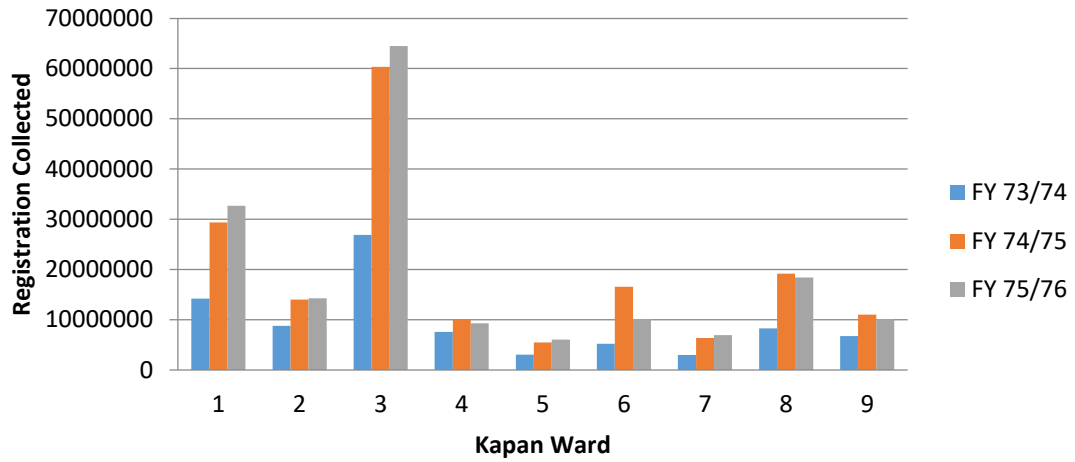
The above graph shows that the land registration is seen higher in ward 3 in FY 75/76 and lowest in ward 5 and 7 in FY 73/74. The land registration is seen decreased in ward 4, 6, 8, and 9 in FY 75/76. This shows that in that year there is less transaction of buying and selling of land.

4.3.8. Cluster wise Revenue Comparison
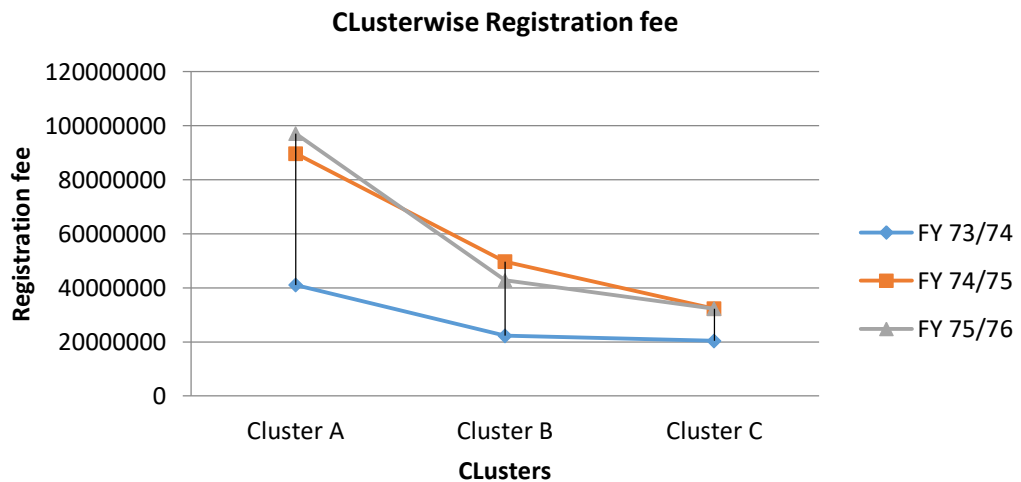
There is a gradual increase in cluster A, land registration during FY 74/75 then other clusters. The land registration has been decreased in cluster B in the FY 75/76, whereas there is no change in Cluster C.

4.3.9.   Infrastructure and Services

4.3.9.1.Road
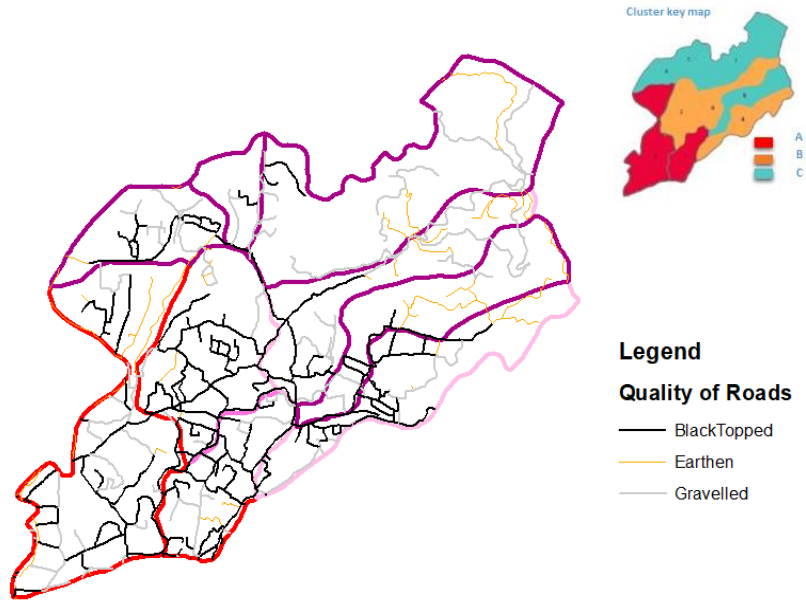
Figure 12 Quality of Road map of Cluster

Source: IUDP of 14 municipalities – Nest, ERMC and Geocon
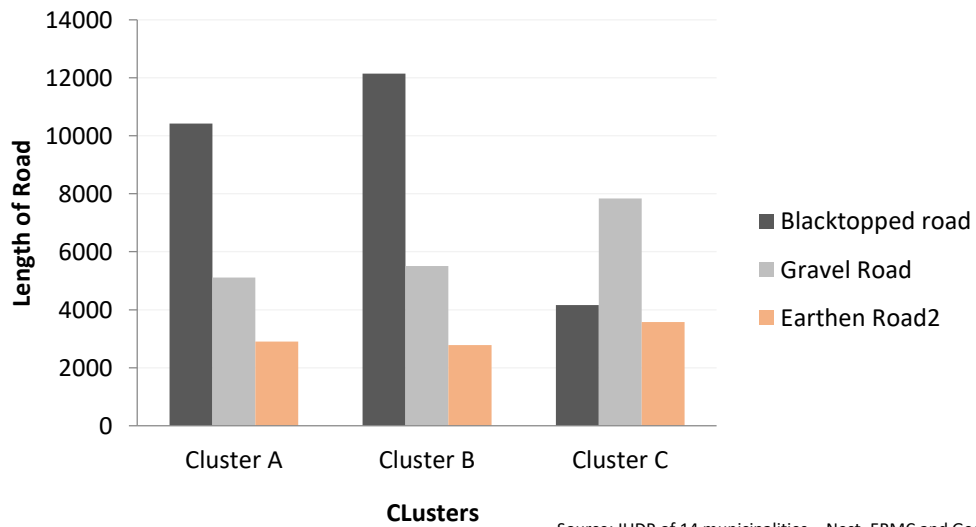
Graph 1 cluster comparisons of quality of Road

Cluster B has more blacktopped road so the land value is higher in such areas then Cluster A, C whereas gravel and the earthen road are seen higher in cluster C.

4.3.9.2.Social Infrastructure
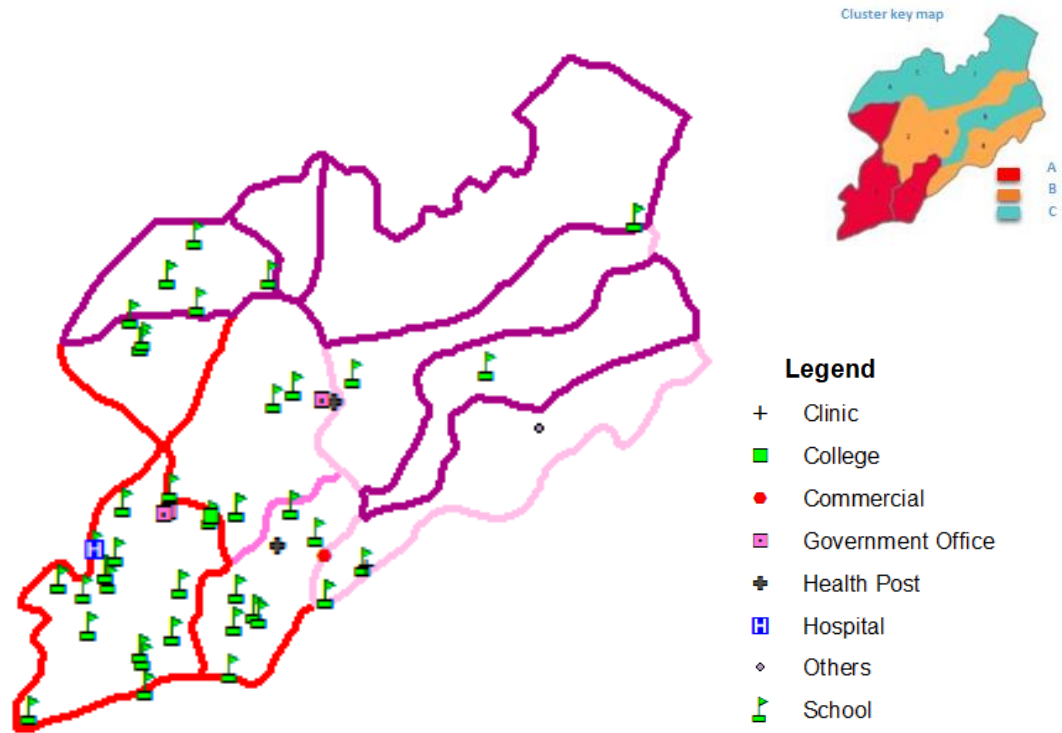
Figure 13 Cluster map of Social Infrastructures
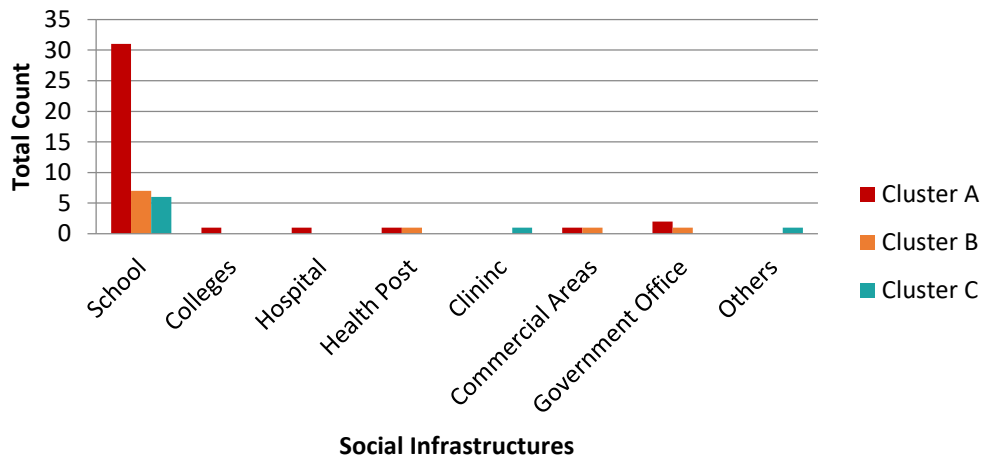
Graph 2 Cluster comparisons of social infrastructures

Cluster A has a high value of social infrastructures then other clusters so the land value is higher.

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4.3.9.3.Religious Infrastructure
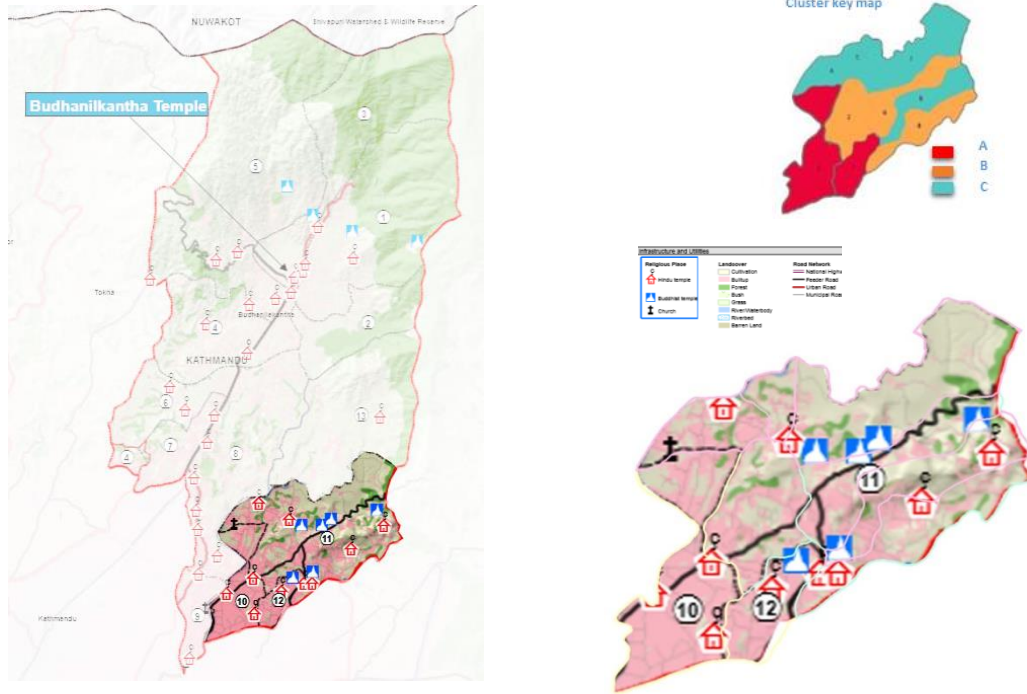
Figure 14 Cluster map of religious infrastructures
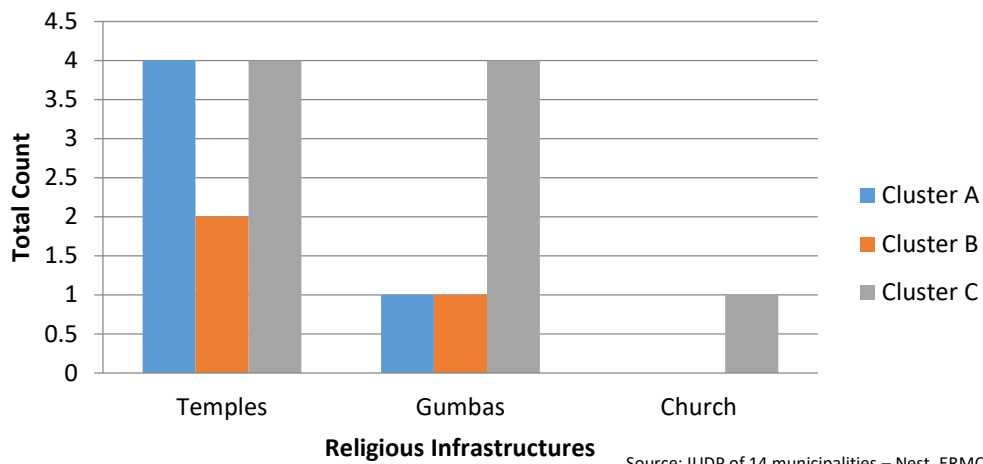
Source: IUDP of 14 municipalities – Nest, ERMC and Geocon

Graph 3 Cluster comparisons of religious infrastructures

From the above graph we can say that cluster c is rich in religious infrastructure so land price near to the structure is maximum. Hindu, Buddhist, and Christian reside on the cluster C.

4.3.9.4.Risk Sensitive land use plans
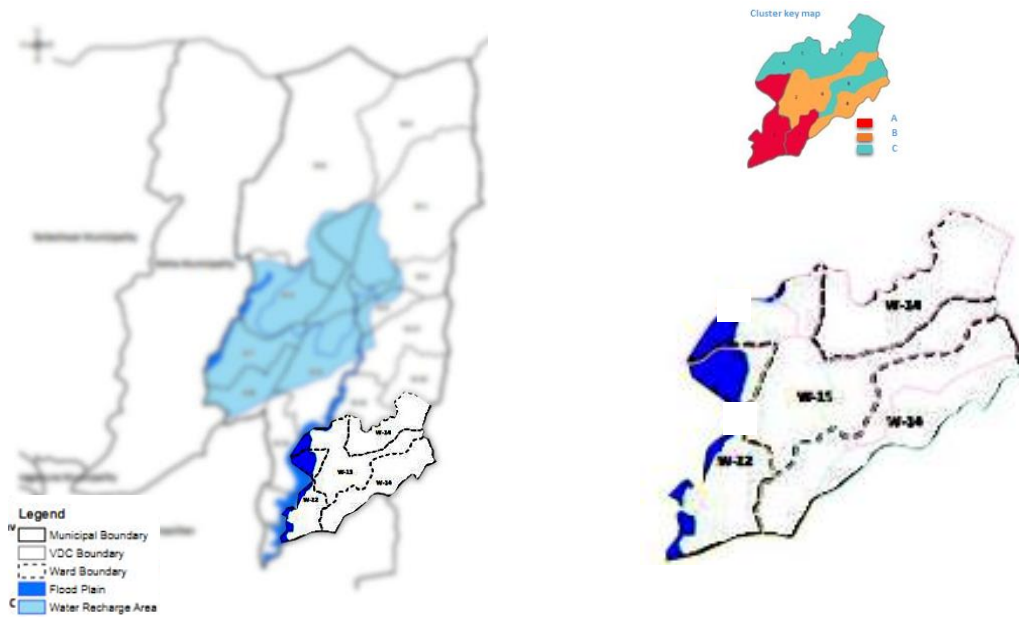
Figure 15 Flood Plain Area map: Budhanilkantha Municipality and Cluster

Cluster A is more vulnerable to flood so the land price in flood plain areas is less than the other clusters.
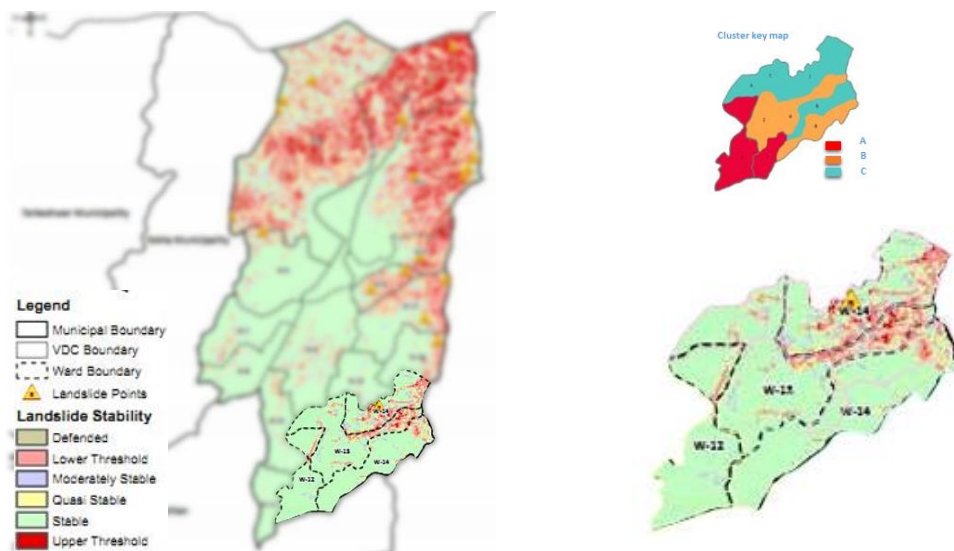
Figure 16 Landslide Susceptibility Map: Budhanilkantha Municipality and Clusters

Cluster C is more vulnerable to a landslide so land prices in such areas are less than the other clusters.
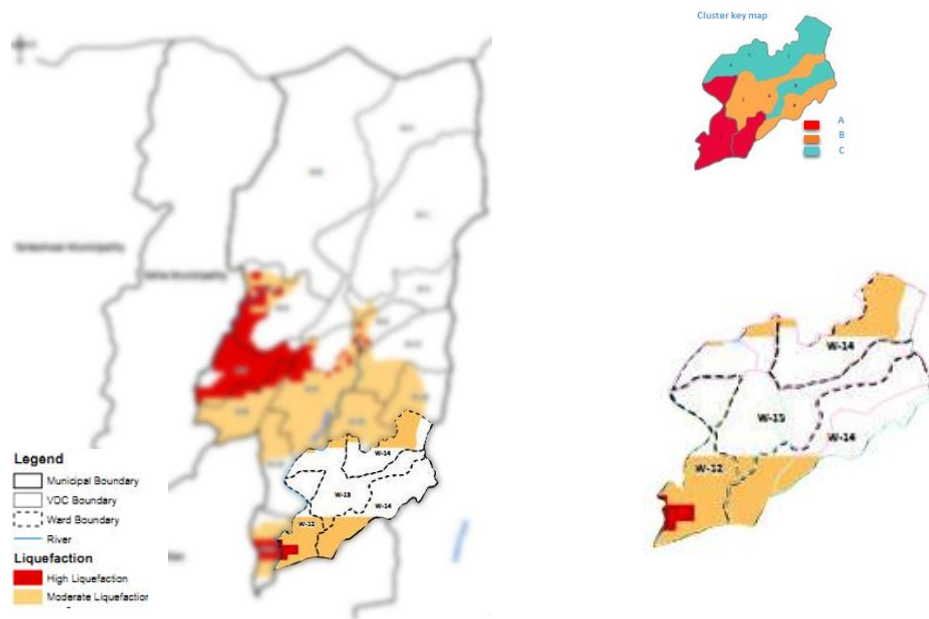
Figure 17 High Susceptibility Map: Budhanilkantha Municipality and Clusters

Cluster A has a high liquefaction area than other clusters so the land price may vary accordingly. The estimated hazard for liquefaction and high PGA due to earthquake, flood, and landslide obtained from a previous study by UNDP/CDRMP project shows that the western part of the municipality has the probability of the high liquefaction. Near the river and flood plain of Dhobikhola cluster A has high liquefaction potential.

The area vulnerable to risk affects the land price. Areas with high risk are less in demand and land value is minimum whereas areas without risk are high on demand and high land value can be seen in such areas.

Image 4 **Dhobikhola corridor: Flood plain and liquefaction area   Image 5 landslide Area**

4.4. Land Use Intensity

4.4.1. Land Use Change

The land-use scenario of Budhanilkantha municipality has been changing drastically in recent years. Land use data obtained from 2012 estimates that around 42.2% of the municipality area is covered with forest, whereas 36.7% is agricultural land and only 20.4% is built-up. Infrastructural development is rising within the municipality. Southern and western parts of the municipality are most developed while as we go to the northern part of the municipality, the development process is slow and has abundant patches of forest land.
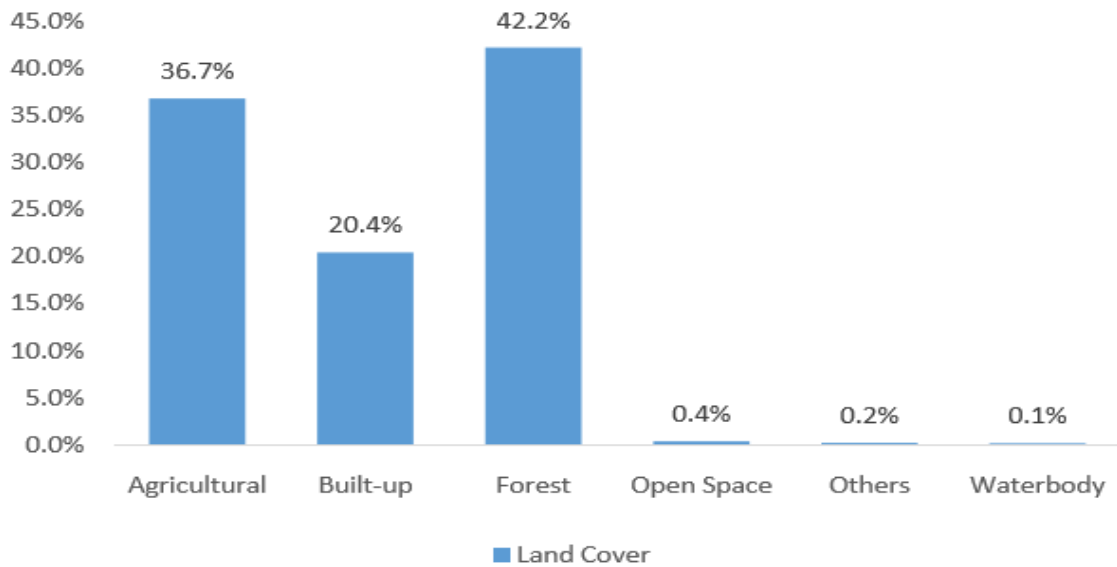
Graph 4 Land Use 2012 of Budanilkantha Municipality
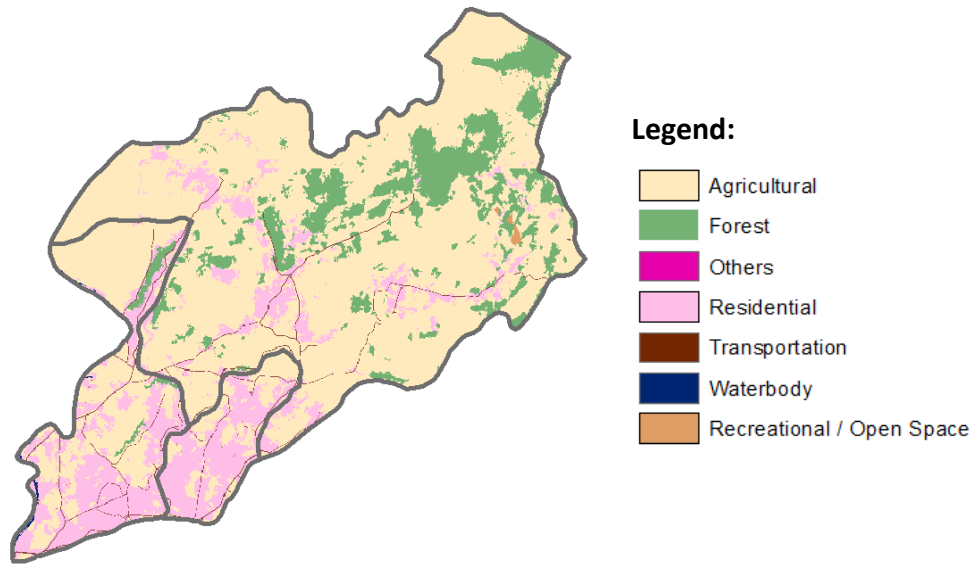
Figure 18 Land Use 2000

In Kapan, the land use in 2000 was found much in agriculture and forest followed by very few settlement areas. River is the source of water bodies present and minimal recreational space was found.
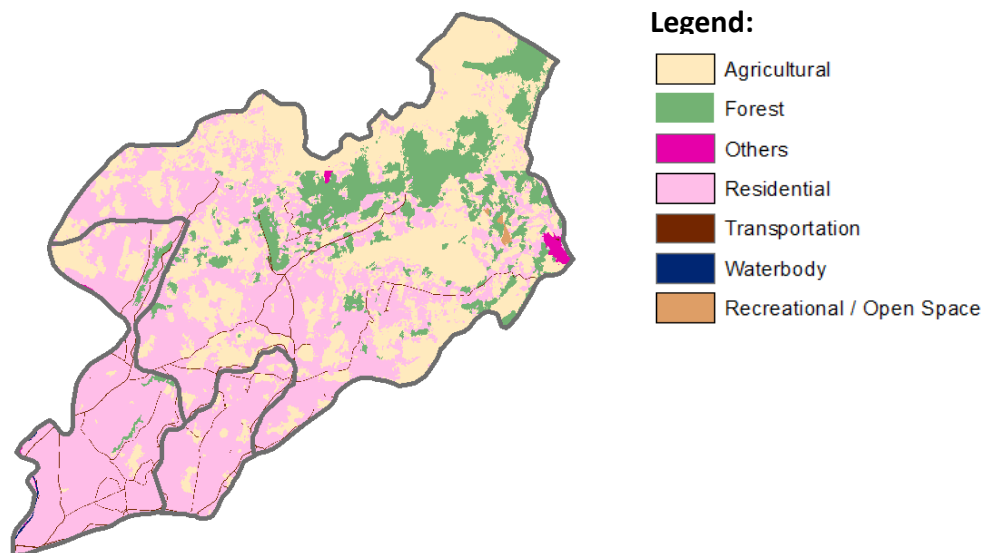
Figure 19 Land Use 2012   (Source: genesis intl consultancy)

The land use in 2012 was found much in built-up areas. There is no change in forest areas but agriculture land has been converted into built-up spaces. This shows the urbanization of the area.

Land use : 2000

Land use : 2012
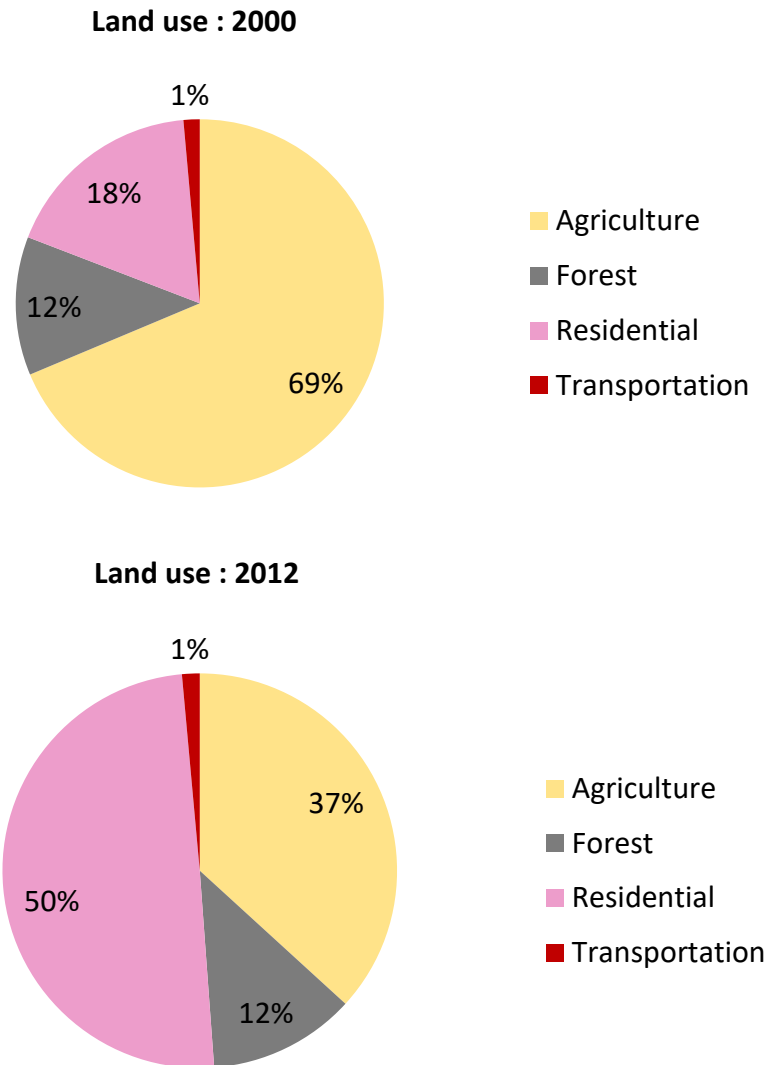
(Source: genesis intl consultancy)

The above graph shows the changes in agricultural land. 69% of agricultural land in 2000 has been converted into 37% in 2012. The increase in built-up areas in 2000 with 18% to 50% in 2012. This shows that the development of infrastructure cause depletion of agricultural land and an increase in settlement areas.
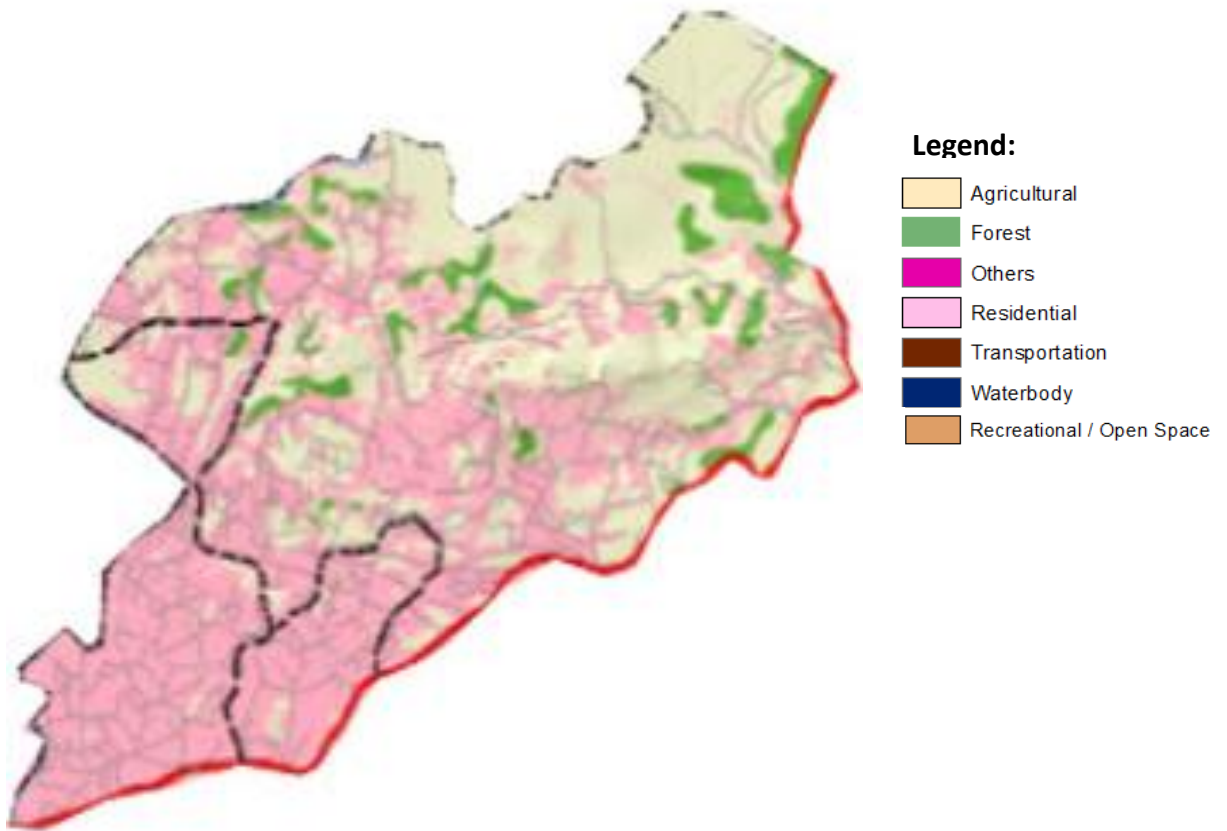
Figure 20 Land Use 2018

The forest at the North has been changed into bushes and built-up areas whereas the agricultural land has been changed into built-up areas towards the South. Inadequate open space and haphazard settlement with improper transportation network can be seen from the images above.

Land-use changes can be seen clearly towards the North area where there is agricultural land previous but due to urbanization and development of activities it has been converted into built-up areas. South Portion also has drastic changes in settlement areas due to the development of the area and also those areas are near to Kathmandu Metropolitan city ward 6. After the VDC was converted into municipality there is more development of activities as a result of a loss of agriculture land into built-up areas.

4.5. **Chronological study of land-use changes**

Cluster key map

There are changes in land development from 2005 to 2019. The rapid pace of development can be observed from satellite images. Cluster A has been developed rapidly where less vacant land can be observed whereas, in Cluster B, the agricultural land being converted into built-up spaces and cluster C development can be seen around the Gumba areas but also can see the vacant plots towards North. The development is also observed along the main road.
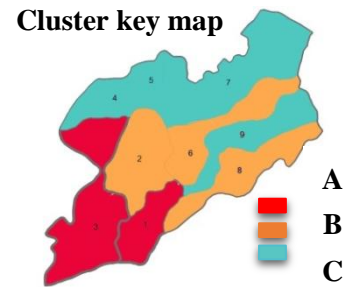
Year 2005
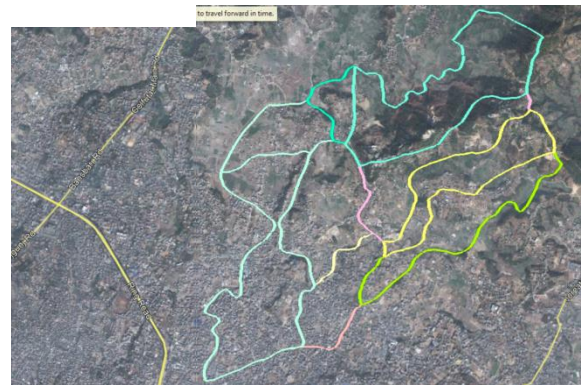
Year 2010
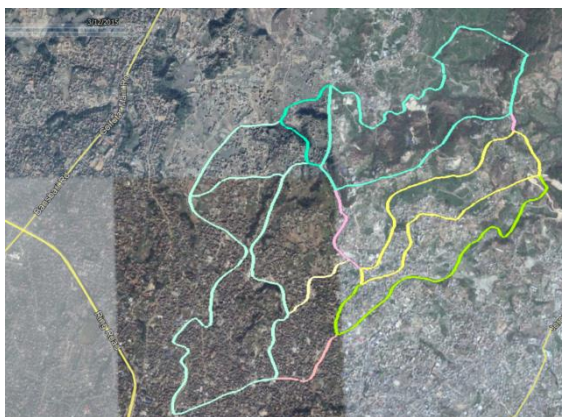
Year 2015
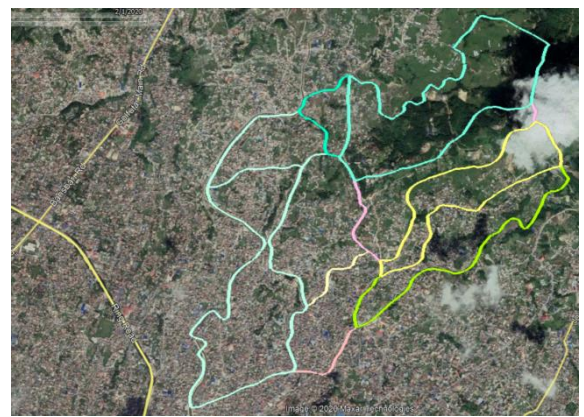
Year 2019

Figure 21 Satellite Image showing land use pattern of different time period

4.5.1. Spatial Analysis: Building footprints
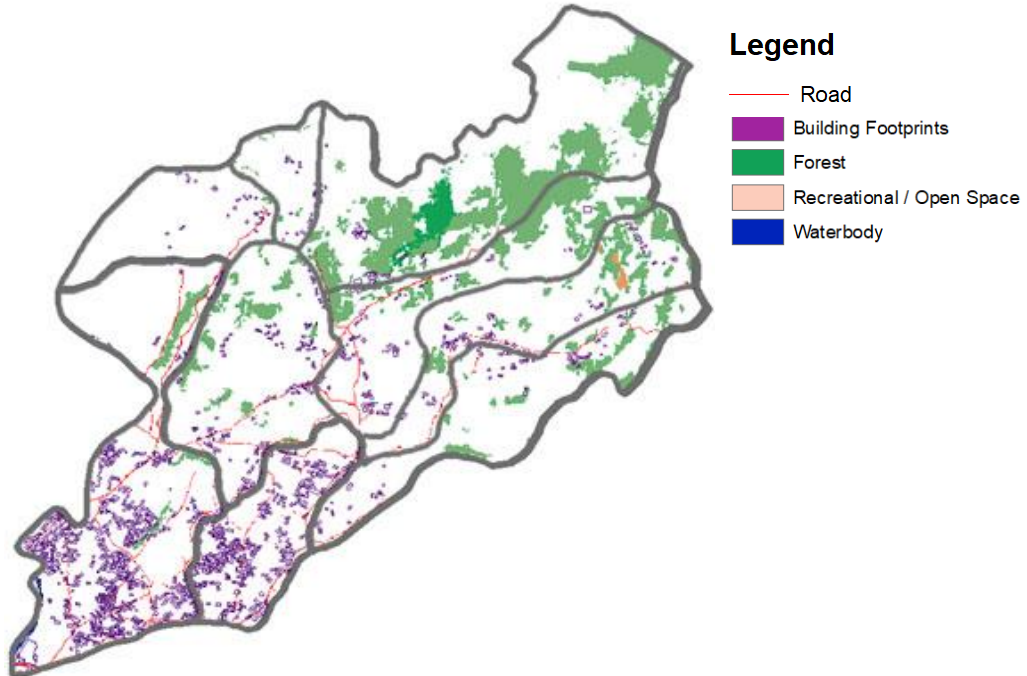
Figure 22 Building Footprints 2000
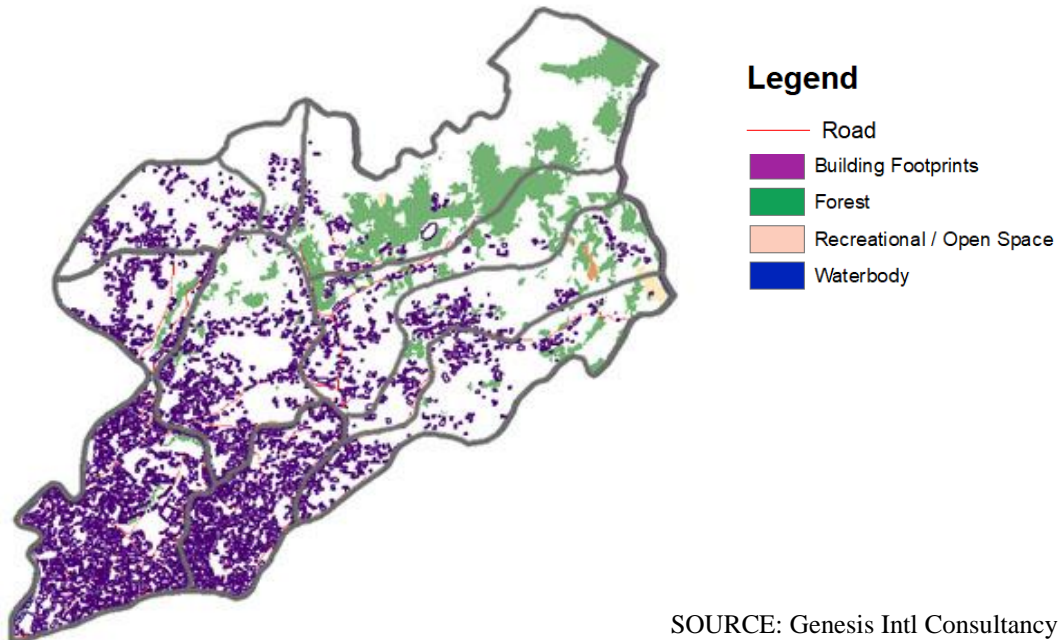
SOURCE: Genesis Intl Consultancy

Figure 23 Building Footprints 2012
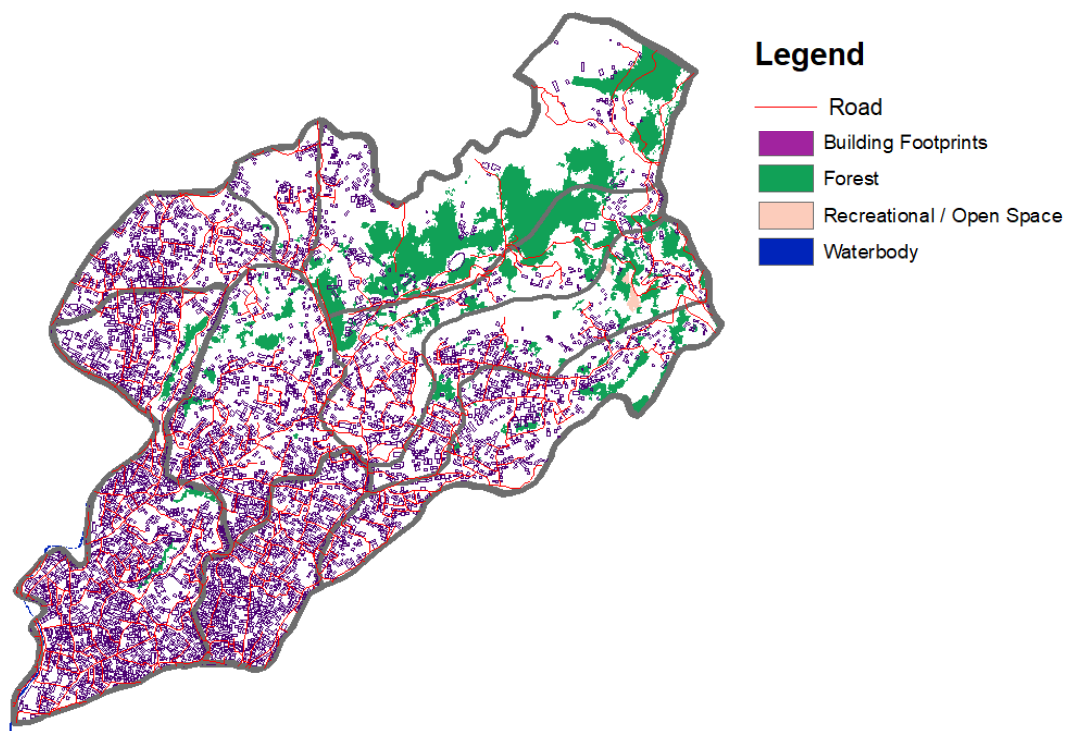
Figure 24 Building Footprints 2018
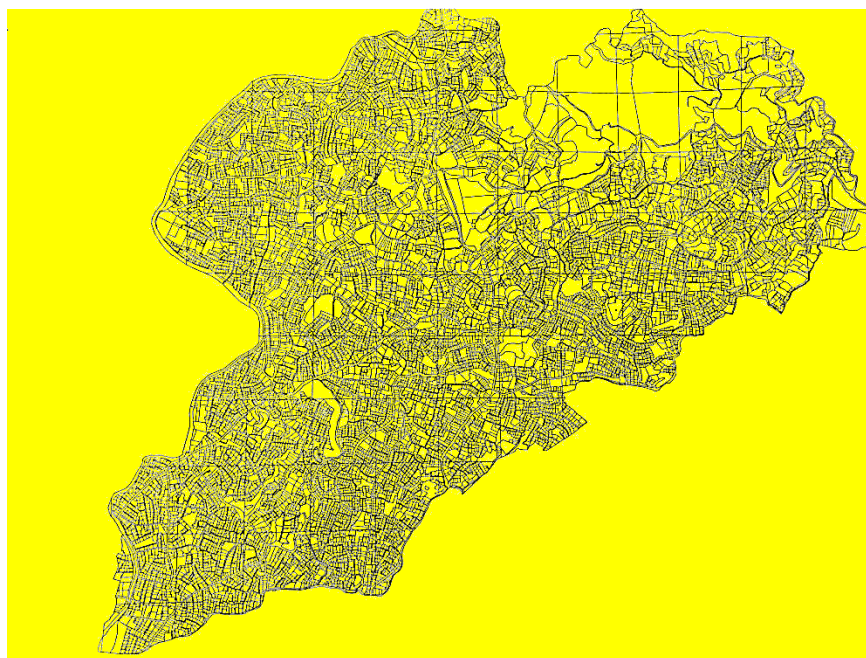
Figure 25 Cadastral Map

SOURCE: Survey department, Chabahil

4.6. **Site Attributes**

S.No	Factors	Cluster A	Cluster B	Cluster C	Source
1.	**Distance from ring road**	1 km	1-1.5km	<2km	Google map
2.	**Topography**	Less slope	High	Moderate	RSLUP report
3.	**Infrastructures** **Physical** **Social** **Cultural**	Road, electricity, drainage and sanitation and public transport (33%) Neighborhood (26%) Presence of temples (50%)	Road, electricity, water supply, and public transport (40%) Neighborhood and presence of relatives (29%) Presence of Gumbas (43%)	Road, electricity, drainage and sanitation, easy access to public transport (36%) Neighborhood (33%) Presence of Gumbas (54%)	Respondents (HH survey)
4.	**Economic Activities**	Market center, rental and business opportunities (47%) Rental Value: 41-5o/sq ft (54%)	Affordability (40%) Rental value: 41-50 rs/sq ft (47%) 31-40 rs/sq ft (37%)	Market Centre, business opportunities (39%) Rental Value 41-50 rs/sq ft (43%)	Respondents (HH survey
4.	**Population growth**	13.03%	12.34%	3.49%	Annual growth rate(CBS 2001, 2011)
5.	**Land use**	Commercial cum residential (50%)	Commercial cum residential (40%)	Agriculture (32%)	Respondents (HH Survey)
6.	**Risk sensitive land use plans**	Flood and liquefaction risk	Landslide	landslide	RSLUP report

CHAPTER 5   RESEARCH SETTING

5.1. Analysis of government minimum land valuation comparison

5.1.1.   Minimum Land Price ward wise comparison of Budhanilkantha Municipality 10, 11 and 12 (Kapan ward 1,2,3,4,5,6,7,8,9)

Let the **Ward (1, 3) = Cluster A, Ward (2, 6, 8) = Cluster B** and **Ward (4, 5, 7, 9) = Cluster C**

5.1.2.   Minimum land price of different wards in FY 11/12, 12/13, & 13/14

SOURCE: MINIMUM LAND VALUATION BOOK (FISCAL YEAR 2011/12, 12/13, 13/14)
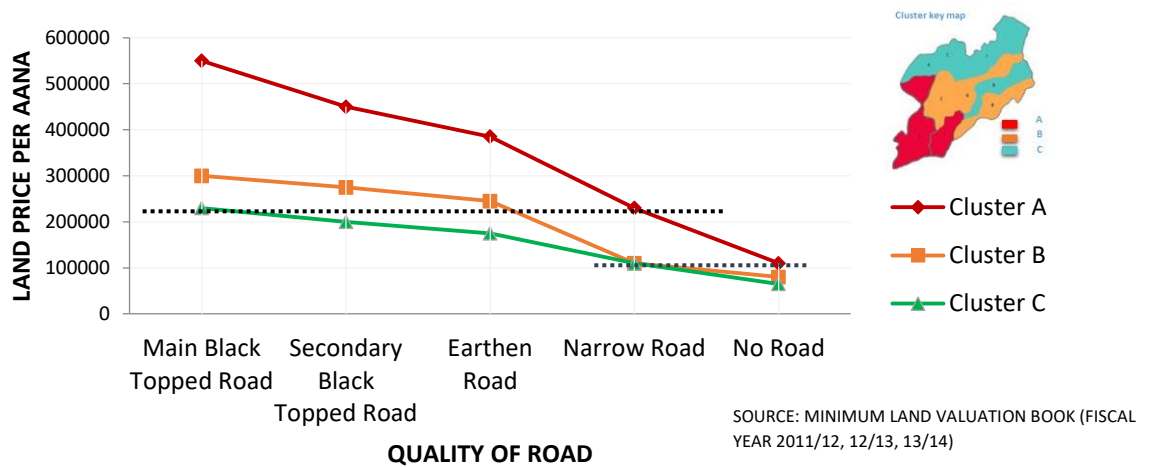
Graph 5 Minimum land price of different cluster in FY 11/12, 12/13, 13/14

The above graph shows the difference in land value from FY 2011 to 2014 of 3 different wards of Budhanilkantha municipality. The land price is seen decreasing in main, secondary blacktopped , gravel , earthen , narrow or no road in Cluster B by 83.34 % , 63.64% , 60% , 57.14% , 109.09% , 37.5% and Cluster C by 139.13% , 125% , 116.21% , 120% , 109.09% , 69.23% then Cluster A. The Cluster C has also been decreased by 30.43%, 37.5%, 35.13%, 40%, 0%, and 23% then Cluster B.

From the above graph we can see the price of Cluster C; the main blacktopped road is equal to the price of Cluster B; earthen road and is equal to the price of Cluster A; narrow road. The higher the slope, the more is the price. Cluster A has a higher slope so the price increment is seen higher. Cluster B and C have a higher slope in the narrow road so the price is seen higher in the graph.

Quality of Road	Cluster A (Lakhs per aana)	Cluster B (Lakhs per aana)	Cluster C (Lakhs per aana)	Relative price of Clusters		
				Cluster A	Cluster B	Cluster C
Main Black Topped Road	5.5	3	2.3	2.39	1.30	1
Secondary Black Topped Road	4.5	2.75	2	2.25	1.375	1
Earthen Road	3.85	2.45	1.75	2.2	1.11	1
Narrow Road	2.3	1.1	1.1	2.09	1	1
No Road	1.1	0.8	0.65	1.69	1.23	1

Table 3 Comparative analysis of government land price of different cluster in FY 611/12, 12/13, 13/14

The relative price of cluster A has the highest in the quality of road of main blacktopped whereas lowest in the area where there is no road available but we can see that cluster B has the highest in Secondary blacktopped road and no change in the narrow road then cluster C.

5.1.3.   Minimum land price of different wards in FY 14/15
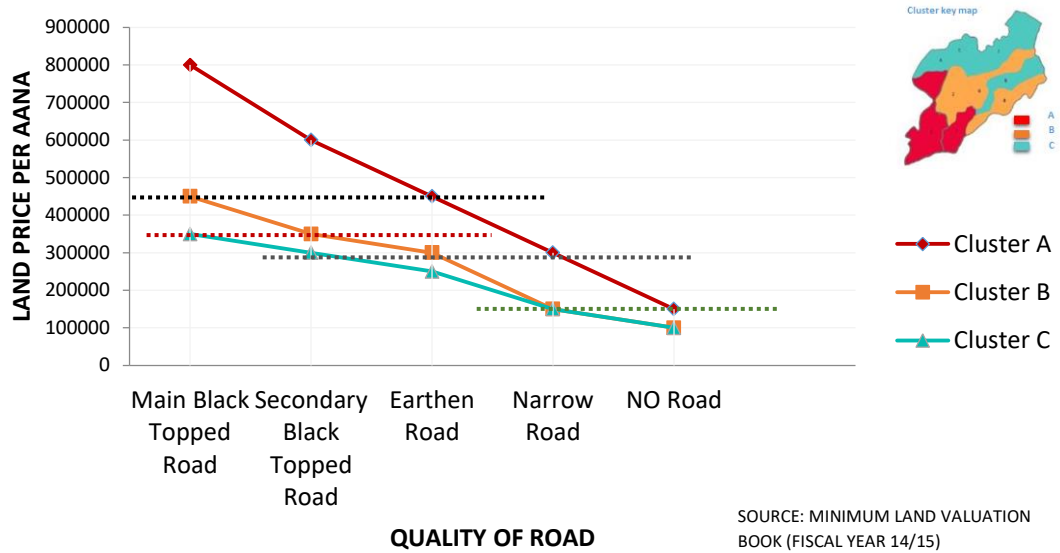
Graph 6 Minimum land price of different cluster in FY 14/15

The above graph shows the difference in land value FY 2014/15 of 3 different wards of Budhanilkantha municipality. The land price is seen decreasing in main, secondary blacktopped , gravel , earthen , narrow or no road in Cluster B by 77.77 % , 71.42% , 50% , 100% , 50% and Cluster C by 128.57% , 100% , 80% , 100% , 50% then Cluster A. The Cluster C has also been decreased by 28.57%, 16.67%, 20%, 0% and 0% then Cluster B.

From the above graph we can see the price of Cluster C; the main blacktopped road is equal to the price of Cluster B; secondary blacktopped road whereas the price of Cluster B; the main blacktopped road is equal to the price of Cluster A; earthen road. The price of Cluster C; secondary blacktopped road is equal to the price of Cluster B; earthen road. The price of Cluster B, C; narrow road is equal to the price of Cluster A; no road. The higher the slope, the more is the price. Cluster A has a higher slope so the price increment is seen higher in secondary blacktopped road. Cluster B and C have a higher slope in the narrow road so the price is seen higher in the graph. Therefore, land evaluation in such an area is seen as high.

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Quality of Road	Cluster A (Lakhs per aana)	Cluster B (Lakhs per aana)	Cluster C (Lakhs per aana)	Relative price of Clusters		
				Cluster A	Cluster B	Cluster C
Main Black Topped Road	8	4.5	3.5	2.28	1.28	1
Secondary Black Topped Road	6	3.5	3	2	1.16	1
Earthern Road	4.5	3	2.5	1.8	1.2	1
Narrow Road	3	1.5	1.5	2	1	1
No Road	1.5	1	1	1.5	1	1

Table 4 Comparative analysis of government land price of different cluster in FY 14/15

The relative price of cluster A has the highest in the quality of road of main blacktopped whereas lowest in the area where there is no road available but we can see that cluster B has the highest in the main blacktopped road but no change in narrow, no road then cluster C.

5.1.4. Minimum land price of different wards in FY 15/16, 16/17, 17/18

SOURCE: MINIMUM LAND VALUATION BOOK
(FISCAL YEAR15/16, 16/17, 17/18)
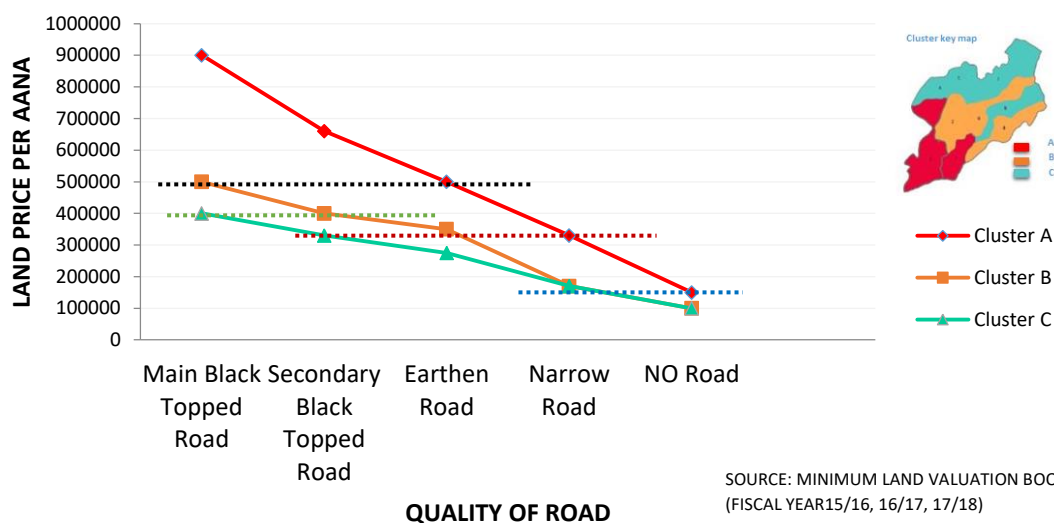
Graph 7 Minimum land price of different cluster in FY 72/73, 73/74, 74/75

The above graph shows the difference in land value FY 2015/16, 16/17, 17/18 of 3 different wards of Budhanilkantha municipality. The land price is seen decreasing in main, secondary blacktopped , gravel , earthen , narrow or no road in Cluster B by 80% , 65% , 42.85% , 94.11% , 50% and Cluster C by 125% , 100% , 81.82% , 94.12% , 50% then Cluster A. The Cluster C has also been decreased by 25%, 21.21%, 27.27%, 0% and 0% then Cluster B.

From the above graph we can see the price of Cluster C; the main blacktopped road is equal to the price of Cluster B; secondary blacktopped road whereas the price of Cluster B; the main blacktopped road is equal to the price of Cluster A; earthen road. The price of Cluster C; secondary blacktopped road is equal to the price of Cluster A; narrow road and is nearly equal to Cluster B; earthen road. The price of Cluster B, C; the narrow road is nearly equal to the price of Cluster A; no road. The higher the slope, the more is the price. Cluster A has a higher slope so the price increment is seen higher in the secondary blacktopped road. Cluster B and C have a higher slope in the narrow road so the price is seen higher in the graph. Therefore, land valuation in such an area is seen as high.

Quality of Road	Cluster A (Lakhs per aana)	Cluster B (Lakhs per aana)	Cluster C (Lakhs per aana)	Relative price of Clusters		
				Cluster A	Cluster B	Cluster C
Main Black Topped Road	9	5	4	2.25	1.25	1
Secondary Black Topped Road	6.6	4	3.3	2	1.21	1
Earthern Road	5	3.5	2.75	1.8	1.27	1
Narrow Road	3.3	1.7	1.7	1.94	1	1
No Road	1.5	1	1	1.5	1	1

Table 5 Comparative analysis of government land price of different cluster in FY 15/16, 16/17, 17/18

The relative price of cluster A has highest in the quality of road of main blacktopped whereas lowest in the area where there is no road available but we can see that the cluster B has highest in the earthen road, that means Cluster B is urbanizing but no change in narrow, no road then cluster C.

5.1.5.   Minimum land price of different wards in FY 2018/19, 19/20
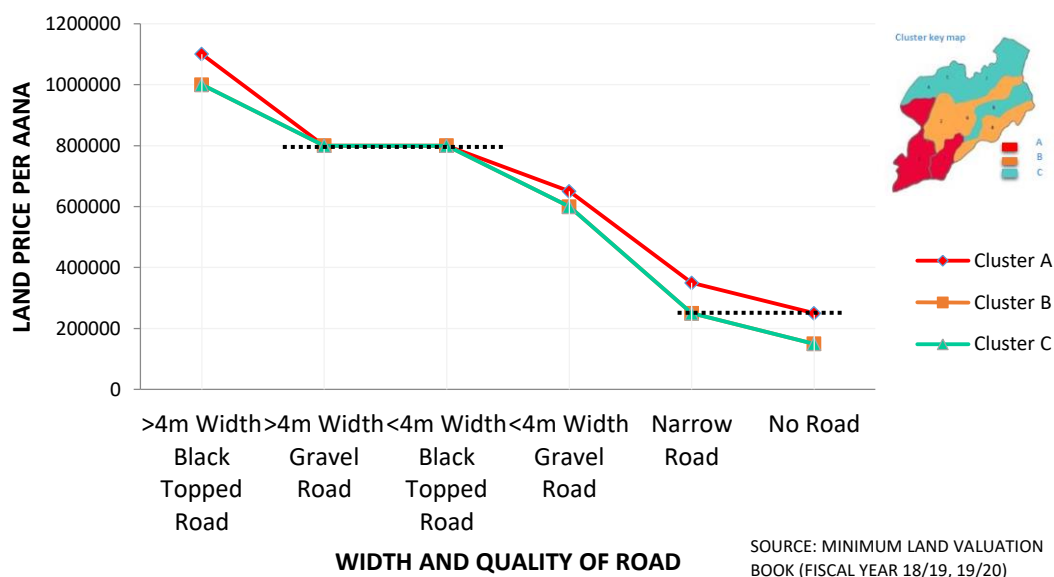
Graph 8 Minimum land price of different cluster in FY 18/19, 19/20

The above graph shows the difference in land value FY 18/19, 19/20 of 3 different wards of Budhanilkantha municipality. The land price is seen decreasing in greater than 4m blacktopped, gravel road or less than 4m blacktopped, gravel road, or earthen, narrow or no road in Cluster B by 10%, 0%, 0%, 8.34%, 40%, 66.67% and Cluster C by 10%, 0%, 0%, 40%, 66.67% then Cluster A. There is no change in Cluster B and C.

From the above graph we can see the price of Cluster A, B, C; >4m width Gravel road and <4m width blacktopped road is equal. The price of Cluster B, C; narrow road is equal to the price of Cluster A; no road. The higher the slope, the more is the price. Cluster A has a higher slope so the price increment is seen higher in >4m width gravel road and narrow road. Cluster B and C have a higher slope in the narrow road so the price is seen higher in the graph. Therefore, land evaluation in such an area is seen as high.

Width and Quality of Road	Cluster A (Lakhs per aana)	Cluster B (Lakhs per aana)	Cluster C (Lakhs per aana)	Relative price of Clusters		
				Cluster A	Cluster B	Cluster C
>4m Width Black Topped Road	11	10	10	1.1	1	1
>4m Width Gravel Road	8	8	8	1	1	1
<4m Width Black Topped Road	8	8	8	1	1	1
<4m Width Gravel Road	6.5	6	6	1.08	1	1
Narrow Road	3.5	2.5	2.5	1.4	1	1
No Road	2.5	1.5	1.5	1.6	1	1
No Road	1.5	1	1	1.5	1	1

Table 6 Comparative analysis of government land price of different cluster in FY 18/19, 19/20

The relative price of Cluster B and C are same, that means these both the cluster are equally urbanizing whereas these clusters are nearly equal to Cluster A, the gap between these land price of clusters are seen minimized. This is due to urbanization.

5.1.6. Minimum Land Price Fiscal years comparison of Budhanilkantha Municipality 10, 11 and 12 (Kapan ward 1,2,3,4,5,6,7,8,9)

Let the Fiscal Year 11/12, 12/13, and 13/14 be FY 1, Fiscal Year 14/15 be FY 2 and Fiscal Year 15/16, 16/17, 17/18 be FY 3. The Ward (1, 3) is Cluster A, Ward (2, 4, and 6) is Cluster B, and Ward (3, 5, 7, and 9) is Cluster C.

5.1.7. Minimum land price of a Cluster A in different fiscal years
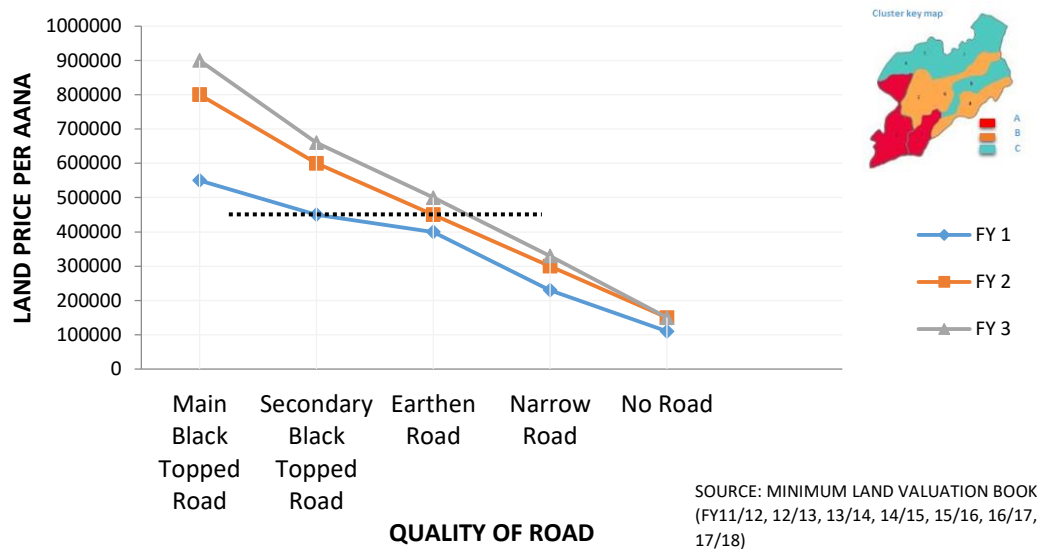
Graph 9 Minimum land price of Cluster A of different fiscal years

The above graph shows the difference in land value of different fiscal years 11/12, 12/13, 13/14, and 14/15, 15/16, 16/17, 17/18 of a Cluster A. The land price is seen increasing in main and secondary blacktopped due to the high slope of increment. The price of land in Fiscal Year 1; secondary blacktopped road is the same in Fiscal Year 2; earthen road. The higher the slope, the more is the price. Cluster A in Fiscal Year 1 has a higher slope; Secondary blacktopped road so the price increment is seen higher. Therefore, land valuation in such an area is seen as high.

Quality of Road	Fiscal Year 1 (Lakhs per aana)	Fiscal Year 2 (Lakhs per aana)	Fiscal Year 3 (Lakhs per aana)	Relative price of Fiscal Years		
				Fiscal Year 1	Fiscal Year 2	Fiscal Year 3
Main Black Topped Road	5.5	8	9	1	1.45	1.63
Secondary Black Topped Road	4.5	6	6.6	1	1.33	1.46
Earthen Road	4	4.5	5	1	1.12	1.25
Narrow Road	2.3	3	3.3	1	1.30	1.43
No Road	1.1	1.5	1.5	1	1.36	1.36

Table 7 Comparative analysis of minimum land price of Cluster A (Ward 1, 3) of different fiscal years

The relative price of Cluster A is increasing in the changing course of time that means it has been increased rapidly in FY 2 but after that less increase in FY 3. This is due to the change in development intensity of that area.

5.1.8. Minimum land price of a Cluster B in different fiscal years

Graph 10 Minimum land price of Cluster B of different fiscal years

The above graph shows the difference in land value of different fiscal years 11/12, 12/13, 13/14, and 14/15, 15/16, 16/17, 17/18 of a Cluster B. The land price is seen increasing in main and secondary blacktopped due to the high slope of increment. The price of land in Fiscal Year 1; main blacktopped road is the same in Fiscal Year 2; earthen road. The price of land in Fiscal Year 2; secondary blacktopped road is the same in Fiscal Year 3; earthen road. There is no deflection in price in narrow and no road. The higher the slope, the more is the price. Fiscal Year 1,2 has a higher slope; Secondary blacktopped road whereas the slope is also seen more in Fiscal Year 1, 2,3; narrow road so the price increment is seen higher. Therefore, land valuation in such an area is seen as high.

Quality of Road	Fiscal Year 1 (Lakhs per aana)	Fiscal Year 2 (Lakhs per aana)	Fiscal Year 3 (Lakhs per aana)	Relative price of Fiscal years		
				Fiscal Year 1	Fiscal Year 2	Fiscal Year 3
Main Black Topped Road	3	4.5	5	1	1.5	1.66
Secondary Black Topped Road	2.75	3.5	4	1	1.27	1.46
Earthen Road	2.5	3	3.5	1	1.2	1.4
Narrow Road	1.1	1.5	1.7	1	1.36	1.54
No Road	1.1	1.5	1.5	1	1.36	1.36

Table 8 Comparative analysis of minimum land price of Cluster B of different fiscal years

The relative price of Cluster B is increasing in the changing course of time that means it has been increased rapidly in FY 2 but after that less increase in FY 3. This is due to the change in development intensity of that area.

5.1.9. **Minimum land price of a Cluster C in different fiscal years**

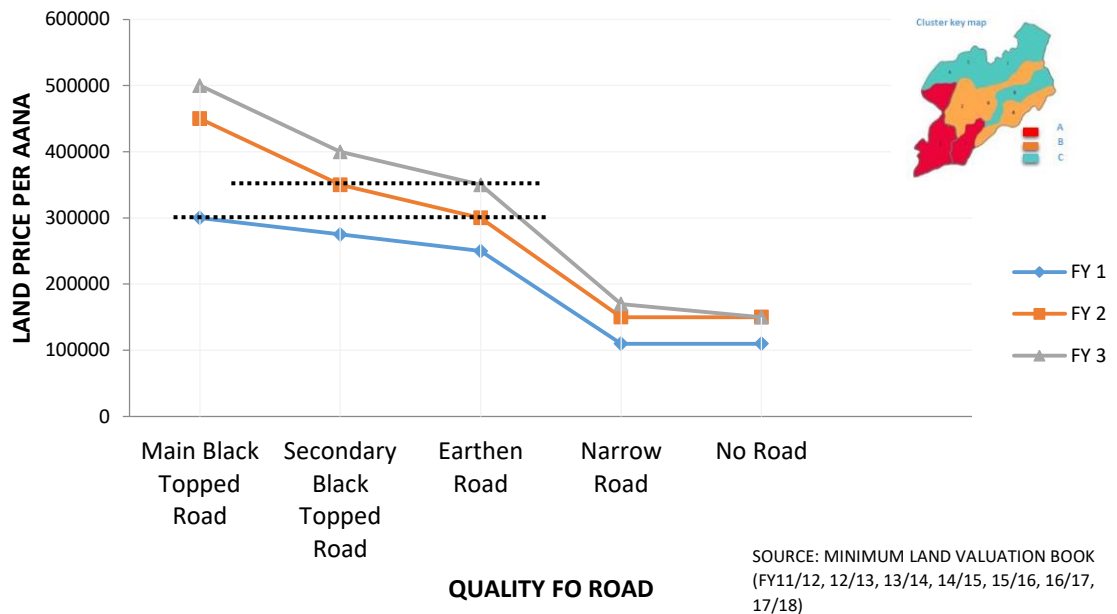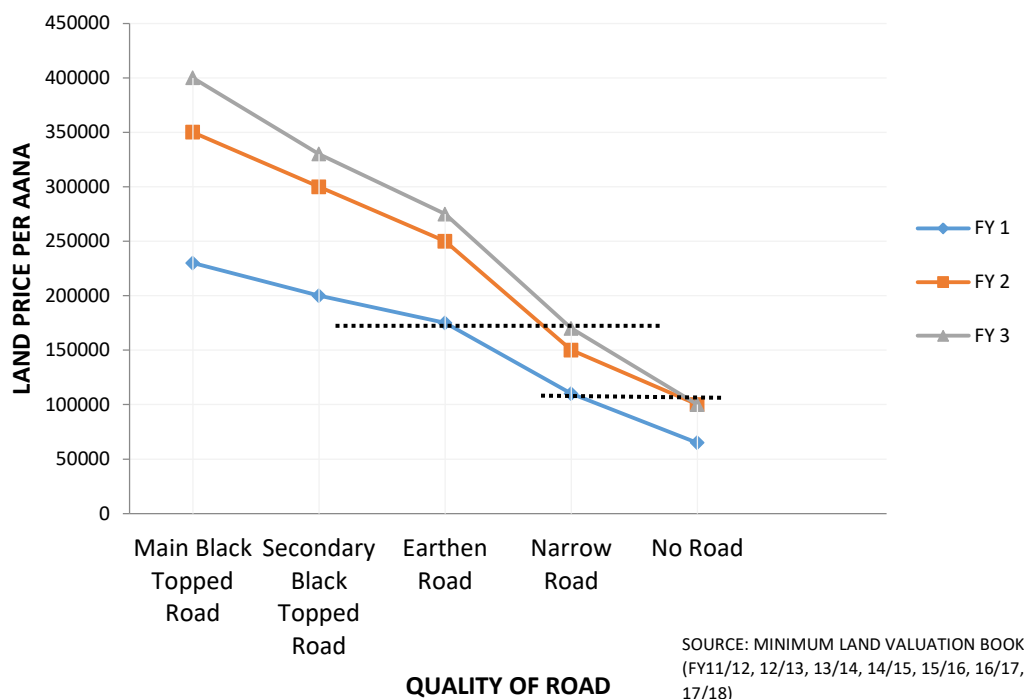**Graph 11 Minimum land price of Cluster C of different fiscal years**

The above graph shows the difference in land value of different fiscal years 11/12, 12/13, 13/14, and 14/15, 15/16, 16/17, 17/18 of a Cluster C. The price of land in Fiscal Year 1; the earthen road is nearly same in Fiscal Year 3; narrow road. The price of land in Fiscal Year 1; the narrow road is the same in Fiscal Year 2, 3; no road. The higher the slope, the more is the price. Fiscal Year 1,2 has a higher slope; Secondary blacktopped road whereas the slope is also seen more in Fiscal Year 1, 2,3; narrow road so the price increment is seen higher. Therefore, land evaluation in such an area is seen as high.

Quality of Road	Fiscal Year 1 (Lakhs per aana)	Fiscal Year 2 (Lakhs per aana)	Fiscal Year 3 (Lakhs per aana)	Relative price of Fiscal years		
				Fiscal Year 1	Fiscal Year 2	Fiscal Year 3
Main Black Topped Road	3	4.5	5	1	1.5	1.66
Secondary Black Topped Road	2.75	3.5	4	1	1.27	1.46
Earthen Road	2.5	3	3.5	1	1.2	1.4
Narrow Road	1.1	1.5	1.7	1	1.36	1.54
No Road	1.1	1.5	1.5	1	1.36	1.36

Table 9 Comparative analysis of minimum land price of Cluster C of different fiscal years

The relative price of Cluster C is increasing in the changing course of time that means it has been increased rapidly in FY 2 but after that less increase in FY 3. This is due to the change in development intensity of that area.

5.1.10. Comparisons of Minimum valuation of land in areas where main blacktopped road and road width greater than 4m
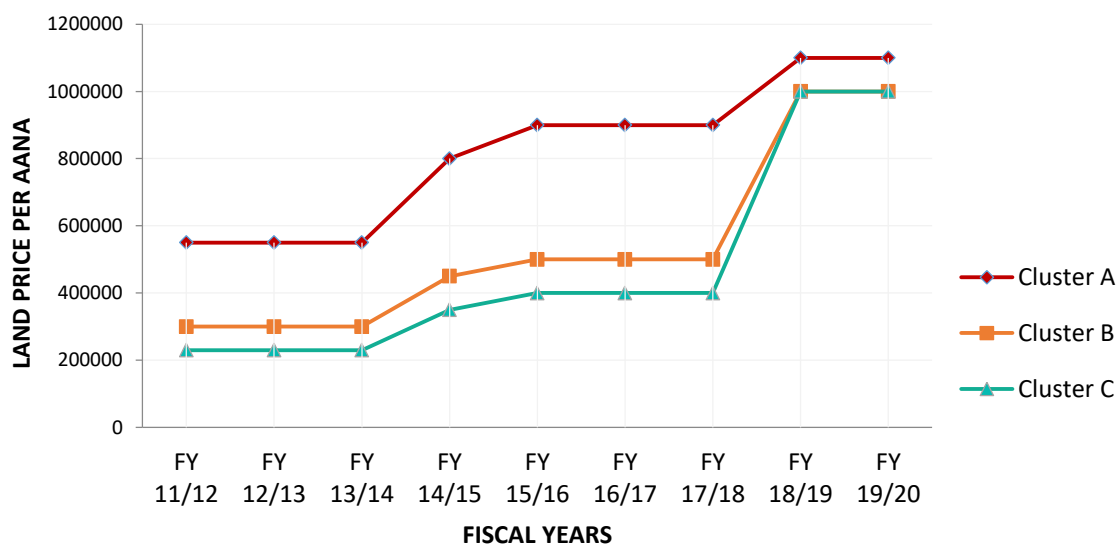
Graph 12 Government minimum valuation of land in areas where the main blacktopped road and road width greater than 4m of all wards in different fiscal years

The above graph shows the highest minimum land value of different wards of different fiscal years 11/12, 12/13, 13/14, and 14/15, 15/16, 16/17, 17/18 of a Cluster A, B and C. The higher the slope, the more is the price. Fiscal Year 13/14, 14/15, and 15/16 has a higher slope; the Main blacktopped road whereas the slope is also seen more in Fiscal Year 17/18 so the price increment is seen higher. Therefore, land valuation is seen a drastic change in such fiscal year.

Fiscal Years	Cluster A (Lakhs per aana)	Cluster B (Lakhs per aana)	Cluster C (Lakhs per aana)	Relative price of Clusters			Remarks
				Cluster A	Cluster B	Cluster C	
68/69	5.5	3	2.3	2.39	1.30	1	Main Black

							topped road
69/70	5.5	3	2.3	2.39	1.30	1	Main Black topped road
70/71	5.5	3	2.3	2.39	1.30	1	Main Black topped road
71/72	8	4.5	3.5	2.28	1.28	1	Main Black topped road
72/73	9	5	4	2.25	1.25	1	Main Black topped road
73/74	9	5	4	2.25	1.25	1	Main Black topped road
74/75	9	5	4	2.25	1.25	1	Main Black topped road
75/76	11	10	10	1.1	1	1	>4m Black topped road
76/77	11	10	10	1.1	1	1	>4m Black topped road

Table 10 Government minimum valuation of land in areas where the main blacktopped road and road width greater than 4m of all wards in different fiscal years

In the changing course of time, the relative price of the cluster gets decreased as we can see from the table above. There is no change ni FY 11-14 whereas fewer changes can be observed until FY 15-18 and there is a slight change in FY 18-20. During the time FY 18-20, the relative price of the width of the road is almost the same so that means the width of the road has less impact if the area is being urbanized.

5.1.11. Comparisons of Minimum valuation of land in areas where there is no provision of road

Graph 13 Comparisons of Minimum valuation of land in areas where there is no provision of road

The above graph shows the lowest minimum land value of different wards of different fiscal years 11/12, 12/13, 13/14, and 14/15, 15/16, 16/17, 17/18 of a Cluster A, B and C with the (No road) quality of the road. The higher the slope, the more is the price. Fiscal Year 17/18, to FY 18/19 has a higher slope so the price increment is seen higher. Therefore, land valuation is seen a drastic change in such fiscal year.

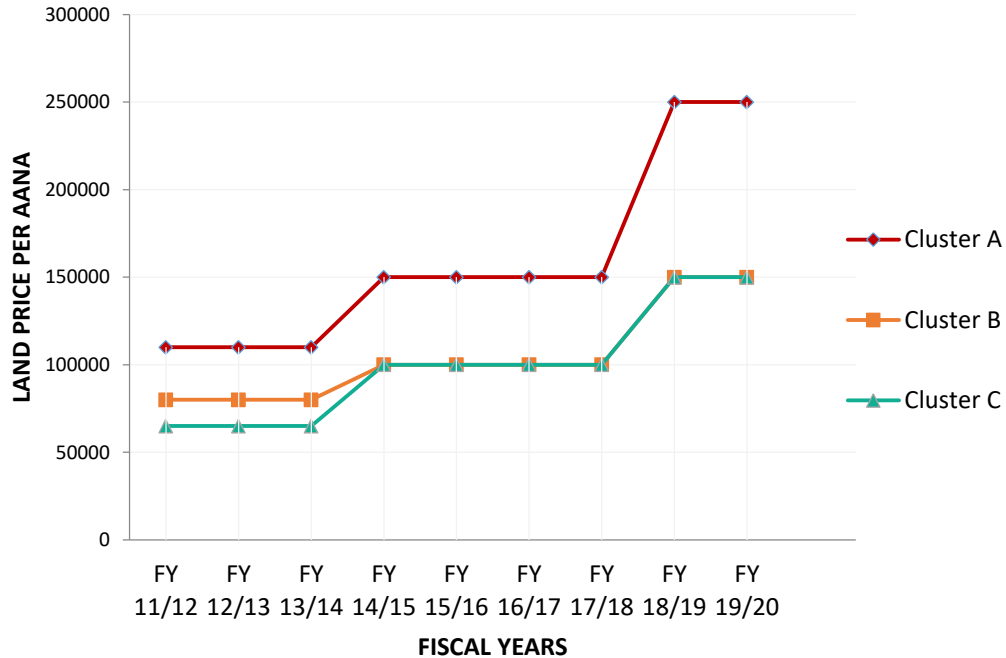| Fiscal Years	Cluster A Lowest Minimum Land Value (Lakhs per	Cluster B Lowest Minimum Land Value (Lakhs per	Cluster C Lowest Minimum Land Value (Lakhs	Relative price of Clusters		
				Cluster A	Cluster B	Cluster C

75

	aana)	aana)	per aana)			
68/69	1.1	.8	.65	1.69	1.23	1
69/70	1.1	.8	.65	1.69	1.23	1
70/71	1.1	.8	.65	1.69	1.23	1
71/72	1.5	1	1	1.5	1	1
72/73	1.5	1	1	1.5	1	1
73/74	1.5	1	1	1.5	1	1
74/75	1.5	1	1	1.5	1	1
75/76	2.5	1.5	1.5	1.67	1	1
76/77	11	1.5	1.5	1.67	1	1

Table 11 Comparisons of Minimum valuation of land in areas where there is no provision of road

5.1.12. Analysis of government valuation of land

The minimum valuation of land carried out by the government depends on the location (Cluster A vs. Cluster B vs. Cluster C) and the quality of the road (= accessibility). The above graph and tables describe the variation in land prices in different fiscal's years. Land price is not only governed by location as in changing course of time we can see that the gap between the Cluster B and C are same and is nearly equal to cluster A. But in recent years, location does not matter so much but accessibility does (Cluster B and C have overlapped; the difference with A has decreased). This is expected.

As an area is more urbanized, differences in land prices across locations tend to decrease. In other words, bid rent theory still works but the slope gets flattened as urbanization increases.

5.2. **Review of Land Evaluation by Banks**

Bank follows certain guidelines for the land evaluation and they are according to the land use and width of a road along with the infrastructure development and are shown below:

Metropolitan City, Sub-Metropolitan City, and Municipality

S.No.	Infrastructure	Price	Explanation
1.	Main road along major economic activities (major Commercial areas). Road width more than 8m.	Market value 70% and Government value 30%. Valuation by bank: 3.8x government value	Market Value= 5 times of government value
2.	Commercial areas (road, electricity and telecommunication, shopping market). Road width more than 6m.	Market value 65% and Government value 35%. Valuation by bank: 2.95x government value	Market Value= 4 times of government value
3.	Commercial cum residential areas (road, electricity and telecommunication, shopping market).	Market value 60% and Government value 40%. Valuation by bank: 2.2x government value	Market Value= 3 times of government value

	Road width more than 4m.		
4.	Old urban residential area with gravel, earthen road, or no motor access road less than 4 feet. (less than 60 feet length of the road).	Market value 50% and Government value 50%.

Valuation by bank: 1.5.x government value | Market Value= 2 times of government value |
| 5. | No road access.

Agricultural area. | Market value 40% and Government value 60%.

Valuation by bank: 1x government value | Market Value=

Government value |

(Source: ADB, Mortgage security valuation guidelines 2011)

5.2.1. Analysis of bank and land valuator land valuation

For land valuation, banks (ADB) use minimum valuation as a basis for calculating the market land price. This is a risk-minimizing strategy of the banks. However, it is interesting to note that the banks use different multiplication factors as per the location, width of road, or the use of land. This is different from the minimum valuation of land set by the government.

This means, there are certain factors that the government considers, and some additional factors are considered by the banks.

5.3. **Cluster A**

Total Samples: 30
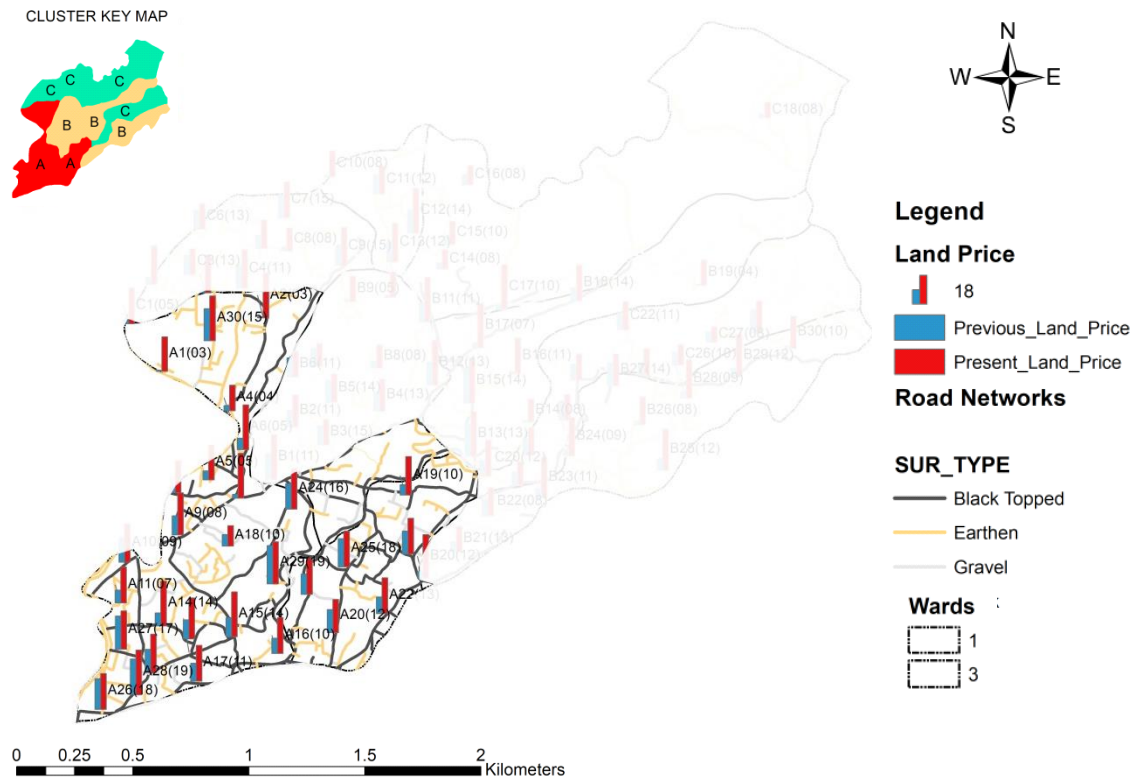
Figure 26 Previous and present land price

The figure shows the GPS point of the data collected through a household survey. The data shows the present (2020) and previous land values (2004-2019) of those areas. There is a significant change in land value where we can observe the road surface type affecting it.

From the collected data (of 30 households), it was found that around 70% (or 21 households) had bought the land which was followed by 30% (or 9 households) where the land is inherited. This shows that the people are migrated to this place.

5.3.1. Previous and present land price
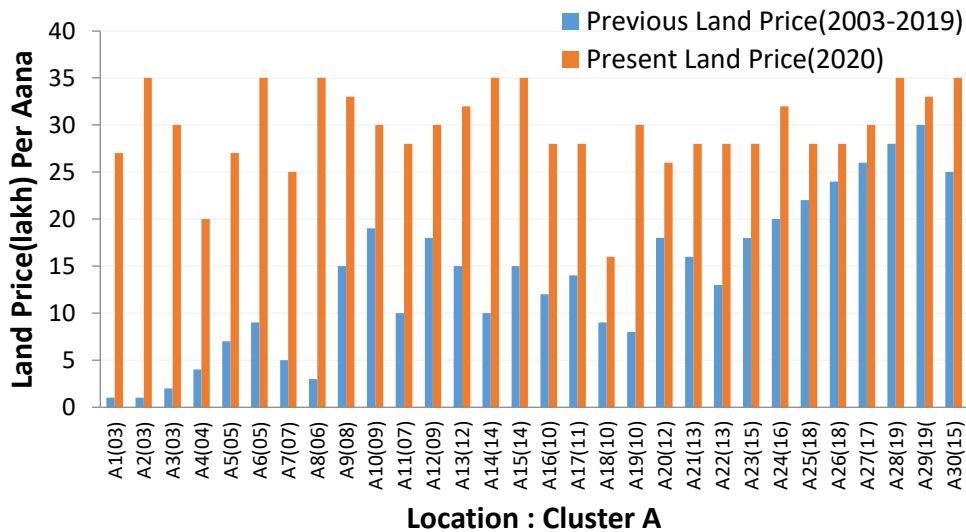
Graph 14 Previous and Present land price

There is an increase in land prices from 2003 to the present time. The increase of land price varies accordingly year wise and the surface and width of the road. The above graphs show the variation in land prices. In the same year also we can see the fluctuation of the land price which can be said that there are certain determinants affecting land value. Location, infrastructures are also a factor for an increase in land value. The average land value is found to be 14 lakh previously (2003-2019) whereas 29.5 lakhs in the present time (2020).

5.3.2. Plot sizes

Plot size of the respondents varies in size. Most of the parcels are 4-8 aana in size. Residents holding above 8 aana along the main road are very less. Most of the area of plots of people has been reduced due to road expansion that is in construction.

5.3.3. Rental value

Since, the survey is being carried out mostly near to the main roads. The rental value is asked with the house owner only. The areas are commercialized so the rental value has also increased by many folds. The current rental value is Rs 41-50 per square feet.
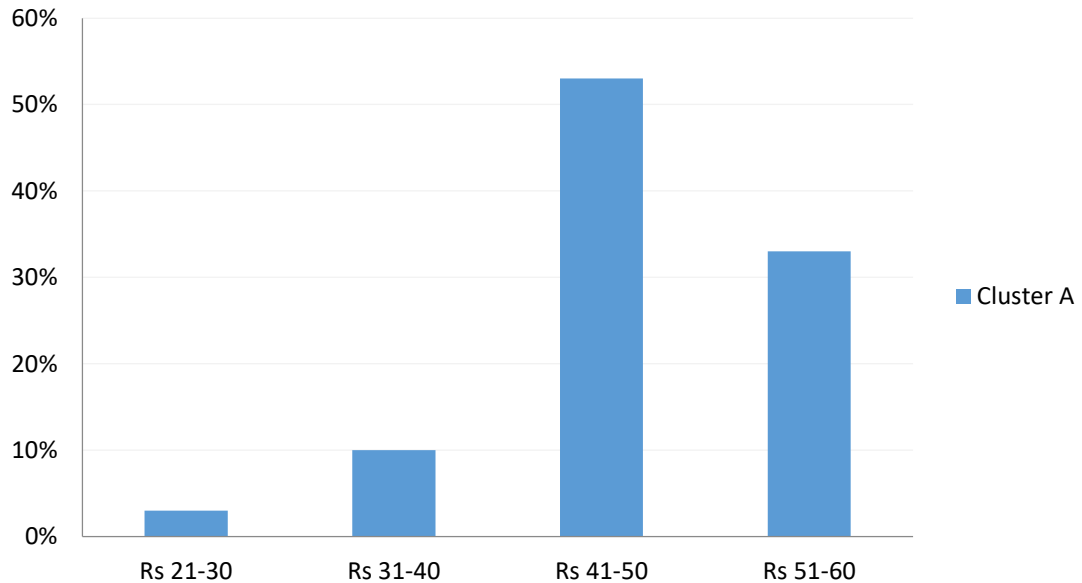
Graph 15 Present value of room per sq.ft

5.3.4. Activities in the area

The whole area is being commercialized at a rapid pace. The area has a mixed land use with shops/businesses on the ground floor and upper floors as residences. The business potential of the area is also attractive by many financial institutions to open up their business in that area. Many banks, cooperatives have their presence felt in the area. Besides, business activities in the area comprise of computer training institutes, electronic and electrical equipment, general stores, etc.

5.3.5. Reasons for selecting land

There are various reasons for selecting land. The major reasons are the pull factors behind migration. During the household survey, multiple-choice options were provided to know the reason for selecting the land. People are much focused to buy the land in the areas where there is good infrastructure and services available, business opportunities, and mostly the accessibility and location. If the buying of land is for business opportunities then the rental value is also being observed by the landowner. The respondent's reasons for selecting land are shown below:
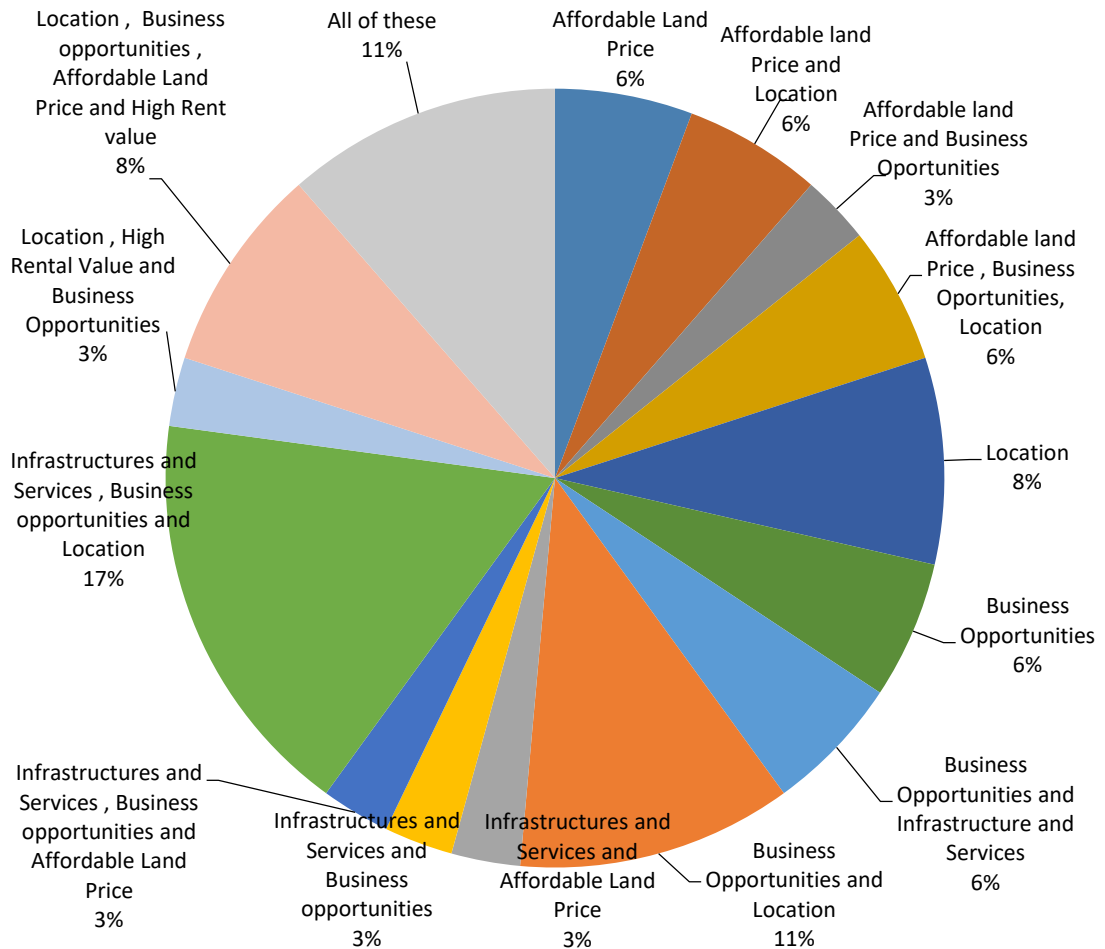
Graph 16 Reasons for selecting land

5.3.6. Physical Reasons for selecting land

The physical reasons for selecting the land are the type of road, road width, and availability of other infrastructures. The one who seeks for buying the land is the road. Other infrastructure like the availability of electricity, communication, water supply, and drainage. This cluster has all the infrastructure facilities. In this cluster, public transport was also seen as a major element for selecting the land. Ease access to public transport was observed through the respondent's answers. The distribution of respondents for physical reasons for selecting a site with multiple choices can be observed below:
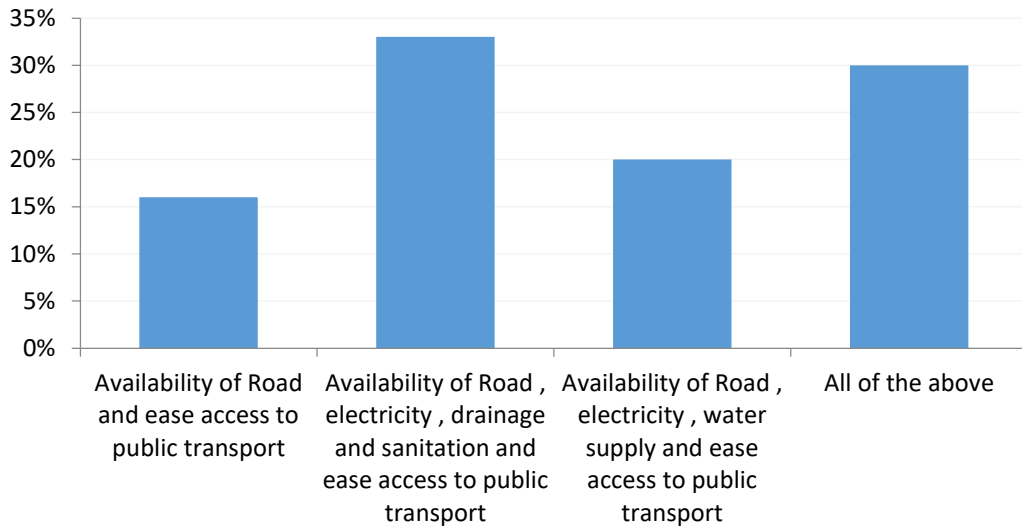
Graph 17 Physical Reasons for selecting land

5.3.7. Social reasons for selecting land

The social reasons for selecting site depends upon the type of neighborhood present followed by the safety and security of a place. In this location, a mixed type of ethnic groups was found. The presence of relatives and social infrastructure is also the social reasons for selecting the land.
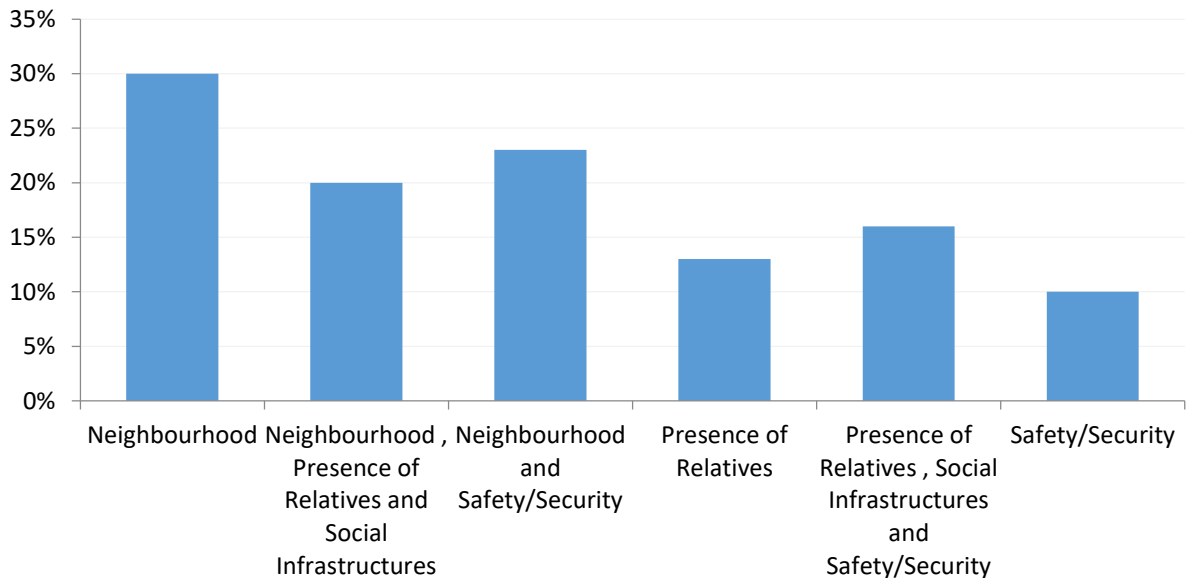
Graph 18 Social reasons for selecting land

5.3.8. Religious reasons for selecting land

There are religious reasons for selecting the land. The availability of temples and gumbas also affect the land value. Respondents in this area towards North bought land so that the area is near to Budanilkanatha temple.
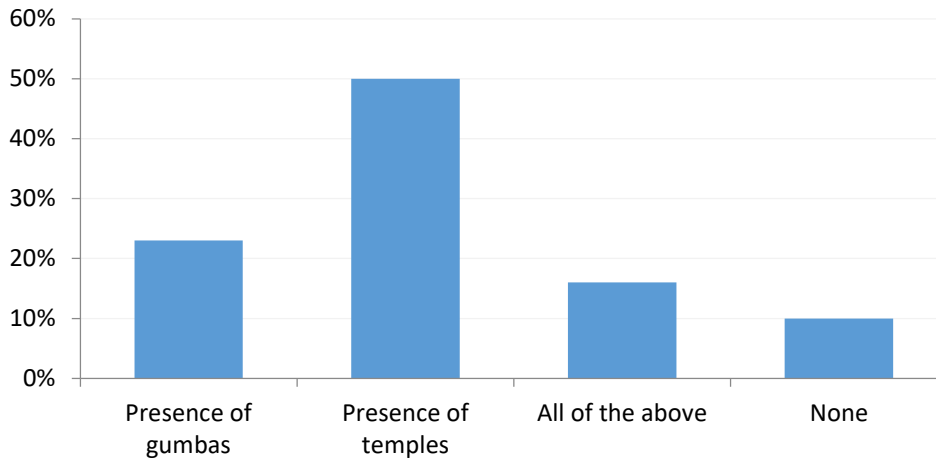
Graph 19 Religious reasons for selecting land

5.3.9. Economic reasons for selecting land

The land that has been bought long before towards the north is affordable whereas, in present, the areas with high rental value and land near to market center are the economic reasons for selecting land.
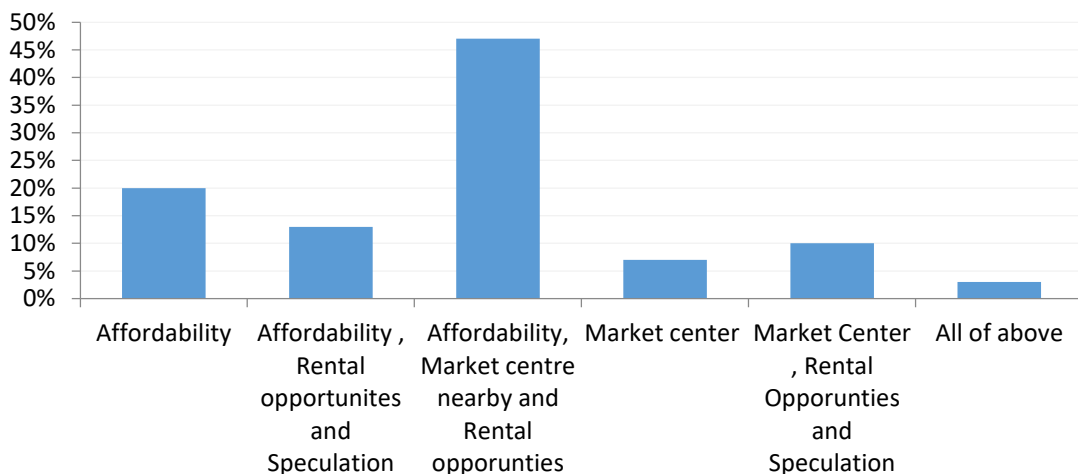
Graph 20 Economic reasons for selecting land

5.3.10. Land use

Agriculture, which has been the most dominant land use has rapidly depleted with changing time. Most of the farmland has been converted to the built-up area. Of the respondents, 43% of agriculture land has been converted into 3% whereas commercial, residential, and commercial cum residential areas have also been increased as shown below.

Previous Land Use

Present Land Use
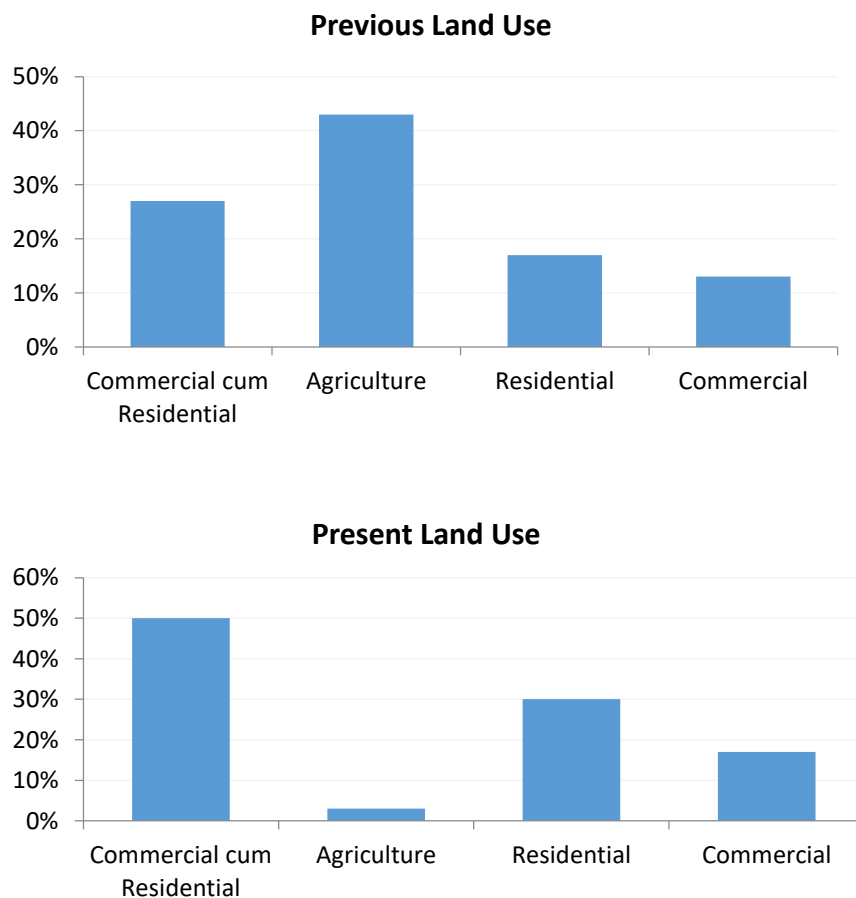
Graph 21 Land use changes

5.3.11. Causes for spatial transformation

- Highly Populated, economic opportunities/ potential

- Transportation, public facilities

- Location (Kathmandu Metropolitan city- Ward 06 nearby)

5.4. **Cluster B**

Total Samples: 30
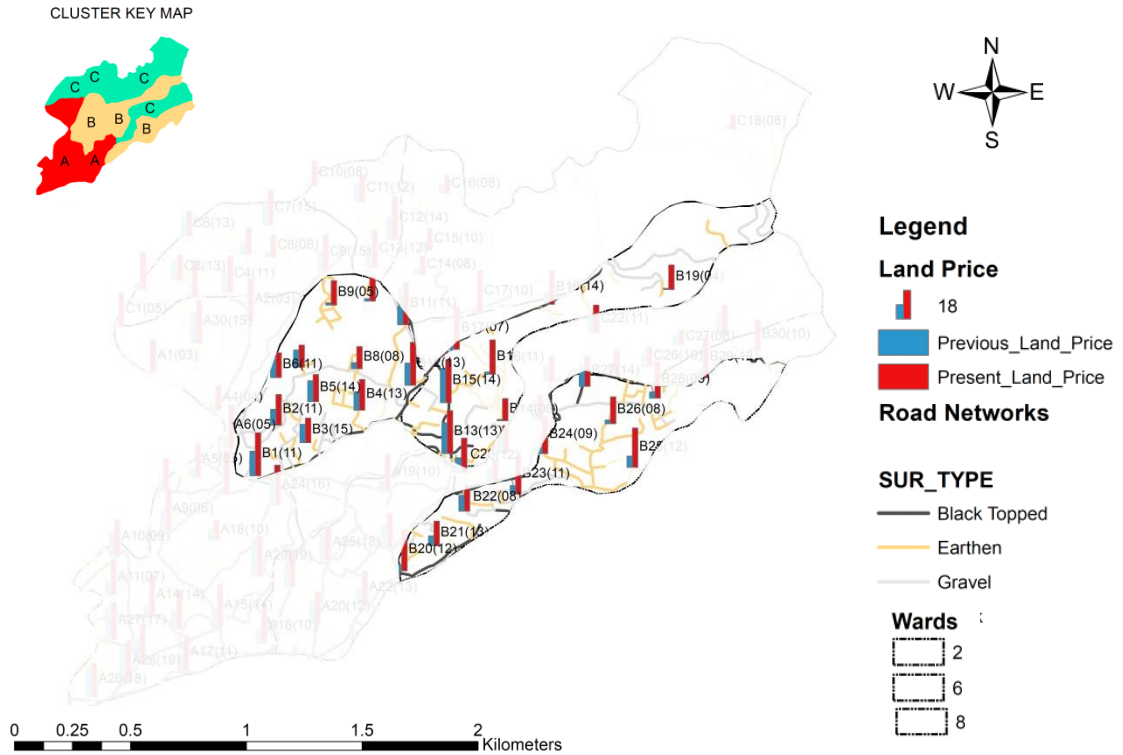
Figure 27 Previous and present land price

The figure shows the GPS point of the data collected through a household survey. The data shows the present (2020) and previous land values (2003-2019) of those areas. There is a significant change in land value where we can observe the road surface type affecting it.

From the collected data (of 30 households), it was found that around 75% (or 23 households) had bought the land which was followed by 25% (or 7 households) where the land is inherited. This shows that the people are migrated to this place.

5.4.1. Previous and present land price
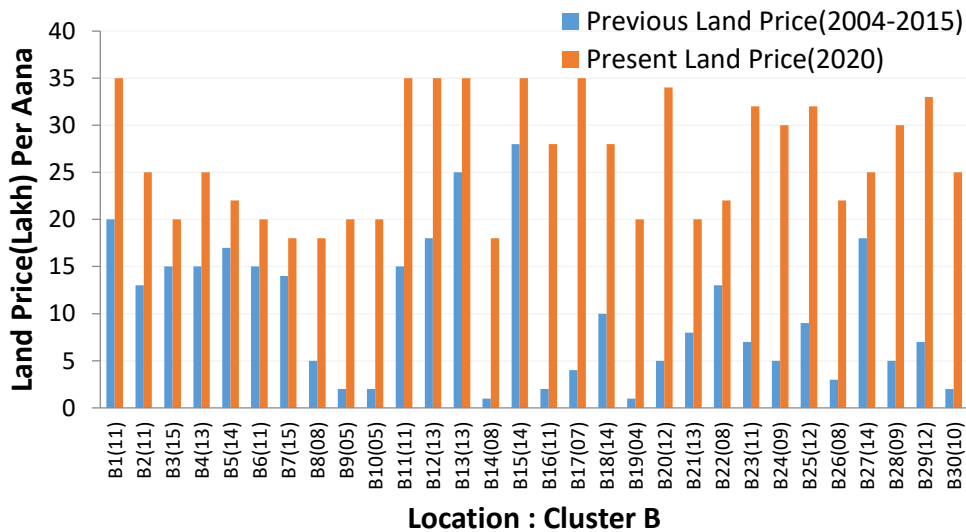
Graph 22 Previous and Present land price

There is an increase in land prices from 2004 to the present time. The increase in land price varies accordingly year wise and the surface and width of the road. The above graphs show the variation in land prices. In the same year also we can see the fluctuation of the land price which can be said that there are certain determinants affecting land value. Location, infrastructures are also a factor for an increase in land value. The average land value is found to be 10 lakh previously (2004-2015) whereas 25 lakhs in the present time (2020).

5.4.2. Plot sizes

Plot size of the respondents varies in size. Most of the parcels are 4-8 aana in size. Residents holding above 8 aana along the main road are very less. Most of the area of plots of people has been reduced due to road expansion that is in construction.

5.4.3. Rental value

Since, the survey is being carried out mostly near to the main roads. The rental value is asked with the house owner only. The areas are commercialized so the rental value has also increased by many folds. The current rental value is Rs 31-40 and 41-50 per square feet.
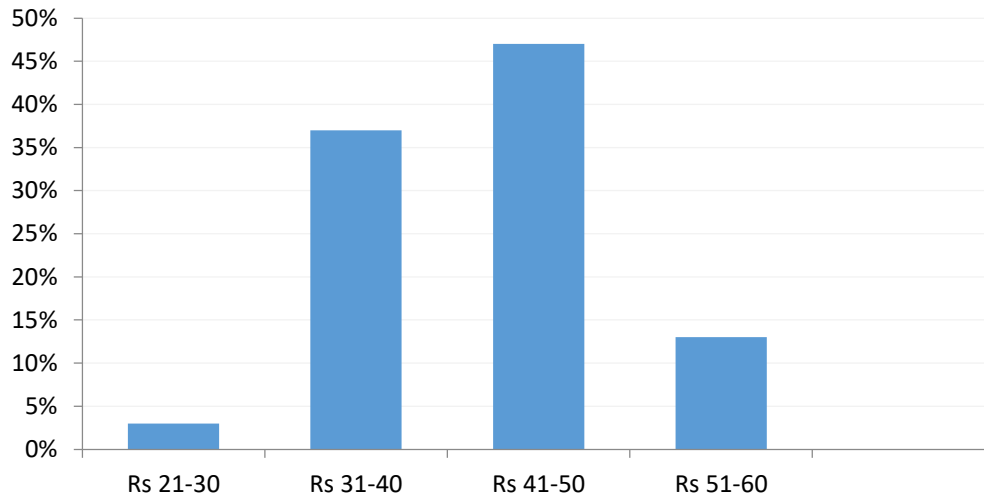
Graph 23 Present value of room per sq. ft.

5.4.4. Activities in the area

The whole area is being commercialized at a rapid pace. The area has a mixed land use with shops/business on the ground floor and upper floors as residences. The business potential of the area is also attractive by many financial institutions to open up their business in that area. Many offices, cooperatives have their presence felt in the area. Besides, business activities in the area comprise of workshops, training centres, electronic and electrical equipment, general stores, etc.

5.4.5. Reasons for selecting land

There are various reasons for selecting land. The major reasons are the pull factors behind migration. During the household survey, multiple-choice options were provided to know the reason for selecting the land. People are much focused to buy the land in the areas where there is good infrastructure and services available, business opportunities, and mostly the accessibility and location. The respondent's reasons for selecting land are focused much on location, accessibility, business opportunities, and affordable land price.

Reasons for selecting land
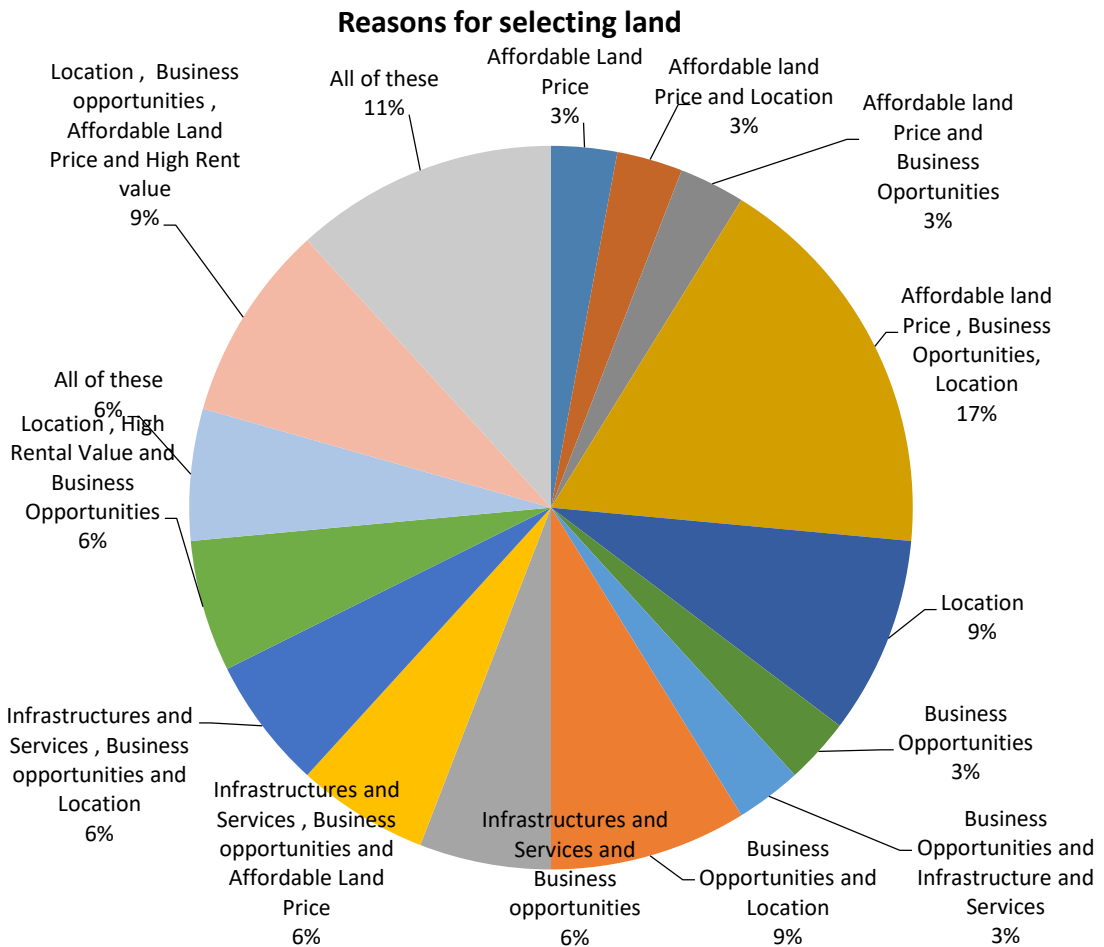
Graph 24 Reasons for selecting land

5.4.6. Physical Reasons for selecting land

The physical reasons for selecting the land are the type of road, road width, and availability of other infrastructures. The one who seeks for buying the land is the road. Major blacktopped roads were found. Other infrastructure like the availability of electricity, communication, water supply, and drainage. This cluster has no water supply. In this cluster, public transport was also seen as a major element for selecting the land. Ease access to public transport was observed through the respondent's view. The distribution of respondents for physical reasons for selecting a site with multiple choices can be observed below:
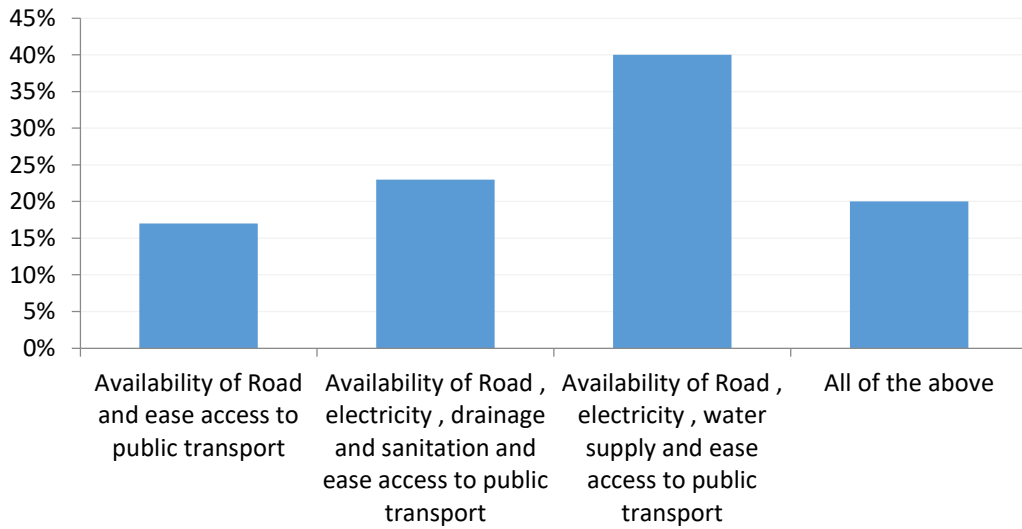
Graph 25 Physical Reasons for selecting land

5.4.7. Social reasons for selecting land

The social reasons for selecting site depends upon the type of neighborhood present followed by the safety and security of a place. In this location, homogenous ethnic groups were found. The presence of relatives and social infrastructure is also the social reasons for selecting the land.
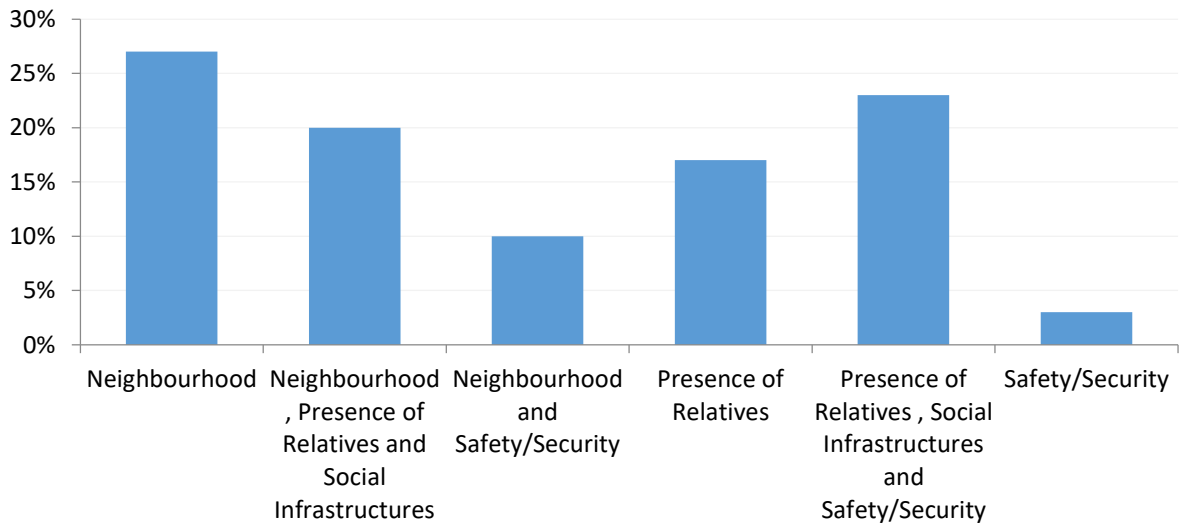
Graph 26 Social reasons for selecting land

5.4.8. Religious reasons for selecting land

There are religious reasons for selecting the land. The availability of temples and gumbas also affect the land value. Respondents in this area towards North bought land so that the area is near to gumba and temples.
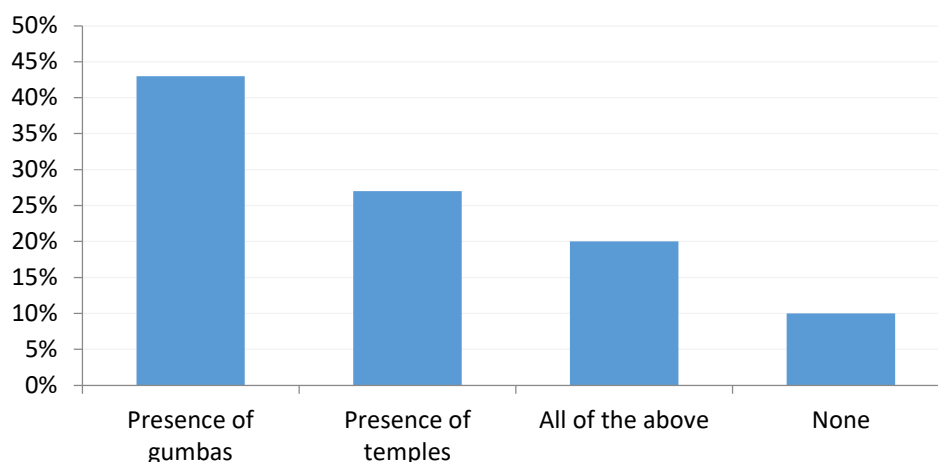
Graph 27 Religious reasons for selecting land

5.4.9. Economic reasons for selecting land

The land that has been bought long before towards the north is affordable whereas, in present, the areas with high rental value and land near to the market center are the main reasons for selecting land.
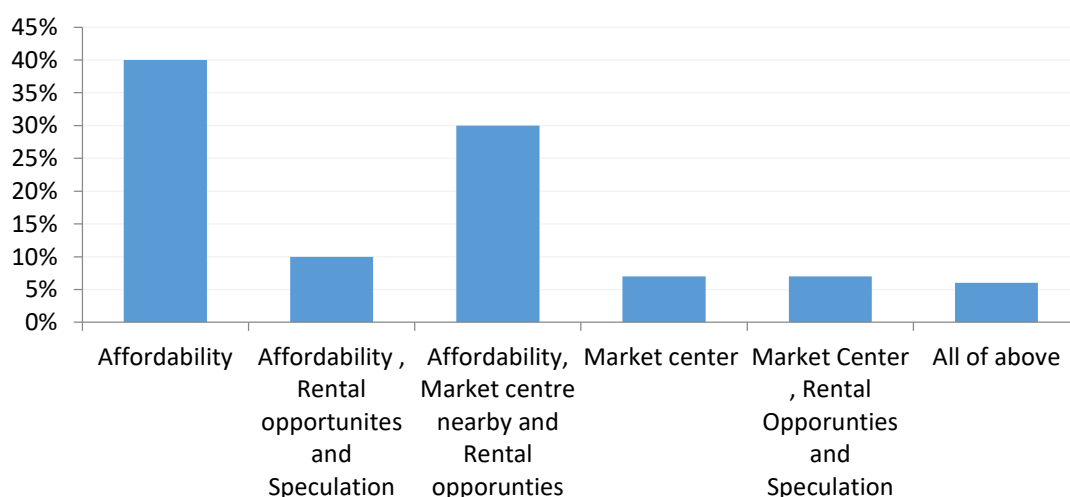
Graph 28 Economic reasons for selecting land

91

5.4.10. Land use

Agriculture, which has been the most dominant land use has rapidly depleted with changing time. Most of the farmland has been converted to the built-up area. Of the respondents, 67% of agriculture land has been converted into 23% whereas commercial, residential, and commercial cum residential areas have also been increased as shown below.

Previous Land Use
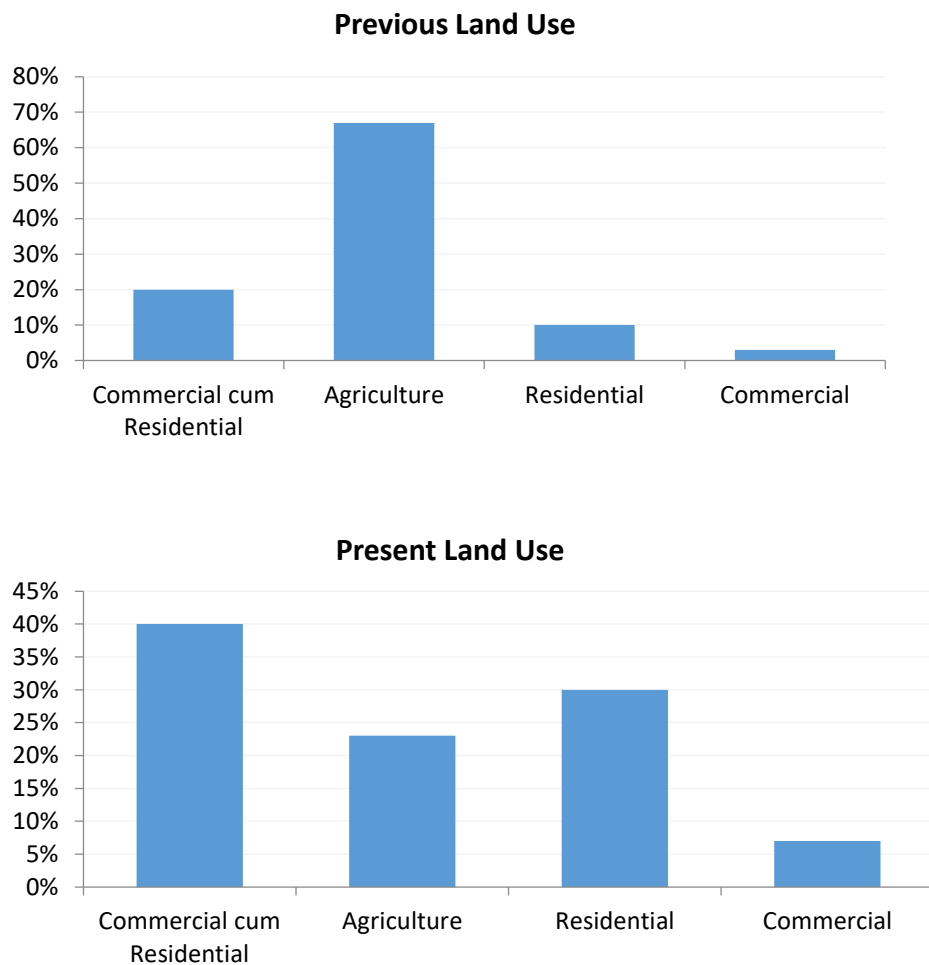
Present Land Use

Graph 29 Land use changes

5.4.11. Causes for spatial transformation

- Economic opportunities/ potential

- Transportation , public facilities

5.5. Cluster C

Total Samples: 28
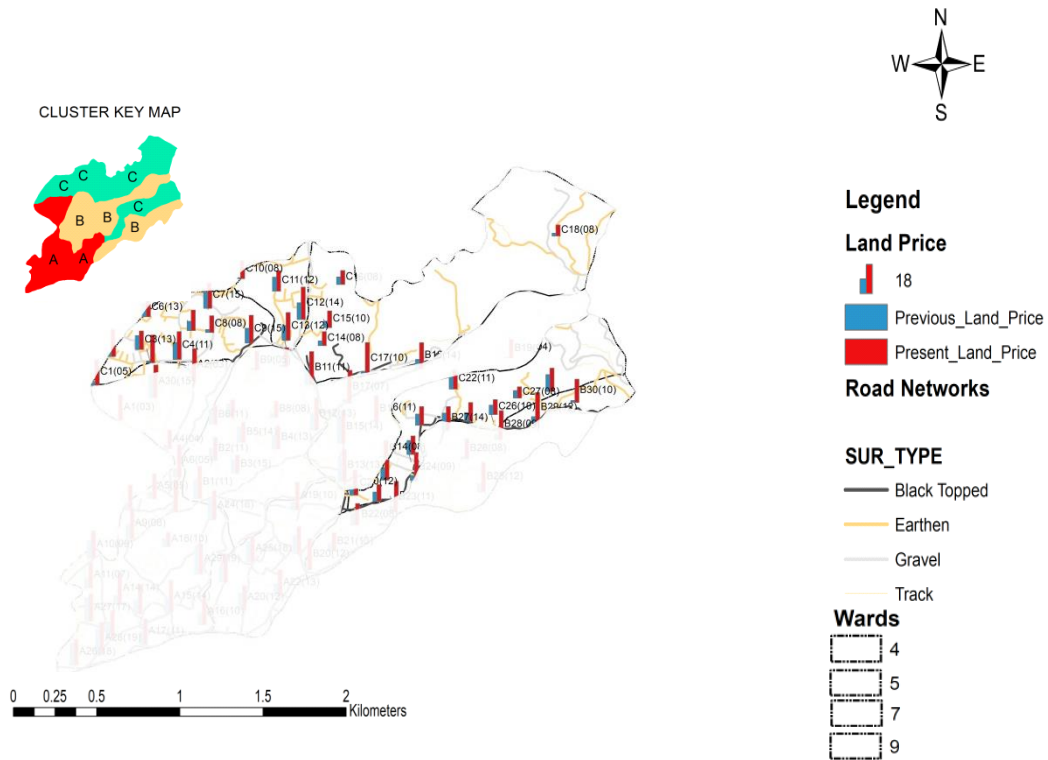
Figure 28 Previous and present land price

The figure shows the GPS point of the data collected through a household survey. The data shows the present (2020) and previous land values (2004-2015) of those areas. There is a significant change in land value where we can observe the road surface type affecting it.

From the collected data (of 28 households), it was found that around 65% (or 18 households) had bought the land which was followed by 35% (or 10 households) where the land is inherited. This shows that the people are migrated to this place.

5.5.1. Previous and present land price
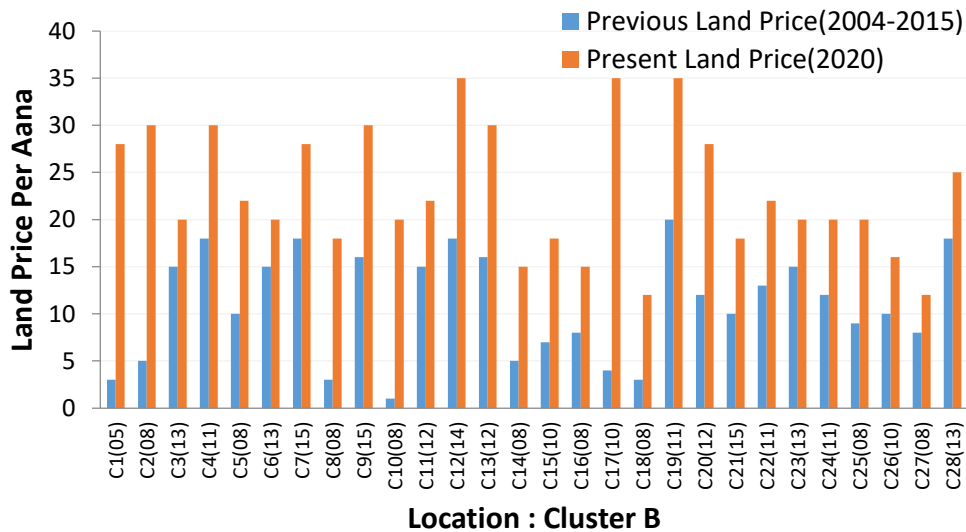
Graph 30 Previous and Present land price

There is an increase in land prices from 2004 to the present time. The increase in land price varies accordingly year wise and the surface and width of the road. The above graphs show the variation in land prices. In the same year also we can see the fluctuation of the land price which can be said that there are certain determinants affecting land value. Location, infrastructures are the factors for the increase in land value. The average land value is found to be 11 lakh previously (2004-2015) whereas 23 lakhs in the present time (2020).

5.5.2. Plot sizes

Plot size of the respondents varies in size. Most of the parcels are 4-8 aana in size. Residents holding above 8 aana along the main road are very less. Most of the area of plots of people has been reduced due to road expansion that is in construction.

5.5.3. Rental value

Since, the survey is being carried out mostly near to the main roads. The rental value is asked with the house owner only. The areas are commercialized so the rental value has also increased by many folds. The current rental value is Rs 31-40 and 41-50 per square feet.
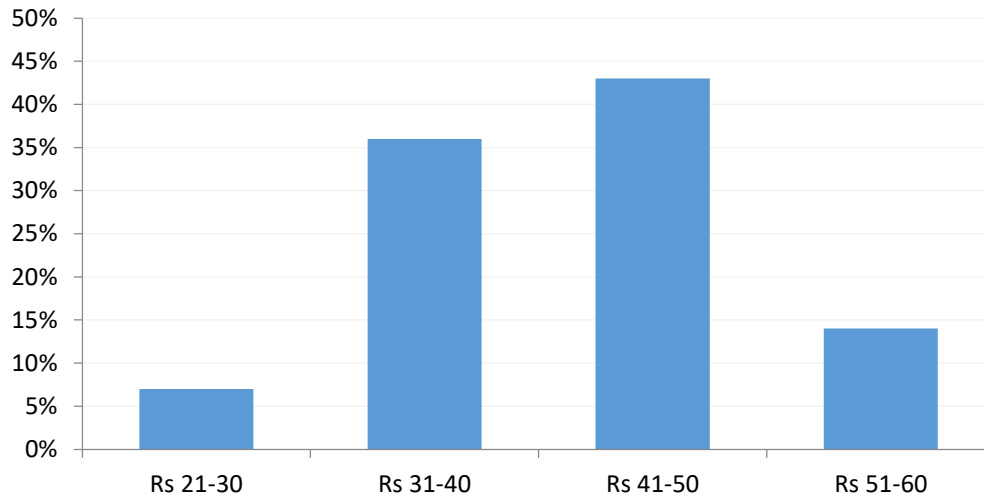
Graph 31 Present value of room per sq. ft.

5.5.4. Activities in the area

The whole area is being commercialized at a rapid pace. The area has a mixed land use with shops/businesses on the ground floor and upper floors as residences. The business potential of the area is also attractive by many financial institutions to open up their business in that area. Many banks, offices, cooperatives have their presence felt in the area. Besides, business activities in the area comprise of workshops, electronic and electrical equipment, general stores, etc.

5.5.5. Reasons for selecting land

There are various reasons for selecting land. The major reasons are the pull factors behind migration. During the household survey, multiple-choice options were provided to know the reason for selecting the land. People are much focused to buy the land in the areas where there is good infrastructure and services available, business opportunities, and mostly the accessibility and location. The respondent's reasons for selecting land are focused much on location, accessibility, business opportunities, and affordable land price.

Reasons for selecting land
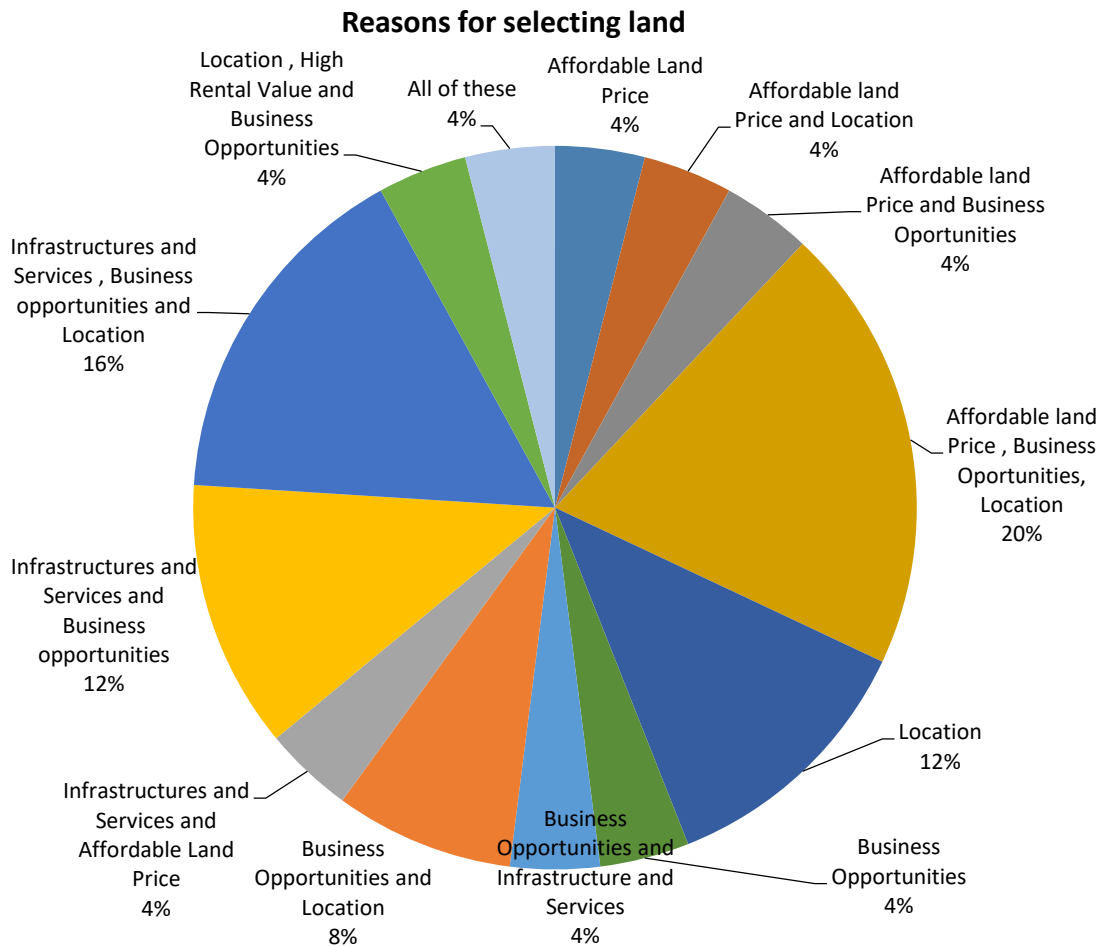
Graph 32 Reasons for selecting land

5.5.6. Physical Reasons for selecting land

The physical reasons for selecting the land are the type of road, road width, and availability of other infrastructures. The one who seeks for buying the land is the road. Major blacktopped roads were found. Other infrastructure like the availability of electricity, communication, water supply, and drainage. This cluster has no drainage and sewerage facilities so land is found cheaper than other clusters. In this cluster, public transport was also seen as a major element for selecting the land. Ease access to public transport was observed through the respondent's view. The distribution of respondents for physical reasons for selecting a site with multiple choices can be observed below:
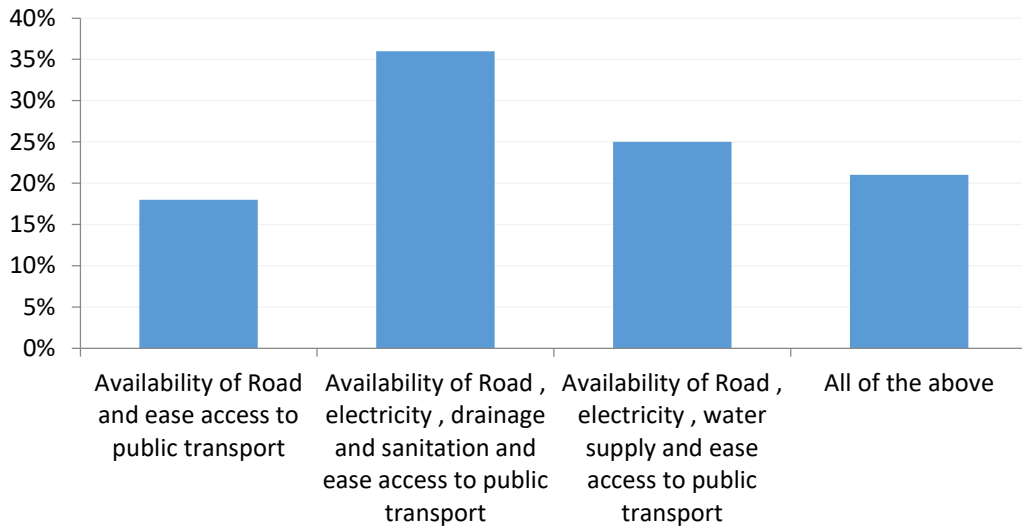
Graph 33 Physical Reasons for selecting land

5.5.7. Social reasons for selecting land

The social reasons for selecting site depends upon the type of neighborhood present followed by the safety and security of a place. In this location, homogenous ethnic groups were found. The presence of relatives and social infrastructure is also the social reasons for selecting the land.
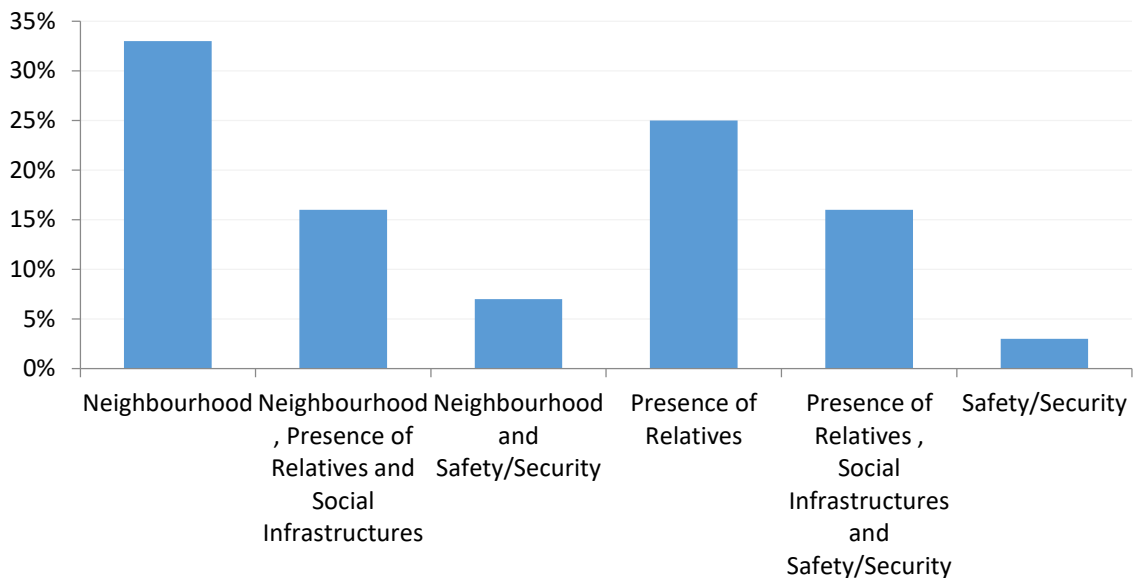
Graph 34 Social reasons for selecting land

5.5.8. Religious reasons for selecting land

There are religious reasons for selecting the land. The availability of temples and gumbas also affect the land value. Respondents in this area towards North bought land so that the area is near to Kapan gumba and temples.
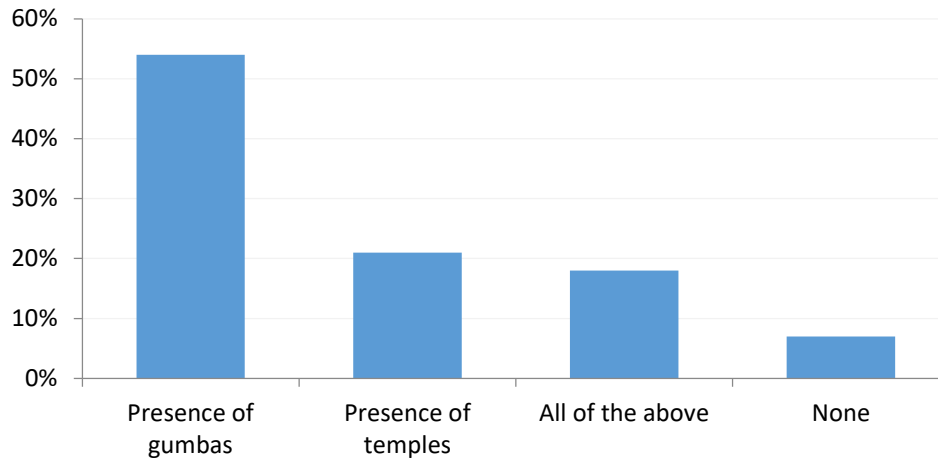
Graph 35 Religious reasons for selecting land

5.5.9. Economic reasons for selecting land

The land that has been bought long before towards the north is affordable whereas, in present, the areas with high rental value and land near to the market center are the main reasons for selecting land.
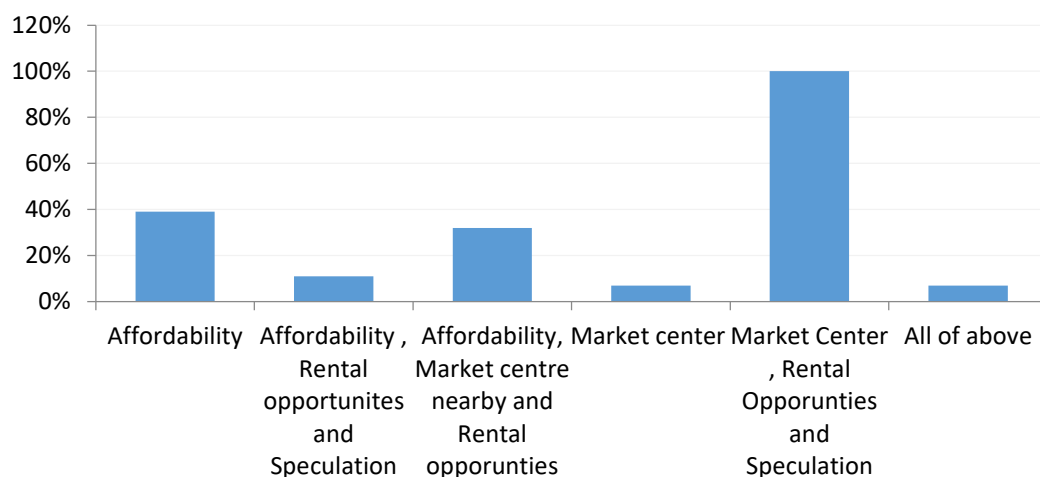
Graph 36 Economic reasons for selecting land

98

5.5.10. Land use

Agriculture, which has been the most dominant land use has rapidly depleted with changing time. Most of the farmland has been converted to the built-up area. Of the respondents, 64% of agriculture land has been converted into 32% whereas commercial, residential, and commercial cum residential areas have also been increased as shown below.

Previous Land Use
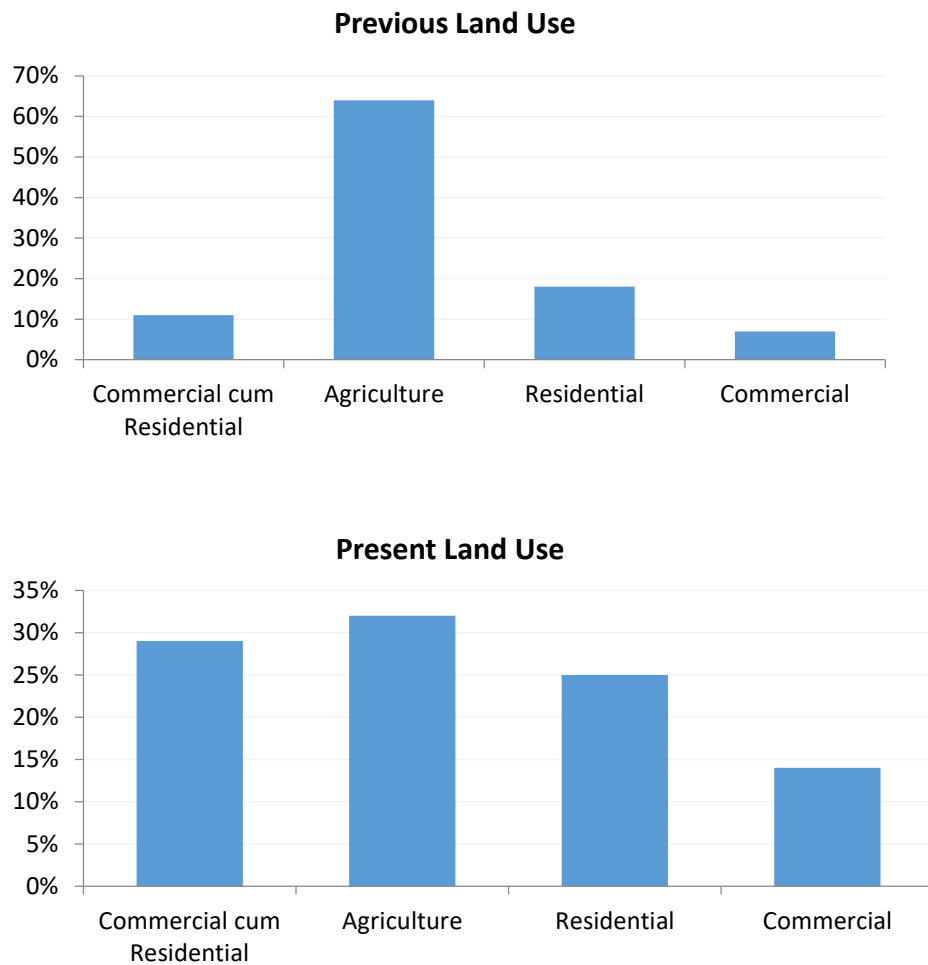
Present Land Use

Graph 37 Land use change

5.5.11. Causes for spatial transformation

- Economic opportunities/ potential

- Transportation, public facilities

5.6. **Overall Analysis**

Total Samples: 88
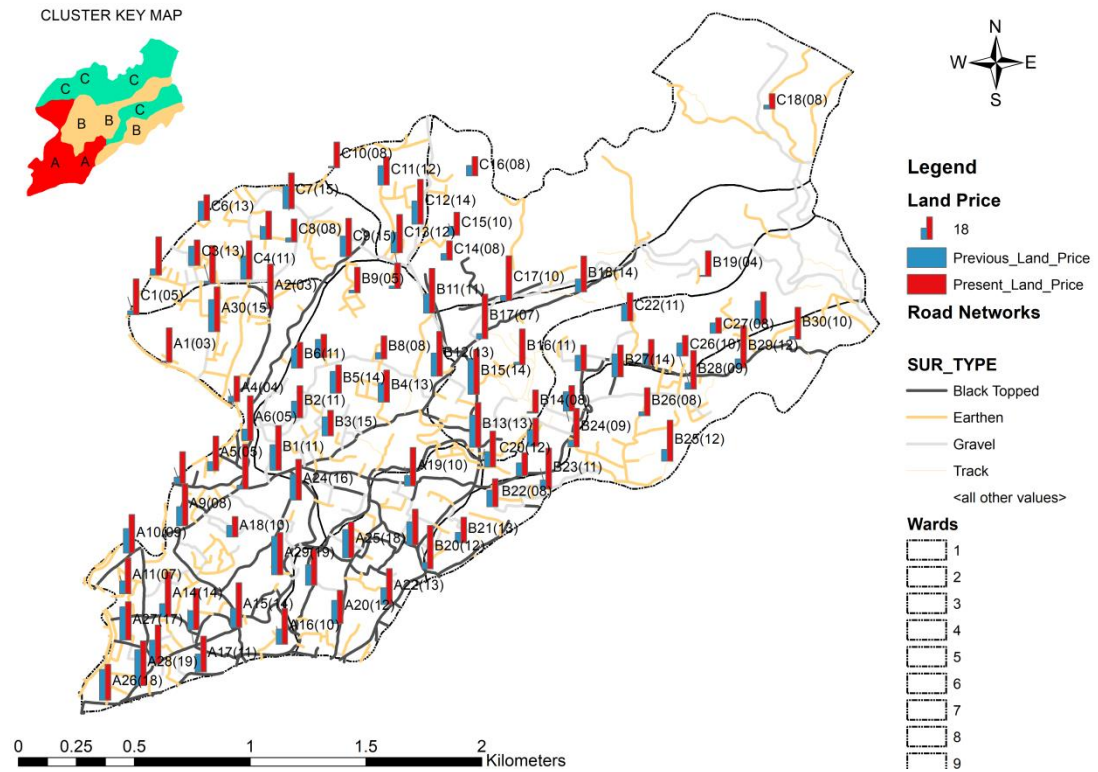
Figure 29 Previous and present land price

The figure shows the GPS point of the data collected through a household survey. The data shows the present (2020) and previous land values (2003-2019) of those areas. There is a significant change in land value where we can observe the road surface type affecting it.

From the collected data (of 88 households), it was found that around 70% (or 62 households) had bought the land which was followed by 30% (or 26 households) where the land is inherited. This shows that the people are migrated to this place.

5.6.1. Plot sizes

Plot size of the respondents varies in size. Most of the parcels are 4-8 aana in size. Residents holding above 8 aana along the main road are very less. Most of the area of plots of people has been reduced due to road expansion that is in construction.

5.6.2. Rental value

Since, the survey is being carried out mostly near to the main roads. The rental value is asked with the house owner only. The areas are commercialized so the rental value has also increased by many folds. The current rental value is Rs 41-50 per square feet.
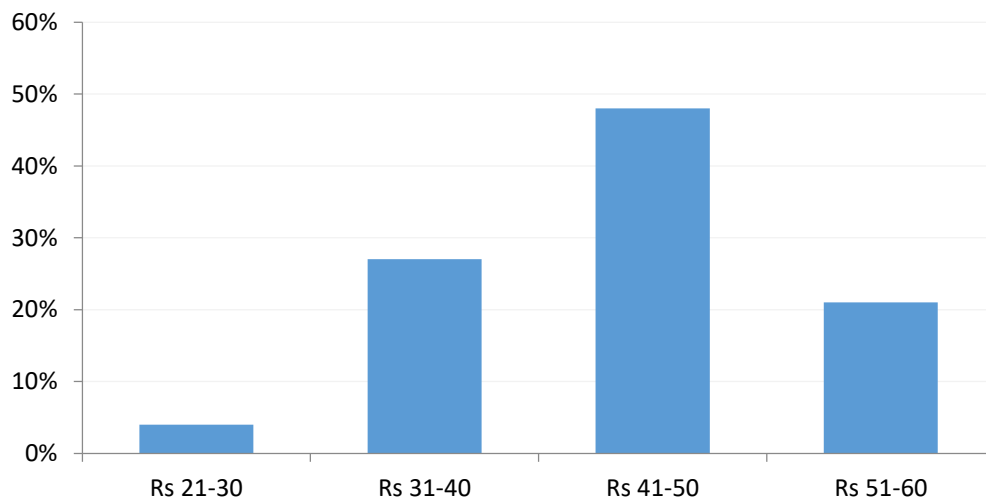
Graph 38 Present value of room per sq. ft.

5.6.3. Activities in the area

The whole area is being commercialized at a rapid pace. The area has a mixed land use with shops/businesses on the ground floor and upper floors as residences. The business potential of the area is also attractive by many financial institutions to open up their business in that area. Many banks, offices, cooperatives have their presence felt in the area. Besides, business activities in the area comprise of training centers, workshops, electronic and electrical equipment, general stores, etc.

5.6.4. Reasons for selecting land

There are various reasons for selecting land. The major reasons are the pull factors behind migration. According to the respondents, people are much focused to buy the land in the areas where the land has the strength of business opportunities followed by the location of the area. Affordable land prices and infrastructure and services are also the reason for selecting land. Very few people seek buying of land for the rental purpose.
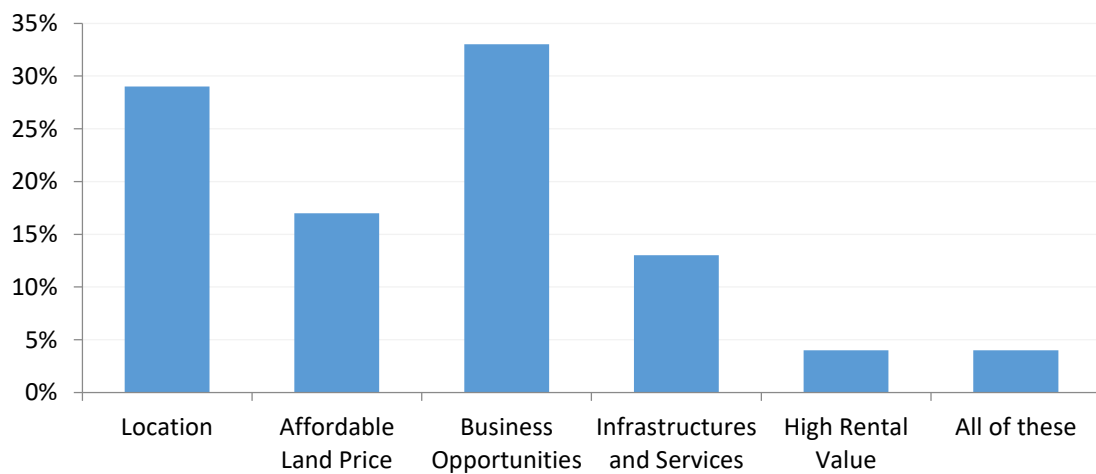
Graph 39 Reasons for selecting land

5.6.5. Physical Reasons for selecting land

The physical reasons for selecting the land are the type of road, road width, and availability of other infrastructures. The one who seeks for buying the land is the road. Other infrastructure like the availability of electricity, communication, water supply, and drainage. In this area, public transport was also seen as a major element for selecting the land. Ease access to public transport was observed through the respondent's view. The distribution of respondents for physical reasons for selecting a site can be observed below:
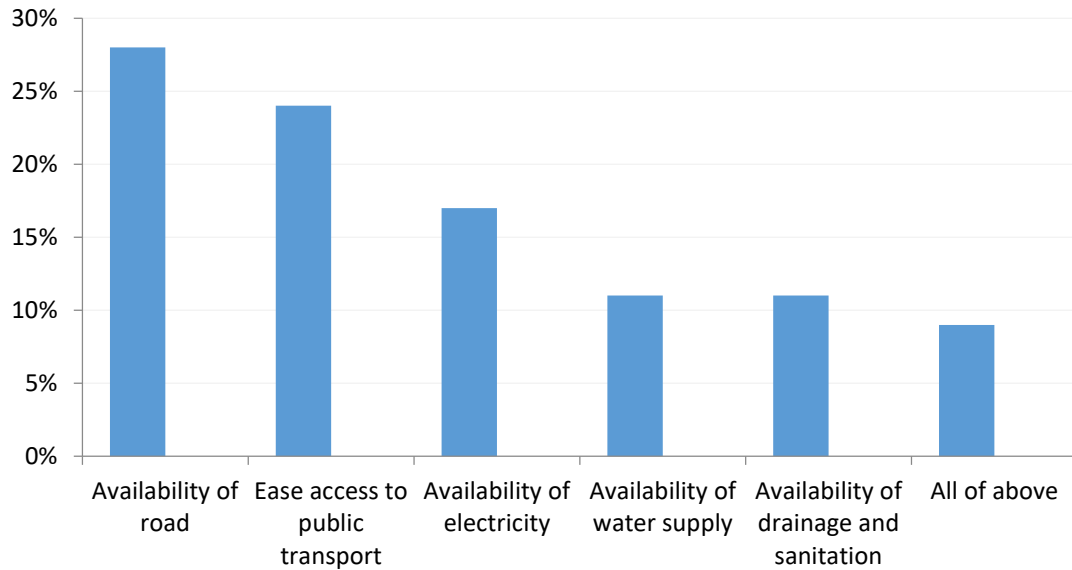
Graph 40 Physical Reasons for selecting land

5.6.6. Social reasons for selecting land

The social reasons for selecting site depends upon the type of neighborhood present, presence of relatives followed by the safety and security of a place. In this location, homogenous and heterogeneous ethnic groups were found. The proximity of social infrastructure is also the social reasons for selecting the land.
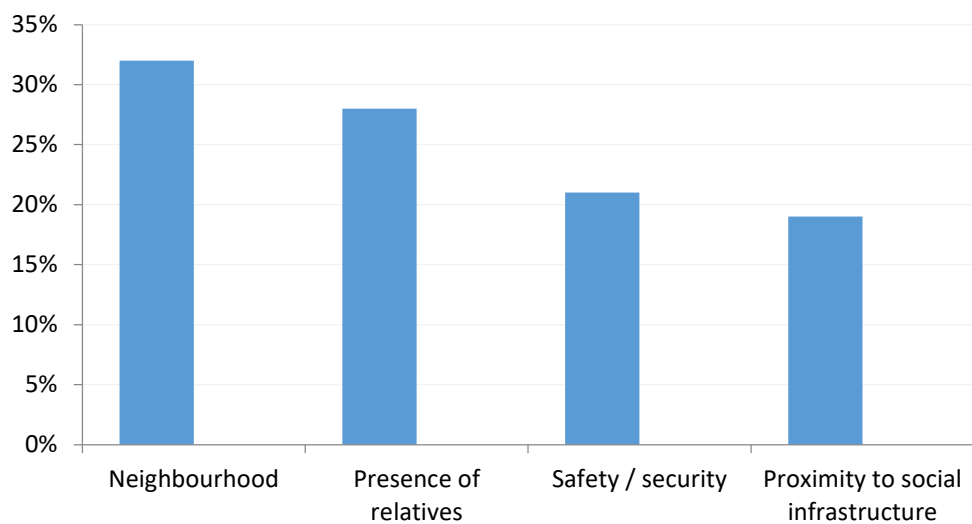
Graph 41 Social reasons for selecting land

5.6.7. Religious reasons for selecting land

There are religious reasons for selecting the land. The availability of temples and gumbas also affect the land value. Respondents in this area towards North bought land so that the area is near to gumba and temples.

Graph 42 Religious reasons for selecting land

5.6.8. Economic reasons for selecting land

The land that has been bought long before towards the north is affordable whereas, in present, the areas with high rental value and land near to the market center are the main reasons for selecting land.
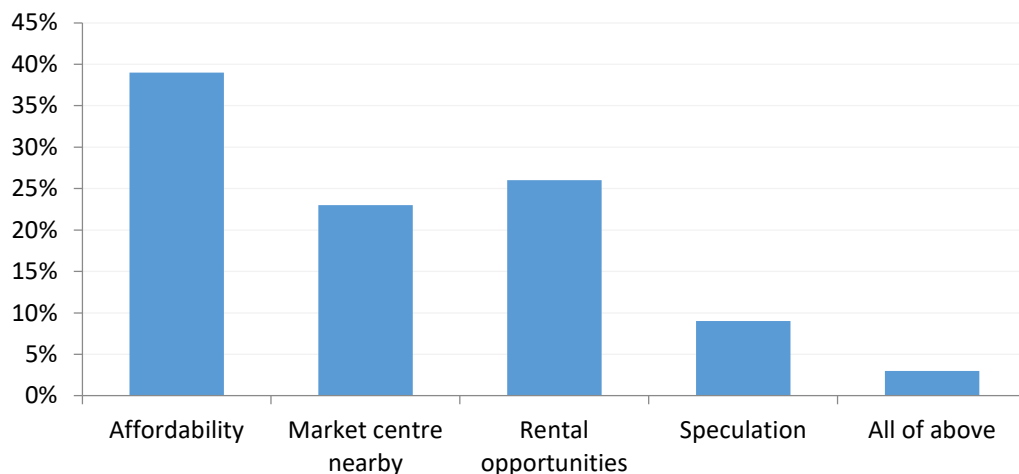
Graph 43 Economic reasons for selecting land

5.6.9. Land use

Agriculture, which has been the most dominant land use has rapidly depleted with changing time. Most of the farmland has been converted to the built-up area. Of the respondents, 58% of agriculture land has been converted into 19% whereas commercial, residential, and commercial cum residential areas have also been increased as shown below.

Previous Land Use
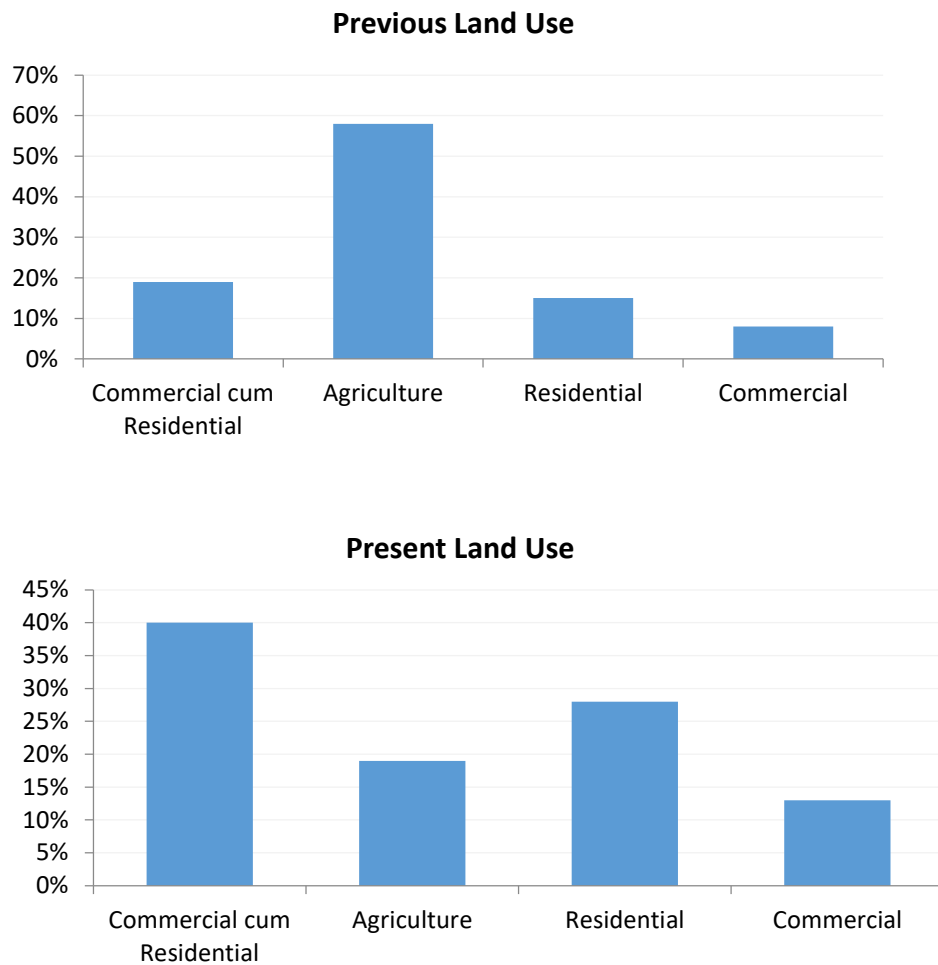
Present Land Use

Graph 44 Land use change

5.6.10. Causes for spatial transformation

- Location, Economic opportunities/ potential

- Transportation, public facilities

5.7. VALUATION BY REAL ESTATES

5.7.1. CLUSTER COMPARISONS OF PRESENT LAND PRICE WITH TYPE AND WIDTH OF ROAD: SOURCE (WEBSITES)

Total Sample: 10

Type and Width of Road	Land Price Per Aana		
	Cluster A	Cluster B	Cluster C
Above 20' BTR	40	35	30
13-20' BTR	35	28	25
9-12' BTR	30	25	20
Above 20' Gravel road	32	25	25
13-20' Gravel road	28	22	21.5
9-12' Gravel road	24	20	19
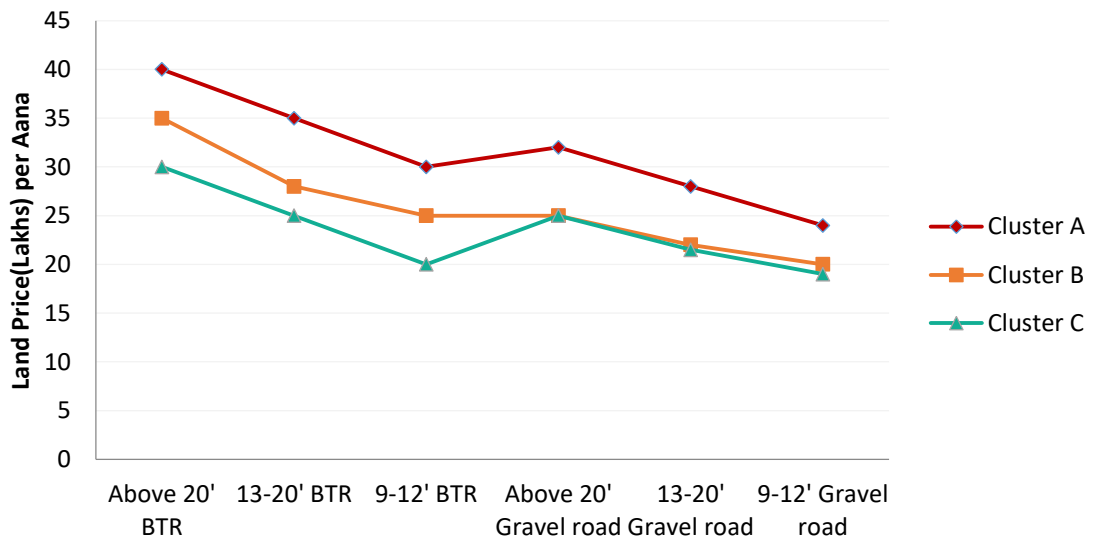
Graph 45 width and surface type of road in different clusters

From the above graph and table we can say that the land prices are affected by the width and surface type of road. The increase in land price in cluster A then other clusters are seen in the above table from 40 lakhs per aana to 35, 30 lakhs per aana. Land price is seen higher where the width of the road is high where we can see that the price decreases as a result of the width of the road decreases. Surface type of road

also plays an important role in determining a land price, road width above 20' but different surface types like blacktopped and gravel we can see land price differences from 40 lakhs per aana in cluster A to 32 lakhs per aana. From the graph we can see that clusters B and C with the same road type but different width of road coincides which means that different width with the same surface type also doesn't affect much. Other factors are determining the land price.

5.7.2. CLUSTER COMPARISONS OF PRESENT LAND PRICE WITH LANDUSE, INFRASTRUCTURES, AND WIDTH OF ROAD: SOURCE (WEBSITES)

Total Sample: 15

Type and Width of Road	Land Price Per Aana		
	Cluster A(Lakhs)	Cluster B (Lakhs)	Cluster C (Lakhs)
Social Infrastructure (school) above 20' BTR 9-12' BTR	40 35	35 30	32 28
Religious Infrastructure (Temple, Gumba) >20' BTR 13-20' BTR/20' GRAVEL ROAD 9-12' BTR	35 30	29 25	25 25
Commercial Areas 13-20' BTR 9-12' BTR	45 35	30 25	27 23
Residential Area 9-12' BTR	28	21	18
Market Area 9-12' BTR or 13-20' Gravel Road	32	25	25
Bus and Micro station; 13-20' Gravel Road	28	25	22

The above table shows the land prices according to the land use, infrastructure present, width of road, and surface type of road. The land price varies accordingly more in the areas where there is more social infrastructure then religious one with 40, 35, 32 lakhs per aana in cluster A, B, C with social infrastructure then the religious

one with 35, 29, and 25 lakhs per aana. Similarly, land price is seen higher in commercial areas and market areas then the residential one.

CLuster A : Present Land Price with Landuse , Infrastructures and Width of Road
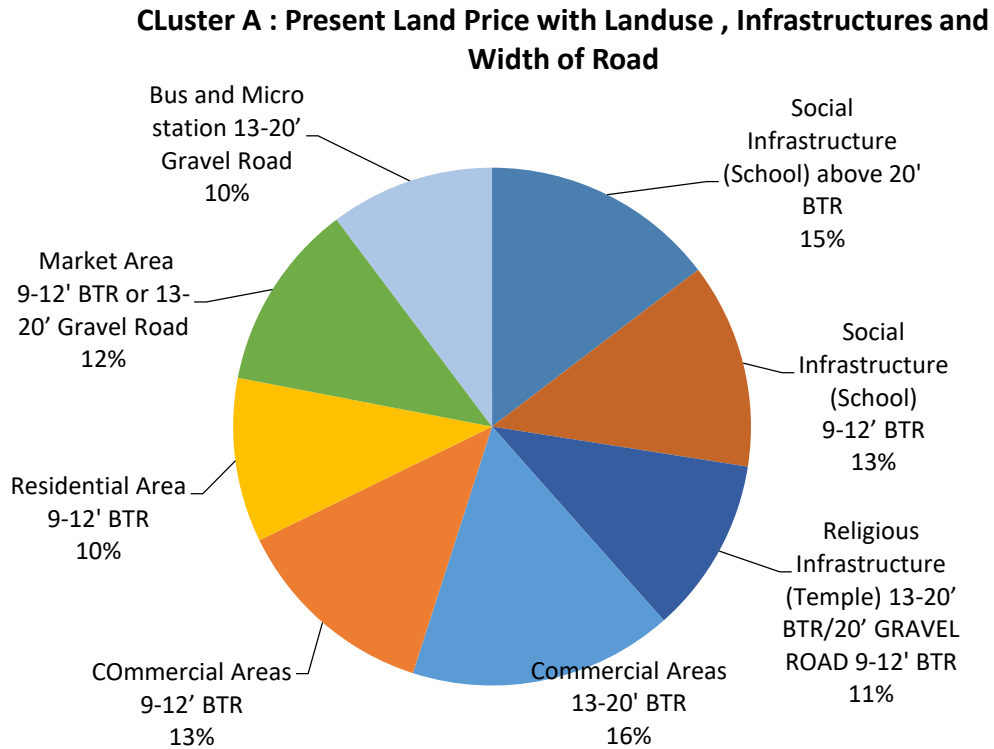
Graph 46 Present land price of Cluster A

According to the 15 samples, commercial areas with higher road width are preferred more to affect land price increase. Social infrastructure above 20' road width of blacktopped road with less road width (9-13' BTR) of commercial areas also affects land price. Therefore, we can say that commercial areas play a vital role in the increase in land prices. Here, more than road type and width, land use affects the land price which can be seen from the above graph as a result of which land use is one factor for affecting the increase in land price.

CLuster B : Present Land Price with Landuse , Infrastructures and Width of Road

Bus and Micro station ; 13-20' Gravel Road 10%

Market Area 9-12' BTR or 13-20' Gravel Road 10%

Residential Area 9-12' BTR 9%

Commercial Areas 9-12' BTR 10%

Commercial Areas 13-20' BTR 12%

Social Infrastructure above 20' BTR 15%

Social Infrastructure 9-12' BTR 12%

Religious Infrastructure >20' BTR 12%

Religious Infrastructure 13-20' BTR/20' Gravel Road 9-12' BTR 10%
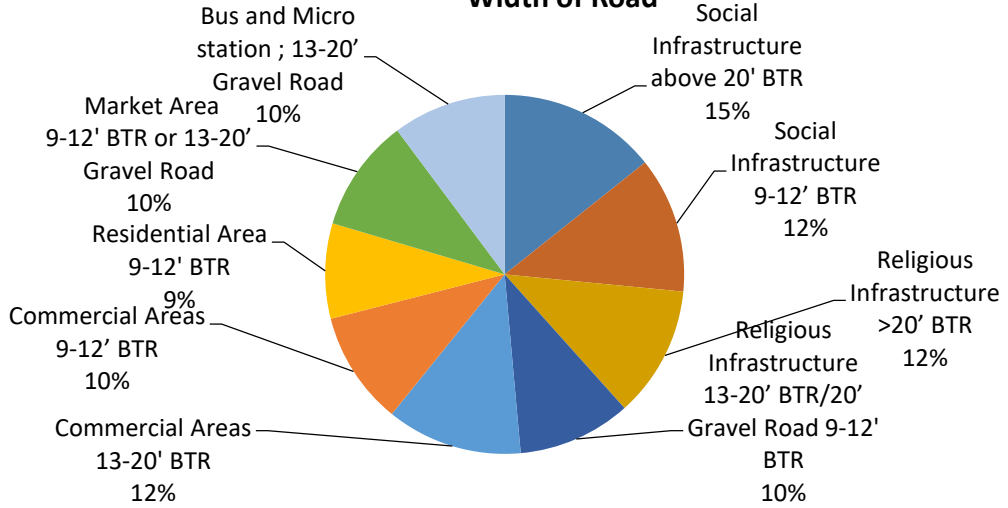
Graph 47 Present land price of Cluster B

CLuster C : Present Land Price with Landuse , Infrastructures and Width of Road

Bus and Micro station ; 13-20' Gravel Road 10%

Market Area 9-12' BTR or 13-20' Gravel Road 11%

Residential Area 9-12' BTR 8%

Commercial Areas 9-12' BTR 10%

Commercial Areas 13-20' BTR 12%

Social Infrastructure above 20' BTR 14%

Social Infrastructure 9-12' BTR 13%

Religious Infrastructure >20'BTR 11%

Religious Infrastructure 13-20' BTR/20' Gravel Road 9-12' BTR 11%
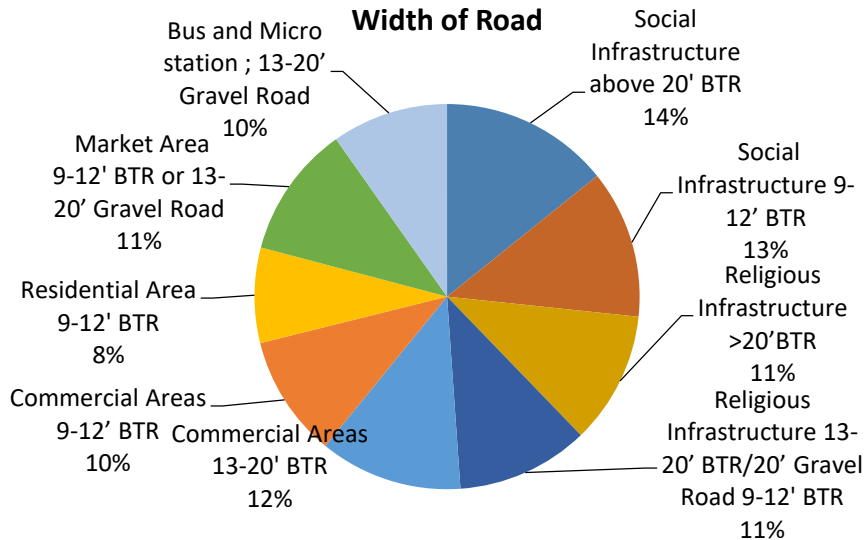
Graph 48 Present land price of Cluster C

Social infrastructure above 20' road width of blacktopped road affects an increase in land price. In this, commercial areas affect less than social infrastructure which means the area is on the verge of commercialization. Therefore, we can say that social infrastructure and commercial areas play a vital role in the increase in land prices.

According to the key informant's interview(Broker), "Mr. Baburam Bhattarai, the land price of cluster A has affected by the accessibility(near to ring road areas), expansion of roads, development of commercial areas, surface type of road, market center nearby, hospitals nearby the areas and soon. The land price in clusters B and C are on the verge of commercialization. These areas are on the way of development. Previously there were no road facilities but now there is a provision of road, upgrade in surface type of road, clean water supply, and drainage facility. Commercial areas are being more. The settlement has been increased. Many new construction of buildings can be observed here. Previously, land is sold at a very less price but due to commercialization there is an increase in land price.

" Mr. Shambhu Ghimire", a land broker said that urbanization in clusters B and C has impacted in an increase in land price. Previously some years before these places doesn't have a proper drainage facility and water supply as a result of which land was found in cheaper price i.e. 5 lakhs per ropani(<2005) but in present years land price per aana is found to be 35-30 to least 15 lakhs per aana. This is because of the commercial growth of the areas, development of new roads connecting to other municipalities, the change in VDC to a municipality, etc. The development of this area is also being carried out after an earthquake(2015). With adequate facilities, settlement started to grow as a result of which many business activities occurred that impacted an increase in land price of the areas.

"Mr. Narendra regmi, land broker said that the change in building use, residential to commercial along main roads, expansions of roads, development of chowks with commercial use, added infrastructure, public transportation, development of business activities along the KMC ward-6 area, neighborhood areas and most of them migrated people with maximum transactions on land are responsible for an increase in the land price. The land price has been increased from 15 lakhs per aana(2010) to 30-40 lakhs per aana along main roads whereas there also an increment in residential areas(5 lakhs per aana to 20-30 lakhs).

"Mr. Naresh Nepal", a land broker said that the change in land use, agriculture to residential to commercial along main roads, expansions of roads, development of chowks with commercial use, added infrastructure, public transportation, development of business activities along the expanded area towards north, neighborhood areas and most of them migrated people with maximum transactions on land are responsible for an increase in land price. The land price has been increased from 25 lakhs per aana(2015) to 30-40 lakhs per aana along main roads whereas there also an increment in residential areas(15 lakhs per aana to 20-30 lakhs).

"Mr. Hari Sharma", a land broker said that the land previously used to be very cheap where there was not the presence of infrastructure due to VDC but land in today's context has changed drastically after being the municipality. Development of infrastructures increased in settlements, opportunities for business, market areas were developed leading the cheaper land into high costs.Not only this, it added change in building use, residential to commercial along main roads, expansions of roads, development of chowks with commercial use. Previously the areas get flooded so the land was found cheaper in such areas. The land price is seen lower in high risk-sensitive areas (slopy land). Some people buy land for speculation after the road expansion gets completed they can sell it on higher prices so the land on two side roads has not been sold yet.The land price has been increased from 25 lakhs per aana(2016) to 30-40 lakhs per aana along main roads whereas there also an increment in residential areas(18 lakhs per aana to 25-30 lakhs).

5.7.3. Analysis of real estates and broker's valuation of land

From the above graphs and key informants interview(brokers), we can say that the factors that affect an increase in land price are the width of the road , surface type of road, land use, commercial areas are paid higher than residential areas, accessibility of the area, zoning and regulations, the expansion of projects, development of infrastructures. Therefore, land prices are affected mainly by the infrastructures available and the location of the place.

5.8. **Comparative analysis of land price from different sources**

The comparative analysis of land valuation criteria obtained from different sources i.e government, bank, land valuator, real estate, brokers, land buyer are as follows:

S.No.	Institution and individual Involved in evaluating Land prices	Data Obtained	Land Valuation Criteria's Analysis
1.	Nepal Government	(Minimum Land Valuation, Chabahil, FY 2068/2069-2076/2077))	- Location - Quality of Road - Accessibility
2.	Bank	Agriculture Development Bank, Mortgage security valuation guidelines, 2068	- Location - Land Use - Width of road
3.	Land Valuator	Key Informants Interview and Valuation reports	- Location - Accessibility - Road Linkages - Importance of Location - Proximity to Social Infrastructures - Existing land use

			• Parameters of Boundaries
			• Legal aspects of Property
			• Possibility of future improvements
			• Occupant of the land
			• Yearly income from the land
			• Sales value of land
			1. Market Rate per aana
			2. Government rate per aana
			Fair market value of Asset : (Source: ADB, Mortgage security valuation guidelines 2068)
			Distress Value: 80% of fair market value
4.	Brokers	Key Informants Interview	• Value proposition of the land
			• Quality of property
			• Location
			• Accessibility
			• Land Use
			• Zoning and regulations
			• Infrastructures and

			facilities
			• Government announces development or expansion of projects
5.	nd buyers	Household Questionnaire Survey	• Affordability
			• Location
			• Accessibility
			• Land use
			• Topography
			• Infrastructure (physical: Road width and surface, drainage and sanitation, water supply and electricity, public transport)
			• Social (Neighbourhood, presence of relatives)
			• Religious (gumbas, temples)
			• Economic Activities(market center, business opportunities, and rental value)
			• Risk sensitive Areas

CHAPTER 6   CONCLUSION

Findings from this study reveal a positive movement in land value over time in space, structural characteristics of land and neighborhood/locational factors are found to be responsible for the determinants observed. Overall market is shaped by the decisions of government, landowners, and developers. The result suggests the various determinants affecting land values and they are as follows:

- Physical Characteristics of land: Location, topography, accessibility, details of the road abutting the property, description of adjoining properties

- Planning Parameters: Land use, Zoning, bye-laws, and Regulations, Development controls, surrounding land use and adjoining properties in terms of usage

- Legal aspect of the property: type of land, road widening, heritage restrictions

- Economic Aspects of Property: rent, tax, availability of land, growth opportunities, new construction and vacancies

- Socio-cultural aspects: the social structure of the areas, population, social stratification, regional origin, age group, education levels, income levels, location of slums/squatter settlements nearby

- Infrastructure availability: physical infrastructure i.e road, water supply, electricity, sanitation and sewerage and stormwater drainage, social infrastructure like hospital, offices and health centers, religious infrastructure like temples, and gumbas

- Marketability of the property: locational attributes, demand, and supply

- Environment factors: Presence of environment pollution in the vicinity of the property in terms of industry, Landfilling sites, heavy traffic, risk-sensitive areas.

- Architectural and aesthetic quality of property: neighborhoods with modern or traditional buildings, presence of landscape elements, and heritage value.

The economic effects of transportation improvements are major in determining the land value. So far, analyses have examined how transportation improvements (expansion of roads, quality upgraded) affect either the value of vacant land or total property values, providing considerable that transportation improvements lead to higher property values. However, several analyses in that transportation improvements raise the value of property, considered separately from the value of the land on which the houses sit.

If road attributes improve land prices significantly more than locations, then more distant areas will also get developed eventually and developers will buy cheap lands, wait or construct roads, and sell back lands at higher costs and the buyers will use the land more intensely to offset high price.

If locations dominate land price (this could be the case in short run), maybe there are still vacant lots. In the long run, this may not be the case. It is found out that while high-income earners values and consider structural and neighborhood characteristics while getting accommodation, the low income and migrants do not consider this, as their primary motive is to secure accommodation anywhere as long as it is close to their place of employment, hence the high income is found in the better neighborhood while the poorer are found anywhere as long they will pay less to occupy those facilities.

The involvement of brokers in land selling also has caused an impact on the increase in land values. A broker for commission elaborates on the type of land available with an increase in land price. Lack of plans and policies has deteriorated the condition of Kapan for a long time and without a concrete resolution the condition is likely to deteriorate further. This is evident that the haphazard development in the region under the study area.

Results from these findings will help government, urban planners to determine how best to make optimal locational decisions giving their constraints, also, the Kapan based on critical land value determination needs will help the government in formulating and implementing the basis for fixing land values for urban area and development in urban centers.

Attributes	Cluster A	Cluster B	Cluster C	Remark
Government minimum land valuation **Location , Road characteristics**	Near to ring road and closer proximity to Maharajgunj, Chabahil and Budanilkantha area. Black topped road attached to land are higher in price than other roads.(quality of roads matters than width).	Apart from ringroad but closer proximity to urban centre ie. Boudha, Jorpati etc. Width of road matters as black topped road of cluster A is equal to the gravel road or secondary road in Cluster B.	Apart from ringroad but closer proximity to urban centre ie. Boudha, Jorpati , Budanilkantha area etc. Width of road matters as black topped road of cluster A is equal to the gravel road or secondary road in Cluster C.	Government minimum price can be used as a proxy for market price as even banks do so.

Attributes	Cluster A	Cluster B	Cluster C	Remark
Real estate, brokers	Location and easily accessible, presence of infrastructures, commercialization and high rental value but doesn't elaborate about the risk sensitive areas.	Expansion of road width, upgrading of quality of roads, infrastructure development, in a pace of commercialization but doesn't elaborate about the risk sensitive areas beside topography which can be easily seen.	Expansion of road width, upgrading of quality of roads, infrastructure development, in a pace of commercialization but doesn't elaborate about the risk sensitive areas beside topography which can be easily seen.	Risk sensitive areas needs to be addressed.
Landowner's perception	Location, high rental value, infrastructure development, and presence of good neighborhood or relatives. Beside topography no risk observed.	Location, rental value, infrastructure development, affordable land price and presence of good neighborhood or relatives.	Location, rental value, infrastructure development, affordable land price and presence of good neighborhood or relatives.	Risk sensitive areas needs to be addressed.

CHAPTER 7   RECOMMENDATIONS

This study shows that factor affecting land values, land valuation in the study area is being done informally. The study area needs concentrating the effort on policy issues and also needs a resolute action. This would need collaborative effort from many concerned agencies and policies that are lacking in our case.

- Land use policy (density, zoning, subdivision controls, and taxation)

- Institutional Setup (arrangements, planning, implementation)

- Policy documents(land use plans)

- Integrated land use plan (land use+ mobility/road network)

- Land value capture

Land prices depend on several factors. High land prices induce high intensity with high density. If supplemented by good infrastructure, high density is good otherwise it will be problematic (poor mobility, vulnerable to disasters, etc).

Possibility of land value capture (if having road increases price significantly, then these areas are good for land pooling or land readjustment).

The study shows that the minimum government land prices tax has been carried out by land buyers where it is not exactly shown the exact land price tax they pay resulting in the less revenue collection of that area which helps in lack of infrastructure development. The tax generated from the sale and bought of land helps in developing that area but here minimum tax being paid. For this, a valid source of an institution must be set out for clear evidence of the total cost of the land they pay.

Due to urbanization, vacant plots are few lefts in cluster A where the study suggests that the vertical development would take place. There will be fewer transactions on land but high transaction on space. The floor space in such cases would be transacted then the land and buildings whereas in other clusters, horizontal development with less population density world occur. Other recommendations are as follows:

Major Issues	Current Trend	Impact	Proposed Interventions
Uncontrolled urban sprawl	People are constructing buildings without considering far, bye-laws, ground coverage, and planning guidelines.	Unhealthy settlement areas. The development of infrastructures becomes costly.	Enforce integrated land use plans and demarcate the area suitable for development and provide infrastructure accordingly.
Unplanned land sub-divisions	The land management policy doesn't comply with urban planning standards where land brokers are more active then planners.	Inefficient use of land.	Introduce land management policy and regulation of activities of land brokers through legislation.
Loss of agriculture land into built-up areas	Agriculture land converted into built-up spaces.	Loss of open space, less groundwater recharge, unhealthy environment.	Delineation of agriculture areas in land use plans and include open spaces in the areas.
Lack of proper management	Weak capabilities of a municipality and local authorities.	Basic services not provide at the optimum level.	Improvement in capacity, Involvement of urban planners in the municipality.

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ANNEX

Annexes

7.1. Land Revenue office: Kalanki

The revenue office looks after 4 municipality and some wards of KMC and is briefly shown below:

S. No.	Land Revenue Offices	Description
1.	Kalanki	• Ringroad: Balkhu to Banasthali KATHMANDU METROPOLITAN CITY • KMC ward 13, 14, 15 KIRTIPUR MUNICIPALITY • Kirtipur Municipality ward 1,2,10 (Along Road Side) • Kirtipur Municipality ward 3,9 (Kirtipur Chakrapath area) • Kirtipur Municipality ward 4,5,6,7,8 NAGARJUNG MUNICIPALITY • Nagarjung Municipality ward 9,10 (Sichutaar VDC) • Nagarjung Municipality ward 4,5 (Sitapaila VDC) • Nagarjung Municipality ward 6,7 (Dadapauwa Ramkot VDC) • Nagarjung Municipality ward 8

(Bhimdhunga VDC)

- Nagarjung Municipality ward 1,2,3

(IchanguNarayan VDC and Balaju ward 7,8,9)

CHANDRAGIRI MUNICIPALITY

- Chandragiri Municipality 15

(Teenthana VDC)

- Chandragiri Municipality 14

(Nayanaikab VDC)

- Chandragiri Municipality 10, 11

(Satungal VDC)

- Chandragiri Municipality 12

(Balambhu VDC)

- Chandragiri Municipality 3,4

(Thankot VDC)

- Chandragiri Municipality 5,6,7

(Thankot Mahadevsthan VDC)

- Chandragiri Municipality 2 (wardbhanjyang VDC)
- Chandragiri Municipality 13

(Naikab PuranoBhanjyang VDC)

- Chandragiri Municipality 1

(Dahachowk VDC)

- Chandragiri Municipality 8

(Matatirtha VDC)

- Chandragiri Municipality 9 (Macchegaun ward 1,7,8,9 VDC)

		DAKSHINKALI MUNICIPALITY
		• DakshinkaliMunicipality (Chalnakhel VDC) • Dakshinkali Municipality (Chhaimale VDC) • Dakshinkali Municipality (Talkududechaur VDC) • Dakshinkali Municipality (Pharping Bhimsensthan VDC) • Dakshinkali Municipality (Sokhel VDC) • Dakshinkali Municipality (Seshnarayan VDC)

7.2.   **Land Revenue office : Dillibazar**

The revenue office looks after ring road, land sheet number areas and Tokha municipality and is briefly shown below.

S. No.	Land Revenue Offices	Description

1.	Dillibazar	
		ROAD • Manohara Arniko Highway Ringroad : • Tinkune - Gaushala - Chabahil. • Balkumari : Koteshwor- Thapathali - Tripureshwor • Banasthali - Maharajgunj- DhobiKhola Bridge • Newbaneswor , Old baneswar , Bhimsengola , Thapathali , SinghaDurbar , Hanumansthan **LAND SHEET NUMBER** • Sheet number 1-8 , 10-17 , 19-22 , 24-33 , 35-39 , 41-48 , 50 , 52-58 , 60-72 , 74-76 , 78-80 , 86 , 88 **TOKHA MUNICIPALITY** • Tokha Municipality Ward 11 , 12 (Gongabu 1,2,3) • Tokha Municipality Ward 13 , 14, 15 (Gongabu 4,5,6,7,8,9)

7.3. **Land Revenue office : Chabahil**

The revenue office looks after Kathmandu metropolitan city, Budanilkantha municipality, Gokarneshwor municipality and Kageshwori Manohara municipality and is briefly shown below:

S. No.	Land Revenue Offices	Description

1.	Chabahil	KATHMANDU METROPOLITAN CITY
		• KMC ward 6 ,7
		BUDANILKANTHA MUNICIPALITY
		• Kapan ward 1,2,3,4,5,6,7,8,9
		• Mahankal, Bishnu , Chapali Bhadrakali and Chunikhel wards
		GOKARNESHWAR MUNICIPALITY
		• Gokarneshwor Municipality (Jorpati VDC)
		• Gokarneshwor Municipality (Gokarna VDC)
		• Gokarneshwor Municipality (Baluwa VDC)
		KAGESHWORI MANOHARA MUNICIPALITY (Gothatar & Mulpani)

7.4. Land Revenue office: Tokha

The revenue office looks after Budanilkantha and Tokha municipality and is briefly shown below:

S. No.	Land Revenue Offices	Description

1.	Tokay	BUDANILKANTHA MUNICIPALITY
		• Budanilkantha Municipality ward 6,7 (Khadka Bhadrakali)
		TOKHA MUNICIPALITY
		• Tokha Municipality ward 2 (Tokha Chandeshwori VDC)
		• Tokha Municipality ward 1 (Jhor Mahankal VDC)
		• Tokha Municipality ward 5,7 (Dhapasi VDC 7,8,9)
		• Tokha Municipality ward 4,5,6 (Dhapasi VDC 1,2,3,4,5,6)
		• Tokha Municipality ward 3 (Tokha Saraswoti VDC 7,8,9)
		• Tarkeshwor Municipality ward 1 (Sanghla VDC 6,9)

7.5. **Land Revenue office : Sankhu**

The revenue office looks after different VDC areas and is briefly shown below:

S. No.	Land Revenue Offices	Description

1.	Sankhu	VDC'S • Alapot • Indrayeni • Gagalfedi • ThaliDanchi • Nayapati • NangleBhare • Pukhulacchi • Bhadrabas • Lapsifedi • Salkha Bajrayogini • Suntole • Sundarijal

7.6.   **Land Revenue office: Manamaiju**

The revenue office looks after different VDC areas and is briefly shown below:

S. No.	Land Revenue Offices	Description
1.	Sankhu	VDC'S • Manamaiju • Kavresthali • Jitpur • Futung • Goldhungha • Dharmaesthali

Questionnaire Survey:

1. Respondent Name:
2. Location :
   - Cluster A
   - Cluster B
   - Cluster C
3. Origin :
   - Local resident
   - Migrated – if migrated from ……………
4. Household size:
5. How long have you been staying in this location?
   - 1-5 years
   - 6-10 years
   - 10-15 years
   - >16 years
6. Land
   - Inherited--- When
   - Bought------ When
7. Cost of land (/Anna)
   - Present---------- Rs ……
   - Previous---------Rs …….. When ……..
8. Land uses
   - Present : Agriculture , Residential , Commercial , Industrial and others
   - Previous: ------- When -------------
9. Rental value
   - Present…….. Rs……
   - Previous…….. Rs…..
10. What are the reasons for selecting the land? Order it.
    - Accessibility: Location
    - Infrastructure and services
    - Affordable land : Price
    - Business opportunities : Economic agglomerations
    - Others
11. What are the physical reasons for selecting land?
    - Availability of road
    - Availability of electricity
    - Availability of drainage and sanitation
    - Availability of water supply
    - Ease access to public transport
    - None

- Others
12. What are the economic reasons for selecting land?
    - Affordability
    - Speculation
    - Rental Opportunities
    - Market center nearby
    - None
    - Others
13. What are the social reasons for selecting land?
    - Neighborhood
    - Presence of relatives
    - Safety / security
    - Proximity to social infrastructures i.e. school , hospital, offices
    - others
14. What are the religious reasons for selecting land?
    - Availability of temples
    - Availability of gumbas
    - Availability of church
    - None
    - Others
15. How did u come to know about this place?
    - Advertisement
    - Relatives
    - Brokers/expeditors
    - Others
16. What are your means for investing in this land?
    - Bank loan
    - Self-financing
    - others

Final Presentation Comments

Professors and External Examiner	Comments	Adressed Comments (Pg. No.)
Mr. Suresh Prakash Acharya (External Examiner)	Land use intensity(vertical and horizontal intensity) Background of Kapan	Future Research works to be carried out. Pg. 9 and pg. 39
Dr. Bharat Sharma (External Examiner)	Is the Bid-rent theory still exists in this place or not?	Currently, Ringroad influence land price but this may not be the reason in long case.
Dr. Sudha Shrestha	Presentation map color Land price should be decreased or increased? Put your views	The land price should be affordable to all.
Dr. Asim Bajracharya	Suggested to rank the value of the major land influencing factor in infrastructures (i.e which is major responsible Physcial, Social or cultural) and give the specific recommendations each.	Since this research is to find the determinants of land value. Rank wise influencing factor hasnot being carried out.

ARTICLE