Investment Opportunities and Challenges for the Real Estate Industry in India:

A Case of Delhi NCR

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Abstract

The real estate market of Delhi NCR is growing at a significant pace reaching each and every possible corner of the metropolitan city. The research develops a framework by implementing a methodology that includes AHP, which provides an analysis of the investment opportunities coupled by challenges concerning real estate investment process in the region of Delhi NCR. The proposed methodology incorporates expert opinion related to real estate sector for obtaining pair wise comparison of various significant factors influencing the real estate market growth. This analysis enables to prioritize the different sub regions of Delhi NCR in terms of real estate market growth. The research can be of immense help to the investors/buyers by providing them an in-depth analysis of each sub region corresponding to their specific investment opportunity.

The research also informs the developers pertaining to real estate projects about the various significant attributes that majorly contributes towards the real estate market growth of a particular sub region. The research delivers an idea to the real estate developers concerning various factors that are most significant to real estate market growth. The developers can focus more upon those factors while coming up with a real estate project in a particular area.

The research also suggests the shortcomings of certain sub regions of Delhi NCR with respect to real estate growth potentials, which should be taken up in near future. This will eradicate the extra pressure on the infrastructure & environment of certain areas. This will eventually result into a uniform and balanced spread of all sub regions, thereby leading to a sustainable development pattern.

1. Introduction

The real-estate industry is inextricably linked to socio-economic growth and development of a nation. Increased availability and affordability of housing can improve the quality of life for citizens, and the overall development of infrastructure improves productivity within the economy. House prices has also directly impacted upon macroeconomic health through the wealth effect: as house prices rise, home-owners feel wealthier and are likely to increase consumption and boost aggregate demand (Calomiris et al. 2012).

The term "real estate" is defined as land, including the air above it and the earth below it and any buildings or structures on it (Parida 2011). Land plus anything permanently fixed to it, including buildings, sheds and other items attached to the structure. Real estate is the business that sells, rents, and leases the places where we as people live and transact business (Straw 2008). Real estate, in the parlance of trade theory, is the ultimate "non-tradable" durable asset. It is neither exportable nor importable, and essentially has a fixed location with a decentralized market (Edelstein et al. 2010).

One main reason for the difficulty of defining real estate is the complexity of the object. Whereas "real" comes from "realty", which means land and all things permanently attached to it, "estate" refers to all things that a person owns (Brueggeman and Fisher 2005, p. 1). Analyzing real estate therefore implies not only an economic perspective, but also a broader perspective that includes the analysis of issues related to the "land" the object is built on.

Though, when talked in general, real estate simply indicates the residential units in form of apartments, row housing and villas. But, from a broader perspective the real estate whenever referred, if not stated signifies the three segments viz. Residential, Commercial and Retail units. The real estate industry is an important pillar industry of the national economy. It plays an important role in improving people's living conditions and living standards,

boosting economic growth, expanding employment and accelerating the urban construction (Wu and Guo 2011). In a positive sense, however, due to very high multiplier effects resulting from investments in this sector, real estate is often referred to as an "economic locomotive", since real estate investments have a significant influence on the gross domestic product and on the employment rate (Bruer and Nadler 2012).

The global economy suffered from the financial crisis which came to its peak in the middle of 2008 (Bruer and Nadler 2012). The improvement in the economy has directly influenced the Asia Pacific as well by increasing the amount of money flowing into it. This growth is expected to directly impact the Real Estate market of the developing nations. In recent years, most emerging economies have experienced large foreign real estate investment (FREI) and an appreciation of house prices (Fereidouni 2012). The United States, Pramerica (2012) projects that, the growth of institutional grade commercial real estate market during the period 2011-21 in developing nations will be much higher leaving behind developed nations. China tops the list with AGR of 18%, followed by India (16.6%) & Russia (10.6%), shown in Figure 1.

<<Insert Figure 1>>

The real estate sector in India is being recognised as an infrastructure service that is driving the economic growth engine of the country. The Indian Aranca Research (2013) estimated that the total economic value of the real estate activity in the country ranges between US$65-70 billion, which contributes 5-6% to the GDP growth. Of its total size, residential segment, with 90-95% size, forms the major chunk of the market, followed by the commercial segment (4-5%) and organised retail segment (1%).The real estate is not only one

of the major revenue generating sectors, but also responsible for driving out huge employment opportunities which is the need of the hour.

The Indian Aranca Research (2013) analysed that the Indian real estate market size is expected to touch US $ 180 billion by 2020. Foreign direct investment in the sector is expected to increase to US $ 25 billion in the next 10 years from the present US $ 4 billion. An analysis made by the research agency clearly shows that the real estate market size has grown from USD billion 50.1 during fiscal year 2008 to USD billion 66.8 during fiscal year 2011.

The Indian Confederation of Real Estate Developer's Association of India (2013), analysed that the real estate sector has a total supply pipeline of close to 3.6 billion sq ft lined up for completion in the year 2013. About 98% of this is concentrated in the residential segment, including organised as well as unorganised space. The spread of organized real estate space in leading cities of India in 2012 is shown in Figure 2.

<<Insert Figure 2>>

The Indian Confederation of Real Estate Developer's Association of India (2013), estimated that the total investment of about INR 254,000 crores, will help generate revenues worth INR 370,000 crores, and provide employment to about 7.6 million people across the country. The total contribution of the real estate sector in the gross domestic product of the country has been estimated to be about 6.3% in 2013. The Indian Confederation of Real Estate Developer's Association of India (2013), also analysed the growth in size of various segments of real estate in India from year 2005 to 2012, shown in the Figure 3. The figure clearly shows almost ten times growth in each of the segments.

<<Insert Figure 3>>

With such a massive supply of real estate units, it is very clear that the realty sector is one of the booming industries that will emerge as the major contributor to the national economy in the near future. In order to provide better perspective to the reality market, this research has been undertaken. The residential market in India constitutes majorly dominates the Indian real estate. Residential real estate industry has witnessed stupendous growth in the past few years. The current demand of Residential real estate across top seven cities in India as analysed by the Indian Cushman & Wakefield Research (2013) suggests that Delhi NCR is one of the top most cities when comes to residential real estate demand as shown in Figure 4.

<<Insert Figure 4>>

As noted by Sahel (27 Dec 2013), Vice Chairman of Lotus Green - Delhi NCR on an average sees new construction of 1 Lac residential units per annum. Of these, approximately 60 per cent lies in the Noida region. Although this massive development of residential real estate units provides the investors with plenty of options to invest in, but at the same time creates a situation of confusion regarding where exactly should they invest.

From above details, it is very clear that the real estate market in India as well as Delhi NCR is growing at a very fast pace. Investors who are willing to buy a property have numerous options. The investors who have minimal knowledge about the Growth potentials and opportunities of each sub regions are unable to arrive at an efficient decision. This research helps investors to in-depth analyse each sub region corresponding to their specific investment opportunity. This research helps the investors to identify the opportunities coupled by challenges of investing in a particular sub region of Delhi NCR. This will guide the buyers with a better & clear picture of the existing situation of the reality market of each

sub region of Delhi NCR. Thus, the research will eventually attract more number of buyers that will result into a speeding growth of real estate market growth.

From the developer's perspective it is important to understand the major contributors of real estate market growth of any area. The research will also inform the developers of the exact requirements of the buyers, thereby developing exactly what is desired. This will directly impact the real estate market growth. Thus, it is very clear that the research will benefit both the investors as well as developers, which are mutually responsible for real estate market growth of a sub region. The previous research applies linear models to address the development phases of the real estate market (Grebler and Burns 1982; Grenadier 1995). The other is based on nonlinear model analysis, such as fuzzy pattern recognition (Weng and Zhang 2004). However, nonlinear models lack of empirical analysis in the selection process of standard values for the indicators, so the research findings are very likely inconsistent with the development realities of the real estate market. This paper incorporates AHP method for evaluating the real estate market growth of Delhi NCR. This paper will be of great help to the domestic as well as foreign investors thereby driving the foreign direct investment into the Indian economy eventually leading to real estate market growth.

2. Literature Review

Li et al. (2014) investigated the application of artificial neural networks in the identification of real estate cycles for the case of China. The paper suggests that deep understandings of the cyclical changes in real estate market have significant meanings for market participants to make appropriate investment decisions. The paper innovatively applied artificial neural networks to identify real estate cycles in China, and accurately predicted its development phases with a well trained artificial neural network based on 1993–2008 historical training samples. The results indicate that, China's real estate market has

oscillational characteristics and the performance of the artificial neural networks reaches high accuracy.

Chiang and Yu (2013) investigated upon improving real estate broker service quality via TOPSIS and AHP. To a buyer, he will consider so many different criteria due to its impact on the product when he decides to buy a real estate or not. And some of these multiple criteria decision-making (MCDM) attempt to have conflicting decision objectives. An evaluation model is constructed to rank the priorities of the real estate properties by a broker using TOPSIS and AHP. It can be helpful to the real estate broker when he wants to locate multiple candidates whose attributes closely match the requirements of a buyer for the purpose of promoting a mutually agreeable match. This approach should increase the level of satisfaction among clients.

Tsai et al. (2013) analysed the real estate prices with a perspective of spatial correlation with shopping district. This study is to evaluate the difference of the prices of real estate in the three groups. There are 256 data chose form Taichung city and 121 data chose form Kaohsiung city. The classification depends on (1) the distance from shopping district is 500m. (2) the distance from shopping district is 500m to 1000m. (3) the distance from shopping district is 1000m to 1500m. The data were analyzed using Kruskal-Wallis one-way analysis of variance by rank, Wilcoxon rank sum test and Spearman's rank correlation coeff icient.

Narendran (2013) studied the residential real estate industry in India. The study examined the differences in residential property prices across different cities in India. It also projects how the Soaring prices have led to increasingly unaffordable property prices in large metropolitan cities. The study investigates the city-fixed effects on growth in house prices across fifteen different cities. The study concludes that, though different empirical models

suggest different conclusions about these effects, point estimates suggest above-normal growth in house prices in Delhi for the period 2009-2013.ill et al. (2012) investigated the Factors that Influence Indian Propensity to Invest in the Real Estate Market. This study examines the factors that positively influence the propensity of Indian investors to invest in the real estate market. This study examines the factors that positively influence the propensity of Indian investors to invest in the real estate market. The results show that investment expertise of investors, investors' knowledge of neutral information, investor's motivation from an advisor, and family positively influence the Indian propensity to invest in the real estate market. This study contributes to the literature on the factors that influence the investment propensity of investors.

Zhang et al. (2011) analysed the competitiveness evaluation for real estate developers. The paper presents a fuzzy competitiveness rating (FCR) method for measuring the competitiveness of real estate developers with referring to the Chinese real estate industry. Research data used for analysis were collected from a case study in Green Town Company. Research into the assessment of real estate developers' competitiveness has been limited. The fuzzy competitiveness rating method is proposed as an alternative effective approach in assessing the competitiveness of real estate developers. The FCR method furnishes real estate developers with innovative solution to assess their competitiveness. By understanding properly organizational competitiveness, real estate developers can adopt appropriate actions and strategies to utilize organization resources more effectively to enhance their competitiveness, thus improve their business performance in the real estate market.

With the rapid development of real estate industry in China, more and more people from all walks of life have started to pay attention to real estate prices. Wu & Guo (2011) screened out seven relevant factors which affect the real estate prices. They used DEMATEL method to analyze cause and effect relation among these influence factors and find out the main

factors which affect real estate prices, including supply and demand situation, oneself condition and population factors. The research aims to provide scientific basis for the government in the real estate industry to achieve effective of macro-control and management, and provide technical support for the investment decisions of the enterprise and the home buyers.

Mao and Wu (2011) introduced a fuzzy real option real estate project based on risk analysis which incorporated fuzzy mathematics to assess the levels of income risk and cost risk in the real estate investment, and then adjust the relevant parameters of fuzzy real option based on the above risk assessment of real estate project, which will improve the rationality and validity of the engineering potential value evaluation. Also, the paper illustrates the assessment model with an example of a real estate investment project in Hangzhou.

Jackson and Orr (2011) proposed the real estate stock selection and attribute preferences. The research enables fund managers to make hypothetical purchase decisions, viewing properties comprising a realistic bundle of attributes and making complex contemporaneous trade-offs between attributes, subject to their stated market and economic forecasts and sector specialism. The results reveal that 'fixed' property characteristics (location and obsolescence) are dominant in the decision-making process, over and above 'manageable' tenant and lease characteristics which can be explicitly included within models of probabilities of income variation. This reveals investors are making ex-ante risk judgements and are considering post acquisition risk management strategies. The study also reveals that behavioural factors affect acquisition decisions.

Zavadaska et al. (2010) developed a real estate's knowledge and device based-based decision support system. The research includes creating and maintaining customer's personalized real estate objectives, preferences, and evaluation criteria; participation of

various stakeholders (buyers, sellers, brokers, etc.) in joint determination of criteria (criteria system, values and weights) defining real estate; market signalling, provide device-based data about indoor microclimates and allergens causing allergy in buildings; searching for real estate alternatives, finding alternatives and making an initial negotiation table, completing a multiple criteria analysis of alternatives, making electronic negotiations based on real calculations, determining the most rational real estate purchase variant, and completing an analysis of loan alternatives offered by certain banks.

Guidice et al. (2011) formulated a decision support system for real estate investment choice. The research develops a measureable decision support system that takes into account the key factors that determine the 'attractiveness' of such investments in a competitive context. The paper aims to design an integrated complex evaluation model that is able to map out and encapsulate the multidimensional spectrum of factors that shape the attractiveness of alternative real estate options. It involves selecting the relevant attributes for the specification of a random utility model capable of simulating the behaviour of market operators when they are faced with a choice between alternative real estate investment sites.

Falkenbach (2009) developed a framework for market selection for international real estate investments. The paper studies the market selection criteria in international real estate investments. It presents the results of a questionnaire study among internationally investing property investors in Europe. The results indicate that the most important factors for market selection are safety of property rights and title as well as expected return on property investments. Also other factors describing institutional set-up and market maturity were found to affect the market selection process, whereas the correlation of the property returns was not found to have a large impact on market selection.

Wadhwani (2009) analysed the opportunities and challenges of investing in one emerging market, the Indian real estate. With a population of over 1 billion, India has been a major beneficiary of the "Globalization of Real Estate". This thesis identifies the opportunities in India that have caused global capital to flow into Indian real estate and the key factors driving Indian real estate. It explains the challenges of investing in Indian real estate and seeks to provide strategies for navigating the real estate landscape in India.

Arora (2008) investigated the real estate sector in the Indian economy for investment opportunities. It undertakes an analysis of the Indian economy with a focus on the real estate for investment opportunities. Indian real estate sector is believed to offer foreign investors with an attractive opportunity of investment and lead to rapid expansion in FDI and international trade. Venture funds entries in real estate are expected to add to the growth momentum created by affordable financing options and rising disposable incomes. The result of the study clearly shows a bright future in the real estate sector in the Indian economy apart from all the risks involved in investment in real estate markets.

Mehta (2007) made a study involving quantitative approach for analysing Indian Real Estate Market for Investment. The study focussed upon evaluation of the investment opportunities present in the Indian real estate market. The research examines the different aspects of the market such as the importance of India as an investment destination, hindrances in the market, sources of capital available, scope of the industry etc to get a deeper insight of the market. These factors have helped to determine the factors to be considered before investment.

Peng & Xin (2007) evaluated the growth of real estate financial system based on BP neural network. The paper chooses 14 main indexes to compose an evaluation index system. Based on the evaluation index system, an error -back-propagation BP network model is built

to evaluate the growth of real estate finance. Data of real estate financial system from 1997-2005 are used as train and test samples of BP neural network. After training, the BP neural network is used to evaluate and forecast by simulation. So by using the evaluation model of this paper, decision makers can decide to use what kind of macro adjusting and controlling policies to gain anticipated aim of real estate finance in the future.

3. The Study Area

The real estate market of Delhi National Capital Region (Delhi NCR) has shown a significant growth in the past oweing to its surrounding areas which act as a major support to the Core city when it comes to infrastructure potentials. The surrounding areas also termed as suburbs having a hold of massive parcel of lands, provides a more affordable options to the prospective investors. This affordability is enjoyed by the developers in terms of easy and cheap availability of land.

The Indian Jones Lang LaSalle (2013) studied the spread of each of the three segments of Delhi NCR. The research clearly shows that highest number of residential inventory lies in Gurgaon sub region followed by Noida & Ghaziabad. A major chunk of commercial and retail segments of real estate have came up in suburbs as compared to the core Delhi city.

The Indian Knight Frank Research (2011) analysed the supply of residential segments of real estate in the core city as well as the different surrounding regions during the year 2009-11. This analysis shows that core Delhi has merely 2% of hold which on the contrary is dominated by the peripheral towns including Gurgaon, Faridabad, Noida and Ghaziabad.

From the above set of data presented as evidence, it is very clear that the suburbs are the major drivers of the variations of the real estate market of NCR as a whole.

3.1 Hot Spots for Real Estate of Delhi NCR

Delhi NCR is an agglomeration of certain satellite towns surrounding the core, which includes Noida, Ghaziabad and Gurgaon (Bhandari et al., 2011). It is very clear that the major areas that are either experiencing or expected to see a prominent real estate growth in the near future are the sole drivers of real estate market of Delhi NCR. The current hot spots for real estate market of Delhi NCR are presented in Figure 5 below:

<<Insert Figure 5>>

4. Methods of Study

The objective of the study is to find out the potentiality of real estate market in Delhi NCR. More specifically, we identify and categorize the market potential of real estate business in Delhi NCR. The investigation procedure involves various steps, which is underlined below.

4.1 Identification of Attributes / Factors

In the specific sector of the housing market, the capacity to attract investments is defined as the ability of a territory to offer a favourable environment for investors and users, that is able to attract individuals looking for places where they can locate their property investment or settle (Gabetti and Nomisma, 2005).The real estate market of any sub region is influenced by the collective impact of various physical and social factors which prevail in the locality. The various significant factors that influence the real estate market growth of a sub region are collected from various research papers. 'Residential location/Connectivity, Shopping location/Commercial hub and land use factor' comprise the list (Jun, 2011). Location/Connectivity factor is an important aspect of real estate market evaluation and has been used by various other authors in the past (Gayda 1998; Walker et al. 2002;

Kim et al. 2005; Ortuzar et al. 2000; Bravi and Giaccaria 2006; Rosato et al. 2008). 'Land availability and government policies' also turn out to be the relevant factors influencing the growth (Zhang et al. 2011). Another important factor which impacts the real estate market includes 'affordability' and 'returns' (Jackson and Orr, 2011; Falkenbach 2009). Affordability is also used by various other authors (Cooper et al. 2001; Earnhart 2002; Gayda 1998; Perez et al. 2003; Walker et al. 2002; Wang and Li 2004; Kim et al. 2005; Bravi and Giaccaria 2006). Apart from it, 'existing infrastructure (physical and social), Floor space Index and connectivity' is counted as a significant factor that influences the reality market (Tsai et al., 2013). For a region like Delhi NCR, where each destination has its specific identity in terms of its own growth potentials, the real estate market growth is an integrated impact of the influencing factors. Ball and Srinibasan (1994) proposed a second order hierarchy structure applying AHP for the house selection decision making. Following the same structure the various factors are arranged and are presented in the form of tree diagram in Figure 6 below:

<<Insert Figure 6>>

4.2. The Assessment of Relevant Attributes

4.2.1 Data Sampling

Due to the difficulties in data acquisition and lack of transparency for quantitative data available in the field of real estate, the majority of current research is merely qualitative description (see for instance, He et al. 1996; Zhang and Sun 2006). We also follow the similar pattern in our study. The study follows face to face interviews with the people related to real estate so as to reach a suitable conclusion. It enables to find out about the attitudes, thoughts & behaviour of the people (End users & Investors) towards real estate market of

Delhi NCR. The process has two steps: identifying the sub regions; and identifying the respondents.

Step 1: Identifying the Sub Regions

While working upon this section of the research, it is very peculiar to frame out the study area and spotting the target areas. In this study, as the major concern is to identify the hot spot investment destinations having specific growth potential in the near future. So, basically there are two major assumptions that have been made while figuring out the target areas to be considered. These include:

- A major fraction of area surrounding a particular investment destination, grow in a similar development pattern as the core destination has came up.

- In many of the cases, these areas adhere by the same Government policies as is applicable for the core destination.

Taking these assumptions on mind, the areas fulfilling the above two criterions are considered as one sub-region. In the Delhi NCR case, the major destinations, which are expected to experience a significant real estate activity in the near future as discussed includes North Delhi, South Delhi, West Delhi, Noida City, Noida Expressway, Greater Noida West, Ghaziabad, Gurgaon, Bhiwadi. Incorporating the above discussed assumption into my research, the major target areas area shown in Figure 7.

<<Insert Figure 7>>

Step 2: Identifying the Respondents

As stated above, in the field of real estate in the Indian market there is lack of transparency and low quality data available, the main task is to identify the respondents who have in depth knowledge of the real estate market trends of their specific locality. As this

project involves much of a buyers/investors perspective, it is also essential that the respondents must have interacted with the investors/buyers, so that they may have a better understanding of their aspirations and sentiments (Hui et al. 2012). Keeping these intentions on priority, the major sets of respondents that have been interviewed include Developers; and Real Estate Agents/Property Dealers. These players of real estate market have also been mentioned in the research done by (Breuer and Kreuz 2011). Seven respondents/experts from each sub region have been interviewed.

4.2.2 Structure of the survey

A survey questionnaire was prepared which was used to interview each of the twenty eight interviewees in the different sub regions of Delhi NCR. The survey is split into majorly two steps mentioned below:

Step 1: The Pair Wise Comparison of Criterion & Sub Criterion

The survey comprises of pair wise comparison of each of the significant factor (Criterions & Sub Criterions). This pair wise comparison values on a ten point scale (0 – 10) is shown in the tree diagram in Figure 8 below:

<<Insert Figure 8>>

Step 2: The Pair wise Comparison of Investment Destination (Alternatives)

This step involves a pair wise comparison of alternatives/various real estate investment destinations, against each of the sub criterions which eventually impact the real estate market of a sub region. The experts from each of the four sub regions on the basis of full understanding of exact market scenario are required to assign comparison values to each of the sub region from a pair of them, in context of the various sub criterions shown in Figure 9 below.

<<Insert Figure 9>>

4.2.3 Data Collected from the Survey

The pair wise comparison values on ten point scale (0-10) as obtained from the twenty eight surveys are arrived at common opinion by taking geometric mean of each of comparison value. The Geometric mean value for each pair is presented in a tabular form. *Pair wise comparison of criterions and sub criterions*: Shown in Tables 1 & 2 below.

<<Insert Tables 1-2>>

Pair wise comparison of alternatives:

The subsequent Table 3 shows the pair wise comparison of alternatives corresponding to each of the sub criterions.

<<Insert Table 3>>

4.3 Data Analysis & Interpretation technique

Several researches have been done, which involves the analysis of various components associated with the real estate market using different analysis tools. The use of AHP concerning real estate analysis is very effective and has been incorporated by several researchers in the past as well.

Chiang and Yu (2013) investigated upon improving real estate broker service quality via TOPSIS and Analytical Hierarchy Process (AHP). The pair-wise comparison underpinning the Analytical Hierarchy Process (AHP) used by Hutchison et al. (2005) to estimate the impact of specific factors on current real estate investment risk perceptions, or the triadic comparison involved in Personal Construction Theory and Repertory Grid techniques (for

example, these methods were used by Timmermans, van der Heijden, and Westerveld (1982) and Preston and Taylor (1981) to examine the decision making preferences of shoppers and residential home buyers, respectively (Xi et. al., 2011) proposed a model for real estate investment risk evaluation using AHP and Grey system theory. The risks of the real estate based on analytic hierarchy process and simulation (Jiang et al., 2007). The influence factors of the real estate price analysis based on fuzzy evaluation (XU Jing et al., 2008).

The analytic hierarchy process (AHP) is a well known method for analyzing multiple quantitative and qualitative criteria for purpose of generating weights or ranking (For a view of the basics of AHP methodology see Satty, 1980, or Ball and Srinibasan, 1994). The output of the AHP process is the mathematical weights that reflect the relative importance of each of the criteria when compared against all other criteria. The greater the AHP weight, the greater the relative importance of that criteria.

Regarding data analysis, either the computational procedure described by Srinvasan and Kim (1994) can be used to compute the weights or micro computer software can be used such as Statistical Package for the Social Sciences (SPSS) (Schniederjans et al. 1995) etc. In the present research, online software named 'Makeitrational' is used. The software is an easy to use decision-making software for making important choices in groups and individually. It Organizes Multi-Criteria Evaluation and Simplifies Decision Making. The software basically involves the Analytical Hierarchy Process (AHP) method to develop the framework in the process of decision making and prioritization. The AHP method allocates the global & local weights to each of the component of analysis. These weights presented in the data interpretation part are further used to arrive at final results in terms of prioritizing the various alternatives and sorting out the short comings against each alternative.

The global and local weights allocated to each of the criterion & sub criterion is presented in the Table 4 below:

<<Insert Table 4>>

From the table above it is very clear that the 'availability of land' is the most important factor that contributes towards the real estate market growth of any sub region. Followed by the 'land availability factor is the 'affordability' factor which drives the real estate market growth. Next in the importance scale lies the 'mixed use development policy' which enhances the real estate market growth. Finally, the last but significant factor that contributes towards the reality market growth is 'commercial/industrial hub' which eventually attracts the residential real estate growth.

5. Results and Discussion

5.1 Prioritization/Ranking of Real Estate Investment Destinations: DELHI NCR

The result shown in Figure 10, clearly suggests that the cumulative influence of all the criterions on the reality market growth is maximum for Noida. The sub region also takes a lead from others in the context of 'number of project launch' and 'influence of Government policies' holding highest FSI and mixed use development. Also the increased demand criterion has a significant influence on the real estate market of Noida. Thus, overall Noida has the best prospects of reality market growth.

<<Insert Figure 10>>

So, while making a real estate investment, the properties at Noida should be of order-one priority. Following the queue, Gurgaon can be placed at the order-two in the priority. Being

one of the most affordable destinations, Ghaziabad can be placed at order-three. For the reasons of very low prospects of further development, Delhi should be given the last place in the priority order.

5.2 Ranking in context of: Number of project launch

The result shown in Figure 11 considering, number of project launch, Noida is enjoying the maximum benefit out of it. The land availability factor majorly contributes to the reality market of Noida and Gurgaon. This is being realized at Noida extension which is experiencing the maximum number of upcoming projects. Besides, Dwarka expressway scored second position in number of upcoming projects.

Although the existing infrastructure has a major influence in Delhi, but due to very low land availability and thereby low prospects of further development, the overall market growth is subdued. The commercial/industrial hub factor has maximum contribution towards growth of reality market of Gurgaon. Being the top most commercial hub as well as Bhiwadi emerging as industrial hub with a hold of 2500 industrial units, the prospects are well off.

<<Insert Figure 11>>

5.3 Ranking in context of: Increased demand of Residential Real Estate units

The increased demand of residential real estate factor dominantly influences the reality market of Ghaziabad oweing to its highly affordable property range, shown in Figure 12. Besides, the good connectivity is also responsible for the real estate market growth in Ghaziabad.

<<Insert Figure 12>>

The affordability factor is also highly influencing for the realty market growth of Noida as well. Besides, the higher returns factor (maximum for Noida) is also enhancing the reality market in Noida to great extent. Although, the connectivity has maximum influence on reality market of Delhi city, but possessing very low affordable segments of property and depreciating returns, the overall market growth is subtle.

The cumulative influence of affordability, connectivity and returns has least contribution towards the real estate market growth of Gurgaon.

5.4 Ranking in context of: Influence of Government policies on Real Estate growth

Considering the influence of Government policies on the real estate market growth, the privilege of highest FSI and recent incorporation of mixed use development policy is majorly responsible for the reality market growth in Noida, shown in Figure 13. The land acquisition issues had slightly suppressed the market sentiments, with least contribution towards market growth.

<<Insert Figure 13>>

While, these factors have an almost equal impact on the reality market of other sub regions, the Government should take initiatives to propose the provisions of higher FSI as well as mixed use developments, both of which are responsible for drastically enhancing the reality market of any sub region.

6. Conclusion

The project builds a strategy to prioritize the various real estate investment destinations across Delhi NCR by implementing a methodology that includes AHP. The conclusions which can be made from the study are presented in the Table 5. The table shows the

preference order based upon individual ranks which an individual should take into consideration while buying a property. The table also highlights the specific opportunities offered by each destination which places it at a certain position in the ranking list.

<<Insert Table 5>>

From the above discussion it is very clear that the reality market of Noida is highly progressive supported by the various growth potentials which enhance the real estate activity in the sub region. The sub region also takes a lead from others in the context of 'number of project launch' and 'influence of Government policies' holding highest FSI and mixed use development. Also the increased demand criterion has a significant influence on the real estate market of Noida. Thus, overall Noida has the best prospects of reality market growth.

So, while making a real estate investment, the properties at Noida should be of order-one priority. Following the queue, Gurgaon can be placed at the order-two in the priority. Being one of the most affordable destinations, Ghaziabad can be placed at order-three. For the reasons of very low prospects of further development, Delhi should be given the last place in the priority.

6.1 Infrastructure Development Strategy for Different Sub-Regions of Delhi NCR

The following tables show the contribution of each of the sub criterion towards the real estate market growth of different sub regions of Delhi NCR. The values corresponding to the alternative against each sub criterion is a quantified representation of the existing condition (shown in Tables 6, 7 & 8). These values help identify certain shortcoming in the infrastructure, growth potential and other significant contributing factors towards the real estate market growth.

Comparison in context of: Number of Project Launch

<<Insert Table 6>>

Comparison in context of: Increased demand of Residential Real Estate units

<<Insert Table 7>>

Comparison in context of: Influence of Government policies on Real Estate growth

<<Insert Table 8>>

The lowest values corresponding to each of the sub criterion against the alternative suggests the weak point of that particular sub region. These values of sub criterion representing the infrastructure & growth potential would be used in the succeeding step while framing the 'Infrastructure Development proposal plan'.

The values obtained in the Tables (6, 7 & 8) are a numerical representation of the existing scenario of infrastructure and other growth potential related to real estate market of a sub region. The lowest value against each sub criterion corresponding to that specific alternative represents the weak node of growth. This weak node should be focussed upon while framing an Infrastructure development proposal plan for a particular sub region. This will impart equal growth potential to each of the sub region, thereby leading to a balanced and uniform development of the region. The very basic generalized guidelines in terms of infrastructure development strategy for the different sub regions are presented in the Table 9 below:

<<Insert Table 9>>

6.2 Key Recommendations

The study suggests the following recommendations:

- Land availability if made easier, it will help in increase in real estate investment thereby leading to reality market growth.

- Developers should go for affordable segment of 700 – 900 sqft.2BHK flats which would be priced ranging between 20 – 50 lacs. This segment is the most preferred layout which attracts the mid segment buyers. This will ensure good returns to the developers in the future.

- Government should offer more flexibility towards the mixed use type development. Since integrated housing projects have higher market potentials as they are more suited to the demand for residential houses. It will provide impetus to the real estate growth.

- In order to achieve uniform spatial growth, the Government should normalize the FSI norms so that each sub region may have equal prospects of developments. This will not only attract more number of real estate developers, but also ensure that all the spokes of the hub Delhi NCR are expanding at a uniform pace, thereby maintaining a balance between growths of different sub regions. This will eventually lead to sustainable development.

As noted by Arora (Dec 19, 2012), M.D. Supertech Limited - infrastructure growth should be in conjunction with real estate development. The study emphasizes upon the significant factors related to real estate investment and subsequent growth potential of Delhi NCR. The study also indicates the limitations in the primary factors contributing to real estate growth which need to be taken care of in the future so as to maintain a balance between different sub regions in terms of pressure on the existing housing development, infrastructure and environment. Delhi NCR being prime example of hub and spoke model, this will

eventually lead to balanced and sustainable development that will result into uniform expansion of the city involving equal growth in all the sub regions.

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Appendix 1: FIGURES
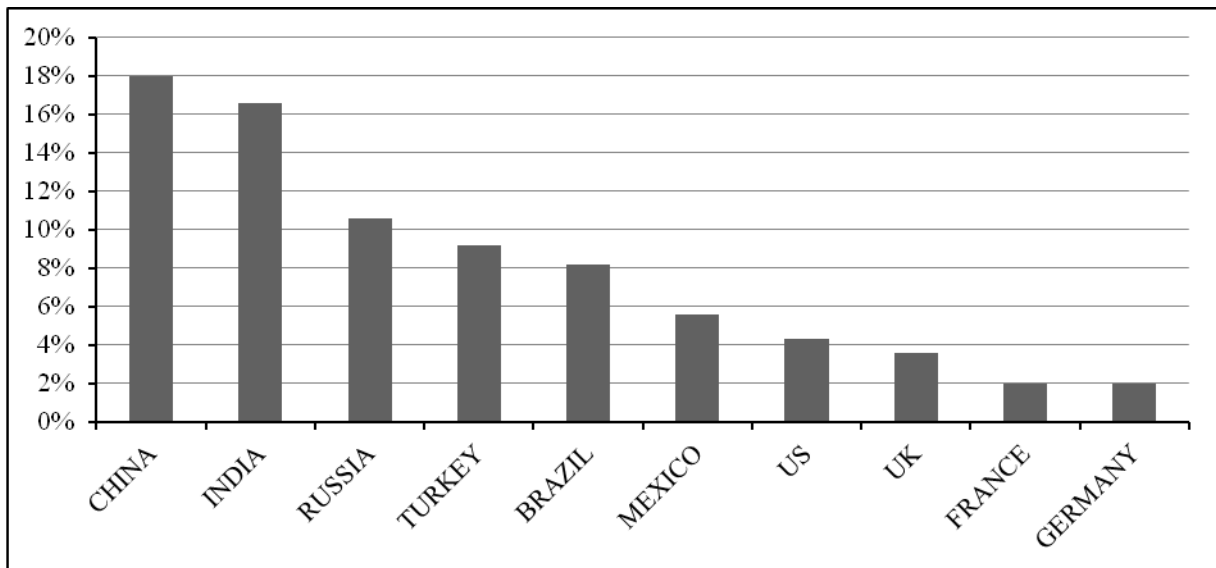
Figure 1: Annualized Growth of Real Estate in Select Countries, 2011-21

Source: Pramerica
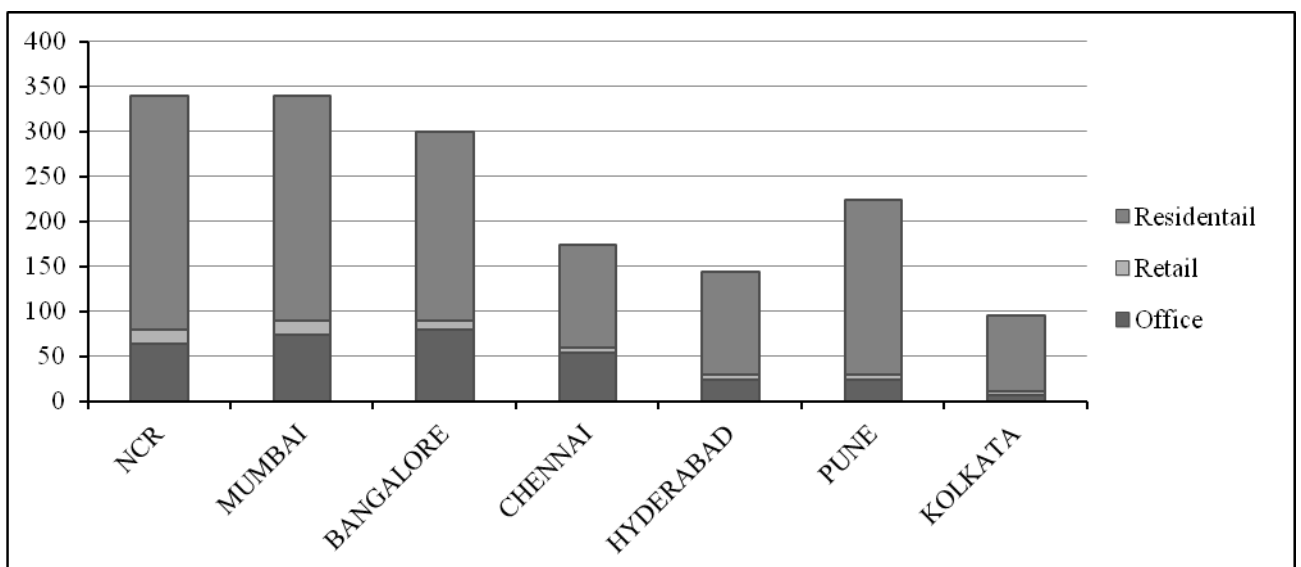
Figure 2: Spread of Organized Real Estate in Leading Cities in India (2012)

Source: C.B. Richard Ellis
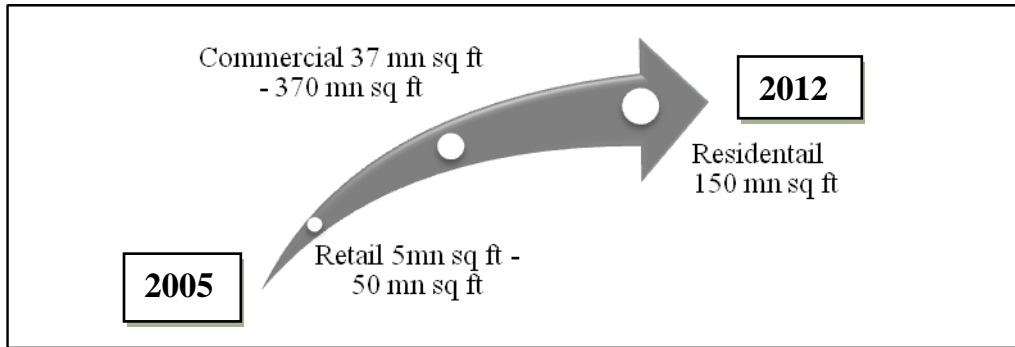
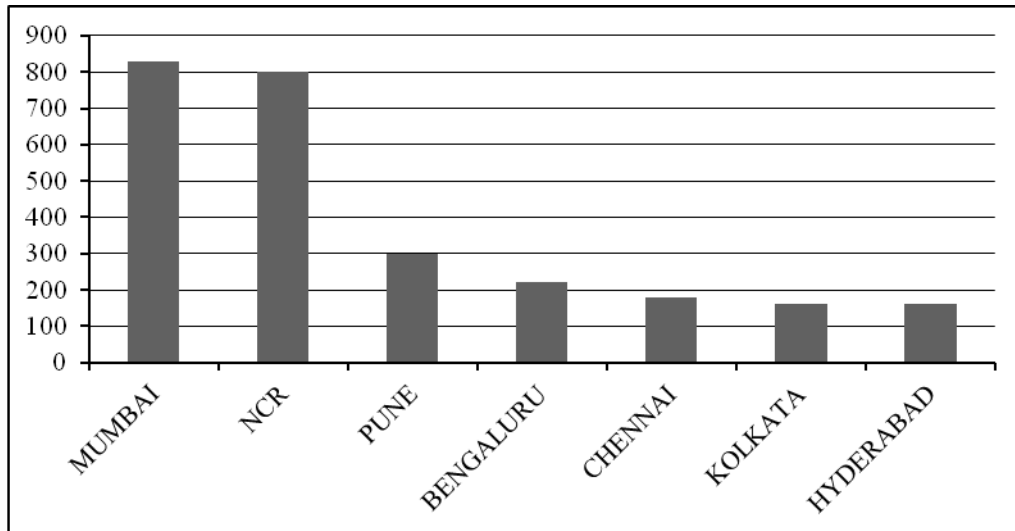**Figure 3: Growth of Real Estate Almost Ten Times (2005-12)**

Source: CREDAI

Figure 4: Demand Analysis of Top 7 Cities (000 UNITS), 2010- 14
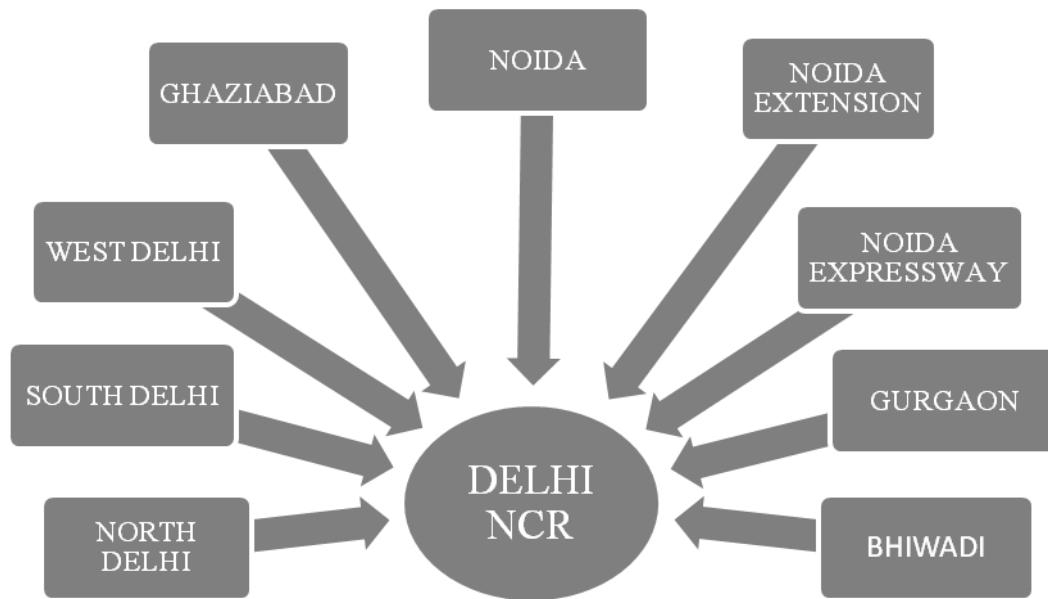
Source: Cushman & Wakefield

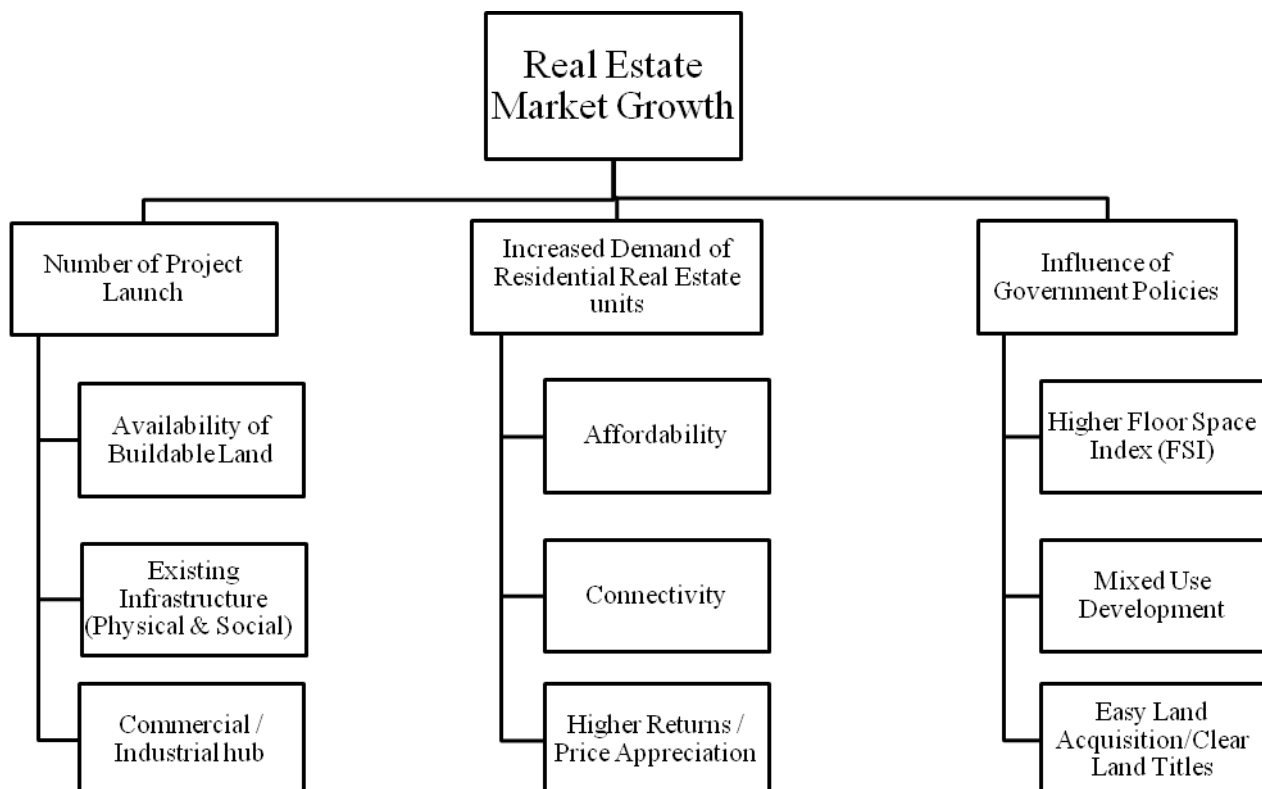**Figure 5: Current Hot Spots for Real Estate Industry of Delhi NCR**

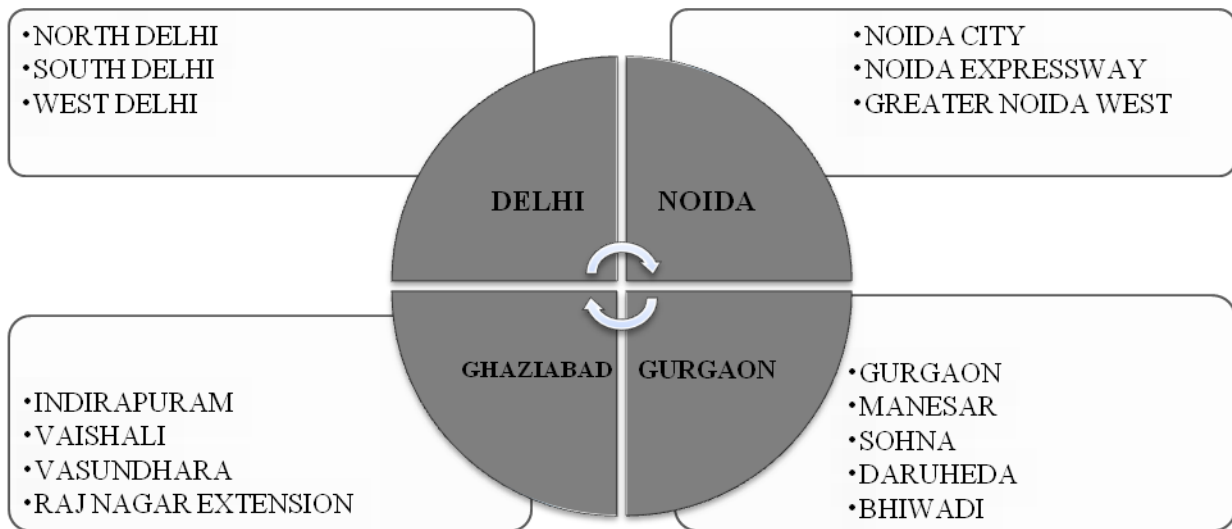**Figure 6: Significant Factors Influencing Real Estate Market Growth of a Sub Region**
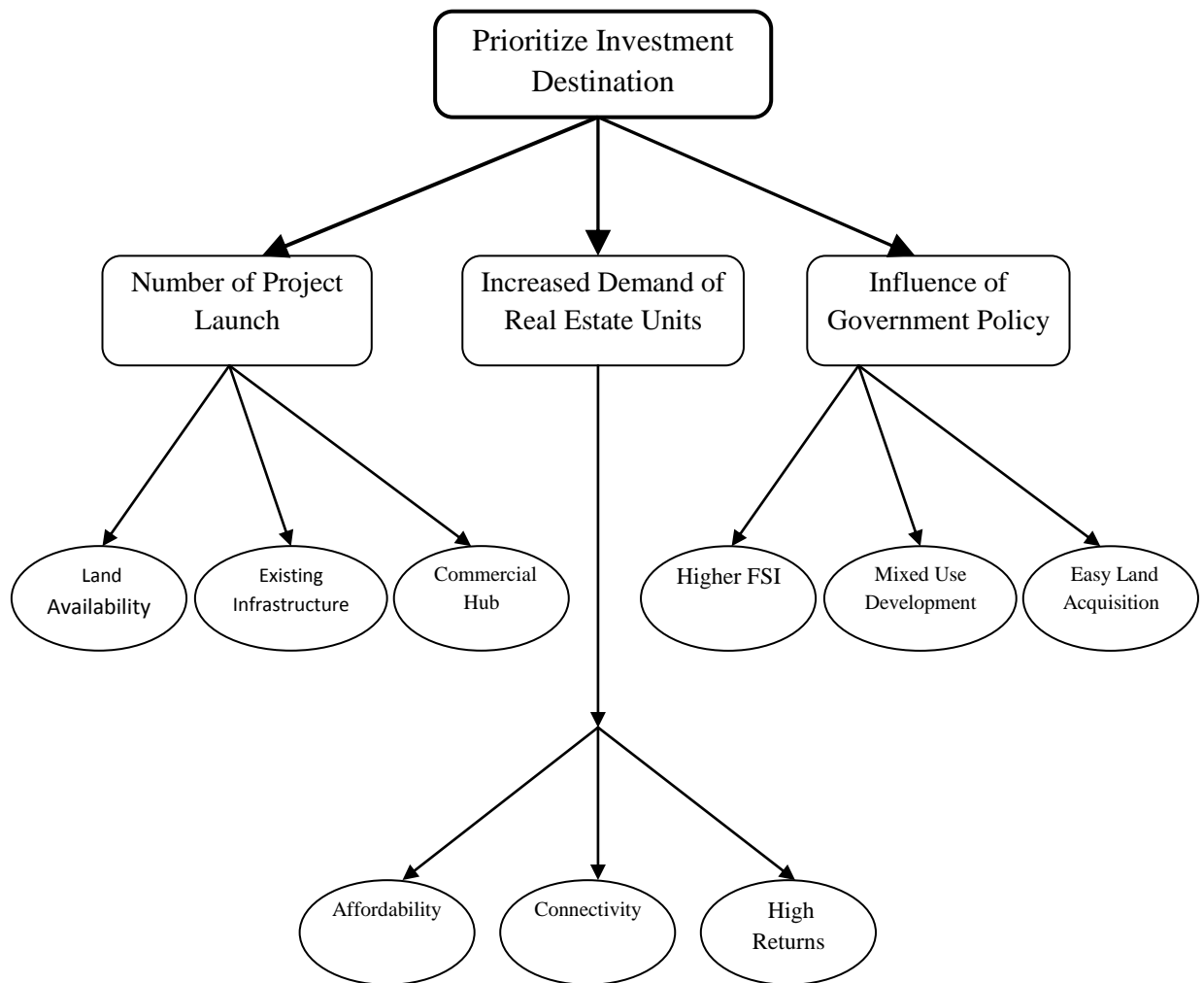
Figure 7: Identifications of Sub-Regions in Delhi NCR

Figure 8: Tree Diagram Showing Pair Wise Comparison of Criterions and Sub Criterions
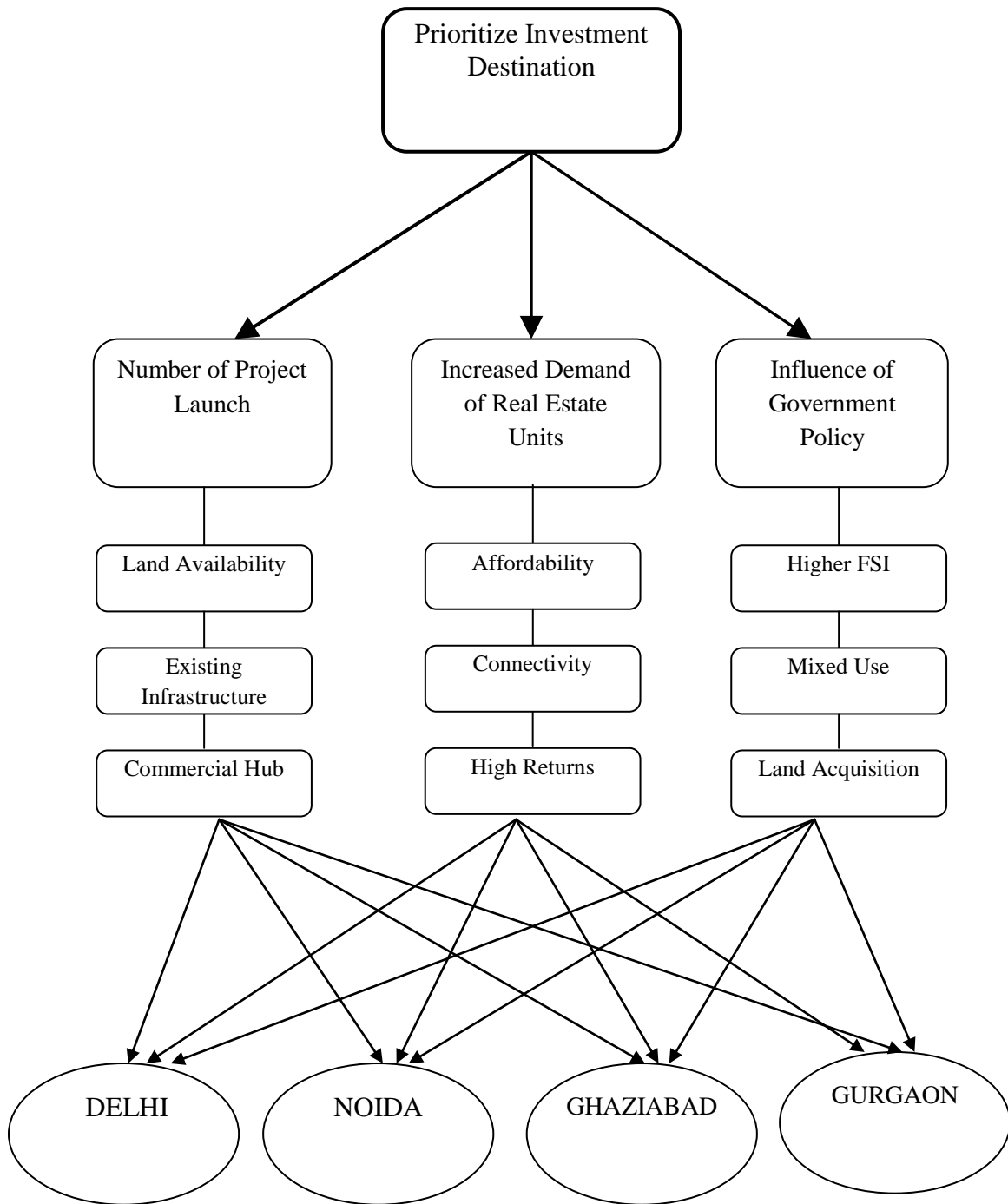
Figure 9: Tree Diagram Showing Pair Wise Comparison of Alternatives against Each Sub Criterion
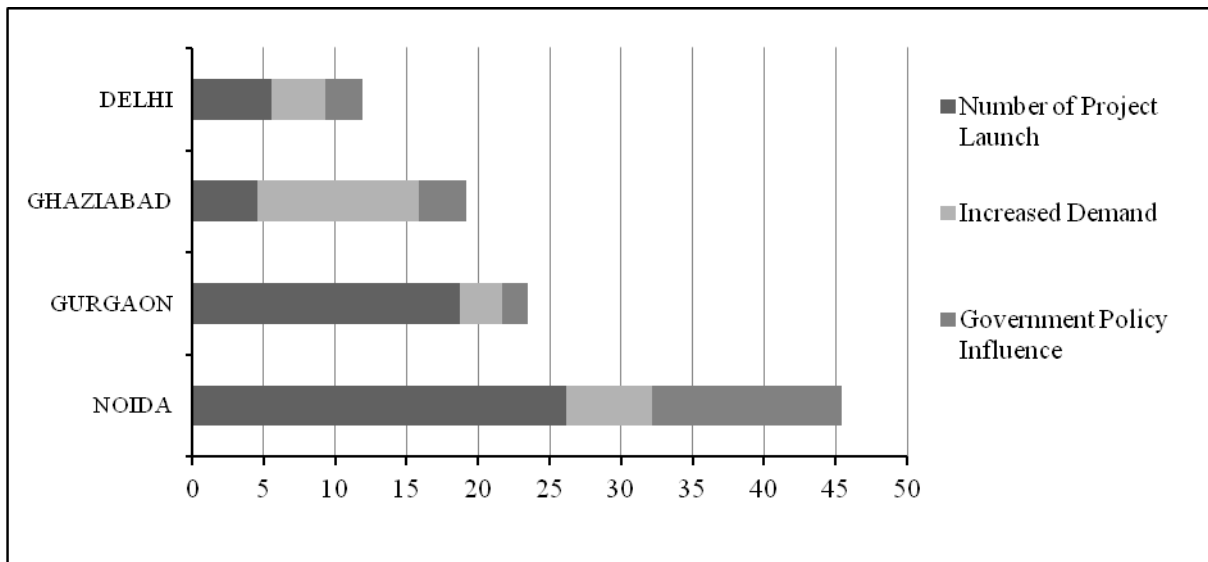
Figure 10: Overall Ranking of Real Estate Investment Destinations of Delhi NCR

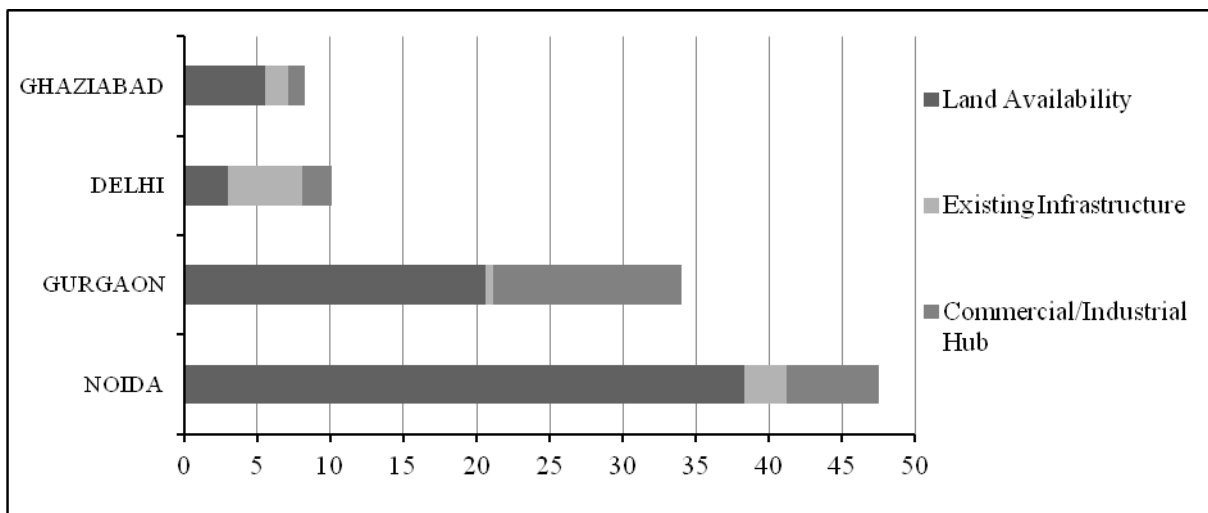**Figure 11: Ranking in Context of Criterion 'Number of Project Launch' Integrating Contribution of Each Sub Criterion**
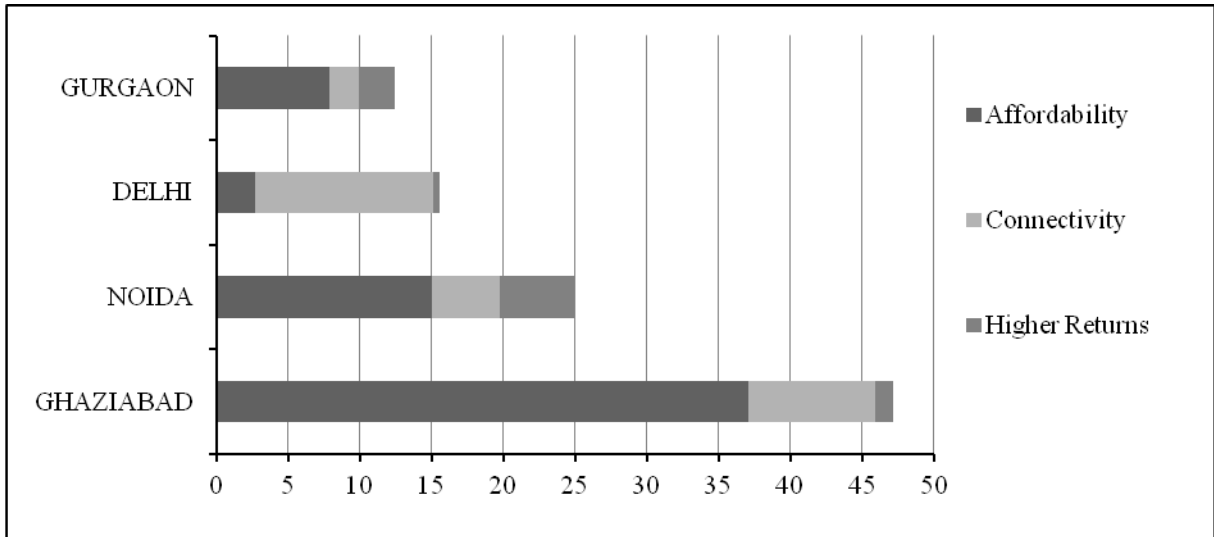
Figure 12: Ranking in Context of Criterion 'Increased Demand' Integrating Contribution of Each Sub Criterion
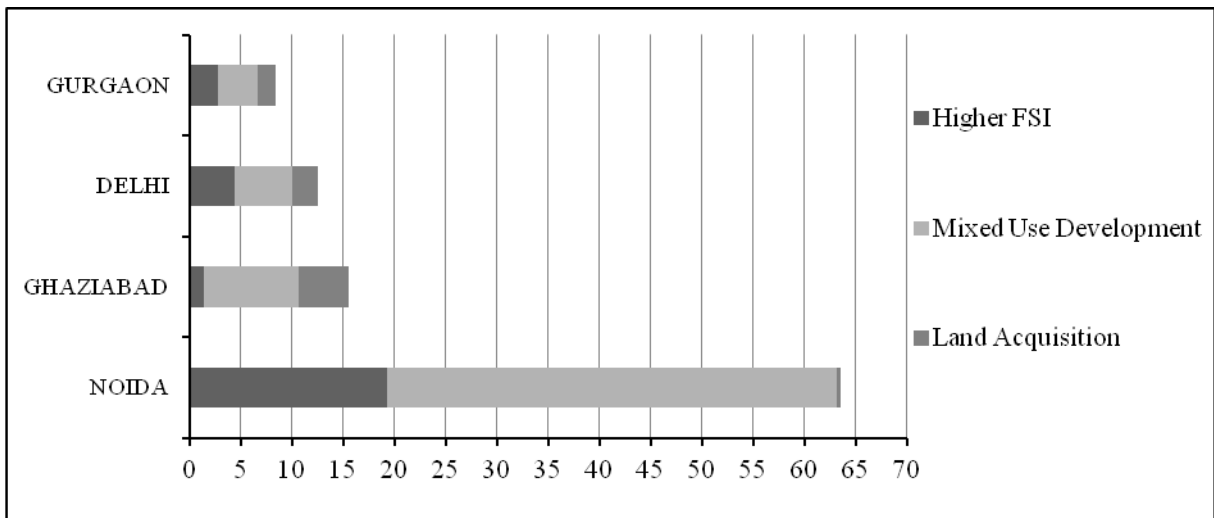
Source: Authors Findings

Figure 13: Ranking in Context of Criterion 'Government Policy Influence' Integrating Contribution of Each Sub Criterion

Source: Authors Findings

Appendix 2: TABLES

Table 1: Pair Wise Comparison Values of Criterions

Pair Wise Comparison of Criterion		
Number of project launch - Increased demand	Number of project launch - Influence of Govt policy	Increased demand - Influence of Govt policy
4.5	4	5

Source: Authors' Expert Survey

Table 2: Pair Wise Comparison Values of Sub Criterions

Pair Wise Comparison of Sub Criterion		
Number Of Project Launch		
Availability of land-Existing Infrastructure	Availability of land - commercial/Industrial hub	Existing Infrastructure-Commercial /Industrial hub
3	3.5	6
Increased Demand of Residential Real Estate		
Affordability-Connectivity	Affordability-Returns/ Price Appreciation	Connectivity-Returns/ Price Appreciation
4	3	3.5
Influence of Government policies on Real Estate growth		
Higher FSI - Mixed Use Development	Higher FSI - Easy Land Acquisition	Mixed Use - Easy Land Acquisition
6	3.5	3

Source: Authors' Expert Survey

Table 3: Pair Wise Comparison Values of Alternatives against Each Sub Criterions

Pair Wise Comparison of Alternative Against Each Sub Criterion					
Availability Of Land					
Ghaziabad-Delhi	Noida-Delhi	Gurgaon-Delhi	Ghaziabad-Noida	Noida-Gurgaon	Ghaziabad-Gurgaon
4	1.5	2	8	4	7.5
Existing Infrastructure (Physical & Social)					
Ghaziabad-Delhi	Noida-Delhi	Gurgaon-Delhi	Ghaziabad-Noida	Noida-Gurgaon	Ghaziabad-Gurgaon
6	6	7.5	6	3	3
Commercial/Industrial Hub					
Ghaziabad-Delhi	Noida-Delhi	Gurgaon-Delhi	Ghaziabad-Noida	Noida-Gurgaon	Ghaziabad-Gurgaon
6	3	2	7	6	8
Affordability					
Ghaziabad-Delhi	Noida-Delhi	Gurgaon-Delhi	Ghaziabad-Noida	Noida-Gurgaon	Ghaziabad-Gurgaon
1.5	2.5	3	3.5	4	3
Connectivity					
Ghaziabad-Delhi	Noida-Delhi	Gurgaon-Delhi	Ghaziabad-Noida	Noida-Gurgaon	Ghaziabad-Gurgaon
5.5	6	6.5	4	3.5	3.5
Returns/Price Appreciation					
Ghaziabad-Delhi	Noida-Delhi	Gurgaon-Delhi	Ghaziabad-Noida	Noida-Gurgaon	Ghaziabad-Gurgaon
3.5	2.5	3	7	4	6
Higher Floor Space Index (Fsi)					
Ghaziabad-Delhi	Noida-Delhi	Gurgaon-Delhi	Ghaziabad-Noida	Noida-Gurgaon	Ghaziabad-Gurgaon
6.5	2	5.5	8.5	2	6
Mixed Use Development					
Ghaziabad-Delhi	Noida-Delhi	Gurgaon-Delhi	Ghaziabad-Noida	Noida-Gurgaon	Ghaziabad-Gurgaon
4.5	1.5	5.5	8	2	4
Easy Land Acquisition/Clear Land Titles					
Ghaziabad-Delhi	Noida-Delhi	Gurgaon-Delhi	Ghaziabad-Noida	Noida-Gurgaon	Ghaziabad-Gurgaon
4	7.5	5.5	2	7	4

Source: Authors' Expert Survey

Table 4: Allocated Local & Global Weights towards Each Component

Criterion	Global Weight [%]	Local Weight[%]
Prioritization of Real Estate investment destinations : DELHI NCR	100	100
Number of project launch	54.99	54.99
Availability of buildable land	**37.06**	67.38
Commercial/Industrial hub	**12.4**	22.55
Existing infrastructure (Physical & Social)	5.54	10.07
Increased demand of Residential Real Estate units	24.02	24.02
Affordability	**15.05**	62.67
Connectivity	6.72	27.97
Higher Returns / Price Appreciation	2.25	9.36
Influence of Government policies on Real Estate growth	20.98	20.98
Higher Floor Space Index (FSI)	5.87	27.97
Mixed use development	**13.15**	62.67
Easy Land Acquisition/Clear Land Titles	1.96	9.36

Source: Authors Findings

Table 5: Prioritization of Real Estate Investment Destination Highlighting Specific Opportunities

Real Estate Investment Destination Ranking			
(1) NOIDA	**(2) GURGAON**	**(3) GHAZIABAD**	**(4) DELHI**
• Maximum availability of land • Affordable options available • Highest expected returns (30-40%) • Highest FSI & Mixed use developments	• Largest commercial/ industrial hub • Significant land availability • Significant returns (30-35%)	• Highly affordable options • High level of connectivity • Easy land acquisition • Prospects of Mixed use	• Lowest affordability • House Price depreciation • Selected commercial & no industrial hub • Low prospects of mixed use development

Source: Authors Findings

Table 6: Quantified Representation of Existing Condition in Context of Number of Project Launch Criterion

CRITERION	GURGAON	GHAZIABAD	NOIDA	DELHI
• **Land Availability**	30.54	8.17	56.9	4.39
• **Existing Infrastructure**	**5.29**	**16.14**	**28.12**	50.45
• **Industrial Hub**	57.41	**5.23**	**28.21**	**9.15**

Source: Authors Findings

Table 7: Quantified Representation of Existing Condition in Context of Increased Demand Criterion

CRITERION	GURGAON	GHAZIABAD	NOIDA	DELHI
• **Affordability**	12.61	59.16	23.97	**<u>4.26</u>**
• **Connectivity**	**<u>7.21</u>**	31.59	**<u>16.85</u>**	44.35
• **High Returns**	26.39	13.01	55.09	5.51

Source: Authors Findings

Table 8: Quantified Representation of Existing Condition in Context of Government Policy Influence Criterion

CRITERION	GURGAON	GHAZIABAD	NOIDA	DELHI
• **Higher FSI**	**<u>10.21</u>**	**<u>4.99</u>**	69.11	**<u>15.69</u>**
• **Mixed use Development**	**<u>6.19</u>**	**<u>14.85</u>**	69.89	**<u>9.07</u>**
• **Easy land Acquisition**	17.35	52	4.85	25.8

Source: Authors Findings

Table 9: Infrastructure Development Strategy for Various Sub-regions of Delhi NCR

Infrastructure Development Strategy			
(1) NOIDA	**(2) GURGAON**	**(3) GHAZIABAD**	**(4) DELHI**
• Provide more Commercial & Industrial units. • Improve infra - Power cut & Water supply. • Improve Connectivity – Railway station & Airport • Solve the Land acquisition issues at priority	• Improve infra – Power cut & Drinking Water, Parks. • Improve Connectivity – Public Transport & Railway station • Incorporate Higher FSI – 3.5 & Mixed use development.	• Improve infra – Power, Water, Schools, and Parks. • Establish Commercial & Industrial Units • Higher FSI – 3.5 should be incorporated • Incorporating 'Mixed development policy'	• Establishing more Commercial hubs • Higher FSI - 3.0 should be incorporated • Incorporating 'Mixed development policy' • Ceiling down circle rates - Affordability