Impact of Environmental and Amenity factors on Urban House Prices: A Micro Level Study

KEYWORDS

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ABSTRACT *Land is a unique creation and a precious gift of nature. Land is heterogeneous and every piece of land is spatially specific. The economic supply of land can be increased by intensive use or extensive use of land as in the case of reclamation. The economic supply of land has been subjected to limitation imposed by various factors-natural, economic, institutional and technological. Climate, topography, location and nature of the soil are the natural characteristics that affect the supply of land for various acts. For example location is a dominant factor, which influences the supply of land for non-agricultural purpose. Therefore, this paper examines the impact of environmental and amenity factors on urban house price in Chennai City*

1.1 Introduction

The market forces influence the allocation of land between alternative uses, its intensity and extent of use. In the short-run supply of land is inelastic. When sudden change in demand for land takes place, the shortage of land, would cause a shift in the existing pattern of use or more intensive use of existing land. Agricultural land may be converted to residential land. The demand for land arises from the various direct and indirect uses to which it can be put. Direct users are those in which land it self is a consumption good as in the case of residential sites. Indirect using which land is used as a means of producing goods to be used in industry or in agriculture as a raw material, for producing consumption goods. The increasing demands for land for non-agricultural use is directly with associated with the phenomenon of increasing urbanization. The extracts pressure on the spatial density, this in turn leads to encroachment on agricultural land for residential users. Population growth has a considerable impact upon the demand for land. Increase in population, necessitates more food production and this leads to increase in demand for agricultural land. The basic need for shelter, shopping complex, industrial location, roads, causes large-scale conversion of land for non-agricultural purposes.

The role of land in the urban economy is multi-dimensional. On the one hand, land is an important input in the construction of residential, commercial and industrial structures as well as in the provision of public investment projects (i.e., streets and parks). Secondly, land can be viewed as a "pure asset" which is held by individuals both as hedge against inflation and for speculative motives. Since capital markets in developing countries are usually not properly functioning, a land holding constitutes one of the few options available for the accumulation of wealth[4]. Finally, land plays a key role in urban fiscal affairs; taxes and charges on real estate not only contributed to the revenue of the municipal government, but also have the potential to influence the distribution of income. Given the importance of land in urban activities it is therefore necessary to gain a better understanding on the operation of the urban land market. Housing, unlike most traded goods, exhibits certain uncommon features making its study distinctive and complex. These features include durability and heterogeneity. Housing is a heterogeneous good with varying dimensions both quantitatively and qualitatively, which complicates its definition and its measurements. As a result of these varying dimensions, both buyers and sellers may view the dwelling units with the same selling price as substantially different. However, the quantitative traits of housing such as the number and size of rooms, baths and the lot size exhibit less problems of definition and measurements relative to the qualitative attributes such as the physical quality (or) structural quality and neighborhood quality (or) ever vocational quality. Therefore,

this paper examines the impact of environmental and amenity factors on urban house price in Chennai City

1.2 Methodology

The study has adopted zonal arrangement in the selection of particular study area of Chennai City. The study involved data collection and analysis of primary data, the relevant primary data viz., intensity attributes and environmental and amenity factors are collected from selected respondents in the study area. The study has used random sampling method; therefore, this study selected 30 sample households (i.e respondents) from each zones, totally 120 sample respondents are selected all over Chennai.. The relevant data are obtained with the help of structured schedule.

1.3 Measurement of Variable and Model Specification

The analysis the researcher has taken some key factors as determinants of urban residential land value in the selected study areas. Hence, this analysis, the sample areas are divided into Sector I, which consists of south and north Chennai and Sector II, which consists of west and central Chennai. The factors relating to socio economic environment viz., rental value, family income, income from NRI's, transport cost, delinquency rate, physical natural environment viz., occupational density, topography, plot size, air pollution, noise pollutions, water facilities and amenity factors viz., distance from residence to central place, work place, school and hospital have been taken under the purview of present discussion. It is assumed that these attributes either individually or collectively are responsible for the variations in residential land value. By noting the efficacy of the above discussion, this section aims to discuss, how far and to what extent these attributes are responsible for the differences in residential land values in the sample sectors of Chennai City. The above mentioned environmental and amenity factors are instrumental in determining the aggregate urban residential land values.

To test the influence of the above mentioned environmental and amenity attributes on urban residential land value and to determine, the functional relationship between them in both Sectors of Chennai City, the data are applied to the regression equation in the logarithmic form[47]:

For Sector I (South and North)
$$Y = ax1b1x2b2 .....x8b8 + u .... (1)$$
Transformed in to
$$Log y = log a1 + b1 log X1 + b2 log X2 .... b 8 log X8 + u .... (2)$$

For Sector II (West and Central)
$$Y = ax1b1x2b2 .....x8b8 + u .... (3)$$

Transformed in to

$\log y = \log a_1 + b_1 \log X_1 + b_2 \log X_2 \dots b_7 \log X_7 + u \dots (4)$

Therefore, X represents individual attributes which are not independent. **Table 3.3,** lists the results of the statistical test of the significance of the functional relationship as expressed by the equation. The 't' values are the result of a test of the significance of the relationship.

1.4 Results and Discussion

Further**, table 1.1**, indicates that the impact of environmental and amenity factors viz., transport cost, water facilities and distance from residence to work place on residential land value is higher in Sector II than the Sector I. The value of elasticity co efficient of transport cost is 0.1287 and 0.06015 indicating that, if transport cost increases by Rs.10, the residential land value per square foot declines by Re.1.29 in Sector II, 60paise in Sector I. While the value of elasticity of water facilities has increased by 10 per cent, the residential land value per square foot push up by 90 paise in Sector II town and 59 paise in Sector I. On the other hand, the value of elasticity of coefficient of distance from residence to work place has increased by 1 km, the residential land value increases by 15 paise only in Sector II, therefore, this Sector is a developing area, the new houses are built with all types of amenities and the demand for such houses is greater, ultimately price of these houses are higher. This Sector II has experienced a scarcity of water supply during the summer. In this situation people are willing to pay more prices for the residential land with adequate water supply. The impact of distance from residence to work place on urban residential land value in Sector II indicates the desirability of certain minimum distance between shopping centre and residential neighborhood. Whether this is by way of natural selection or a deliberate action of the planners in the placement of activities, it is difficult to say. But there is an important reason and guideline for planners in the placement of activities.

In Sector I and Sector II, it can be inferred that these areas come under the category of the Metropolitan city, which is the and capital of Tamilnadu, it is the only place of satellite employment center with the focus of maximum over al accessibility to all kinds of activities in the both sectors of Chennai City. There is therefore, highest interchange and interaction of individuals which has led to overcrowding leading to highest residential land value. The urban residential land value is influenced to a great extent by environmental and amenity factors. Even though specialization is viewed as the most important cause of increase in residential land value, the scarcity of land in relation to the demand, especially in the face of rapid urbanization and the absence of adequate investment opportunity in the productive section leading to heavy investment in the real estate business, influence the residential land values.

Table 1.1 Estimation of Important Environmental and Amenity factors on Residential Land Values (Sector wise) in Chennai City Dependent Variable (Y): Residential Land Value in Rs. per Square Foot

Name of Explanatory Variables	Value of Elasticity (b)	
	Sector I (i.e south and north Chennai)	Sectors II (i.e west and central Chennai)
Constant (a)	0.32014** (0.1469) [2.18]	0.72349* (0.17667) [4.10]
Rental Value (X1)	0.45953* (0.036239) [12.68]	0.36070* (0.03203) [11.26]
Family Income (X2)	0.11212* (0.030466) [3.68]	0.086311* (0.03831) [2.25]
Transport Cost (X4)	-0.060149* (0.014604) [4.12]	-0.1287* (0.058219) [2.21]
Occupational Density (X6)	0.15054* (0.036246) [4.15]	0.11776* (0.038648) [3.05]
Air Pollution (X9)	-0.12235* (0.020914) [2.81]	-
Water Facilities (X11)	0.058775*(0.020914) [2.81]	0.089516* (0.018173) [2.58]
Distance: CBD (X12)	-0.16532*(0.045738) [3.61]	-0.046953*(0.018173) [2.58]
Distance: Workplace(X13)	-	0.15307* (0.04676) [3.27]
Distance: School /College (X14)	-0.10365*(0.035255) [2.94]	-
R2 Value	**0.7601**	**0.5666**

*Source: Computed Note: Figures in Parentheses represent Standard Error and Square Brackets represent 'T'Value * Significant at 1 per cent level*

1.5 Conclusion

It is observed that the nature of relationship between residential land values and the explanatory variables of environmental and amenity factors, the residential land value is positively determined by rental value, family income, occupational density, water facilities, distance from residence to workplace and negatively determined buy the transport cost, distance from residence to central place and air pollution. The findings have proved the location theory, travel cost minimization theory, density gradient theory and housing characteristic theory. Hence, the variation in urban residential land value is significantly determined by environmental and amenity factors in both sectors of Chennai City.

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