

Property Tax Reform for Municipal Fund Mobilisation from Value Capture of Real Estate Development

¹Preeti Jaiswal, ²Arti Jaiswal

¹ Research scholar, ²Assistant Professor,
¹ Department of Architecture and Planning,
¹ MNIT, Jaipur, India.

Abstract : Infrastructure development meets the needs of human society effectively. The problem lies in the accounting of these benefits, and how it can be utilized. In this scenario, government authorities have significant roles in infrastructure development, land management and taxation of the households improves. This paper investigates the critical linkage between infrastructure and property tax in Indore a city of Madhya Pradesh, India. An assessment reform is a good first step toward revenue generation. This paper talks about the relationship between the infrastructure development and incrementing the property value, it can help in finding property tax.

IndexTerms - Determinants, Development, Infrastructure, Land Value, Property tax.

1 INTRODUCTION

Indian cities are facing lack of developable land due to rapid urbanization and fast population growth. It has been in the focus of policy debates among scholars, politicians, policymakers, and urban managers partly because it has been a peculiar good and partly for urbanisation. Not only land considered essential to life support for farmers, but it also becomes one of the most important assets that can be a principal source of wealth and power. The ongoing issue in land management, especially in developing countries, is to develop land in a way that increase the capacity of an economy and promote human settlement. Service makes the environment livable, whereas in most of the Indian cities, there is a huge difference is seen from the national service level benchmark. Service level Gap is shown in Table 1.

Table 1: Service Level Gap

| Service | Service Indicators | Gap |
|----------------------|---|-----|
| Water Supply | Per capita water supply | 48% |
| | Metering of water connection | 87% |
| | Non-revenue water (NRW) | 12% |
| | Cost recovery in WSS | 61% |
| Sewerage | Coverage of toilets | 30% |
| | Collection efficiency of the sewage network | 90% |
| SWM | Household level coverage of SWM | 65% |
| | Extent of scientific disposal of SW | 90% |
| Storm Water Drainage | Storm water drainage network | 54% |

Source: High Powered Expert Committee Report-2011, Ministry of Urban Development, GOI

The process of urbanization in India has been emerging immense pressure on urban local bodies for infrastructure and services in the last many years. According to census 2011, 31% of the Indian's Population live in urban areas and is expected to increase further to 50% by 2050. Urban population is likely to increase from present 377 million to 900 million by 2050. It emerged as one of the fastest growing economies. (Swamidurai, 2014). The analysis indicated that urban infrastructure demand increases with population growth. After this analysis, three dimensional surface maps were prepared with latest mapping software GIS to show the spatial distribution of these two aspects in the Indore. Strangely, there was a striking similarity between the two maps which validates that parts of the Indore with higher infrastructure services has higher land value and vice versa. At the end, policy implications have been highlighted as part of the discourse. Most of the Urban

Local Bodies (ULBs) are not able to meet the increasing demand for infrastructure and services due to their slow growth in municipal revenues. (Vaidya, March 2010) (Shiromany, 2016)

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The text within the body of the paragraphs should be in 12 point Times New Roman font throughout with a character spacing of 1.5. The section headings are to be in uppercase, bold, 12 point font, and centered. The starting line of a paragraph should be indented 0.5 inches. All the headings (section headings, sub-section headings and sub-sub-section headings) should be separated with a blank line with each other.

2 LITERATURE REVIEW

Recently many researchers have focused to find innovative interventions for channelizing economic growth. India does not have to look very far for affluent government intervention in channelizing urbanization for economic growth. In view of the poor financial condition of the ULBs, it is being recognized that the property tax must be made a revenue productive tax instrument through appropriate reform strategy.

Notable public economist Richard M. Bird elucidated that the most important administrative challenge in developing countries is determining the market values of land for deciding the tax base because if the tax base is not estimated properly, it is difficult to build up tax payers' confidence. This results in lower revenue collections. Land value determinants are associated with many factors, not only the geographical and environmental conditions, but also government policies. These factors have been assessed in many studies and discussed with the help of different techniques like spatial analysis and statistical tools. (Schwab, 2008).

Bandyopadhyay investigated that Jawaharlal Nehru National Urban Renewal Mission 2007 (JnNURM), is first reform program of the Government of India to support urban development, this placed a lot of emphasis on reforming the property tax regimes of state governments. One of the main focuses was on improving methods of property tax assessment, accompanied by appropriate administrative reforms. Property surveys and usage of GIS technology was encouraged within an integrated framework to ensure better coverage of the properties. (Bandyopadhyay, 2013). In Bangalore, Karnataka the Brahad Bangalore Mahanagar Palika (BMP) has moved away from a rental value property tax assessment system to a quasi-capital value based assessment. The sum of the land and the building value is the taxable value. BMP captured factors which contribute in land value gain and start using it in property tax calculation.

As long as the relative contribution of property value determinants is ignored, the chances of higher revenue at urban level are blurred. Change in property tax base means the chances of better revenues for authorities and communities. Improvement in the taxation method through property valuation has a positive effect on the socioeconomic status of city and nation. This study explored the urban and spatial factors which affect the urban revenue generation and its relation to property value. Relative profitability and utility in neoclassical margin list theory are determined by accessibility. This results in a gradient of intensities of land use and land prices, which decline outwards from the Centre. (Bandyopadhyay, 2013) According to Alonso's notion, the bid-rent formulations rest upon the assumption that different activities will have bid-rent curves, which vary in form according to their need to be at the center of the city and their sensitivity to transport costs. This theory provides the rationale for the arrangement of land uses and values indicated in the figures below. (Goenka, 2016)

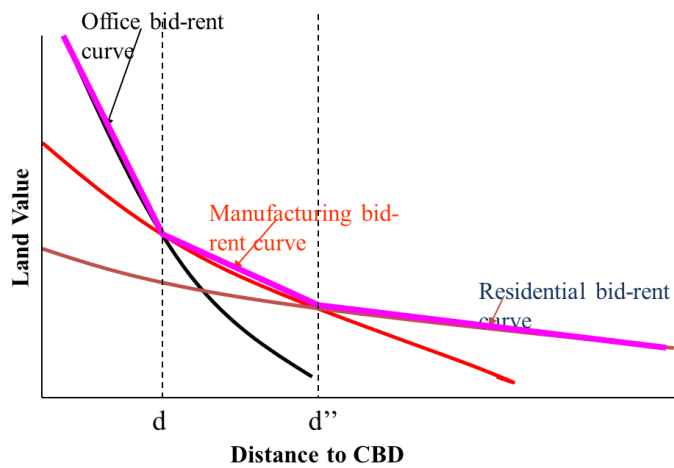


Figure 1: Monocentric (AMM) model

Source: "Building the economy block by block"

Furthermore, Norman G. Miller and David M. Geltner presented that real world cities are not purely monocentric they have other major activity areas besides the Central Business District (CBD). Large cities are sprinkled with neighborhood business districts (NBDs) that serve the needs of local communities (figure below). They conclude that the actual residential land price function can exhibit complex curvilinear shapes, and hence land prices may not automatically decline with distance from the CBD. (Geltner)

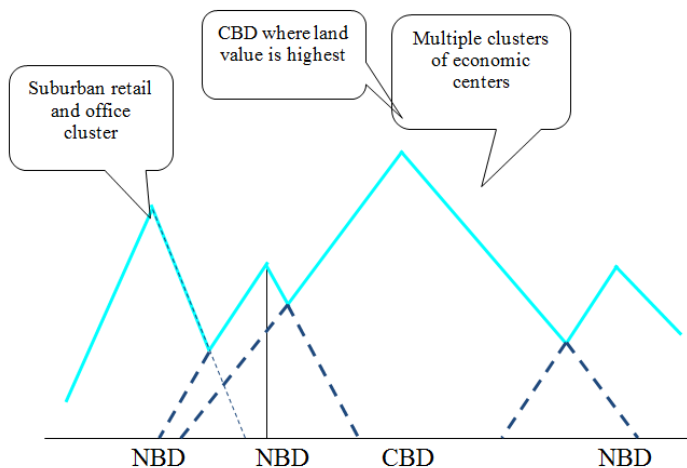


Figure 2: Principles for new Economy

Source: "Real Estate Principles for the New Economy": Norman G. Miller and David M. Geltner

Urban development has continuously challenged our understanding about the pattern of land value distribution and the determinants underlying the patterns. To find out the determinants of property tax base, study of assessment techniques became more important. There are two assessment techniques are in practice first Annual Rental Value (ARV) method and other is Unit Area assessment system, they are simple arithmetical systems. In the unit area value system the entire city has to be grouped into somewhat homogenous categories for specifying a unit area value. Such groupings could be done taking into consideration factors like average rental value, the average capital value of land, quality of physical infrastructure, availability of social and market infrastructure, type of development, economic classes of occupants etc. (Vaidya, March 2010)

The appraiser considers three approaches to determine property value for taxation. These are Cost approach, Sales comparison (market) and Income approach. In the cost approach property value is sum of the estimated land value, plus the depreciated cost of the building and other improvements. Cost estimating uses three methods Comparative (unit of area or volume), Quantity survey and Unit-in-place method (Phillip, 2012) Second method of valuation of property for taxation is through a sales comparison approach of determination, in this to calculate the tax they compare the property value with change in different determinants in the locality of the property. These determinants of tax are Location, Design, age, and quality of construction, Improvement size, Amenities, Condition, Land size, Site amenities and government restrictions. By comparing all the determinants quality and accessibility of the property, then find out the area with good infrastructure from those areas they collect property tax at the higher rate. A third approach to calculate property tax is Income Approach.

The income approach, also called income capitalization, converts future benefits of property ownership into an indication of present worth (market value). Present worth, which is the result of capitalizing net income, is the amount a prudent investor would be willing to pay now for the right to receive the future income stream. (Phillip, 2012)

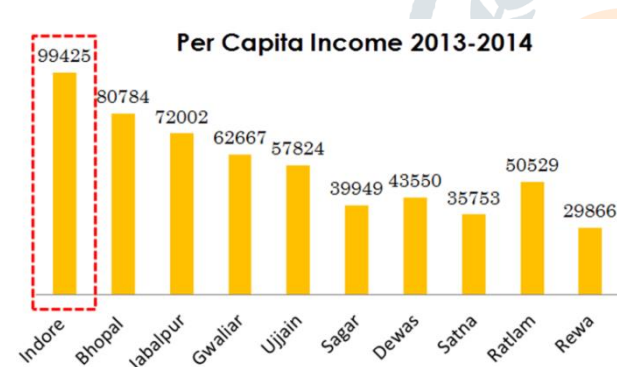
3.1 Assessment of property taxation method: Case of Indore, India

Indore is located in the central part of the India. It is playing the role of commercial capital and education center for Madhya Pradesh. Among all the district of Madhya Pradesh, Indore has a highest urbanization rate shown in Table-4. The Madhya Pradesh planning commission report says that per capita income is highest in Indore (Fig.-5)

Table 2: Population Growth Rate of Indore

| Urbanization of Indore | | | | |
|------------------------|------------|------------|---------|-------------|
| Year | Total Pop. | Urban Pop. | % Share | Growth Rate |
| 2011 | 3276697 | 2427709 | 74.09% | 71.28% |
| 2001 | 2465827 | 1730363 | 70.17% | 42.97% |
| 1991 | 1274518 | 743473 | 58.33% | 40.82% |

Figure 3: Per Capita Income



(Source: Madhya Pradesh planning commission report-2011) Present Property Tax Assessment System in Indore is based on a zone based 'Self-Assessment' (SA) system. It has been calculated tax on Annual Letting Value (ALV). In this method Indore is divided into six zones and has zone wise different letting value to calculate property tax, this property taxation method is function of Type of Building, Type of Construction and Location. Accessibility factor, Land use and building use division details are not taken for tax calculation.

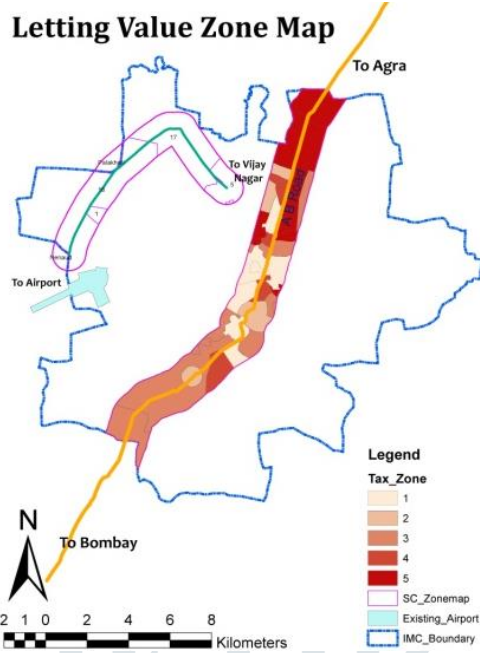
Annual taxable amount = ((Area of Building x Letting Value) – 10% (Area of Building x Letting Value))

From these calculations, Annual taxable amount is calculated after that property tax is calculated on the following giving rates.

Table 3: Tax Rates in Indore

| S. No. | Annual taxable amount | Tax Rate (in %) |
|--------|-----------------------|-----------------|
| 1 | Till Rs. 6000/- | Tax free |
| 2 | 6000-36000 | 6% |
| 3 | 36001 - 60000 | 8% |
| 4 | More than 60001 | 10% |

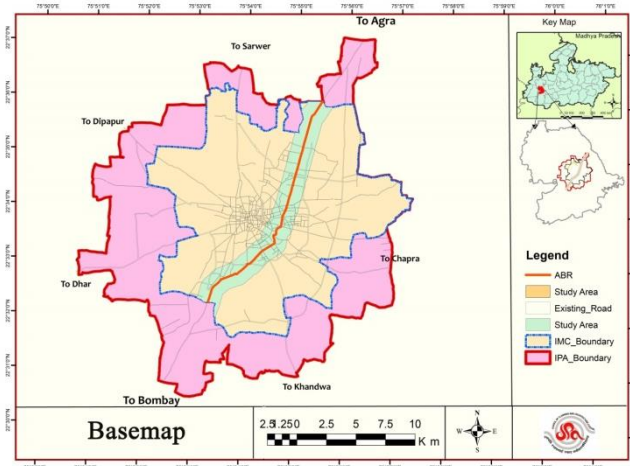
Property Tax = Annual taxable amount X Tax Rate



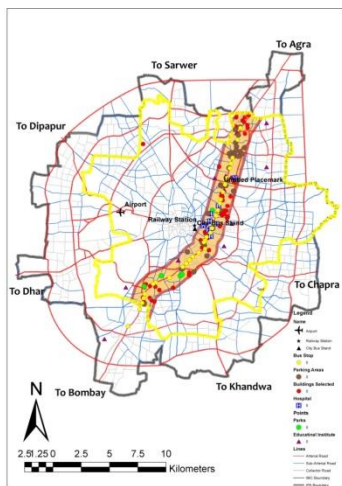
Letting value is revised only two times first in 2001 and second time in 2008. From 1996 to 2017, Letting value for residential building use are revised in 2001 after revision only zone 1 and zone 2 shows a slight change in letting value, other zones show no revision. For non-residential land use, letting value got revised only once in last 20 years in 2007. The revised value of non-residential building use show major change by 33% in zone 1 and zone 2 in base value. Zone 5 and zone 4 does not show any change in pukka and the semi pukka type of construction category. Property Tax calculation is a process of capturing the impact of various factors on a land parcel. In present method it was reported that the demarcation of the properties has not been done properly. The letting value base is not clear. It divided the land in six zones, but land value is independent of those zones. Property tax is independent of property value, services available on site, building use. These are basic factor of property value. The approaches to appraising land are needed that can be used to predict the market land price, which would give planners, decision makers and real estate developers a powerful tool for determining the property tax and valuing properties.

3 RESEARCH METHODS

Land value does not only depend on the physical characteristics of a building, but also it is depended to the built environment surrounds to that building. In the valuation of any land the function of the land, location externalities of the land and the accessibility are the most important factors. To study land value a 1000mtrs buffer selected along A.B. Road as a study area, for a primary survey to measure the impact of the determinant of land value. In rapid baseline assessment 52 buildings were studied along the A.B Road, out of which 24 are non-residential and 23 are residential and 5 industries. The location of different services and selected buildings is shown on the Map3.



Map 2: Base Map of Indore



Map 3 : Location of selected buildings and parameter

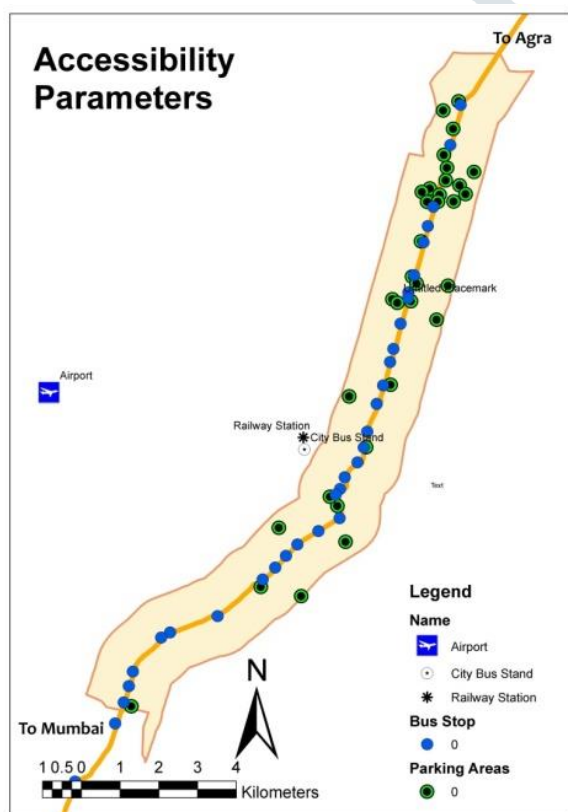


This study deals land price in term of market value. Collector publishes the market value of land as circle rate as per the rule prescribed under the stamp act, 1899 and Principles for the determination of market value and prevention of undervaluation of instruments rules, 1975 is applicable to the case of Indore. To understand the importance of different services we need to calculate its impact on land value to capture that impact, I did Linear Structural Relation study along the AB road. Determinant analysis is done on accessibility and amenity Parameters these parameters described in Table-16. Locations of accessibility parameter are shown on Map-7 and amenities are shown on Map8.

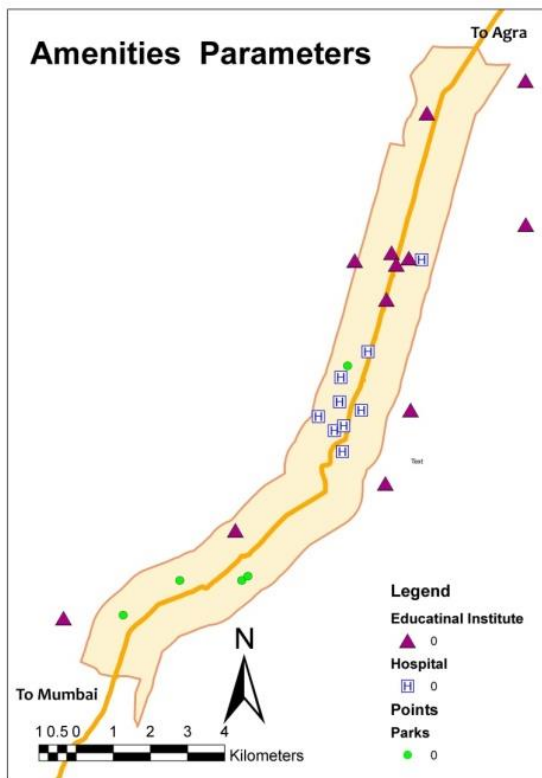
Table 4: Land value determinants assessed

| Factors | Determinant | |
|-----------------------------------|-----------------------|-----|
| Distance from Road | Arterial Road | |
| | Sub- Arterial | |
| Circle Rates | | |
| Distance from Amenities | Parks | |
| | Hospital | |
| | Educational Institute | |
| Building use | Residential | |
| | Commercial | |
| | P-S-P | |
| | Industrial | |
| Distance from city Accesses Point | Airport | |
| | Railway Station | |
| | Bus Stand | |
| | Bus Stop | |
| | Parking Places | |
| Land Development | Building Age | |
| | Type of Roof | RCC |
| | | RBC |
| Tin Shade | | |

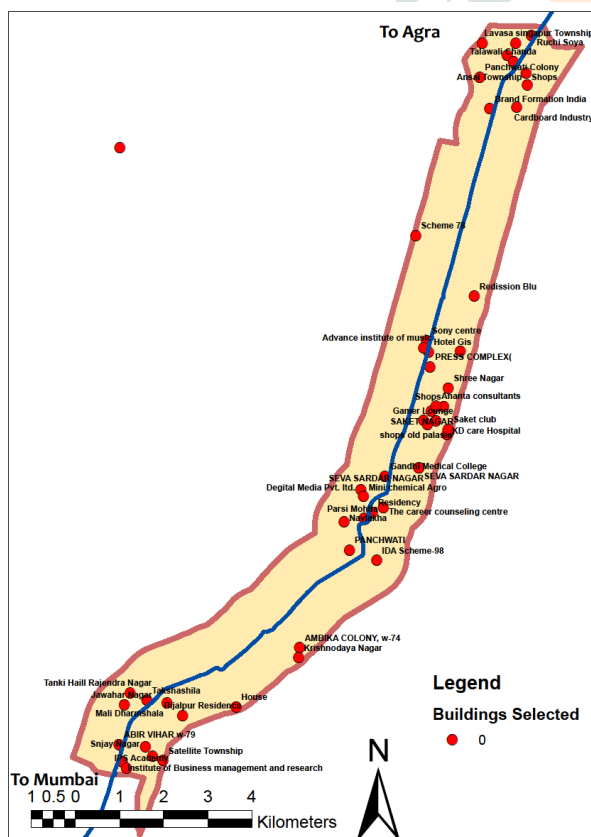
Map 4: Selected Accessibility Parameters



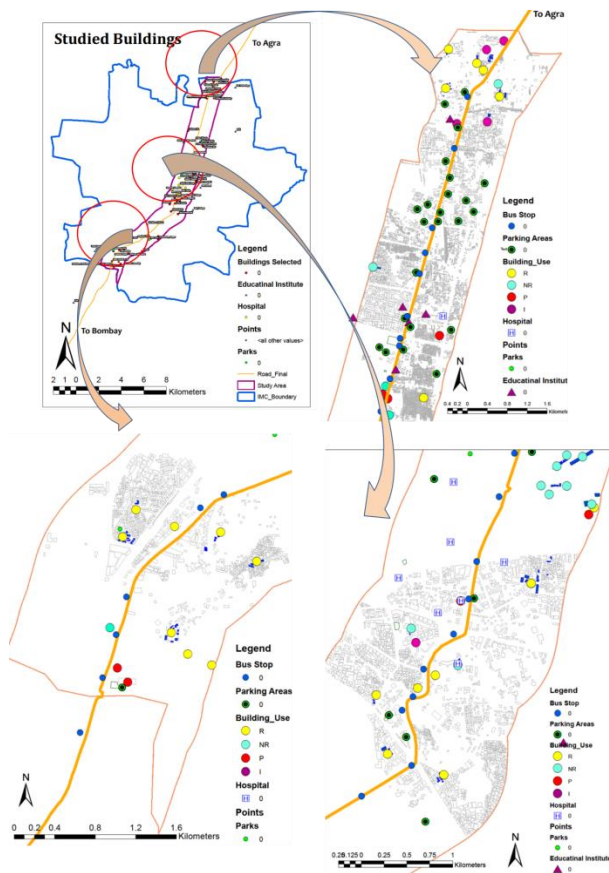
Map 5: Selected Amenities Parameter



Map 6: Building Studied



Map 7: Location of Selected Building



4 DATA ANALYSIS

To study the impact of determinants listed in table 8. Distance from different services and amenities are measured from the selected building then ordinary least squares regression (OLS) analysis is done to the selected buildings shown on map-4. Descriptive OLS statistics of the data on fourteen variables of interest were calculated and results are tabulated in Table 10. The model shows representative equation and the value of coefficient of determination (R²). The coefficient of determination tells about accuracy of the model. Table 10 indicates that multiple r-square and adjusted r-square are more than 50% which shows strong positive relation between the dependent variable property value with the independent variable.

Table 5: Coefficient of Determinant

| | |
|--------------------------------|----------------------|
| Input Features: | attached file |
| Number of Observations: | 52 |
| Multiple R-Squared [d]: | 0.645 |

This equation also shows that the determinants are positively interdependent with some other determinants as shown in Histograms and scatter plots.

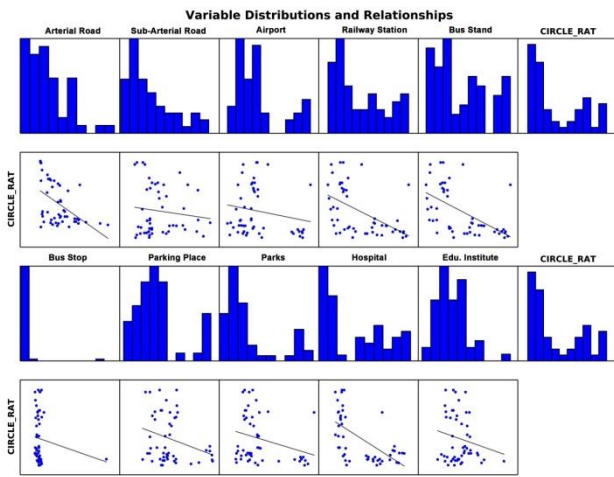
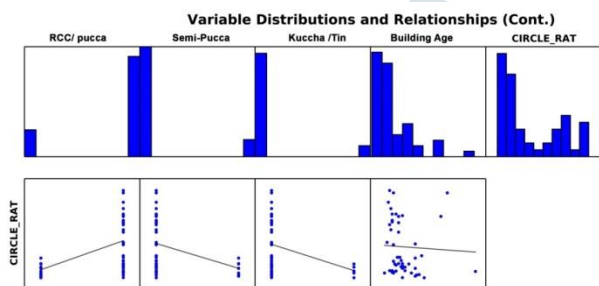


Figure 4: Variable Distribution and Relationships



Each scatter plot depicts the relationship between a determinant and the existing published market value of property. The histograms show how each variable is distributed. Strong relationships appear as diagonals and the direction of the slant indicates if the relationship is positive or negative. Circle rate shows a strong positive relationship with the Arterial road, bus stand, railway station, educational institutes and building age.

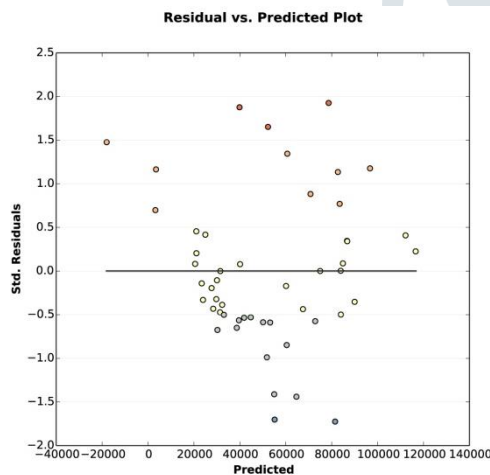
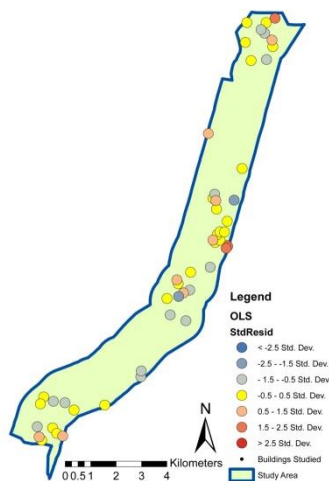


Figure 5: Residual vs. Predicted Plot

The histogram of these residuals matches the normal curve, indicated above in blue. This shows given model is an Ideal model. If the histogram looks very different from the normal curve, shows a biased model. Coefficient represents the strength and type of relationship between each explanatory variable and the dependent variable. Map7 shows the ideal location for different buildings to get more land value and direct the development to generate more revenue. The blue colored buildings indicate suitable infrastructure provided according to its building use where red color building indicates that the required infrastructure is not available for that particular type of building user.



Map 8: Most Suitable development according to building use

3.2 Property Tax Equation

To develop land value equation, the data was analyzed through SPSS and Geographic informatics system (GIS) and digital models were developed. Linier Multiple Regressions is used to find out coefficient of determinants of land value. Results of analysis are tabulated in table 11.

Table 6: Regression Index

Model Summary

| Model | R | R Square | Adjusted Square | R | Std. Error of the Estimate |
|-------|-------------------|----------|-----------------|---|----------------------------|
| 1 | .803 ^a | .645 | .510 | | 25456.205 |

ANOVA^a

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|-------|------------|-----------------|----|----------------|-------|-------------------|
| 1 | Regression | 43469170138.722 | 14 | 3104940724.194 | 4.791 | .000 ^b |
| | Residual | 23976680630.509 | 37 | 648018395.419 | | |
| | Total | 67445850769.231 | 51 | | | |

a. Dependent Variable: Circle rate

b. Predictors: (Constant), Building Age , Tin Shade, Bus Stop, Sub- Arterial , RBC, Artirial Road, Parks, Parking Places, Educational Institute, Hospital , Railway Station, Airport, RCC, Bus Stand

Coefficients^a

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---------------------------------|--|-----------------------------|------------|---------------------------|--------|------|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 28686.289 | 59408.496 | | .483 | .632 |
| | Arterial Road(X ₁) | -40.411 | 10.973 | -.430 | -3.683 | .001 |
| | Sub- Arterial(X ₂) | -0.970 | 14.030 | -.007 | -.069 | .945 |
| | Airport(X ₃) | 5.997 | 7.531 | .342 | .796 | .431 |
| | Railway Station(X ₄) | -1.774 | 2.140 | -.148 | -.829 | .412 |
| | Bus Stand(X ₅) | 2.618 | 6.975 | .229 | .375 | .710 |
| | Bus Stop(X ₆) | -3.521 | 4.012 | -.131 | -.878 | .386 |
| | Parking Places(X ₇) | -2.008 | 10.922 | -.026 | -.184 | .855 |
| | Parks(X ₈) | -7.280 | 3.370 | -.531 | -2.160 | .037 |
| | Hospital (X ₉) | -7.760 | 5.709 | -.603 | -1.359 | .182 |
| | Educational Institute (X ₁₀) | 8.842 | 7.991 | .179 | 1.107 | .276 |
| | RCC(X ₁₁) | 17994.026 | 34584.935 | .204 | .520 | .606 |
| | RBC (X ₁₂) | 9431.458 | 37767.399 | .089 | .250 | .804 |
| | Tin Shade (X ₁₃) | -3970.977 | 31161.257 | -.033 | -.127 | .899 |
| Building Age (X ₁₄) | 236.289 | 313.630 | .084 | .753 | .456 | |

a. Dependent Variable: Circle rate

3.3 Land Value Equation

$$= 28686.289 + 40.411X_1 + 0.97X_2 - 5.997X_3 + 1.774X_4 - 2.618X_5 + 3.521X_6 + 2.008X_7 + 7.280X_8 + 7.760X_9 - 8.842X_{10} - 17994.026X_{11} - 9431.458X_{12} + 3970.977X_{13} - 236.289X_{14}$$

Regression analysis shows that there is negligible impact of distance from the railway station and parking areas. Distance from the sub-Arterial road, hospital and building age have a large positive impact. In given land value model land value changes by changing surrounding services and Intercept changes with a change independent variable. So this model is not a rigid model.

Property Tax= Land Value from governing equation X Tax Rate

The developed regression equation is applicable to find the similar tax in different locations. Model shod that different determinants have different threshold and range, thus some of these are significant at city level while others are significant at local area or plot level.

5 CONCLUSION:

Spatial distribution of land value and infrastructure available in surrounding and on the site reflects a strong correlation between the two variables. Taking Indore as a model, the perspective explained in the paper has certain policy implications which are enumerated below. The land value increased due to the urban development and thus inevitably raising the land value in the many areas of the highest level. Property tax should calculate on market value which depends on Location, Design, age, and quality of construction, Land size, Site amenities and government restrictions. This brief paper has discussed the separate aspects of property tax appraisal; and adjustments to valuation to arrive at the assessment. The three appraisal standards presented were Cost approach; Sales comparison (market) approached and Income approach. GIS capabilities not only facilitate the organization and management of geographic data, but they also enable the revenue goals.

6 REFERENCES

- bala Saroj, D. H. (2009). *Guide Lines For Valuation Of Immovable Properties*. New Delhi: Central Public Works Department.
- Bandyopadhyay, S. (2013, October). Property Tax Reforms in India: A Comparison of Delhi and Bangalore. *International Center for Public Policy*.
- Bird, R. M. (2003). *Subnational Revenues: Realities and prospects*.
- Deichmann, S. V. (2006, April). Fiscal and Distributional Implications of Property Tax Reforms in Indian Cities. *Working Paper, 39, 38*. New Delhi, Delhi, India: National Institute of Public Finance and Policy, New Delhi.
- Geltner, N. G. (n.d.). "Real Estate Principles for the New Economy".
- Goenka, A. (2016). *Building the economy block by block*. Mumbai: PwC.
- Higgins, J. (1993). The Radical Statistician. In J. Higgins, *Introduction to Multiple Regression* (p. 15).
- Mourre, C. G. (2012). Property taxation and enhanced tax administration in challenging times. *Economic Papers, 463*.
- Phillip, J. (2012). *Appraisal Methods for Real Property*. Salem: Property Tax Division, Salem.
- Schwab, D. (2008). *Alternate Methods of Valuing Property for the Purpose of Property Taxation*. Washington, DC: Indiana Department of Local Government Finance.
- Shiromany, A. (2016). Financing of Urban Infrastructure For Implementing urban resilience. Bhopal, Madhya Pradesh, India.
- Swamidurai, S. (2014). Factors Affecting Urban Land Value in Indian Cities - Chennai City as a Case Study. *IJRSI, 31-34*.
- Vaidya, C. (March 2010). *Best Practices On Property Tax Reforms In India*. New Delhi: National Institute of Urban Affairs.
- Vaidya, C. (March 2010). *Best Practices On Property Tax Reforms In India*. New Delhi: National Institute of Urban Affairs.