



## A COMPREHENSIVE REVIEW OF URBAN LAND MARKET ASSESSMENT AND ITS APPLICATIONS

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### Abstract

**Objectives:** The objective of this paper is to provide an easy-to-understand definition of what Urban Land Market Assessment is, why they are useful, what the parameters involved in one are, what types of ULMA there are, and what improvements can be made to them.

**Methods:** This study primarily uses the 2007 ULMA done on Chennai as a framework to identify and list the basic parameters used in a ULMA and explains what they denote and why they're important. It also uses some other local ULMAs to understand the different types and uses of ULMAs as well as uses some miscellaneous studies on Land Use and Land Value to explain those concepts in detail, as they are especially important to a ULMA.

**Findings:** This paper details how to practically and feasibly conduct a Comprehensive Urban Land Market Assessment in a region. It shows the detailed process of conducting a ULMA and the important parameters to measure. It also lists some inferences to be made and improvements to be done to the ULMA process to make it even more relevant and useful.

**Novelty:** This study suggests the addition of more parameters to the ULMA process to make it even more useful, those being - Topography, Soil, Fertility, Water Availability, Natural Drainage, Transport Network, Developmental Possibilities, Job Accessibility, and Existing Legal Framework. It also provides some inferences on the ULMA process to provide more helpful details on the best way to conduct a ULMA and things to keep an eye on while conducting one. It also provides newer, more efficient ways of measuring land value (Discounted Cash Flow Method and Sales Comparison Method).

**Keywords:** Urban Land Market Assessment, land value, future value, land use, population growth.

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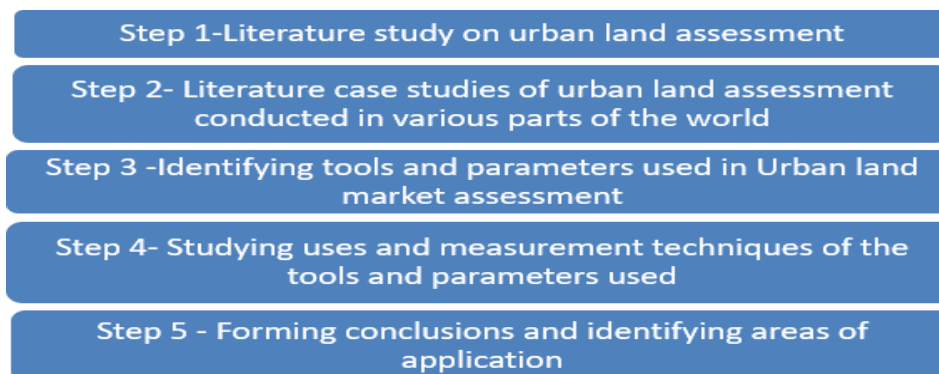
## 1. INTRODUCTION

Assessment is the process of determining the value (and sometimes the use) of property. The value of land and property comprises not just the land or building itself, but the people who live there, how the land is used, the population trends and density of the land in question, housing value and the housing stock of that area of land as well. As such, Urban Land Market Assessment is a comprehensive study of the true value of land, which takes all the above factors into consideration as well, in order to create a comprehensive and spatially disaggregated profile of the land considered. Urban Land Market Assessment not only gives insight on the value of the land, but also shows us whether governmental policies implemented to develop the land are actually working or not. It also helps the government formulate and implement effective land development policies.

The main research and studies done on Urban Land Market Assessment have been by David E. Dowell.

## 2. Methodology

### 2.1 Method of Research



### 2.2 Tools and parameters

There are certain tools and parameters used in Urban Land Assessment. They are:

#### 2.2.1 Brief Background Study of the Intended area:

The first step in conducting ULMA is to conduct a brief background study of the intended area. This brief background study refers to an overview of the multiple important characteristics of a city, their importance, how they have developed in the past, and how they will develop in the future. The background study includes the importance of the area to its district, state, and country, the various functions and roles it has played throughout its history, its population count, and the socio-economic, political, and industrial roles it plays today. The study also includes the geographical position of the area, the economic growth, the

He first released a study titled ‘The land market assessment’ in 1995 followed by a study titled ‘Chennai Urban Land Market Assessment’ in 2007. These two studies were one of the earliest to define the term ULMA and conduct a ULMA as well.

But after these two major studies on ULMA, only some minor instances of ULMA done on a local scale have been documented. There have been no recent major studies focused on conducting a ULMA. Hence there is severe shortage of studies on ULMA despite ULMAs being incredibly useful tools for development. Also, the two major studies done by Mr. Dowell are now quite old, and hence have lost some relevance and need to be improved upon as well.

Therefore, this study aims to define what a ULMA is, list all the parameters of a ULMA, explain why these parameters are important, and how to measure them as well. It will also give some suggestions and inferences to improve the ULMA process.

population growth and the challenges faced by the area, the relevant policies and the future prospects of the area. This information is used to identify patterns and trends in the urban land market, and to identify areas of potential growth or constraint.

#### 2.2.2 Population trends and spatial patterns:

Population Trends and Spatial Patterns refer to the population trends of an area, including how much the population has grown in the past, the current and future growth rate, and how it compares to other regions in the country. This parameter of Urban Land Market Assessment includes three main aspects: Population growth rate, Spatial Distribution of population and Inference. The population growth rate includes the past and current population count of the area, the different population growth rates of the area over its history, how significant this population growth rate is, and

how it compares to other regions in the country.

Spatial Distribution of population includes how the population of the area is distributed among the various regions of the area, how the growth rate differs between the populations of the various regions and the possible reasons for these differences. Inference includes examining the trends mentioned above, hypothesizing possible reasons for these trends, inferring what these trends mean for the area and how they affect the area. Examining population growth and trends is very relevant to Urban Land Market Assessment as demographic growth has a strong and direct impact on land use and urban development. Population growth in an area will stimulate economic growth, which in turn stimulates land development, which leads to increased land value and prices. Policies affecting population growth and patterns also affect land value.”

### 2.2.3 Population density:

Population “density is an important parameter in Urban Land Market Assessment as it helps understand how the area’s population has changed over the years, whether the area has undergone decentralization, and over what period the relevant population changes have happened. High population density usually signifies a high economic growth rate and good economic opportunity, both of which raise the value of the land. To gain a better understanding of population density, it is advised to disaggregate the population density over the distance from the center of the area. However, measuring population density alone does not give much insight into the economic status and land value of an area. Two main measurements are used to measure population density viably: Density Gradient and Comparison Density Gradients.

Density Gradient is a measure of how the population density changes as one moves away from the center of the area, typically described using an exponential function. The formula of Density Gradient is as follows:

$$D(x) = d_0 e^{-gX}$$

Comparison Density Gradients compare the density gradients of the area in question with the density gradients of other important areas and cities. This gives an insight into how population density growth rates differ among different cities in the same period and is also useful in finding the average gradient for different cities in a country.

Comparison Density Gradients help compare the population density gradients of different cities, which in turn helps in formulating hypotheses as to why the above-mentioned are occurring.

### 2.2.4 Land Value (Land Price):

Land Value, or Land Price, is the market value of an area of land, and it is considered the most important parameter in Urban Land Market Assessment. The price of land often shows how developed the areas around it are, the number of socioeconomic opportunities it comes with, and the utility of the given area. The value of land can be estimated by comparing it to market data and adding the cost of building construction. One way to do this is through the use of multiple regression analysis, which involves using statistical methods to identify the best model for estimating land value based on large amounts of data. Land used for different purposes has differing levels of utility, and hence price, and it can be divided into Residential, Industrial, and Commercial Land.

The two main ways to estimate the price of a certain area of land are, the Discounted Cash Flow Method, which estimates the price of an area of land based on the amount of future cash flow it will bring. The Sales Comparison Method is mainly used in Comparative Market Analysis (CMA) to analyze the price of similar recently sold properties, Evaluations are made of the property's location, the quantity of recently sold listings, the age and condition of the house, the amenities, and the average price per square foot. The Discounted Cash Flow Method is a tool that can be used by both people and businesses to assess whether a certain piece of land would be a wise investment. The formula for Discounted Cash Flow (DCF) method is given below:

$$DCF = \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \frac{CF_n}{(1+r)^n}$$

where:

$CF_1$  = The cash flow for year one

$CF_2$  = The cash flow for year two

$CF_n$  = The cash flow for additional years

$r$  = The discount rate

As Land Value is such an important parameter, a valuation report has been given below to properly grasp the concept of Land Value and to understand how the Sales Comparison Method and the Discounted Cash Flow method can be used in real life situations:

**Valuation report as on XX/XX/20XX**

**2.2.4.1 Valuation Report**

2.2.4.1.1 Goal of valuation : To estimate the fair market value of the Vacant Land owned by BSNL at Kottarakkara P.O, Kollam, 691506 as on XX/XX/20XX

a) 2.2.4.1.1.1 Date of inspection: XX/XX/20XX

b) 2.2.4.1.1.2 Date of valuation: XX/XX/20XX

2.2.4.1.2 Name of the reported owner and his address: XXABCDXX

2.2.4.1.3 Brief Summary: The property is located in Maithry Nagar Road opposite Muthumari Amman Temple in Oyur- Kottarakkara Road approximately 2 kilometres from Kottarakkara KSRTC Bus Stand. Re Survey Number 103/4 in Block 23 of Kottarakkara Village.

2.2.4.1.4 Location of the Property : 8°59'45.1" N, 76°46'19.4" E

2.2.4.1.5 Type of Area : Residential Area

2.2.4.1.6 Area classified High / Middle / Poor Urban / Semi-urban / Rural: Urban

2.2.4.1.7 Coming under whether: Municipality Limit

i) Corporation Limits: Municipality Limit

ii) Village / Panchayath / Municipality

2.2.4.1.8 Whether covered under any State / Central Government belongs XXX

Central Govt. enactments (e.g., Urban Land Ceiling Act) or notified under agency area / scheduled area / cantonment area: Diversion Document Not Available

2.2.4.1.9 In case it is an agricultural land, any conversion to house site plots is contemplated Extent of the site: Total Area of the Land is 35.80 Ares (3580 sqmeters)

2.2.4.1.10

2.2.4.1.11 Whether occupied by the owner/ tenant If occupied by tenant since how long? Rent received per month: Belongs to XXXXXX

**2.2.4.2 CHARACTERISTICS OF THE SITE**

- |   |  |
|---|--|
| 12. Classification of the Locality  | : Residential  |
| 13. Development of surrounding areas  | : The surrounding area is a residential settlement with plotted houses. The locality exhibits some rural settlement character of Kerala in terms of large plotted houses." |
| 14. Possibility of frequent flooding  | : Not Known  |
| 15. Availability of the Civic amenities like school, Hospital, Bus stop, market | : Available within 1 kilometer   |
| 16. Level of land with topographical conditions                                 | : The land is having two levels separated by RRM retaining walls.  |
| 17. Shape of the Land   | : Irregular Plot shape, Frontage is narrow and tapering  |
| 18. Type of use to which it can be put  | : Plotted housing / Villas   |
| 19. Any usage restriction   | : No.  |
| 20. Is plot in Town Planning approved layout?                                   | : Not known.   |
| 21. Corner plot or Intermittent plot  | : Intermittent plot  |
| 22. Road facilities   | : Abutting Road is Municipality Road   |
| 23. Type of road available at present   | : Bitumen Road   |
| 24. Width of road is it below 30 ft. or more than 30 ft.                        | : Width of the road is approximately 20 ft (5-6 meters)  |
| 25. Is it a locked land   | : No.  |
| 26. Water potentiality<br>Common well/bore well                                 | : Municipality water connection,   |

27. Underground sewerage system : No.
28. Power supply is available in the site : Electric Posts available nearby
29. Advantages of the site : Maithry Nagar where the property is located is a calm residential area suited for peaceful living. The fresh air, water and greenery around makes it suitable for a retirement village. Kottarakkara town and all the urban amenities are available short 2-kilometer radius.
30. General Remarks if any : Due to the irregular plot shape and the large size the property as a whole might fetch lesser value in comparison to the market rates around. The highest and best use value can be attained by plot division and site development.

#### PART- A (VALUATION OF LAND BY SALE COMPARISON METHOD)

1. Size of plot : Total Area of the Land is **3580 sq. m** as per tax receipt.
2. North & South :
3. East & West :
4. Total extent of the plot to be valued : Area of the Land is **3580 sq. m (88.46 cents)**
5. Prevailing market rate : Rs.6,00,000/ cents to Rs.7,50,000/cents
6. Guideline rate obtained from the Registrar's Office (evidence, thereof to be enclosed): Rs3,00,000/Ares
7. Assessed / adopted Market rate of valuation : Rs.6,50,000/cents
8. Estimated value of Land
- Adopting PMR : 88.46 cents x Rs. 6,50,000/ cents = Rs. 5,74,99,000/-
- Adopting GLR” : 35.80 Ares x Rs.3,00,000/ Ares = Rs 1,07,40,000/-

#### Part-B (Valuation of land by Discounted Cash flow Method)

For DCF method it is assumed that the property is subdivided into individual plots and villas are constructed to maximize the value, Out of the total land (88.46 cents), 75 cents land is earmarked for 15 individual plots of 5 cents each, after deducting

the areas for road and amenities. The plot subdivision rules in KMBR are followed for plot division. A 4BHK villa of saleable area 2200 sq ft is constructed in each 5 cents plot and the land and building is put in the market for sale.

Key Features Considered / Assumptions			
S. No.	Parameters	Unit	Value
1	Land Area	Sq. Mtr.	3580
2	Land Area	Sq. Ft	38520.8
3	Road Widening Area	Sq. Ft	NA
4	Net Planning Area to be developed	Sq. Mtr.	3580
5	Net Planning Area to be developed	Sq. Ft	38521
6	Area of land be set aside as open recreational space		0%
7	Area for Roads and services like OHT, STP, Electrical etc		15%
8	<b>Permissible ground coverage</b>		<b>65%</b>
9	Height Permissible as per AAI	m	NA
10	FSI Adopted		3
11	No. of Floors		2
	Basements	Nos.	0
	Ground and Other Floors	Nos.	15
12	<b>Proposed BUA of Building excluding Basement</b>	Sq. ft	<b>33,000</b>
13	<b>Gross Saleable Area</b>	Sq. ft	<b>33,000</b>
14	Common Areas (Lift, Stairs, Corridors etc)		NA
15	<b>Net Saleable Area</b>	Sq. ft	<b>33,000</b>
16	Size of one Unit	Sq. ft	2200
17	<b>Total No. of Units Proposed</b>	Nos.	<b>15</b>

18	No. of Car Park		15
19	<b>Phased Construction Proposed</b>		
20	No. of Villas	Nos.	15
21	Time Line		Q4, 2023
	Absorption Time Line		Q4, 2023
22	<b>Cost of Construction CoC</b>	<b>Rs. /Sq. ft</b>	<b>1500</b>
23	Gross Land development Cost	Rs. /Sq. ft	75
24	Overheads @ CoC		10%
25	Risk and Contingencies @ CoC		2.50%
26	Building Permission Approval Charges on BUA	Rs. /Sq. ft	50
27	Cost of Construction Escalation	PA	5%
28	Cost of Construction Escalation WEF	Year	2
29	Stamp Duty for Registration		6%
30	Debt : Equity Ratio		0.67
31	Cost of Debt		10%
32	Cost of Equity		20%
33	Weighted Average Cost of Capital (WACC)		16%
34	Charges Payable for Change of Land Use	Rs. /Sq. ft	100
35	Holding Period For the Purchaser	Months	12
36	Holding Cost of purchaser		8%
37	<b>Sale Price per Cents of Developed Land</b>	<b>Rs. /Cents</b>	<b>8,00,000</b>
38	<b>Sale Price of one 2200 sq ft Villa</b>	<b>Rs. /Sq. ft</b>	<b>50,00,000</b>
39	<b>Sale Price of one Villa + 5 cents land</b>	<b>Rs. /Unit</b>	<b>90,00,000</b>
40	Sale Price Escalation	PA	5%

Cost Cash Flow Statement					
S. No.	Particulars	Unit	Year -1	Year -2	Year -3
1	<b>Date</b>		<b>1-Apr-22</b>	<b>1-Apr-23</b>	<b>1-Apr-24</b>
2	Land Development cost		100%		
3	Other Regulatory Cost		100%		
4	Escalation in CoC		0%	0%	5%
5	Cost of Construction CoC	Rs./Sq.ft	1500	1500	1575
6	<b>Construction Phasing</b>				
7	Proposed Constructed Units	Nos.	6	6	3
8	<b>Proposed BUA</b>	<b>Sq. ft</b>	<b>33,000</b>		
9	Cost Phasing		40%	40%	20%
10	<b>Construction Cost Schedule</b>	<b>Lakhs</b>			
11	Total Cost of Construction	Rs.	1,98,00,000	1,98,00,000	1,03,95,000
12	<b>Total COC</b>	<b>Lakhs</b>	<b>198</b>	<b>198</b>	<b>103.95</b>
13	Land Development cost	Lakhs	28.89		
14	Approval Cost	Lakhs	16.5		
15	CLU Charges	Lakhs	0		
16	Stamp Duty Charges	Lakhs	6.44		
17	Overheads Cost	Lakhs	19.8	19.8	10.395
18	Risk and Contingencies	Lakhs	4.95	4.95	2.6
19	<b>Total Cash Outflow</b>	<b>Lakhs</b>	<b>274.58</b>	<b>222.75</b>	<b>116.945</b>

Revenue Cash Flow Statement					
S. No.	Particulars	Unit	Year -1	Year -2	Year -3
1	<b>Date</b>		<b>1-Apr-22</b>	<b>1-Apr-23</b>	<b>1-Apr-24</b>
2	Escalation in Sale Price		0%	5%	5%
3	Sale Price	Rs. /Villa	90,00,000	94,50,000	99,22,500
4	Parking Charges	Rs. /Unit	0	0	0
5	Sales Phasing		20%	60%	20%
6	Saleable BUA YoY	Sq. ft	6600	19800	6600
7	<b>No. of Units Sold</b>		<b>3</b>	<b>9</b>	<b>3</b>
8	No. of Parking Slots Sold		NA	NA	NA
9	Sale Revenue	Lakhs	270	850.5	283.5
10	Parking Revenue	Lakhs	NA	NA	NA
11	Total Revenue	Lakhs	270	850.5	283.5
12	<b>Revenue Schedule</b>				
13	<b>Total Revenue Inflow</b>	<b>Lakhs</b>	<b>180</b>	<b>819</b>	<b>180</b>



Valuation Results					
S. No.	Particulars	Unit	Year-1	Year-2	Year-3
1	Total Revenue	Lakhs	270	850.5	283.5
2	Total Cost	Lakhs	274.58	222.75	116.95
3	Net Project Revenue	Lakhs	-4.58	627.75	166.56
4	Value discounted at WACC	Lakhs	-3.85	539.87	143.24
5	<b>Net Present Value</b>	<b>Lakhs</b>	<b>679.26</b>		
6	Less Holding Charges	Lakhs	8%		
7	<b>Value from Buyers Perspective</b>	<b>Lakhs</b>	<b>624.91</b>		

### CERTIFICATE

- The Present Market value of the above property as per Sale Comparison Method is Rs.5,74,99,000/- (Rupees Five Crores Seventy-Four Lakhs Ninety-Nine Thousand Only) as on 14.01.2022.
- The Market Value of the above Property as per Discounted Cash Flow Method is estimated to be Rs.6,24,91,000/- (Rupees Six Crores Twenty-Four Lakhs Ninety-One Thousand Only) as on 14.01.2022.
- It is here by certified that as per our Opinion, Fair Market Value considered for said Property is Rs.6,24,91,000/- (Rupees Six Crores Twenty- Four Lakhs Ninety-One Thousand Only).
- Title Deed(s) is not shown, document not available with the Executive Engineer, hence

Place : Kozhikode Signature

Date : XX/XX/XXXX (Name and official seal of the Approved Valuer)"

not check.

- If this Land is offered as collateral security, the concerned financial institution is requested to verify the extent of land mentioned in this valuation report with respect to the latest legal opinion and document.
- Value varies with the purpose and date. This report is not to be referred if the purpose is anything other than mentioned in the work order given by XXXXX, XXXXXX Division.
- The property was physically inspected on **14.01.2022**.
- The Legal aspects were not considered in this valuation.
- This valuation work is undertaken based upon based on the work order received from Chief Engineer (Civil) XXXXXX Civil Zone, XXXXXXXX, XXXXX,

### 2.2.5 Land Use:

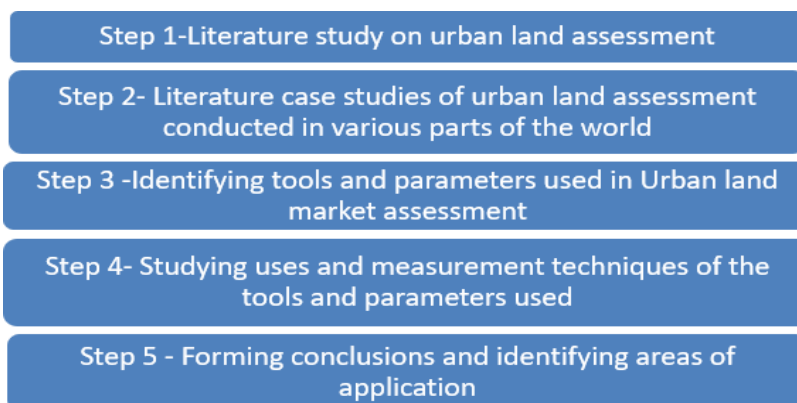
Land use is a key factor that influences land values in Urban Land Market Assessment, as it directly impacts the present and future use of an area of land.

For the sake of preserving open space, soil, and water, it is crucial to examine how land use and land cover change over time. The pattern of human land use in a certain area may be shown via LUCC. For the worldwide fight against climate change and the advancement of sustainable development, the capacity to analyse changes in land use patterns is crucial. Another crucial measure of a region's overall degree of economic progress and development is the pace at which rural land is turned into urban land. In order to provide accurate and current geographic data of LULC and evaluate changes in a study area, a significant amount of remote sensing and geographic information system (GIS) technology has been utilised. Remote sensing data may be quite useful and well suited

for studies that seek for LULC variations. The need to supply food, fibre, water, and housing to a rising global population is driving changes to forests, farmlands, rivers, and air throughout the globe. While land use is often thought of as a local environmental concern, it is quickly becoming a worldwide factor.

### 2.2.6 Housing stock:

Housing stock refers to the total number of dwellings in an area and is measured as the number of houses per sq. km or per hectare. It is important to measure housing stock in Urban Land Market Assessment because it indicates the condition of the people in the area and affects the economy and development of the area. If the housing stock growth rate is greater than the population growth rate, it indicates an increase in housing opportunities and progress, but if it is lesser, it indicates a housing crisis and increase in poverty. A brief overview of the methods is shown below:



### 2.3 A Comparison between Urban Land Market Assessments done in 5 Countries.

There have been several Urban Land Market Assessments done throughout the globe. Broadly speaking, there are three types of Land Market Assessments (LMAs):

#### (i) Type 1 LMA – Problem Focused

Type 1 LMA, i.e. Problem Focused Land Market Assessment refers to Land Market assessment done to address the problems that plague the area of Assessment and hypothesize possible solutions to these problems.

#### (ii) Type 2 LMA – Comprehensive

Type 2 LMA, i.e. Comprehensive Land Market Assessment refers to Land Market assessment done not to focus on particular problems or features of the city, but as a whole. Such LMAs take into consideration all important factors and parameters of a city like population trends, population density, land value, land use, housing stock, etc. The factors and parameters of urban land market assessment discussed in the previous section belong to this type of LMA.

#### (iii) Type 3 LMA – Korean System

Type 3 LMA, i.e., the Korean System, is a type of Land Market Assessment that incorporates urban planning, land, and housing data into their national land and housing information system and their urban planning information system.

The Land Market Assessment that will be compared in this paper is of the following places:

**Mexicali in Mexico**, a Type 1 LMA which is problem focused. It addresses the impact of land value taxation on urban development.

**Hanoi, Ho Chi Minh, and Da Nang in Vietnam**, a Type 1 LMA focusing on urbanization, housing supply and demand, and leading to

recommendations for housing interventions.

**Greater Baku in Azerbaijan**, a Type 1 LMA in that it focuses specifically on the housing sector.

**Luanda in Angola**, a Type 2 comprehensive LMA.

**Chennai in India**, a Type 2 comprehensive LMA.

#### 2.3.1 Case 1: Mexicali, Mexico:

The city of Mexicali located in the northwest region of Mexico adopted a system of land value taxation in 1989. This is a type of property tax that is based on value placed on the land itself, as opposed to any structures or other improvements that are affixed to it. The goal of this study is to examine the impact that land value has on taxation system on urban development in Mexicali.

Two main methods were used: interviews with key stakeholders and analysis of data on housing density and land values. The results suggest that cities in Baja California Norte, including Mexicali, experienced more compact growth from 1990 to 2010 compared to other cities in the region. This means that the cities saw higher levels of housing construction and development in a smaller area, rather than spreading out over a larger area. Additionally, the study found that neighborhoods in Mexicali with higher tax increases tended to experience more housing construction. However, the study is not conclusive due to limitations in the available data.

Overall, this study, “a Type 1 Urban Land Market Assessment, focuses on understanding the relationship between land value taxation and urban land development in Mexicali, and how any issues related to this relationship can be addressed.

#### 2.3.2 Case 2: Hanoi, Ho Chi Minh and Da Nang, Vietnam:

In three Vietnamese cities—Ho Chi Minh City,



Hanoi, and Da Nang—the processes of urban growth and spatial development are examined in this case study. The main areas of emphasis of this inquiry are the housing supply and demand, the land and real estate markets, as well as the urban planning process.

One key finding is that despite being a lower-middle-income country, Vietnam has relatively few slums compared to other urban centers in higher-income countries. This may be attributed to government policies promoting affordable housing and improved access to basic infrastructure and

services in urban areas. The study used a number of methods to understand the forces shaping urban expansion, including identifying market segments, quantifying parameters such as income and access to finance, and analyzing household expenses data and estimates to determine the portion of income that households spend on rent. The study also linked types of housing being built to income brackets to indicate affordability. Overall, this study, a Type 1 Urban Land Market Assessment, provides insights into the complex dynamics of urbanization in Vietnam and the impact of government policies on housing and development.



**Fig 1:** Case study on Hanoi, Ho Chi Minh and Da Nang, Vietnam [World bank (2011), Vietnam Urbanization review: 'Technical Assistance report]

**2.3.3 Case 3: Baku, Azerbaijan:**

The Greater Baku Housing Diagnostic is a ULMA conducted by the government of Azerbaijan to address the issues of substandard and deteriorated housing in the Greater Baku metropolitan area. The study found that over 80% of residential buildings in the country were built 40-50 years ago, with 30% requiring urgent repairs or reconstruction. The situation in the Greater Baku metropolitan area is similar, with rapid urbanization leading to the growth of informal settlements. The study was conducted in two phases: a quantitative assessment which surveyed 1,200 households in the Greater Baku region, and

a qualitative assessment which combined various methodologies such as a desk review, secondary data review, focus group discussions, and expert interviews. Together, the two phases of the study provided a comprehensive understanding of the current state of the housing sector in the Greater Baku region and identified potential bottlenecks in providing formal and affordable housing for different income groups. The findings of the study were used to inform government policies and programs aimed at improving the housing sector in the region. This study is a Type 1 Urban Land Market Assessment.



**Fig 2:** Case study on Baku, Azerbaijan [World bank]

### 2.2.1 Case 4: Luanda, Angola:

Luanda, the capital city of Angola, is home to over six million people and is the fifth largest and fastest-growing city in Africa. Despite this growth, poverty reduction has not kept pace, with more than 50% of the population living in poverty. This ULMA of the Luanda real estate market aims to get a deeper understanding of the nature and economic value of land as well as pinpoint the challenges and opportunities it brings. Discovering the possibilities that land affords is the main objective. This research examines how low-income individuals acquire, exchange, and

maintain ownership of urban property in both informal and formal legal contexts. This inquiry examines newly constructed social housing complexes as well as existing and newly emerging informal communities.” The “Urban Land Market Analysis (ULMA) will look at the buyers' sources, the ways that properties are transferred, the amount of property, the cost of land, and financing, as well as the responsibilities that governmental entities, for-profit businesses, and local communities play in these processes. This study is a Type 2 comprehensive Urban Land Market Assessment.



**Fig 3:** Case study on Luanda, Angola [World bank]

### 2.2.2 Case 5: Chennai, India:

This study presents the findings of an exhaustive analysis of the Chennai Metropolitan Area's land market. The World Bank, the Chennai Metropolitan Development Authority, and the Department of Geography of the University of Madras collaborated on the review (CMDA). The review used historical records of land use data, socioeconomic and housing data, IKONOS satellite images, and questionnaires carried out by real estate broker agents to investigate Chennai's urban land market. The results of this study show that it is feasible to do thorough analyses of the

urban land markets in Indian cities, and that these analyses might be extended to cover non-residential land uses as well. population density in Chennai's suburbs is increasing although it is already rather high in the city center. Strict floor space index (FSI) rules have little effect on the price trends of residential land. Land values are significantly positively impacted by the combination of infrastructure supply and development permission, particularly for industrial purposes. These are a few of the main conclusions. This study is a Type 2 comprehensive ULMA.



**Fig.4.** Case study on Chennai [Chennai Urban land market assessment, Working paper 2007-02]

## 2.3 Suggested Improvements

The main problem with the type of ULMA done by David E. Dowell is that it fails to consider a number of different parameters that are extremely impactful on the urban land market and are very important in determining land value.

Thus, there are some parameters that have to be added to ULMAs to make them more practical, relevant, and useful. They are as follows:

### I. Topography:

Topography, or the physical features of the land, can have a significant impact on the urban land market and should be considered as a parameter in urban land market assessment. Some reasons why are as follows:

1. Land value: Topography can affect the value of land. For example, a property with a steep slope may be less valuable than a property with a flat surface because it can be more difficult and expensive to develop. Therefore, by considering topography, the assessment can accurately reflect the value of the land and help in setting appropriate prices.
2. Infrastructure planning: Topography can also influence the location and design of infrastructure such as roads, bridges, and drainage systems. An urban land market assessment that takes topography into account can help in planning infrastructure that is efficient, cost-effective, and appropriate for the land's physical features.
3. Environmental considerations: Topography can also affect the environmental impacts of development. For example, a property with a steep slope may be more prone to erosion and landslides, while a property located in a floodplain may be subject to flooding. An urban land market assessment that considers topography can help in identifying areas that are environmentally sensitive and require special attention during development.
4. Market demand: The topography of a property can also affect its market demand. For example, a property with a scenic view may be more desirable than a property with no view. By including topography as a parameter, the assessment can provide valuable information about market demand and help in identifying areas with high potential for development.

### II. Soil:

Soil is an important factor that should be considered as a parameter in urban land market assessment because it can affect the suitability of

land for various uses, such as agricultural, residential, commercial, or industrial. Some reasons why are as follows:

1. Land use suitability: Soil properties, such as texture, structure, and fertility, can affect the ability of the land to support different uses. For example, soils with high fertility and good drainage may be suitable for agricultural use, while soils with poor drainage may be better suited for residential or commercial development. By including soil as a parameter, the assessment can help in identifying the most appropriate land uses for a particular site.
2. Environmental considerations: Soil properties can also affect the environmental impacts of land use. For example, soils with low permeability may be prone to erosion, while soils with high permeability may be more susceptible to groundwater contamination. By considering soil properties, the assessment can help in identifying areas that require special attention for environmental protection.
3. Land value: Soil properties can also affect the value of land. For example, soils with high fertility may be more valuable for agricultural use, while soils with good drainage may be more valuable for residential or commercial development. By including soil as a parameter, the assessment can help in accurately reflecting the value of the land.
4. Infrastructure planning: Soil properties can also affect the location and design of infrastructure such as roads, bridges, and drainage systems. An urban land market assessment that takes soil properties into account can help in planning infrastructure that is efficient, cost-effective, and appropriate for the land's physical features.

### III. Fertility:

Fertility is an important factor that should be considered as a parameter in urban land market assessment because it can have significant impacts on the value and suitability of land for various uses, such as agricultural, residential, commercial, or industrial. Some reasons why are as follows:

1. Agricultural suitability: Fertility is a critical factor for agricultural productivity, and therefore, can significantly impact the suitability of land for agricultural use. Soils with high fertility can support a wide range of crops and may be more valuable for agricultural purposes. By considering fertility as a parameter, the assessment can help in identifying the most appropriate land uses for agricultural production.

2. Environmental considerations: Soil fertility can also affect the environmental impacts of land use. For example, soils with high fertility can support vegetation that can help reduce erosion, absorb pollutants, and provide habitat for wildlife. By considering fertility as a parameter, the assessment can help in identifying areas that require special attention for environmental protection.
3. Land value: Soil fertility can also affect the value of land. Soils with high fertility may be more valuable for agricultural use or for residential properties that have gardens or landscaped areas. By including fertility as a parameter, the assessment can help in accurately reflecting the value of the land.
4. Land use planning: Soil fertility can also be an important consideration for land use planning. By identifying areas with high fertility, the assessment can help in promoting agricultural land use or encouraging the preservation of green spaces. Conversely, areas with low fertility may be more suitable for other land uses such as residential or commercial development.

#### **IV. Water Availability:**

Water availability is an important factor that should be considered as a parameter in urban land market assessment because it can have significant impacts on the value and suitability of land for various uses, such as agricultural, residential, commercial, or industrial. Some reasons why are as follows:

1. Land use suitability: Water availability can impact the suitability of land for different uses. For example, agricultural land requires sufficient water for crop growth, while residential and commercial development requires access to clean and reliable water sources. By including water availability as a parameter, the assessment can help in identifying the most appropriate land uses for a particular site.
2. Environmental considerations: Water availability can also affect the environmental impacts of land use. For example, water scarcity or contamination can have negative impacts on wildlife, aquatic ecosystems, and human health. By considering water availability, the assessment can help in identifying areas that require special attention for environmental protection.
3. Land value: Water availability can also impact the value of land. Properties with access to clean and reliable water sources may be more

valuable than properties without such access. By including water availability as a parameter, the assessment can help in accurately reflecting the value of the land.

4. Infrastructure planning: Water availability can also impact the location and design of infrastructure such as water treatment plants, pipelines, and storage facilities. An urban land market assessment that takes water availability into account can help in planning infrastructure that is efficient, cost-effective, and appropriate for the land's water resources.

#### **V. Natural Drainage:**

Natural drainage is an important factor that should be considered as a parameter in urban land market assessment because it can have significant impacts on the suitability of land for various uses, as well as the value and environmental impacts of land. Some reasons why are as follows:

1. Land use suitability: Natural drainage patterns can significantly impact the suitability of land for different uses. For example, land with poor natural drainage may not be suitable for residential or commercial development due to the risk of flooding, while land with good natural drainage may be more suitable for agricultural use. By including natural drainage as a parameter, the assessment can help in identifying the most appropriate land uses for a particular site.
2. Environmental considerations: Natural drainage patterns can also affect the environmental impacts of land use. For example, poor drainage can lead to erosion, sedimentation, and water pollution, while good drainage can help to maintain water quality and prevent soil erosion. By considering natural drainage, the assessment can help in identifying areas that require special attention for environmental protection.
3. Land value: Natural drainage can also impact the value of land. Properties with good natural drainage may be more valuable than those with poor drainage, as they may be less prone to flooding and erosion. By including natural drainage as a parameter, the assessment can help in accurately reflecting the value of the land.
4. Infrastructure planning: Natural drainage patterns can also impact the location and design of infrastructure such as roads, bridges, and drainage systems. An urban land market assessment that takes natural drainage into account can help in planning infrastructure that is efficient, cost-effective, and appropriate for



the land's natural features.

## VI. Transport Network:

Transport network is an important factor that should be considered as a parameter in urban land market assessment because it can have significant impacts on the value, accessibility, and functionality of land. Some reasons why are as follows:

1. Land use suitability: Transport network can impact the suitability of land for different uses. For example, land that is well-connected to major roads, highways, and public transit may be more suitable for commercial or industrial use, while land with limited transport access may be more suitable for residential or agricultural use. By including transport network as a parameter, the assessment can help in identifying the most appropriate land uses for a particular site.
2. Accessibility: Transport network can also impact the accessibility of land for different users. For example, properties that are well-connected to public transit or major roads may be more accessible to employees, customers, and residents, while properties with limited transport access may be less accessible. By considering transport network, the assessment can help in identifying areas that require better transport infrastructure to improve accessibility.
3. Land value: Transport network can also impact the value of land. Properties with good transport connections may be more valuable than those with poor connections, as they may be more accessible and convenient. By including transport network as a parameter, the assessment can help in accurately reflecting the value of the land.
4. Infrastructure planning: Transport network can also impact the location and design of infrastructure such as roads, bridges, and public transit systems. An urban land market assessment that takes transport network into account can help in planning infrastructure that is efficient, cost-effective, and appropriate for the land's transport connections.

## VII. Developmental Possibilities:

Developmental possibilities are an important factor that should be considered as a parameter in urban land market assessment because they can have significant impacts on the potential uses and value of land. Some reasons why are as follows:

1. Land use potential: Developmental possibilities can impact the potential uses of land. For

example, land that has the potential for higher density development or mixed-use development may be more valuable than land that is limited to a single use or lower density development. By including developmental possibilities as a parameter, the assessment can help in identifying the most appropriate and valuable land uses for a particular site.

2. Market demand: Developmental possibilities can also impact the market demand for land. For example, land that has the potential for high-end residential or commercial development may be in greater demand than land that is limited to lower-end uses. By considering developmental possibilities, the assessment can help in identifying areas that are in high demand and may fetch higher prices.
3. Infrastructure planning: Developmental possibilities can also impact the location and design of infrastructure such as roads, utilities, and public facilities. An urban land market assessment that takes developmental possibilities into account can help in planning infrastructure that is appropriate for the potential uses of the land.
4. Flexibility: Developmental possibilities can also provide flexibility for future development. For example, land that has the potential for multiple uses or higher density development may provide greater flexibility for future development and changes in market demand. By including developmental possibilities as a parameter, the assessment can help in identifying areas that provide the greatest flexibility for future development.

## VIII. Job Accessibility:

Job accessibility is an important factor that should be considered as a parameter in urban land market assessment because it can have significant impacts on the value, functionality, and attractiveness of land. Some reasons why are as follows:

1. Employment opportunities: Job accessibility can impact the availability and proximity of employment opportunities for residents and workers in the area. By considering job accessibility as a parameter, the assessment can help in identifying areas with high concentrations of jobs, or areas with easy access to job centers, which can be attractive to businesses and workers.
2. Economic development: Job accessibility can also impact the economic development potential of a location. Areas with good job accessibility may be more attractive to



businesses and investors, leading to greater economic development and potential for higher land values.

3. Transportation planning: Job accessibility can also impact transportation planning in the area. By considering job accessibility, the assessment can help in identifying areas that require better transport infrastructure to improve accessibility to job centers, which can have wider economic benefits.
4. Social equity: Job accessibility can also have important social equity implications. Areas with poor job accessibility can limit economic opportunities for residents, particularly those in lower-income neighborhoods. By considering job accessibility, the assessment can help in identifying areas that require targeted economic development efforts and improvements in transport infrastructure to improve equity.
- 5.

#### **IX. Existing Legal Framework:**

The existing legal framework is an important factor that should be considered as a parameter in urban land market assessment because it can have significant impacts on the value, marketability, and feasibility of land use and development. Some reasons why are as follows:

1. Zoning and land use regulations: The existing legal framework, including zoning and land use regulations, can impact the allowable uses, density, and design standards for land. By considering the existing legal framework as a parameter, the assessment can help in identifying areas with favourable zoning and land use regulations that can increase the value and marketability of land.
2. Permitting process: The permitting process is another aspect of the existing legal framework that can impact the feasibility and cost of land use and development. By considering the existing legal framework, the assessment can help in identifying areas with streamlined permitting processes and favourable regulatory environments that can reduce the costs and time associated with development. Legal risk: The existing legal framework can also impact legal risk associated with land use and development. By considering the existing legal framework, the assessment can help in identifying areas with lower legal risk associated with land use and development.
3. Property rights: The existing legal framework can impact property rights and the ability of landowners to use and develop their land. By considering the existing legal framework, the

assessment can help in identifying areas with strong property rights protections, which can increase the value and marketability of land.

In Summary, it is imperative that these 9 parameters be added to the ULMA process as they all influence the Urban Land Market by affecting Land Value, Land Use suitability, Infrastructure planning, Land Accessibility and more.

### **3. Results and Discussion**

The results of this review paper are mainly in the form of a number of inferences that can be made after analyzing all the research and literature there is on Urban Land Market Assessment. These inferences are as follows:

#### **(a) Prioritising:**

Some parameters in ULMA are more important than others, hence prioritising some parameters over others is incredibly important in order to efficiently conduct a ULMA. For example, Land Value, which is the most important parameter in a ULMA, must be measured thoroughly and accurately whereas parameters like Housing Stock needn't be prioritised, as housing stock is already roughly measured under the Land Use parameter. Also, since Land Value is an extremely important parameter to measure, it is advised to conduct ULMAs of places whose valuation has already been done before (preferably recently). This will make the process of conducting a ULMA considerably easier and more efficient.

#### **(b) Collaboration:**

Conducting an Urban Land Market Assessment (ULMA) can be a complex and time-consuming process, so it's important to have a strong team in place. Collaboration between government agencies, academic institutions, and private sector organizations can provide a diverse set of perspectives and resources to the assessment.

#### **(c) Data collection:**

The success of a ULMA depends on the availability and accuracy of data. The data collection process should be well planned, and multiple sources should be used to ensure accuracy and completeness.

#### **(d) Methodology:**

There are different methodologies that can be used to conduct a ULMA, so it's important to choose the best one for the specific context and objectives of the assessment. The chosen methodology should be clearly explained and justified.”

**(e) Stakeholder engagement:**

ULMA should involve the participation and input of relevant stakeholders, such as residents, community leaders, developers, and local businesses. This can ensure that the assessment is responsive to the needs and concerns of the community.

**(f) Use of technology:**

Technology can be a powerful tool in conducting a ULMA. Remote sensing, GIS and other digital tools can be used to process and analyze data and make it more accessible to stakeholders.

**(g) Communication and dissemination:**

The results of a ULMA should be clearly communicated and presented in a format that is accessible to different stakeholders. This can include workshops, report, and online platforms.

**(h) Implementation:**

Conducting a ULMA is not an end in itself, the assessment should lead to concrete actions and policies. The implementation of recommendations and actions should be closely monitored and evaluated to ensure their effectiveness. Lastly, it is highly encouraged to conduct ULMAs, as aside from their incredible utility and importance, not many ULMAs have been done before, meaning that conducting a ULMA would make the author a pioneer in the field and act as reference material for future ULMAs, both for oneself and for others.

**Discussion**

The detailed process of conducting ULMAs is discussed in the paper. There are many factors and parameters such as Population trends, Population density, Land Value, Land Use, and Housing stock which play a vital role in comprehensive ULMA. Examining population growth and trends relevant to Urban Land Market Assessment is very important. This is because demographic growth has a strong and direct impact on land use and urban development. Population growth in an area will stimulate economic growth, which in turn stimulates land development, which leads to increased land value and prices. Places with higher population growth rates and density tend to have higher land value. Thus, an analysis of population growth rates, trends, patterns, and spatial distribution of the population must be done in an Urban Land Market Assessment. Population density gradients show how fast or slow the population density of a city has been rising or falling over a certain period. Comparing the population density gradients of multiple regions

shows which areas have been experiencing the fastest growth, which areas are already well developed, which areas lack sufficient development, which areas have the potential for development, and which areas are nearing the 'developed' state.

Land Price is often the first characteristic of land one considers when assessing the value of that land. All the other parameters in Urban Land Market Assessment are assessed mainly to calculate the most accurate estimate of a land's price. The price of land often shows how developed the areas around it are, how many socioeconomic opportunities it comes with, and the utility of the given area as well. Land use is a necessary parameter to consider in Urban Land Market Assessment, as the present and future use of an area of land directly impacts its value. So in an Urban Land Market Assessment, the assessor is to find out how many different lands uses the assessed area is divided into, how much area each type of land occupies, whether these land use patterns are changing, how fast the land is urbanizing, and so on. It is important to measure housing stock in an Urban Land Market Assessment because it indicates the condition of the people in the area. If the housing stock growth rate of an area is greater than the population growth rate of the area, then it indicates an increase in housing opportunities for people, which is naturally a sign of progress. It can be inferred that all these parameters are very important in assessing the present value as well the future value of land. Therefore at least these parameters should be considered in all Comprehensive Urban Land Market Assessments.

**4. Conclusions**

This paper details how to practically and feasibly conduct a Comprehensive Urban Land Market Assessment in a region. It shows the detailed process of conducting a ULMA and the important parameters to measure. The main highlights of this paper are:

- Urban Land Market Assessment (ULMA) refers to the assessment of Urban Land, not just with respect to market value, but a variety of factors, to determine the region's past development, present status, and possible future development trajectories.
- The factors and parameters assessed in a comprehensive ULMA are Population trends, Population density, Land Value, Land Use and Housing stock.
- Comparing various Type-1 and Type-2 ULMAs,

we have found that Type-1 Problem-focused ULMAs typically only assess land on a limited number of parameters (Usually less than 5), and such ULMAs are intended to examine and solve a specific problem pertaining to that area. On the other hand, Type-2 Comprehensive ULMAs assess land on a wide variety of parameters (Typically 5 or more) to paint a complete picture of the land to not only assess the land's present value, but its possible future value as well.

- This paper has also provided some suggestions on adding 9 very important parameters to the ULMA process to make it more relevant and useful. These parameters are: Topography, Soil, Fertility, Water Availability, Natural Drainage, Transport Network, Developmental Possibilities, Job Accessibility, and Existing Legal Framework.
- This paper has also provided its results in the form of certain inferences that future researchers on the topic must keep an eye on to ensure their ULMA is as useful as possible and of the best quality.

Some recommendations for future studies on ULMA are as follows:

1. It is highly recommended to add the 9 new parameters mentioned in this study to their ULMA as it will greatly enhance the usefulness and practicality of their ULMA.
2. Incorporating new data sources: Future studies on ULMA can benefit from incorporating new data sources and methods, such as satellite imagery, machine learning, and social media analytics. These data sources and methods can provide more granular and real-time insights into urban land markets, which can help in identifying emerging trends and patterns.
3. Assessing the impact of new technologies: The use of new technologies, such as autonomous vehicles and drones, is expected to have significant impacts on urban land markets. Future studies on ULMA can explore the implications of these technologies and assess their impact on land use patterns, transport infrastructure, and property values.
4. Comparative analysis: Future studies on ULMA can benefit from conducting comparative analysis across different cities, regions, and countries. This can help in identifying commonalities and differences in urban land markets, which can inform policy and planning decisions.
5. Community engagement: Community engagement is an important aspect of urban land markets, as it can impact the demand for

different types of land use and development. Future studies on ULMA can explore ways to incorporate community engagement into the assessment process, such as through participatory mapping or citizen science.

6. Incorporating EIA: Incorporating Environmental Impact Assessment (EIA) into ULMA is incredibly important, especially in current times where environmental concerns are of high priority. Integrating EIA into ULMA will help in understanding the state of the environment in the land assessed, the factors harming the environment of the land assessed, and the ways in which environmental degradation in the land assessed can be stopped, and possibly reversed.

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