DYNAMICS OF LAND PRICE AND LAND USE CHANGE: A CASE OF SAVAR MUNICIPALITY, BANGLADESH

[a]Md. Sabbir Sharif*, [b]Adiba Jamal Esa

[a]*Department of Urban & Regional Planning, Khulna University of Engineering & Technology, Khulna, Bangladesh.*
[b]*Department of Architecture, Stamford University, Bangladesh.*

A B S T R A C T

Societies are becoming more and more multifaceted due to population increases and technology advances. Owing to scarcity of land, price tends to rise as because local government invests in infrastructure, transportation, education and health sector. Land is not only a wealth-creating resource for sustenance but also the basic resource requirement for all development. Increasing urbanization is responsible for land price. Every land use shows different land price in terms of urban services and facilities, land use types, accessibility and social and environmental factors. Hence, it is necessary to strike a balance between the urban activities and the associate land conversion in order to attain sustained growth over a longer period of time. Savar municipality of Dhaka district is situated at a distance of about 29 km to the north-west of Dhaka City on the Dhaka-Aricha highway ("Community Series" Bangladesh Bureau of Statistics, 2001). Due to rapid urbanization the rate of rural-urban migration is higher in this municipality. The supply of urban land is limited and demand for industrial, commercial as well as residential land is growing. Consequently, the stock of open spaces has been declining day by day with the increase of population at an alarming rate. This research has concentrated its focus on the effects of expected land use change on land price of Savar municipality. The study has observed that there is a strong relationship in between land use change and land price.

Keywords: Land price, Land use change, Municipality, Correlation coefficient.

INTRODUCTION

The development of an urban structure, location, land use type, the process and planning etc. depends on land price. At the same time land price acts as a determining factor of the extent of urban development. Land is a wealth-creating resource for sustenance. It provides the means for livelihood. It has the potential to contributing significantly to government revenues if it is managed properly. It is the basic resource requirement for all development (Heyford, 2004). The urbanization rate of Bangladesh is 3.1% in 2013 ("South Asian: Bangladesh, The World Factbook", 2013). This rapid increase of urbanization creates pressure on urban land and the price of land. Thus the nature and pattern of land price holds a meaningful place in urban planning and management. Increasing rate of urbanization is the effect

* Corresponding Author:
Email ID: mssharif.kuet@yahoo.com

of population explosion and rural-urban migration. Total population of the country was 114.4 million in 1991 and the percentage of urban population was 20.1, while in 2001 total population was 129.2 million ("Community Series" Bangladesh Bureau of Statistics, 2001).

Rapid conversion of agricultural, flood flow and sub-flood flow lands into urban uses at the periphery of Dhaka city increases the demand for developing useful supply, demand and pricing models. Nevertheless, pricing land offers a challenging task. The average land price growth rate of Savar municipality during 1985-1995 was 928 percent, which was 225 percent during the period of 1995-2005. The amazing growth of land price during the period of 1985-95 was because of the declaration of Savar urban area as a municipality and construction of urban infrastructures. During this high economic growth time, the conventional belief was that land values should soar with increasing demand and decreasing vacancies. Conversely, anticipation of these

values is problematic since spatial factors are often influential ones along with other characteristics of land (Amin, 2009). The study, dynamics of land price and land use change in Savar municipality is undertaken so that it can help to control the urban growth of this area.

METHODOLOGY OF THE STUDY

Three representative wards (5, 7 and 9) are considered as the study of Savar municipality which indicate the overall land use pattern such as residential, commercial, industrial, mixed use, agricultural land etc. In this study, purposive sampling technique is used or else it may not fulfil the purpose. Some factors are considered to select the sample parcel of land, which are: distance from central business district (DCBD), distance from bus stand (DBS), distance from health centre (DHC), distance from the nearest road (DNR), distance from working place (DWP), distance from the nearest school (DNS), distance from Katcha bazaar (DKB), distance from recreation facilities (DRF), distance from shopping centre (DSC), distance from police station (DPS), distance from fire service (DFS), landscape design, access to highway, supplied basic utility services, distance from car parking area, environment etc. The sample size for the wards 5, 7 and 9 are 50, 70 and 90 respectively. Distance from the sample plots to other service facilities are measured using Google-earth. After accumulating and processing both the primary and secondary data statistical analysis is executed.

DESCRIPTION OF THE STUDY AREA

Savar municipality is located at the north-western side of Dhaka City and on the Dhaka – Aricha Highway. According to the Census Report 2001, the total area of Savar upazila is 280.13 sq. km. of which municipality covers an area of 16.67 sq. km ("Community Series" Bangladesh Bureau of Statistics, 2001). It has a population of 161600 with a population density of 9694 per sq. km. (Bangladesh Bureau of Statistics, 2001). Three rivers - Turag River on the east and west, Dhaleshwari and Bangshi River and Buriganga on the south - surround the study area. The existing municipality area was declared as 2nd class municipality in December 14, 1991. Aftermath, Savar was upgraded as 'class A' municipality in July 29, 1997 (Amin, 2009).

LAND USE OF THE STUDY AREA

The analysis of land parcel data by applying Geographic Information System (GIS) software enables planners to better understand the locational and spatial characteristics of a land area, along with its social, economic and environmental dimensions. Land use data is an important source in formulating future urban growth scenario. Existing land use information appended to land parcel boundaries is acquired from Sheltech Pvt. Ltd. This spatial data layer comprises approximately 19500 land parcels (excluding roads and water bodies) and classified into thirteen generic land use categories (Table 1 and Map 1).

Table 1: Land use distribution in Savar municipality.

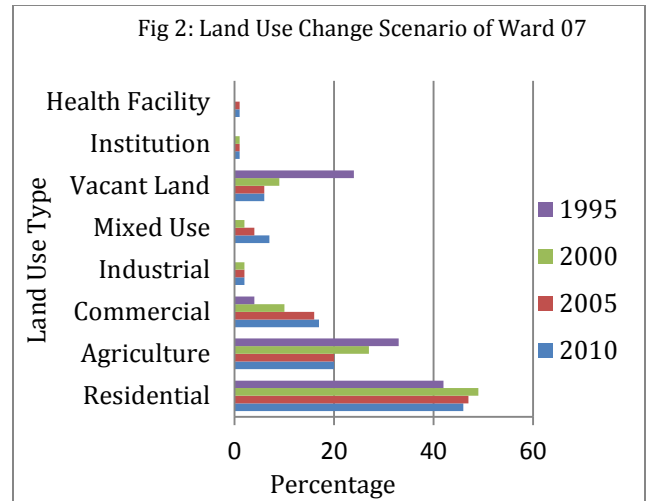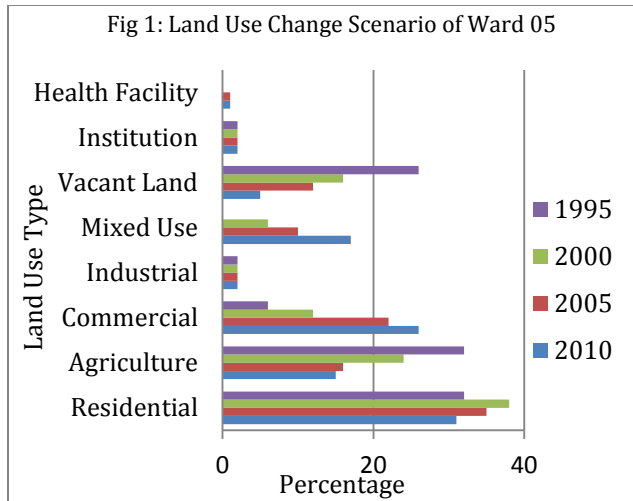| Category	Number of land parcel	Total area (acre)	Percentage (%)
Agriculture	2236	598.613	15.02
Circulation network	4732	138.013	3.46
Commercial activity	789	35.087	0.88
Community services	158	126.499	3.17
Forest area	126	29.495	0.74
Manufacturing and processing	274	62.133	1.56
Mixed use	38	10.008	0.25
Residential	12589	2127.173	53.36
Restricted area	90	16.567	0.42
Service activity	57	15.657	0.39
Vacant land	3284	556.797	13.97
Water body	1765	270.219	6.78
Total	26138	3986.261	100

Source: Sheltech Pvt. Ltd., 2010.
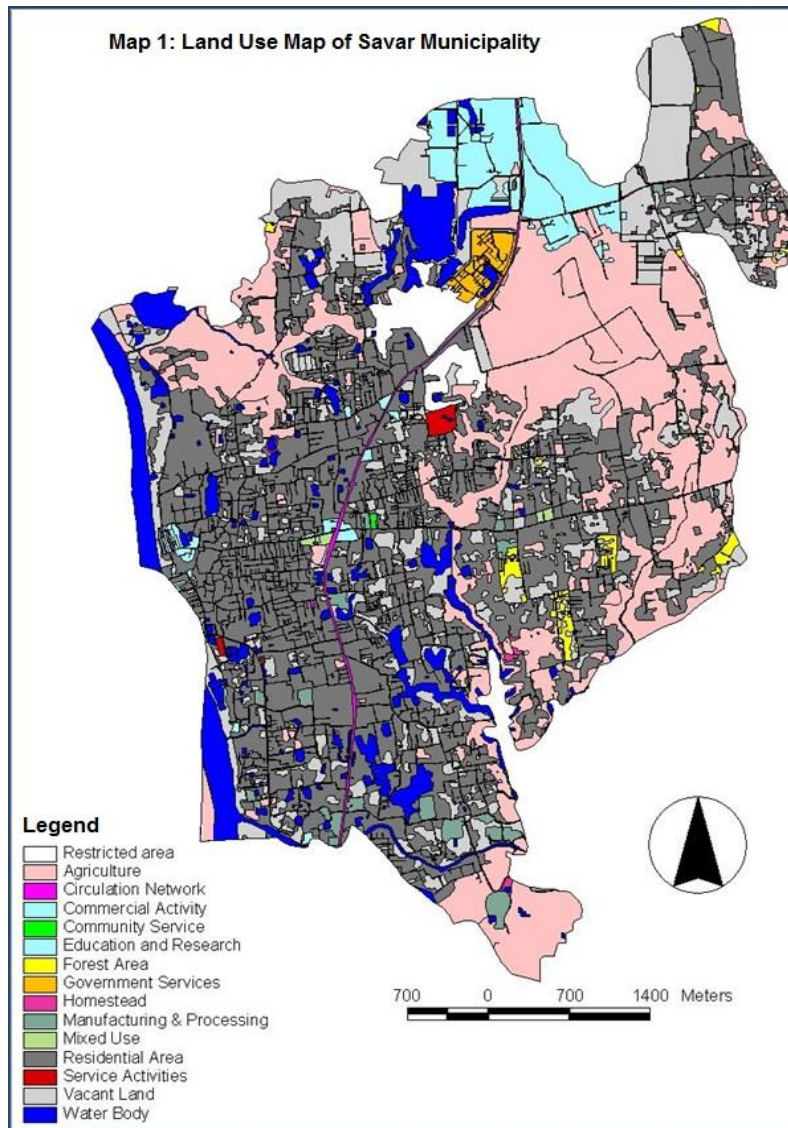
Source: Sheltech Pvt. Ltd., 2010.

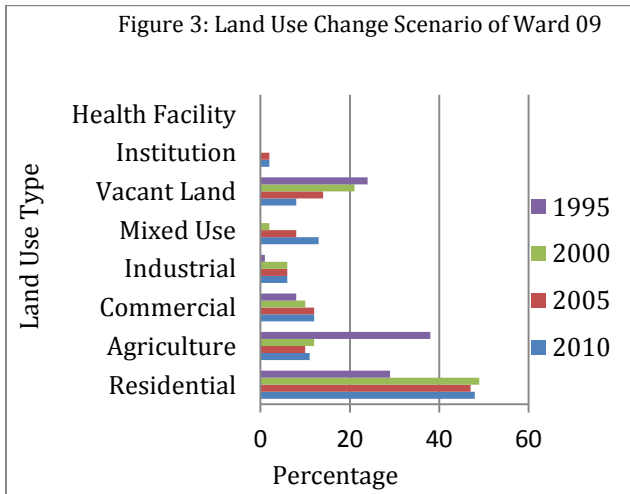## TREND ANALYSIS OF LAND USE CHANGE IN SAVAR MUNICIPALITY

The process of land use and morphological change in Savar municipality in recent decades shows a complexion of rise in housing and expansion of settlements, increase of industrial, commercial and other non-agricultural uses, rise in urban infrastructure service and decrease of agricultural land (Field Survey, 2013). This transformation process gives rise to multi-factorial problems at the same time paving way for accommodating more and more urbanization in the suburban township.

From these bar charts it is clearly identified that in the year 1995, the land use of Savar municipality was mostly dominated by the agricultural sector. With the escalation of time, the agrarian community was diverted to residential community. A common feature is that the mixed use of land was not found before the year 2000. The multi-dimensional thinking of economic stability encourages the mixed land use type to the mass people. It is also mentionable that, with the advancement of rapid urbanization the amenities and facilities are incorporated with the life of urban people, though the percentage of these services is not adequate as much as it essential. With the expansion of Dhaka Metropolitan Area (DMA) the urbanization movement hits the surrounding area and rapid increase of urbanization results to haphazard growth as a whole.

Fig 1: Land Use Change Scenario of Ward 05

Fig 2: Land Use Change Scenario of Ward 07

Source: Field Survey, 2010.

Figure 3: Land Use Change Scenario of Ward 09

EXISTING LAND PRICE OF THE STUDY AREA

Savar, an important satellite town of Dhaka city, is a suburban area to the west of Dhaka Metropolitan Area (DMA). The average land price growth rate of Savar municipality during the last 1985-1995 was 928 percent, which was 225 percent during the period of 1995-2005. The amazing growth during the period of 1985-95 causes of the declaration of Savar urban area as municipality and construction of urban infrastructures (Amin, 2009).

In Savar municipality, commercial land use shows the highest land price because there is an opportunity to use the land for maximum output.

Table 2: Existing land price condition in the study area.

| Land use type	Plot Type	Ward 05	Ward 07	Ward 09	Registered Land Price (BDT Per katha)
		Average Land price (BDT Per katha)	Average Land price (BDT Per katha)	Average Land price (BDT Per katha) rage	
Residential	Corner Plot	1,400,000-1,500,000	1,200,000-1,400,000	1,400,000-1,600,000	639,762
	South-facing Plot	1,400,000-1,500,000	1,300,000-1,400,000	1,400,000-1,600,000	
	Other Plots	1,200,000-1,400,000	1,000,000-1,200,000	1,300,000-1,400,000	
Commercial	CBDArea	1,500.000-2,000,000	1,400.000-1,800,000	-	803,847
	Near to CBD	1,300,000-1,600,000	1,200,000-1,400,000	1,000,000-1,200,000	
Industrial	Any	1,200,000-1,600,000	1,100,000-1,300,000	1,400,000-1,500,000	923,470
Mixed use	Any	1,200,000-1,400,000	1,000,000-1,200,000	1,000,000-1,200,000	-
Agricultural land	Any	1,000,000-1,200,000	800,000-1,000,000	800,000-900,000	300,000

Source: Field Survey &Savar Sub-registry Office, 2010.

The commercial area is mainly developed concentrating Savar Bazar. In the year 2010, commercial land price per katha (720 sq. feet) is BDT 1,500,000. Relative position of CBD area is influencing the price of commercial plots, which varies between BDT1, 200,000 to BDT1, 500,000. On the contrary, there is huge difference in between actual land price and government settled land price. The client registers their land hiding actual value for low registration cost. Sub registry office is responsible for registering land value. As a result the government loses a huge amount of revenue from land transaction every year. For example, the registered commercial land price is BDT 803,847 whereas actual price is around BDT 1, 600, 00000. That means 49% of money could be earned by government if there is no difference between actual and registered land price.

Fig 4: Trend of Land Price Change in Ward 05

Fig 05: Trend of Land Price Change in Ward 07
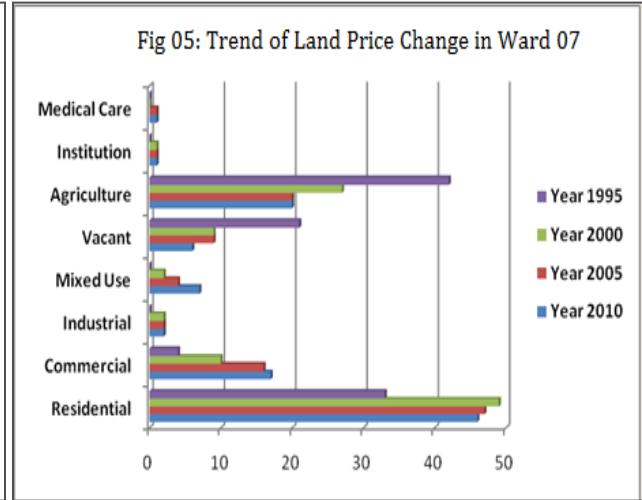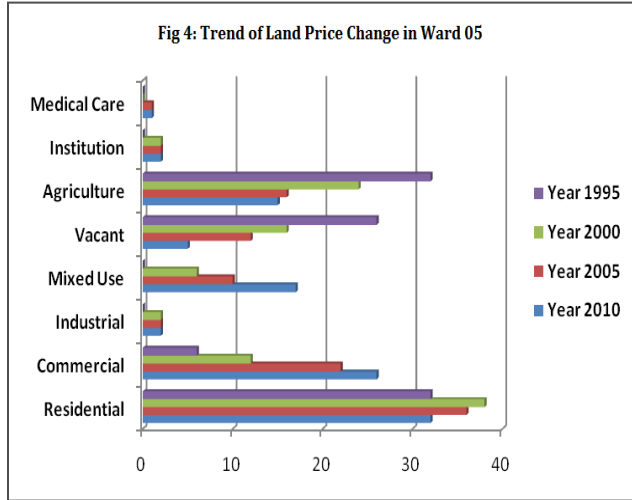
The trend of land price change in different time period is shown in Figures 4, 5 and 6.Source: Field Survey, 2010.

Fig 6: Trend of Land Price Change in Ward 09
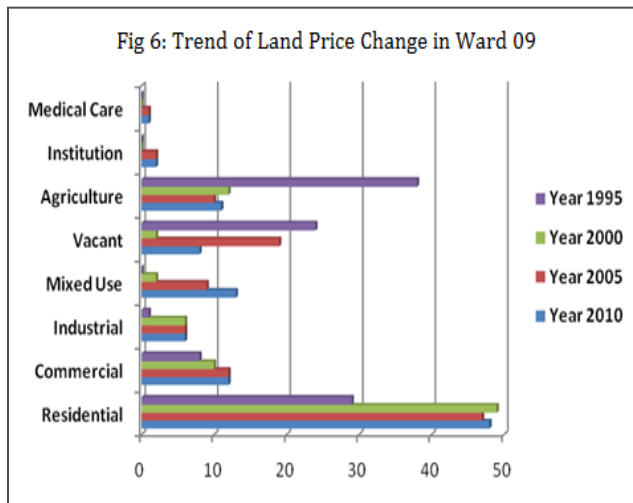
TREND OF LAND PRICE CHANGE

It can be marked from these figures that land price of three adjacent areas changes almost in same rate. After the year 2005, there is a great revolution of land price in Savar municipality. The price of land remains doubled in this time.Within these three wards the price of industrial plots is higher in ward 05 and ward 07 comparative to ward 09.

FACTORS INFLUENCING LAND PRICE

There are many factors that influence land price, such as physical factors, social factors, cultural factors, environmental factors etc. From the literature review and survey, it is evident that some factors are highly affected for changing land price in different areas.

Distance as a Significant Factor: To determine the relationship between the change of land use pattern and land price, distance is considered as a major factor. The Table 3 shown below is a distance correlation matrix derived from the selected variables listed in methodology.

From the table 3 it is found that five variables are highly correlated with the land price (LP). These variables are distance from recreational facilities (DRF), distance from shopping centre (DSC), distance from health centre (DHC), distance from bus station (DBS) and distance from central business district (DCBD). Here, the correlation signifies that the price of land is decreasing with the increase of distance from service facilities. Correlation coefficient (R) is a measure of association between two variables, and it ranges between –1 and 1. If the two variables are in perfect linear relationship, the correlation coefficient will be either 1 or –1. The sign depends on whether the variables are positively or negatively related.

Table 3: Distance correlation matrix.

	LP	DWP	DNS	DRF	DSC	DFS	DHC	DKB	DPS	DBS	DCBD	DNR
LP	1.00	-0.21	-0.21	-0.76	-0.50	-0.03	-0.71	-0.12	-0.13	-0.65	-0.54	0.08
DWP		1.00	-0.17	0.17	-0.02	-0.08	-0.05	0.09	0.06	-0.03	-0.09	-0.02
DNS			1.00	-0.35	0.12	-0.38	0.61	0.00	0.50	0.15	0.57	-0.02
DRF				1.00	0.22	0.31	0.05	0.21	-0.30	-0.28	-0.15	-0.12
DSC					1.00	0.46	0.24	-0.23	-0.06	0.18	0.25	-0.26
DFS						1.00	-0.28	-0.36	-0.40	0.21	-0.31	-0.11
DHC							1.00	-0.03	0.28	-0.07	0.56	-0.03
DKB								1.00	0.00	-0.35	-0.04	0.03
DPS									1.00	0.54	0.65	-0.02
DBS										1.00	0.52	-0.08
DCBD											1.00	-0.24
DNR												1.00

Source: Google Earth & Field Survey, 2010.

The correlation coefficient is 0 if there is no linear relationship between the variables.

A positive R implies that when one variable increases, the other variable increases while a negative R implies that when one variable increases, the other decreases (Chung, 2013).

Location of the Plot and Land Parcel Shape: The location of a plot is one of the most dominant factors for the change of land price. For example the price of a corner plot or south facing plot is much higher than other plots (Table 4). On the other hand the rectangular plots are more valuable than other plots.

Table 4 Land price variation in accordance to plot type.

Ward no.	Land use type	Plot Type	AverageLand price (BDT Per katha)
5	Residential	Corner Plot	1,400,000-1,500,000
		South-facing Plot	1,400,000-1,500,000
		Other Plots	1,200,000-1,400,000

Duration of Water Logging: The inhabitants of Savar municipality conveyed that the number of the drains in their area is inadequate. There are nine scattered low-lying areas namely Genda, Karnapara, Tabbag, Maddapara, Sabujbag, Jalesor, Nayabari, DogarMorh and Saranika. These areas are subjected to water logging during and after heavy rainfall causing troublesome to the municipality residents. Water logging plays a vital role in determining land price. The higher rate of water logging causes the lower rate of land price.

Nearest Road: It is universally known that the development of an area mainly follows the pattern of its road network. In case of Savar municipality, it is undeniable that the value of land is much higher alongside the high way and the change of land use pattern is also depends on it. For example, the price of land near to Dhaka-Aricha High way is about 1,600,000 to 2,000,000 BDT (Field Survey, 2013). It is a common scenario that the land price decreases with the increase of distance from nearest road and its type.

Access to Utility Services: All the basic utility services are existed in Savar municipality, but the provision is not same in all areas. The price of land also varies on the existence of these services.

Land Use of Surrounding Area: The price of a land is also stimulus by the land use of its surroundings. For example, the price of a land within the commercial zone is much higher than the residential zone.

FINDINGS OF THE STUDY

Land plays an important role in society. It is not only a way of development, but also a commercial good and natural birth right. Every land use decision is bounded by an arrangement of administrative, institutional, technical, financial, environmental, cultural and political issues. As a result, the information of land market has become an important factor to understand land issues and to control development. The change of land use and land price is contingent on distance from services and

facilities. With the increase of distance from these service facilities land price decreases and vice-versa. On the other hand the rate of land use change is higher adjacent to these service-facilities whether it is lower with the increase of distance.

The economic characteristics of space depend on the physical factors and the spatial structure of an area. The price of a particular plot is also determined by various environmental, structural and transportation factors like, type of the neighbourhood, width of the main road, width of the access road, distance from the main road, duration of water logging, depth of water during flood, distance of the nearest market place, health facility, school and central business district etc.

Savar municipality is within the DMDP area and a number of garment industries are located here. Due to rapid urbanization the rate of rural-urban migration is higher in this municipality. The supply of urban land is limited and demand for industrial, commercial as well as residential land is growing. Consequently, the stock of open spaces has been declining day by day with the increase of population at an alarming rate.

The expansion of settlements, increase of industrial, commercial, other non-agricultural land use and urban services and conversion of agricultural land is making the process of land use change in Savar municipality complex. Most of the houses have no linkage with drainage and sewerage lines. The housing societies and land owners are developing their land without following any legislative plan resulting urban sprawl. These places require detail planning considering the future population growth and physical expansion of the area. Provision of wide roads near the highways and hierarchy of roads can guide the area for balanced growth towards forming a number of attractive residential neighbourhoods. Rapid expansion and development have already been started in Jamshing, Vatpara, Dogormura, Shahibag, Rajashon and Majidpur area.

CONCLUSION

In recent times, the rate of urbanization is increasing rapidly in Bangladesh. According to the population census 2001, 20.19% people live in urban areas ("Community Series" Bangladesh Bureau of Statistics, 2001). Due to increase of population, a huge pressure is imposed on land. As Land is one of the important natural resource and plays important role in society, all development works is based on it and it is a commercial good also. Establishment of database on land price and land use pattern is essential towards making local land market more efficient. The information of land price can be used to determine market performance, future needs of infrastructure and to control expansion of settlements for ensuring sustainable development. Government can play crucial role in reducing the frequent change of land price by applying policies and legislation. Land value tax can be a good instrument for controlling land price. Land registry office should be reformed and their structure should strictly be maintained. The assessment of land value on the basis of transaction data is not scientific and realistic method at all time. It is because each parcel of land has unique characteristics. Realistic and flexible land value assessment technique should be incorporated. There should be transparency in land registration which will increase the income of local government as well as reduce land value. It is expected that this research will provide useful insights on the topic to the future researchers and policy planners on urban land market.

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