LAND TRANSFORMATION AND LAND VALUATION: A CASE STUDY OF BARAKHOLA, PATULI AND REKJUANI MOUZA NEAR EASTERN METROPOLITAN BYPASS, KOLKATA

[1]Mantu Das, [2]Dipannita Guha, [3]Sukanya Banerjee
[1]Research assistant, [2]Ex-student, [3]Ex-student
[1]Cultural Research Institute, B.C.W & T.D Department, Govt. of West Bengal, India

***Abstract*-In recent decades, changes that human activities have wrought in Earth's life support system have worried many people. The human population has double in the past 40 years and the projected to increase by the same amount again in the next 40 years. The expansion of infrastructure and agriculture necessitated by this population growth has quickened the pace of land transformation and degradation. We estimate that humans have mortified less than 50% of earth's land surface. Land transformation is a critical issue coming up which takes place along with land acquisition. As land cover and land use changes, the presence of amenities also varies. This finally affects the land valuation varying over place and time. Lands are valuated based on its profitability or based on the profit margin of the economic works which have grown up over the land. Land valuation is also required in the time of purchasing of selling of the land because by this valuation the purpose behind the use of the land can be understood. Valuation differs from multistoried building to office, residential purpose, industrial purpose and other cultural or economic purpose. Valuation gives an assumption about the profitability of the sector for which the land is needed. This study gives a comprehensive analysis of land transformation and land valuation of the study area.**

***Index Terms*- Land transformation, Land valuation, Metropolitan area, Land use.**

INTRODUCTION:

Many changes in land use are consequences of the increase human population and the resulting demand for more resources among them, minerals, soil and water. The long term sustainability issue is more serious than, but exacerbated by climate change.

In the 1970s, it was recognized that changes in albedo and evapo-transpiration due to clearing and overgrazing had led to local decrease in rainfall. In the 1980s the role of land use changes in the carbon cycle was highlighted.

Human are likely the premier geographic agent currently sculpting Earth's surface. Earth is moved and landscape modified, commonly degraded by many of our activities. Mining, infrastructure expansion, urban developments are obvious one. The land is an essential resource for future generation.

The two basic features of land transformation are Land use alteration and intensification. It is still remarkable because most alteration of land use drastically reduce the agricultural area. Intensification consequently is the main type of land transformation in all section of regional development. In most cases the benefit of strong intensification severe to particular users. Therefore various by effects arise like, pollutions, contamination, blocking and devastating of renewable natural resources. Land transformation must be accompanied by the developments of a dense network of productive measures and reservation areas, and multiple uses of renewable natural resources. At present complicated system of land use are in evolution.

Land valuation is the value of a piece of property, including both value of the land itself as well is any improvements that have been made to it. Land values increase when demand for land exceeds the supply of available land or if a particular piece of land has nitrifies value greater than neighboring areas (e.g. oil can be found on the land).

Price in money is the generally expression to make and compare land values in a functional market. The price of land determined by its production potential and by the present of future services it in corporate; in modern times it has also become an object of speculation.

STUDY AREA:

Selection of the study area is one of the fundamental steps for any study. The success of any study depends upon the selection of a suitable study area. To achieve the goals and objectives of the present study, study area was selected. Our study areas are Barakhola Mouza and Patuli Mouza which near to the E M Bypass road and Rekjuani Mouza which nearer to the Rajarhat min road of New town area in Eastern Kolkata.

Barakhola Mouza is situated in Kolkata Metropolitan District of West Bengal, India. Which stretches between 22°29'19''N and 22°30'0''N latitude and 88°23'42''E and 88°24'22''E longitude. The Eastern Metropolitan Bypass through (420metre) is the new area and further stretches towards the south.

Patuli Mouza is situated in Kolkata Metropolitan District of West Bengal, India, which stretches between 22°28'12'N and 22°28'42''N latitude and 88°22'32''E and 88°23'2''E longitude. The Eastern Metropolitan Bypass through (2222metre) the new area further stretches towards the south.

Rekjuani Mouza is a vast area so we select Northern part of the Rekjuani Mouza situated between22°37'27''N and 22°38'18''N latitude and 88°28'10''E and 88°29'16''E longitude.

OBJECTIVE:

The main objectives of the present study are as follows-

1. To determine the Processes and Changes in land use and land cover pattern with current impact on land evaluation.
2. To identify correlation between land value and land placement with reference to distance from road.

METHODOLOGY:

For this study both types of data (Primary and secondary data) has been collected from various sources. Secondary information has been collected from word office and BLRO office. Map has been collected from **www.wbregistration.gov.in.** Primary information has been collected by personal interview.

- **Pre-study:** After selecting the topic, different journals and articles on this topic have been gone through from the internet.
- **During study:** On March 2017, selected mouza of Kolkata and South 24 Parganas district has been visited. A pre-designed structured schedule was made to carry on survey among the local tribal people. Data collected by the said processes are all primary in nature.
- **Post-study:** Q-GIS (2.8.6) have also been used to prepared map. Collected data has been tabulated. Suitable cartograms have been made in MS-Excel 2007 software. Both the tables and diagrams have been interpreted and a report has been produced.

1. LANDUSE MAP OF THE STUDY AREA

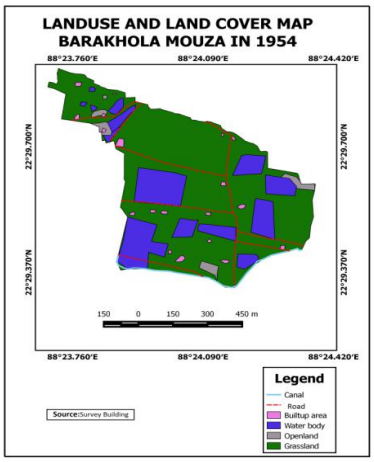
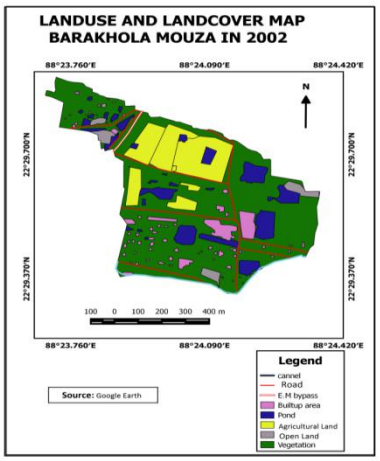


Fig. 1 (a)



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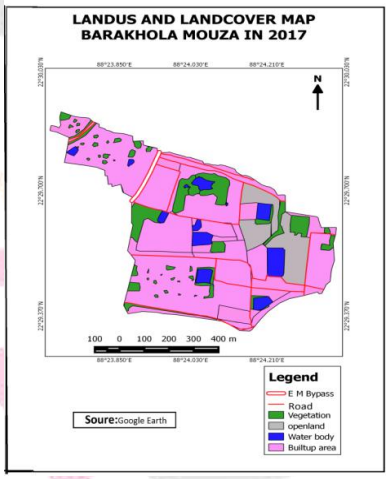

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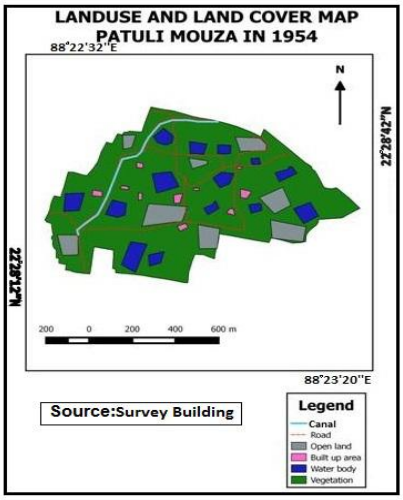

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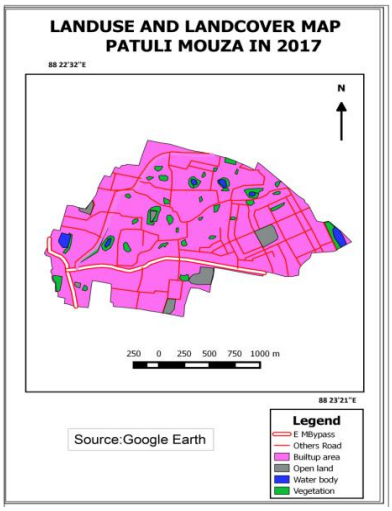

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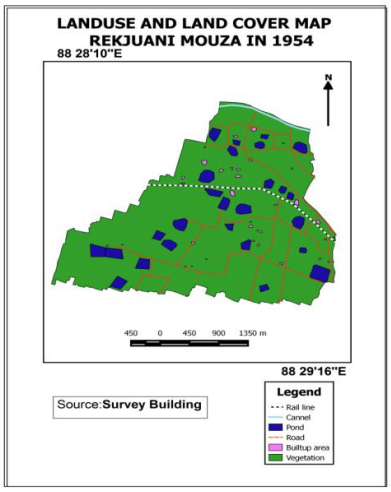

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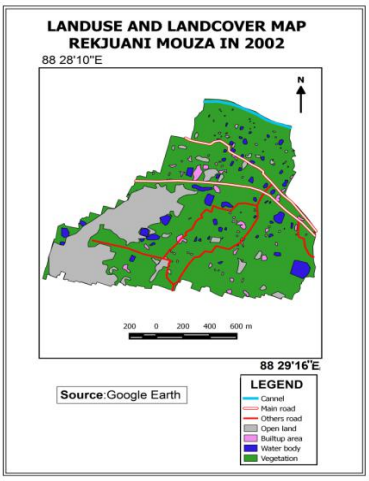

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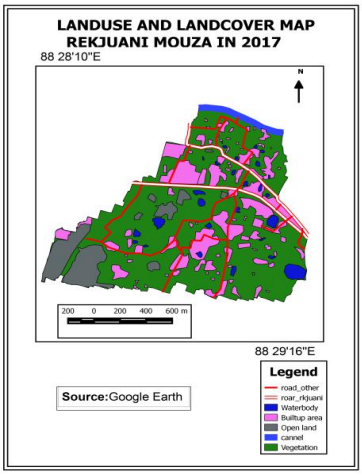


Fig. 1 (i)

2. LAND VALUATION MAP OF THE STUDY AREA

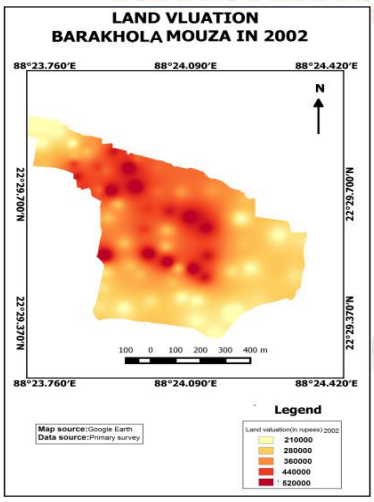
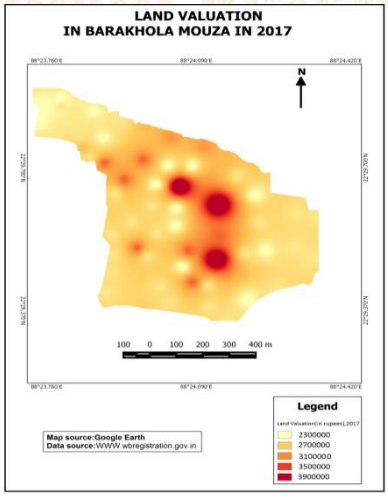


Fig. 2 (a)



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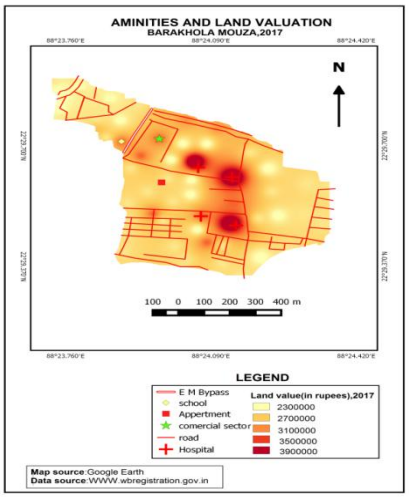

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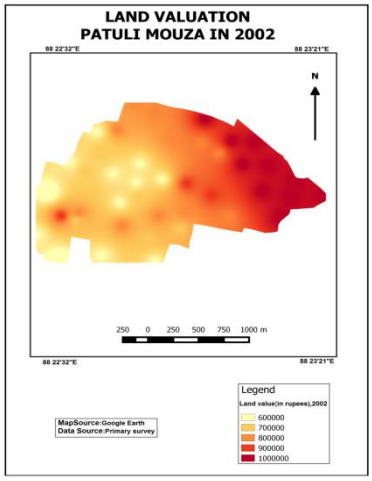

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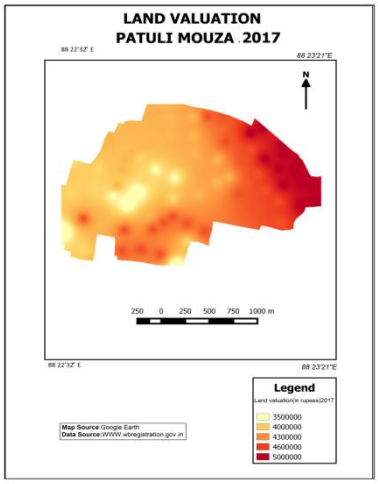

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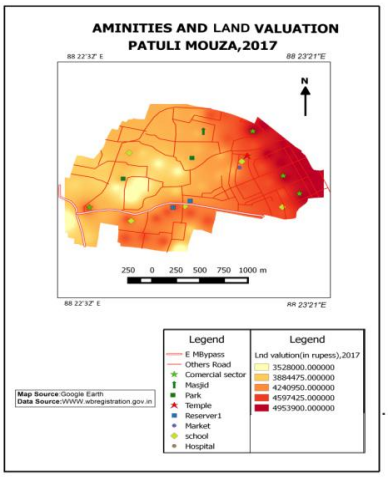

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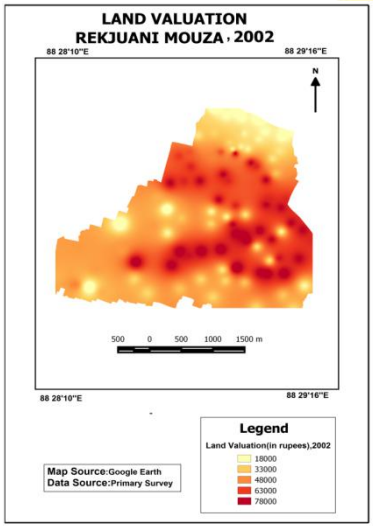

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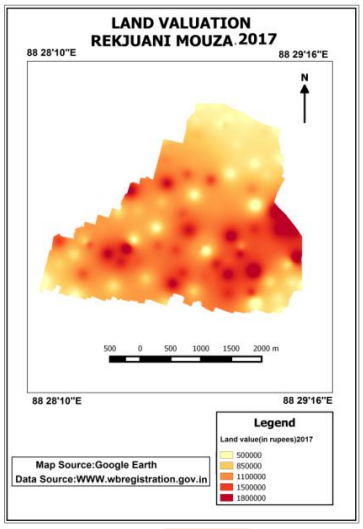

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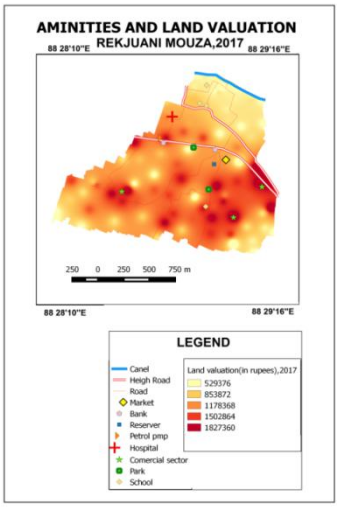

Fig. (i)

❖ RESULT AND DISCUSSION:

1. Process of Land Transformation:

1.1: Barakhola Mouza:

Since 1970s refugees from Bangladesh and other areas started assembling to this area. Getting free land from the government, they started settling over here. Moreover, due to the construction of Jadavpur stadium, land acquisition took place at Jadavpur. The residents living there were given lands at Barakhola to settle down and therefore they were forced to build their new settlements here.

1.2: Patuli Mouza:

This area was previously covered by paddy fields, ponds and vegetation cover. In 1990, the land was distributed to the government workers by the government to settle down based on lottery system. If names came up in lottery, the individuals were given choice to select the land plots on the basis of the economic conditions. The government segregated the people into 3 groups while the distribution-

High income group	Middle income group	Low income group
Official rank holders	Clerical workers	D group workers
Land area of 3 Kattha	Land area of 2 Kattha	Very small plots

The 3rd group was further divided into EWS 3 and EWS 4(Economically weaker sections) for whom government even constructed houses in the given plots as they were economically weak. The first two groups were given plots at very low rates (Rs. 8500/ Kattha). Even these lands were leveled using the soil from other lands and even raised in heights. Many wetlands were also covered up for construction of buildings.

1.3: Rekjuani Mouza:

During the construction of New town, Government, businessmen and promoters bought the lands from farmers and sold them to bigger clients who took up the construction of various buildings in the area. Other than these, many lands are still kept vacant as open land for prospective constructions of schools and hospitals that the government had bought from the poor farmers of the area.

2. Changes in Land Use and Land Cover with Current Impact on Land Valuation:

Land is the main repository of wealth, dominant means of production and important determinant of social status of the household. Land use pattern is changing continuously due to economic, social and above all the political causes.

2.1. Barakhola Mouza

1954: The southern part of the area had a canal of 0.94m length surrounded by grassland and agricultural land on the rest part (Fig: 1(a). Total area under vegetation cover was 70.5 sq. km. There were presence of water bodies such as ponds and marshy lands covering an area of 0.136 sq km. Therefore fishing along with agriculture was the main occupation. The area at this time had mainly footpaths, cart tracks and un-metalled roads with very few metalled roads. The area was almost underdeveloped and settlement was hardly present except few dispersed ones. The total built up area was only 0.0069 sq km. And open land consisted 0.0148 sq. km.

2002: Since the previous time, the area did develop a little that can be attributed to the construction of EM Bypass (Fig: 1(b) in the north-eastern part of the area in 1992, of which 420m passes through this Mouza. Transportation and accessibility developed due to this. Agricultural area consisted of an area of 0.098 sq. Km while the vegetation cover reduced to 0.32 sq. km. The water bodies became smaller in size although fishing still continued. The birth of various business activities started hampering the primary activities. Human interference resulted in decrease of the width of the canal in the southern part of the area. Since 1975-1980, many refugees from Bangladesh started settling in this area clearing up the grasslands and vegetation cover. The settlements and the built up area (0.0304 sq. km.) was mainly present in the southern part. Open lands consisted of area of 0.015 sq. km. The metalled roads also increased. Therefore, the area initiated its developmental process from this time.

2017: There has been a rapid growth and development with clear and noticeable transformation in land cover and land use. The agricultural lands, grasslands and vegetations went through land acquisitions for construction of government and private projects along with big housing complexes and apartments that are spread in the whole area. 'Avidipta Apartments' covers most of the area that was under agriculture and marshy lands (Fig: 1(c). The present built up area is 0.364 sq. km. which includes hospitals, schools, private sector undertakings, shopping mall (Metro Cash and Carry in the north-eastern part), etc. E M Bypass along with other metalled roads creates a mesh over the area now. There is presence of grassland along the Bypass and open lands (0.005 sq. km.) are present in the western part mostly. Presently wetlands consist of an area of 0.0498 sq. km.

Valuation 2017: The present land valuation could be referred from the government registered website www.wbregistrationgov.in, which is based on purpose of land use. The commercially utilized lands have the highest value (Fig: 2(c). The land value is hiking rapidly especially in the central part which mostly has the hospitals presently having the value Rs. 39,00,000. This is the same for the commercial lands in the north-eastern parts where Metro Cash and Carry is present. Other than this market facility, transportation development also effects the valuation especially along the E M Bypass. Even the value of residential complexes and apartments are in crores.

2.2 Patuli Mouza:

1954: The area consisted of paddy fields, ponds, grasslands, vegetation and a canal in the western part of length 1.011375 m(Fig: 1(d). The area under vegetation and grassland was 0. 529 sq. km. and under water bodies was 0.25 sq. km. Built up area consisted of 0.09 sq. km. while open land was 0.26 sq. km. The ponds were of larger size rather most of the area in this Mouza showed characteristics of wetlands. There was almost no visibility of metalled roads but footpaths and un-metalled roads were present. Of the agricultural area, paddy fields cover most of it showing cultivation as the major occupation along with potatoes and bajra.

2002: in 2002, Patuli had already received the light of development the main reason behind it being the construction of EM Bypass in the southern part (Fig: 1(e) for 2222m. The previous un-metalled roads were converted to metalled roads by the government with many new ones constructed. The volume and size of the ponds went down with the area becoming 0.16 sq. km. The ponds and marshes were covered up for construction of various buildings mainly for residential purpose. The open land was of 0.36 sq. km. while the built up area was 1.7 sq. km. transport facilities, job and social security along with the initiation of constructing metro lines resulted in the development. There was still presence of grasslands and agricultural fields.

2017: A massive transformation can be seen in 2017 in Patuli Mouza. There has been intensified development at a rapid rate with presence of high rise buildings, multi complexes, private projects, hospitals and schools (both private and government), administrative offices, market, etc. There is a complex network of metalled roads (Fig: 1(f) present while the water bodies are almost invisible. Water bodies and open land consists 0.02 sq. km. and 0.05 sq. km. respectively. Grasslands are for 0.09 sq. km while the built up area has taken up 0.721 sq. km.

Valuation 2017: With increasing development the land valuation has also risen rapidly. The land value can be calculated to be excessively high in the eastern and southern part depending on the purpose of land use. This is mainly because of the availability of presence of commercial lands, market and big projects in this part. This is almost 46 to 50 lakh. The value of ponds and marshy land is around Rs. 35, 00,000 (Fig: 2(f). The land used for residential purpose has the present value to be around 40 to 45 lakh.

2.3 Rekjuani Mouza:

1954: In the past, Rekjuani Mouza was covered with lake, ponds, wetlands, orchards, vegetation, forests and grasslands with very low built up area. Agriculture was the main economic activity having the largest area. Fishing was for business purpose to mainly area including Bangladesh. The central part showed railway lines by Martin Railway which stretched from Belghachia to Hashnabad (Fig: 1(g). Mainly footpaths were present with almost negligible metalled roads. In the north Noai Canal was present which a creek in nature was, having a width of 6-10ft.

2002: The rapid growth and development started from 1984 after New town came up. In 1956 'Martin Railway closed down and Rajarhat Main road (Fig: 1(h) was constructed in its place resulting in increase in the number of metalled roads. Above all, job facilities attracted people to settle over here. The area under open land was 0.49 sq. km., built up area 0.69 sq. km. and pond 0.8 sq. km. The remaining area was under agricultural activities. The water bodies were spread over the whole area with open land mainly in the south western part. Still the rate of agricultural and fishing activities deteriorated from the past.

2017: Presently, the area under open land is 0.29 aq. Km. vegetation is 0.9 sq. km. and ponds is 0.57 sq. km. The width of the canal was widened by the government to 300 ft (Fig: 1(i). The total road length is 65199m. The area along Rajarhat road through the middle of the area has most number of market, banks, petrol pumps, private offices, multi storied buildings etc. It can be said that the rate of development is least here compared to the other two Mouza.

Valuation 2017: In the junction of Rajarhat road, there are commercial projects which have resulted in the present valuation of Rs. 15 lakhs to 18 lakhs (Fig: 2(i). Moreover, the value of land in the southern part is also high due to the presence of hospitals, schools and offices. The value has not raised much in the northern part as there is only water body, agricultural land and open lands present. This is not more than Rs. 50,000- Rs. 80,000. Therefore it can be seen that Rekjuani has a lesser land value than Barakhola and Patuli.

3. Relation between Land Value and Land Placement

It is obviously important the place of the land where the land activity is being performed. Anyone before starting any land activity in any land first judges some criteria in order to bring out the best possible output from the land. That's why land placement has a very important role in setting up the land value. In the study area it had found that the land value is more or less very much higher than the corresponding areas. Some of the underlying reasons behind it-

- ✓ Commercial activities are performed near and in the study area;
- ✓ The E.M Bypass run besides the Patuli Mouza & Barakhola Mouza and Rajarhat main road passes through the Rekjuani Mouza.
- ✓ Near to the main public utility providers; and
- ✓ It is near the communication hub of the city.

That is why in some cases the demand for land here is significant. And we know demand increases the process. In this case this significant demand increases the land prices of the study area. And that is why the land value of the study area is very much higher in comparison to the same quality other place in the city.

Correlation between distance from road and land value:

We know linear regression is used to measure the relationship between two variables

- ➢ Prediction and a cause and effect relationship
- ➢ Does one variable change in a consistent manner with another variable?

From the collected data we wanted to build a linear relationship between distance from the road and land value. There, in the method it is found that there is some relationship between these two variables that is merely a weak one. We know correlations are ranged between -1 to +1. And the more near to 1 means the two variables are both highly correlated.

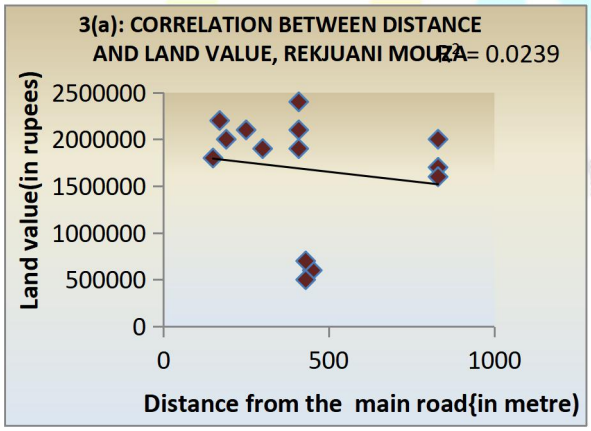

Figure 1.1

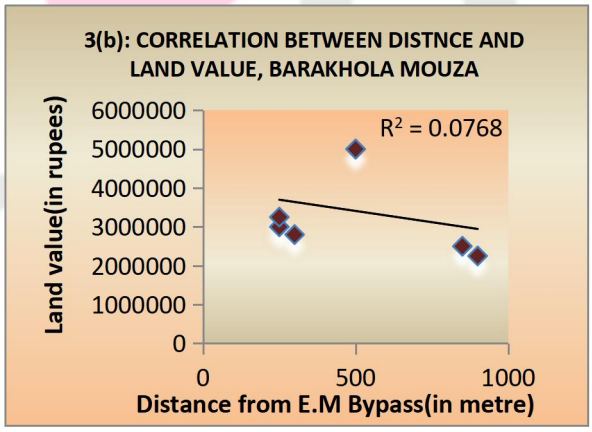

Figure 1.2

In the (fig: 3(a) we see that the R^2=0.0768 and know that R^2 is the indicator of correlation between the dependent and independent variable in Barakhola Mouza. Here the dependent variable is value of the land and the independent variable is distance from the E.M Bypass road. And from the correlation value which is only 0.0768 we can say that there a very little correlation between the two variables.

In the (fig: 3(b) we see that the R^2=0.0239 .Here the dependent variable is value of the land and the independent variable is distance from the main road. And from the correlation value which is only 0.023 we can say that there a also very little correlation between the two variables in Rekjuani Mouza.

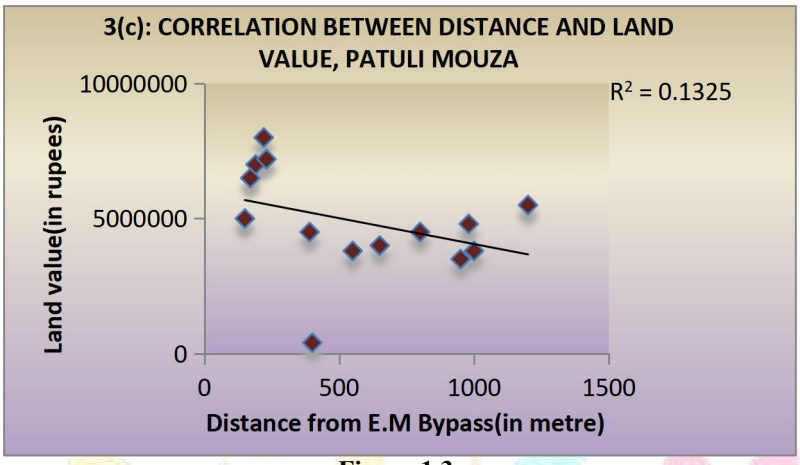

Figure 1.3

In the (fig: 3(c) we see that the R^2=0.1325 .Here the dependent variable is value of the land and the independent variable is distance from the E.M Bypass road. And from the correlation value which is only 0.1325 we can say that there is a moderate weak relationship between the two variables in Patuli Mouza.

It has been found by calculating three areas that there is a weak relationship between two variables. Thus it is clearly seen that land value is not only depending on the distance of road it is also depending on others variables such as commercial sector, hospital, school, market, bank, etc. By analyzing the data we can find that people mostly prefer to build these settlements away from road and in less polluted areas. But in case of commercial purpose they choose to settle near the road side for increasing profit.

4.Land Valuation and Amenities:

4.1: Barakhola Mouza: presently the land value of this area has shown rapid rise due to the set up of three hospitals, namely, AMRI, Medica Super Speciality Hospital, Rabindranath Tagore International Institute of Cardiac Science and Aditya Birla Sankara Nethralaya. The Central part which has these hospitals has the value of land to be Rs. 35 to 39 lakh /kattha (Fig: 2(b). The land along the E M Bypass has the land value of Rs. 27-31 lakh /kattha sue to the presence of commercial activities like Metro Cash and carry and other shopping malls. In the western part Avidipta Apartment has been constructed whose present land value is Rs. 25,00,000 to Rs. 27,00,000. Therefore it can be seen that the value of land for commercial purpose is higher than that used for residential purpose.

4.2: Patuli Mouza: For 15 years since 2002, there has been a rapid development in this area, the most among the 3 study areas. This has a great impact on the land value of Patuli excessively. At present, the eastern part of the area has the highest land value of Rs. 46,00,000- Rs. 50,00,00 Fig:2(e), where shopping malls like Spencer, private sector undertakings, banks, etc are present, utilizing the land for commercial purpose. The least land valuation is of the water bodies in the south-western part which is Rs. 35 lakh. The areas utilized for residential purpose is around Rs. 40-30 lakh/kattha. Therefore, it is seen that the highest land value is for commercial land purposes followed by residential area. The rest portion has lesser value.

4.3: Rekjuani Mouza: It has been observed from the data that the land value in the southern part started increasing rapidly as the development started taking place and for the last 5-6 years this has further accentuated. With the completion of the construction of Rajarhat Main road, the transport and communication system has also developed. Moreover, many school, hospitals, It companies have set up in this area. In search of better job opportunities, people from areas like Howrah, Barasat, North and South 24 Parganas are migrating to the place and purchasing new flats. This rapid growth of settlement and high rate of development is attributed to high land value (Fig: 2(h) of the area. Since agricultural activities are carried out in the northern part, the value of land is comparatively lesser here. On the other hand, the development of market area at the junction of Rajarhat road, in the western part, has contributed to higher land value. The land valuation rises from the middle part toward the south. The value of pond and open land ranges between Rs. 5, 00,000 to Rs. 8, 50,000.

CONCLUSION:

From the above healthy analysis it has been found that the study area shows huge development over time in case of transportation and infrastructure, growth of amenities along with change in land use and land cover pattern. The built up area was constructed by removal of vegetation, covering up water bodies, and removal of agricultural lands which has hampered the ecological balance of the area. Green loss is a very important finding which has taken place due to construction of high rise building and other developmental projects. The primary activities existed in past but at present there have various secondary, tertiary and quinary sectors of occupation for strengthening the

economy. There should be needed some government support with proper implementation of the existing government schemes and creating awareness about the ecologically balanced environment. Similarly, new strategies and policies for proper utilization of the area without hampering the ecological balance and conditions of the local people, so that all can get the fruit of the developmental activities taking place with lesser amount of shortfalls. Finally it can be said that the land valuation is ever changing at a high rate effecting further investments.

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