



RESEARCH PAPER

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Greenfield development: an example of mirpur-airport link road and its impact on the surrounding environment

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Abstract

The study was conducted to estimate the socio-economic change, change of living quality, change of transportation demand etc of the area due to the Greenfield development. Mainly primary data collection method was followed to obtain actual pictures of the area. A questionnaire survey was conducted and field notes were taken during observation period. By analyzing the collected data and various-information, some certain outcomes were provided. Some certain socio-economic and physical changes have been identified in the people of Greenfield development area. Among the transportation demand, boat was the main transport of South Manikdi, Baunia Beribadh and Namapara people and light motor was Maticutta at the time of previous condition whereas the some Tempo stations and Bus stand was set up after the Greenfield development i.e., road was established and light motors were not allowed. After the Greenfield development, monthly income, residential buildings, super market place, price of land adjacent to the road was increased than before the road construction. On the other hand, communication, health and security problem was found before the road construction but these were less after development of Greenfield. Although some problems were found due to road side establishment but also Greenfield development is a good way to give the more facilities of public related to socio-economic, living quality, transport mode, land price in that fringe area.

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Introduction

Dhaka city refers to the area under the jurisdiction of Dhaka City Corporation (DCC). The city had an area of only 125 square miles in 1974, which has expanded to an area about 155 square miles in 2008. Several attempts have been undertaken by government to ensure a planned development of this city. Dhaka Metropolitan Development Plan (DMDP) 1995-2015 was published in 1997. This plan covered an area of 590 Square miles, which is referred as Dhaka Metropolitan Area. In all the development plans, Dhaka City Corporation (DCC) area was given special emphasis because of its immense importance as the core of business, administration and home of major share of population. According to Dhaka Metropolitan Development Plan (DMDP, 1997), the 1980s was the period of major land conversion from rural to urban. It was calculated that between 1983 and 1991 more or less 5,500 hectare lands were converted to urban uses. Around two third of this total land converted in the fringe areas, and the rest in the central urban areas of the city. At the same time, the population increased only 30% in the fringe area and 70% in the central urban areas (Islam, 2003).

In transportation sector, Greenfield development is regarded as the creation of planned communities on previously underdeveloped land. This land may be rural, agricultural or unused areas (Habib Nurul, 2000). Greenfield development is about efficient urban planning that aims to provide practical, affordable and sustainable living spaces for growing urban populations (Heid, 2004). Porter (2002) noted that three elements are prerequisites for sprawl-free Greenfield development. All three need to be incorporated to ensure a success a measured by high livability and a truly connected, dynamic quality of development. Greenfields includes rural, agricultural or unused areas on the outskirts of the city. These areas have high ecological, social and community values. Greenfield development is actually far more suitable than attempting to develop or modify existing urban areas. Greenfield development planning takes future growth and developments into account, so transport system which develops in

Greenfield can serve increasing number of city dwellers. Committed Greenfield areas generally have established infrastructure such as road network for better transportation. Thus, we study an experiment at the Mirpur-Airport Link road establishment and its surrounding environment of the living people to find out the change of socio-economic, living quality, transportation mode etc.

Materials and methods

Site of the experiment

The study area was situated in the northern fringe of the city, comprising parts Maticutta, South Manikdi, Namapara that were included in Joar Shara Mouza of DCC word no. 15 (part) and small part of DCC word no. 98 in the year 2011.

Data collection

This research was based on the review of quantitative and qualitative data collected from questionnaire survey, field notes, scientific articles, report, and official documents from the Dhaka City Corporation (DCC), statistical data from Bangladesh Bureau of Statistics (BBS), mass media and books concerning the subject. For precisely conducting the research, data were collected with two different ways: these were-

Primary data collection

Questionnaire survey- A questionnaire survey was performed to collect the information about socio-economic change and environmental aspect of the study area. Survey was conducted by profound influence in their live and also to the people who have lost their accommodation during acquiring land for the road by government. Number of thirty one question survey was taken, for a convenience sample of 60 heads of household living in the study area of Dhaka. Questions were mainly closed-ended but there also a few open-ended questions. Inclusion criteria required subject age over 20. Interviews were conducted always in an informal environment, private houses or public spaces in order to reduce the possibilities of biased response. The aim of these interviews were to understand what were the main positive and negative aspects of the Greenfield development perceived by the people.

A consent and confidentiality statement was read aloud and the interview conducted with subject consent. Questionnaire survey was taken place from July-August, 2011.

Observation- Observation becomes a scientific tool and the method of data collection for the researcher, when it serves a formulated research purpose, is systematically planned and recorded and is subjected to checks and controls on validity and reliability (Kothari, 2010). Observation methods were followed in this study, mainly consists of field notes. Field notes were taken in order to make a concept about the urbanization of the adjacent area to the link road by observing land use change, change of livelihood and modes of transportation and also condition of evacuate people.

*Secondary data collection: Map collection-*To evacuate the Greenfield development project for the new link road, a proposed road map and an existing

map have been collected. These were obtained from Dhaka City Corporation and prepared by GIS Lab of University of Dhaka. *Statistical Information-* Statistical information was obtained from Bangladesh Bureau of Statistics (BBS), Rajuk and Bangladesh Road and Transportation Corporation (BRTC) etc.

Note here that, to handle the data processing table and graph plotting, computer technology is used and to present maps, GIS techniques; ARC GIS software is used followed by Islam (2011).

Results and discussions

There were diverse types of physical feature found in various part of the study area. Narrow road was the main physical feature of Maticutta before the construction of road. Agricultural field and lowland were found in South in South Manikdi and Namapara which are now almost filled up. At the end, there was a flood protecting embankment on which the new road has been constructed.

Table 1. The road has been constructed on the following physical features.

Feature	Maticutta	South Manikdi	Namapara	Baunia Beribadh
Narrow Road	100%	0%	0%	0%
Water body	0%	60%	73%	30%
Agricultural land	0%	40%	27%	20%
Embankment	0%	0%	0%	50%

Source: Field Survey.

The new road has been fully occupied over the previous existed narrow road at Maticutta. In South Manikdi and Namapara there were huge amount of agricultural land and lowland, acquired during construction.

The road had to cross over the huge low land. So government planned to construct a new embankment. This would be connected with the portion of Maticutta road with flood protecting embankment of Baunia Baribadh. Flood protecting embankment of Baunia Baribadh also took up for construction (Table 1).

Types of Vehicle (before the construction of road)

Maticutta was more developed than other parts of the study area. The area had accessibility with adjacent areas through a narrow road that brought lots of benefit than other areas. Both motorized and non-motorized vehicle moved on this road. So lots of pressure put on the road. On the other hand, boat was the only way of transportation for the people of South Manikdi, Namapara and Baunia Beribadh. However local people of Baunia beribadh also get the advantage of having flood protecting embankment (Fig. 1).

Previous condition

Different types of vehicle, ranging from non-motorized to light and sometimes heavy motor were available on the narrow road of Maticutta except boat. But mass public transport like Bus service, Tempo service was not found.

Boat was the main mode of transport for the people of South Manikdi, Namapara and a major part of Baunia Baribadh locality (Fig. 1). The light vehicles such as motor van, rickshaw and boat etc. were more in Bogra-Tangail road before the new road construction (Khandaker, 2006).

Table 2. Land price adjacent to the road.

Feature	Maticutta	South Manikdi	Namapara	Baunia Beribadh
5 years ago	15*	1.5*	1.5*	1*
2 years ago	20*	2*	2*	1.5*
Present time	40*	35*	35*	20*

*price per katha@lakh

Source: Field Survey.

Availability of vehicles at present

At present, the total study areas have been connected through the road. People can easily drive from one end of the road to another. There are some Tempo stations and a bus station established at Maticutta that provide direct trip from Maticutta to Mirpur-12 over the new highway. The service will be available after formal inauguration of the road (Fig. 2). Haque, 2003 also found high speedy vehicles as bus truck, car, motorcycle and train etc. service was more at the Sirajgonj-Bogra road due to road side establishment.

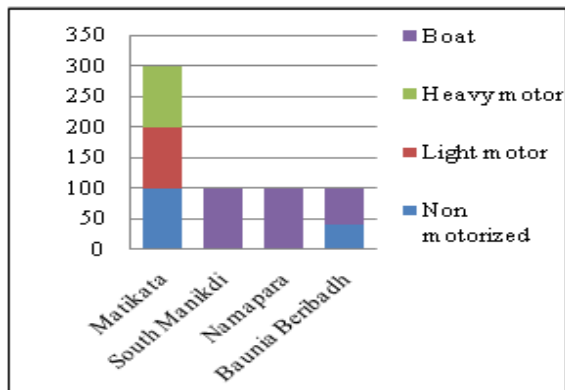


Fig. 1. Availability of vehicle before the road construction.

Present condition

All types of vehicle were still ply on the portion of road at Maticutta. Rickshaw, van, tempo, easy bike (smaller version of tempo), motor-cycle, car, truck etc. everything was very common here. On the other hand, non-motorized vehicles were not allowed at South Manikdi, Namapara and Baunia Beribadh area (Fig. 2).

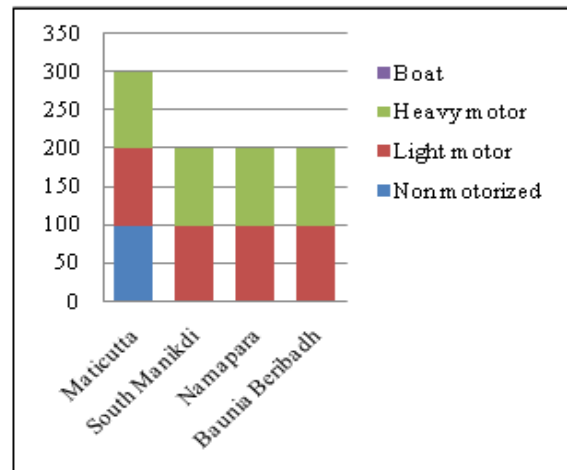


Fig. 2. Availability of vehicle at present.

Development of road side establishment

The survey has been emphasized on those establishments that were developing during the construction of road.

Because the study area was before an underdeveloped area and a major part of the area was lowland which once considered as a branch of river Turag. Most of the establishments have been recently constructed (Fig. 3).

Various road side establishments have been developed in recent years at Maticutta. About 85% roadside plots were occupied by buildings only 15% vacant plot can be found. But plots were just handed over to the developers at the other parts of the study area (Fig. 3).

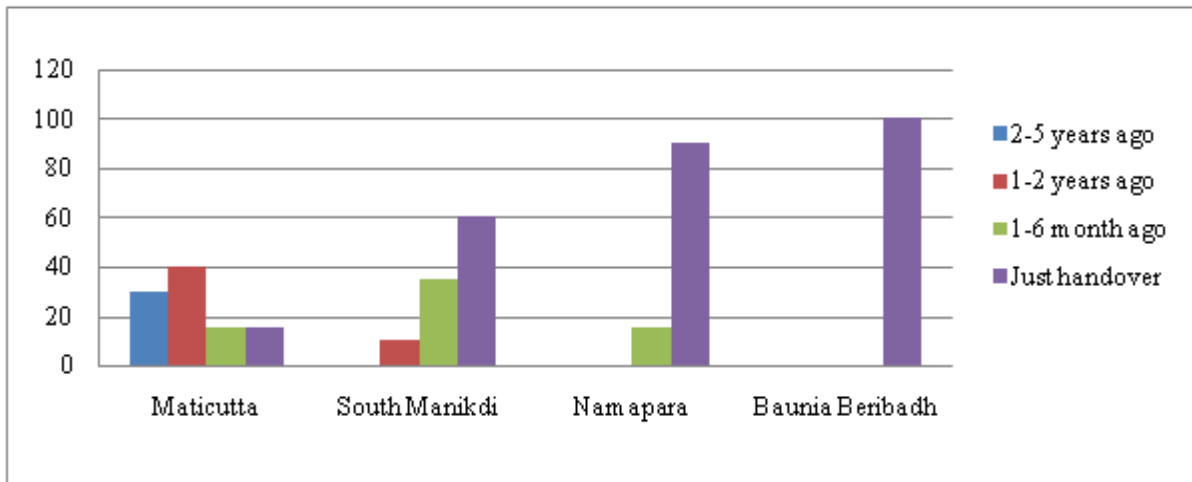


Fig. 3. Development of road-side establishment.

Types of establishment

There are some specific types of establishment can be found near a newly constructed road. As Dhaka is densely populated city and it is always very difficult to find suitable place to live, so development of residential establishment is very common. Beside this, there are also commercial, educational, service center etc. can be developed as a result of construction of a new road.

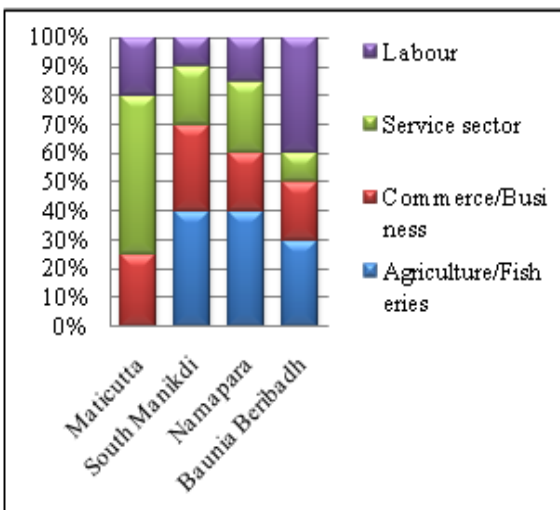


Fig. 4. Main occupation before the construction of road.

Land seekers mainly interested for residential development in this area. Maximum (about 50%) establishments of Maticutta were for residential use. There were also some buildings used for commercial purpose. Very few establishments were for educational purpose.

At Maticutta, there were some road side small shops, whole sale and retail shops, fast food and saloon also available. Some public service center like Masjid, Land registry office, Kazi office, educational institution also found here. Most of the people of South Manikdi, Namapara and Baunia Beribadh area have sold their plot to various real estate companies for residential development. About 80% plots have just been handed over to them. Most of the establishments of South Manikdi, Namapara and Baunia Beribadh were going to construct for residential use only. Senior, 1991 found in his experiment, residential buildings, super shop, modern type market, Shopping centers were established more than before Greenfield development in Toronto city.

Land price adjacent to the road

Land value of adjacent area to the road has increased at a very high rate within 1 to 2 years. Previously, lowland was considered as agricultural land but now as residential plots. The price of land is increasing with the proximity to the main road (Table 2).

Two years ago, per katha land of Maticutta was sold at a rate of about 10-15 lakh taka per katha. It is now increased to 30-40 lakh takas.

The land of South Manikdi and Namapara were sold before only for agricultural purpose, at a rate of 1-1.5 lakh per katha.

But local people are now selling their lands as residential plots to the various companies and individuals at a cost of 20-30 lakh per katha (Table 2). Khan, 2001 also showed that land price adjacent to the road was increasing due to increasing of Greenfield development in different Uttara sector in Dhaka city.

Main occupation (before)

As the area was not previously developed so variety in occupation was limited. The area had limited access with the adjacent services center that made lower land value and cheaper house rent. Most of the dwellers of Maticutta were small services holders. Many fishermen and boatmen lived in South Manikdi and Namapara (Fig. 4).

Maticutta was a suitable place for living for the members of defense service because the area was very close to the Cantonment. About 50% people lived in Maticutta were employed in various defense, government and non-government services. About 30% people engaged in various small businesses. About 40-60% people of South Manikdi and Namapara involved in agricultural practices. About 20-25% was found as service holder and very little number of labors lived. People of Baunia Beribadh occupied mostly primary economic activities such as agricultural activities and fisheries. A large number of labors (about 40%) were lived here because the area is very close to the industrial zone of Mirpur (Fig. 4).

Present occupation

There is huge diversity found in occupation at present. Rapid change occurs in commercial sector which overwhelmed in living quality and income of local people. Many businessmen from other areas are having interest that also promotes variety of occupation in this area (Fig. 5).

The higher land price has increased the house rent and also income of local people. As a result service holders cannot afford to pay the rent and move to comparatively lower house rent area such as South Manikdi and Namapara.

People are encouraged to expand their business at Maticutta and a large number of businessmen are now living here. Commercial activities are only about to start at South Manikdi and Namapara. Above 40% people are now involving with various types of commercial activities and about population engage in service sector here.

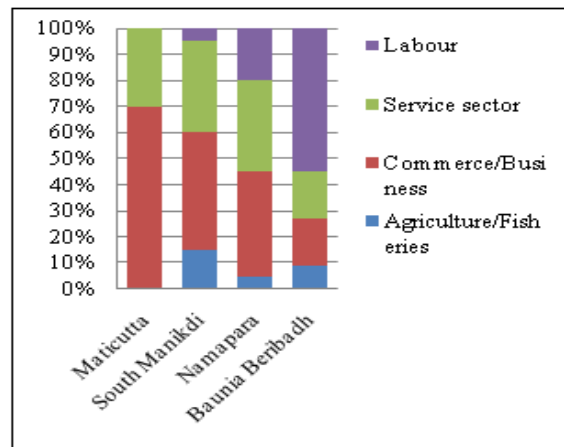


Fig. 5. Present occupation.

A large group of labore is no living in Baunia Baribadh (Fig. 5). Hafiz, 2001 also same experiment and recorded the data on occupation of Purbachal lived peoples. He found agriculture, fish culture, driving of rickshaw etc. was occupation of these peoples when road side was not developed. But when the construction of road at this site the occupation was changed and it was service, commerce, business etc.

Monthly income (before the construction of road)

Income depends on opportunity, quality and variety of jobs. And these criteria depend on growth rate of a region. Before the construction of road, the area was considered as remote area that hindered growth rate as well as narrow down income level. Most of the people depended on what physical environment offer them.

The range of monthly income of the people of the study area was about 5,000-20,000 taka. Only 10-15% people may go above their income up to 20,000 tk. The area was mainly suitable living place for the lower-middle class and middle class group of people (Fig. 6).

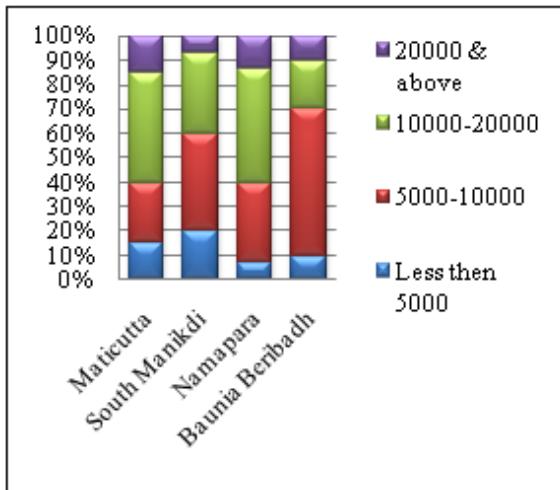


Fig. 6. Monthly income before the construction of road

Monthly income (at present)

As discussed earlier that accessibility of the area has increased land price and also job opportunities, so income level of the local of the people has climbed up.

The main concentration of income range can be found within 10,000 to 20,000 tk and above. About 70% to 90% populations of different locality of the study area are occupying within the range.

Many higher-middle class people are now living in Maticutta. A large number of them are coming from other parts of the city and even outside of the city. Real estate companies develop luxurious residential buildings that attract various high income groups of people. Local people, who are selling their lands at a high price to the developers, also obtain a lot of profit. This also helps to rise of the income level (Fig. 7).

Type of problems

During and after the construction of road, many problems may arise. Communication, health and security problems are involve directly with the initial stage of construction.

The local people of Maticutta faced serious communication problem because they had no other alternate way to get access with another area except the narrow road.

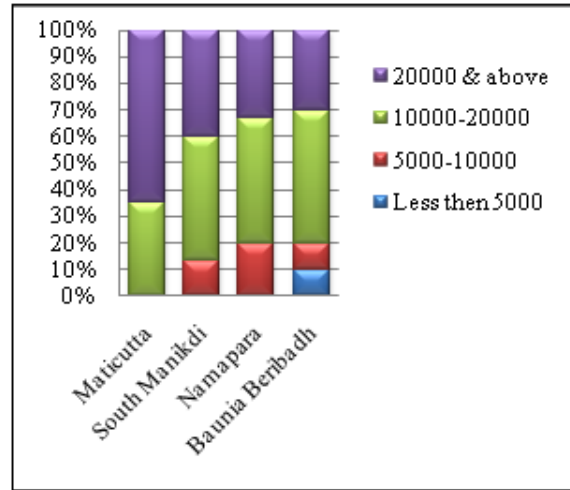


Fig. 7. Present income.

They complained about a newly developed slum beside the road at Kalshi, Mirpur.

That slum people are main security risk for the whole area. There were some original alternate streets that were utilized by the people during construction period.

Problem of water logging (previous time)

Water logging was only a common incident during rainy season. Poor drainage facility in the locality was the main reason for water logging. Baunia Beribadh area was previously protected from flood by an embankment which made this area as a flood free zone.

About only 15-20% land adjacent to some low land faced water logging problem for a short time in South Manikdi and Namapara. Houses and small shops near the narrow street of Maticutta faced serious water logging problem during the whole rainy season as there was lack of proper drainage system (Fig. 8).

Water logging problem at present

Present water logging situation is a very serious problem. Some places of South Manikdi and Namapara that have never or very little faced water logging problem, but now frequently suffering from this problem.

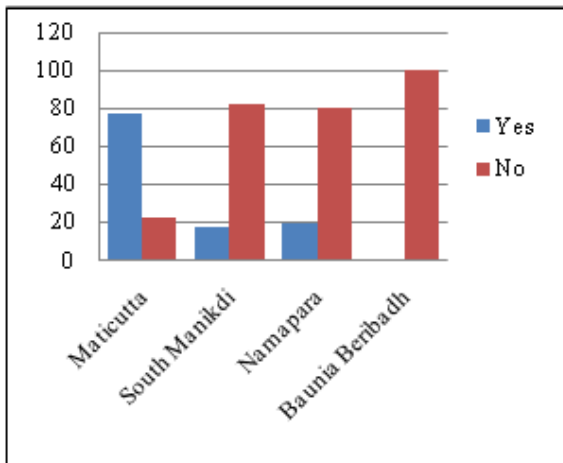


Fig. 8. Water logging problem before the construction of road.

At presents about half of the residents of South Manikdi and Namapara are facing this problem for 3 or 4 months and sometimes more than 6 months. The new road has been constructed over the embankment that is responsible for restraining the natural flow of rain water. Good drainage system adjacent to the road of Maticutta has reduced water logging problem to the plots that are adjacent to road. Local residents of Baunia Beribadh area have never faced any kind of water logging problem because the area is located at southern side of the road and also for the embankment (Fig. 9).

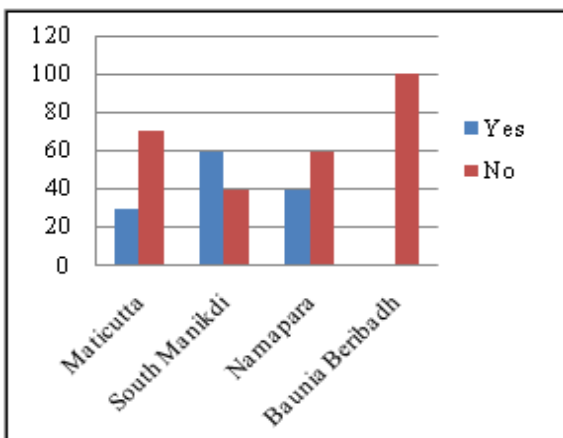


Fig. 9. Water logging problem at present.

Nagari, 2001 Showed same problem in Gulshan area in Dhaka city. He reported that water logging problem was a fact due to the Greenfield development in this area.

Due to lack of available and proper drainage water logging was more than before. The small-medium hole in this area was fill up by sand due to easily road construction was another major cause of water logged problem.

Conclusion

From the above discussions, living quality may changed, transportation facility may enhanced, monthly income may raised etc. among the people in the Greenfield development area by the road construction of the fringe area. Some problems may create due to road construction such as water logging. So it could be concluded that for an effective Greenfield development in the adjacent area of the new road government should take careful planning and policy to develop the area in a proper way and planners should plan in a way that will encourage development in all sectors, such as-commercial, residential, public service sector and so on. Government should come forward with enormous planning and policy for developing such Greenfield areas properly. Environmental friendly policy will help to reduce environmental degradation and suffering of local people.

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