

## **ROLE OF COMPACT TOWNSHIP AND ITS CONSTRAINTS IN ACHIEVING ENVIRONMENTAL SUSTAINABILITY IN BANGLADESH-A CASE STUDY OF RANGPUR UNION**

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### **ABSTRACT**

Exploring the link between Compact Township and environment sustainability is an important theme in rural development research. This paper contributes to understand about the role of Compact Township in environment sustainability and the constraint in the way of achieving sustainable environment. Bangladesh is a resourceful country with heavy man power and this population is increasing. But with the increasing of population encourage the rural agricultural lands disappearing which would be a major threat to the environment. Sometimes environmental sustainability hampers through natural disaster and by human like crime, improper waste management, and different kinds of discriminations. The analysis showed that the presence of disperse settlements, improper distribution of public services, poor sanitation etc. major constraints of sustainability. So, sustainable conscious approach has to be taken in planning, designing and construction of the township to ensure safe and environment friendly atmosphere and also to maintain ecology of the site.

Keywords: Compact township; environmental sustainability; rural development

### **INTRODUCTION**

Bangladesh is a country of different environmental occurrence and it is carrying low-lying land with full of greenery and river beds. Bangladesh has been experiencing degradation of the natural environment for decades in terms of deforestation, river erosion soil quality depletion, water and air pollution, poor solid waste disposal, pollution from chemical fertilizer and pesticides, biodiversity loss and urban congestion like other densely developing countries. More recently climate change impacts consequent on more frequent and devastating extreme climatic events like Aila, Sidr etc and this is affecting on both to natural and human systems. In Bangladesh, there are 105,305,414 people living in rural area (World Bank, 2013) which is 67% of the total population. The agriculture land is 70.1 % of the total land in whole Bangladesh (World Bank, 2012) but at 1989 agricultural land is 80.2 % in total agricultural land which is decreasing than before (World Bank, 2012). Bangladesh will be left with only 0.07 acres (283 sq. meter or 3049 sq. feet) of agricultural land per person by the year 2051 (Hossain 2011). The main objective of Compact Township is to save agriculture land. Compact Township can be defined as an agglomeration of houses, schools, hospitals, markets, rural industries and local governmental unit providing all basic services. (Rashid and Quayes, 2000) This nature of Compact Township ensures environmental sustainability. Every year the country is losing 1% arable land due to the population growth and its infrastructure development. (Islam and Hassan, 2011) Rural people live in an unplanned environment but in a Compact Township their life can be managed in a new systematic way which will increase the food productivity by using lands. Compact City consists of high-density settlements, less dependence on automobiles and clear boundaries from surrounding areas (Rashid and Quayes, 2000). This also adds points for ensuring environmental sustainability. Compact Township plays an important role in village economy by establishing rural industry, which also a great attempt to ensure sustainability in environment. The Compact Township refers to a state in which the density of the settlement functions is constituted adequately, neither excessive nor lacking, with the environment loads. The growth of the township will be kept well balanced with the surrounding environment (Shrivastava, 2009). In the year of 1997, "Smart Growth" was come to the modern world with similar ideas of compact city or township. (Zhou and Yu, 2010). The compactness of urban form affects energy

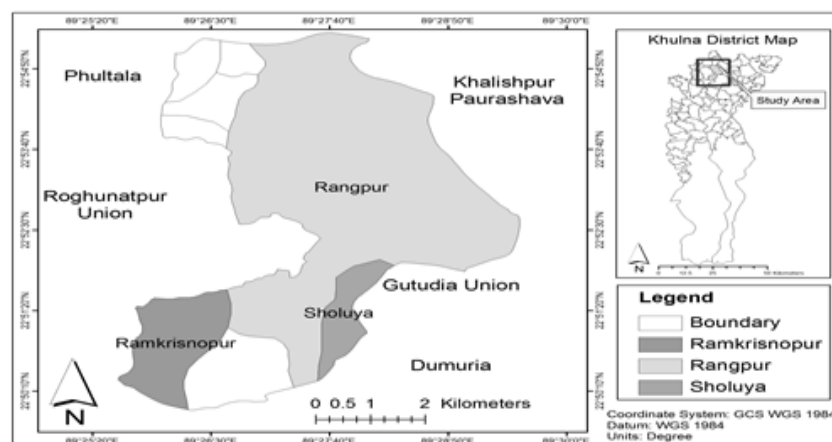
demand and environmental quality. A significant part of the environmental impact of urban activities is related to energy consumption. In most cases, the amount of energy consumed by industrial production is similar to that consumed by transport and by buildings, although energy use in buildings is now increasing to become (Jenks and Burgess, 2000).

## METHODOLOGY

The whole methodology has been divided into 2 parts as study area selection and data collection.

### *Study Area Selection*

Rangpur Union of Dumuria upazilla is considered the study area situated at the middle point of the Bil Dakatia in the southeast part of Bangladesh. Total area is 36.98sq kilometer (8960 acre). Total area is divided into 9 wards (BBS, 2001). There are 8 villages in the Rangpur Union which are named as Sharavita, Botbera, Baranoshi, Mujarghuta, Rangpur, Soluya, Ghona Mother Danga, and Ramkrishnopurr. Among them, Rangpur is the biggest one and selected for study purpose of assessment of environmental sustainability in Compact Township according to area and population.



(Source: Authors Construction in GIS, 2015)

Fig. 1: Study Area Map

The settlement pattern is dispersing in nature. So there is huge opportunity to develop new settlement and there is huge amount of agriculture land for food production. Two houses are standing within around 400-500 square meter interval each other (Field survey, February 2015). In the whole Dumuria upazilla there is no river erosion occurred (BBS, 2011).

### *Data Collection*

Conceptualization of the study by reviewing some journal paper, report, document related to 'Compact Township'. A reconnaissance survey conducted in three villages of Rangpur Union named as Rangpur, Sholuya, Mujarghuta. Then the questionnaires were prepared. Primary data were collected by Focus Group and Key Personnel Discussion and secondary data were collected from the website and Union Parishad Office. The data thus obtained from both primary and secondary sources were then analyzed using SPSS and MS Excel to evaluate the future impact of Compact Township in environmental sustainability.

## FACTORS OF ENVIRONMENTAL HEALTH

The factors used for analysing the constraints to achieve the environmental sustainability in Compact Township described below. The possible worst condition like source and quality of water, unhealthy sanitation usage, misuse of resources for fuel etc. are responsible for achieving sustainability in Compact Township in Rangpur union.

### **Water Quality Analysis**

Maximum villagers use water from deep tube-well and the percentage is 70%. Deep tube-well water is adequate and hygienic for the villagers. Some villagers also use water from pond which is unhygienic. From the analysis it can be said that it easy to provide water through deep tube-well by the project of Compact Township. The safe drinking water facilities are quite good and water source is secure and available. According to observation, the ground water table is high in this area because the aquifer of these are is near to ground level because of beel area and in the rainy reason the low land was filled water.

Table 1: Water Source Type

Water source	Percentage
Deep tube well	70 %
Shallow tube well	28 %
Pond	2%

(Source: Field Survey, February, 2015)

### **Sanitation**

The sanitation problem is common in all places so as Rangpur union. The toilet facilities are available in different manner. The water sealed sanitary facilities are available at 61.3% and non-water sealed sanitary facilities are 23.8% (BBS 2001).

Table 2: Types of sanitation usage

Sanitation type	Percentage of presence
Single pit	88 %
Twin pit	5 %
Water sealed	5 %
Hanging	2 %

(Source: Field Survey, February, 2015)

### **Waste Disposal**

In here, environmental condition is very poor. People are disposing their waste into local pond and beside street. The percentage is 60% for local pond and 40% for beside street (Field Survey, 2015). This pollutes the environment badly. In this analysis the reason behind the occurrence is that the people don't have proper facilities to use dustbin or other system. Union Parishad also don't cooperate with them or use rules to bond them or their behaviours. The people need closed system to dispose their waste. This kind of misconduct is polluting the environment constantly. This will increase the odor and unhygienic condition of pond and street. So this will need to be stopped.

The case is even worse in areas where there is no specific dumpsite. The collected waste is disposed through crude dumping in low-lying areas, nearby water bodies or on a vacant lot. Much of the uncollected waste is also disposed in the same manner.

### **Fuel Usage**

Most of the people are used wood rather than leaf. Wood user is 53%. Fuel usage is controlled by the availability of fuel products with the cost bearing. Wood, leaf will produce black smoke and it will destroy the greenery. It is organic in nature. But it will destroy the whole environment. So bio-gas or gas can be used instead of wood or leaf. It will reduce cost and also environment friendly. In compact township, wood usage can make conflicting situation for concrete structure.

Table 3: Fuel Type

Fuel type	Percentage
Wood	53%
Leaf	32 %
Others	15%

(Source: Field Survey, February, 2015)

### **Water Logging**

In the Rangpur union, the village shows the significant amount of variation in different villages. In the study, the majority says that 69% of those areas don't have any water logging. Recent observation says that the road network on that area is improving. So the water logging is disappearing day by day. 24% says that water logging is high in Rangpur village. This is because Rangpur village is containing 50% beel area which is main reason for existence of water logging. (Field Survey, 2015)

### **Drainage Facilities**

There is no drainage facility so it is possible to provide drainage facilities. The construction cost of providing drainage facilities rather than demolish the existing is low. Compact Township is going provide these facilities. The constraint between Compact Township and Environment Sustainability, can be occurred when people don't know how to use or maintain drainage system. People's inappropriate behavior can turn this whole system in hazardous condition.

### **Solid Waste Management**

Disposing of solid waste in open dumps is the most common method used for ultimate disposal of urban solid waste. In some cities and towns there are designated dumping sites where the collected waste is dumped in unsanitary manner. No waste segregation, waste compaction or daily top seal are used in these dumpsites. In Rangpur Village, the cleaning duration of their solid waste is 75% monthly basis and 25% quarterly. In Compact Township, there will be accommodated huge number of people in one building which required lots of pressure in the system. So monthly or quarterly cleaning system need to be improved in Weekly manner.

Table 4: Cleaning Duration of Solid Waste

Cleaning duration	Percentage
Monthly	75%
Quarterly	25%

(Source: Field Survey, February, 2015)

### **Transportation Usage**

There are many people who use two type of transport system to travel inside and outside the union. In Rangpur union, there are huge gap in distributing the service facility like health facility, major haat, school, college, Union Parishad etc. 56% people motorized vehicle to travel to Dulatpur to other parts of union and 34% people use non-motorized vehicle like van, easy bike, bi-cycle etc. to travel inside (Field Survey, 2015). Motorized vehicle is responsible for a major part of CO<sub>2</sub> emissions and other forms of air pollution. Habitual usage of motorbike can be constrained in the path of achieving environmental sustainability.

## **RESULTS AND DISCUSSION**

It is known that Compact Township is a composite of every basic facility which is required for human living. The Compact Township generally involves building up cities within the villages in which people would receive some urban facilities viz. schools, colleges, healthcare for their children. The theme of a Compact Township is new to our country especially for those people who will be included in it. The study of different analysis shows that Compact Township could be more feasible for the people of Bangladesh and remain environmentally sustain, if it copes with the livelihood pattern of people.

### **Environment Is Sustainable or Not?**

Compact township and sustainability is designed very specific in nature. Accessibility in different services is ensured by compact township but it is not always sustainable. Sustainable can be achieved through proper management of any services. The level of accessibility is increasing with time because people can easily be habitat with any system with time. Like improper waste management, absence of dustbin, poor drainage system, usage of fuel, increasing motorize vehicle etc. are the few obstacles that hamper the environmental sustainability of the Rangpur union. Water supply and source, the percentage of people in access to an improved water source that will indicates the percentage of people will get improved water supply. The improved drinking water source in rural area includes deep tube well,

water pipe line connecting to the house and collected rain water or well. WASA provide water in urban area but it is not available in rural area because it is inadequate.

Table 5: Improved water source for Bangladesh

Year	Improved water source %
1990	65
2000	74
2012	84

(Source: World Bank, 2014)

The energy savings of an efficient transport system or electric supply also relate to the social and economic benefits. The settlement pattern of Rangpur village is dispersed which caused more resources losses. But if Compact Township is going to be implemented then more energy can be saved from now. Bangladesh is improving in day by day. In the past there was no available data for rural people and their health condition. Their needs are always being compromised but now situation is changed. Rural or regional level people are now also get services like urban dwellings through Compact Township. Every development is not only providing positive sides like Compact Township facilities in Rangpur union can be turned into chancy condition.

Most people of this area are engaged in agricultural activity and their economic condition is very low. So they can't afford proper sanitation system and also there is more problem in drinking water. Water logging also causes some sort of environmental pollution here. If it is possible to provide them all the basic needs in a Compact Township system, these environmental issues can be easily solved and can be possible to conserve more energy by applying it.

#### ***The Ultimate Relationship between Environmental Sustainability and Compact Township***

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#### ***Summary of Key Findings***

This research has some findings which are given as follows:

- The improper practice of waste management is responsible for environmental degradation.
- Sometimes environmental sustainability is a major concern because behaviour inappropriateness.
- The usage of wood, leaf as fuel instead of bio gas is endangered the sustainability of environment.
- Increasing the number of motorized vehicle is the reason for CO<sub>2</sub> emission in the nature.
- Proper cleaning of solid waste keeps the environment liveable.

#### **CONCLUSION AND RECOMMENDATION**

Rangpur village is traditional village and it was recorded since 1910s. The savings from poverty and malnutrition is come first to save this people. The land is decreasing with the time for sheltering the new generation and it will destroy the food production. According to the research of 'CT foundation' it was found that every year the country is losing 1-2% of its land (Compact Township Foundation, 2012). The

land use pattern of the country is changing at a great momentum. The World Bank study reveals that a total of 20 million people will be environmental refugees within next 100 years (Daily Star, 2011). With sustainable environmental condition, Compact Township will ensure equal distribution of public utility services, playing an important role in village economy and protecting environment by saving land and natural resources. There is huge opportunity to introduce of multi-retail shop, create opportunity of setting up basic facilities within walking distance etc. So without the proper implementation of Compact Township project Bangladesh will face serious problems in future. There is some recommendation for the adaptation of further study:

- Government and authority should directly communicate with rural people to convince them rather only discussing with focused group. This will gradually switch the negative impression of the government towards positive to rural people.
- Need to raise awareness on the usage of technology used in Compact Township
- Increase usage of non-motorized vehicle and reduce the load on motorized vehicle.
- Induce rules and regulations to control the usage of services so that the excessive use won't turn into hazardous condition

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