

# **A COMPARATIVE ANALYSIS ON AVAILABLE SERVICE FACILITIES AND THEIR DEFICIENCIES USING THRESHOLD AND LOCATION QUOTIENT METHOD: A CASE STUDY ON DIFFERENT WARDS OF KHULNA CITY.**

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## **ABSTRACT**

Bangladesh is one of the most densely populated country in the world. Her cities are experiencing the rapid population growth. As the population growths increase so fast that there are considerable lacking in providing public services comparing with the demand. This paper explained the gaps of different service facilities of different wards of Khulna city by comparing the existing and required facilities. First the study identified the existing service facilities of the selected ward. The threshold population method and location quotient method was used in this paper to identify the surplus and deficit of service facilities of the selected wards. The study found that some of the areas are developed comparatively to others. Finally on the basis of findings few recommendations were provided.

Keywords: Deficit; location quotient method; threshold population method; surplus

## **INTRODUCTION**

Bangladesh is one of the world's most densely populated country with a population of 150 million (Islam, 2013). The country is facing a rapid spread of urbanizations in recent time. People from rural areas come to the urban area for the sake of a better living condition and job opportunity. That makes the urban area overcrowded and keeps pressure on urban services like school (Rahman & Salauddin, 2009), health facilities (Jahan, 2000), park and open space (Rahman, 2014) and many more.

As a divisional city and economic hub of south-western region, Khulna is no exception to this rapid urbanization. In Khulna the urban population is growing due to rural- urban migration. This rapid growing urban population creates pressure on the public services like school, playground, health facilities, marketing facilities, security etc. and thus disparities create within the city (Jahan, 2000). This disparities varies between planned and unplanned areas of the city. The aim of this research is to explore the existing condition of different service facilities like primary school, health facilities, park, open space and security condition of selected wards of Khulna city and find out which wards have over saturated service facilities and which are deprived of by using threshold population and location quotient method.

### ***Objectives***

This research have two broad objectives for which the development of this study progresses.

- To identify the existing condition of the service facilities in the study area.
- To find out the surplus and deficit of existing facilities in the study area.

## **METHODOLOGY**

### ***Methods***

#### ***Threshold Population Method***

A threshold population is the minimum number of people needed for a service to be worthwhile (Goodal, 1987). Threshold population are calculated by simple linear regression method. Equation of linear regression is  $Y = a + bX$ . Threshold population  $P_t = (ad-bc) / (d-b)$  Where,  $P_t$  = threshold

population,  $A_g$  = without facility at this & greater level,  $P_s$  = with facility at this & smaller level,  $a$  = Intercept of  $A_g$ ,  $b$  = Slope of  $A_g$ ,  $c$  = Intercept of  $P_s$ ,  $d$  = Slope of  $P_s$ ,  $Y$  = Population midpoint.

### Location Quotient Method

A location quotient is a way of measuring the relative contribution of one specific area to the whole.  $L.Q. = (x_i/n_i) / (x/n)$ . Where,  $x_i$  = number of facility  $i$  in a given block,  $n_i$  = population of the concerned block,  $x$  = number of facility  $i$  in Khulna city,  $n$  = Total population of Khulna city. If  $LQ < 1$ , then particular facility is less, if  $LQ=1$ , particular facility is exactly sufficient and if  $LQ > 1$ , particular services are exceed (Rahman & Salauddin, 2009).

### Study Area

Khulna is the 3<sup>rd</sup> largest city and second largest port city in Bangladesh. Total area of Khulna City Corporation (KCC) is 47 sq.km consisting of 31 wards (BBS, 2011). Among 31 wards few wards are well planned, some are semi-planned and most of wards are unplanned and as a result their services varies. In this research most important services for Khulna city were selected for analysis. Five wards were selected as study area in which ward no. 24 are well planned because of available service facilities. The ward no. 19 is a semi-planned area as all service facilities are available but not sufficient. The ward no 4, 11, 31 are totally unplanned area and the people of this area are totally deprived of their basic services.

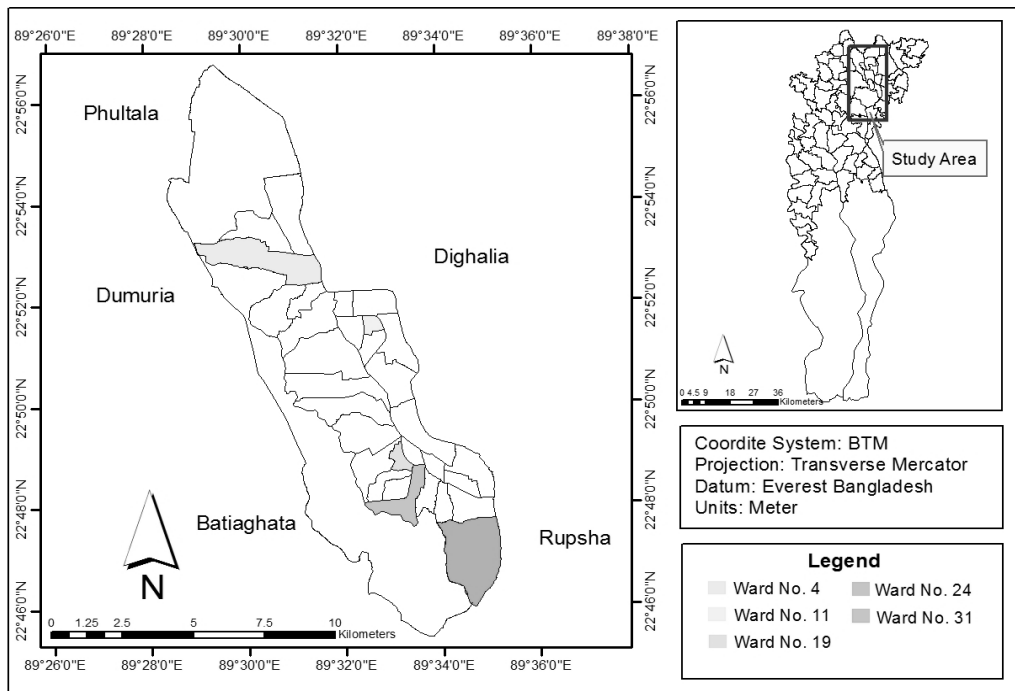


Fig. 1: Study Area Map (Source: Authors Construction in GIS)

### Tools

Here ArcGIS and Microsoft Excel software were used to find out threshold population and location quotient calculation. Most of the data needed for the calculation were collected from KCC and BBS and few were collected through field survey.

## DATA ANALYSIS AND INTERPRETATIONS

### Existing Service Distribution

In Khulna City, Service facility are not well planned in the whole ward of Khulna city. Generally better service facility are concentrated in the central ward. The following table is representing the existing service distribution of the study area:

Table 1: Ward Wise Population Distribution and Existing Service Facility

Ward No.	Primary School	Clinic	Park and Playground	Police Station	Existing Population
4	2	0	3	0	19961
11	0	1	0	0	22373
19	4	2	2	1	30558
24	5	3	1	3	49889
31	7	0	0	1	43889

The above table presents that the selected service facilities are more or less available in ward no. 19 and 24. But the people of other study area like ward no 4 are deprived of proper health facilities and safety. The situation is awful in ward no. 11 as there is no primary school, clinic and police station. In ward no. 31 there are no hospital, park and playground but there are enough primary school and one police station though this is not enough for large number of population's safety.

### **Location Quotient Method**

For calculating Location Quotient (LQ) method existing service facility of the ward and total facility of the whole city is needed. By calculating LQ it is seen which service facility is enough for existing population and which are not. For maximum service facility the LQ value is less than 1 and it can say that existing service facility of Khulna city is not enough for cover existing population. Health facility in those five ward are less. Police camp and primary school facility are same scenario are seen.

Table 2- Location Quotient Method

Ward No.	Primary School	Clinic	Park and Playground	Police Station
4	0.71	0	3.7	0
11	0	0.49	1.08	0
19	0.91	0.73	1.6	0.9
24	0.7	0.67	0.48	1.7
31	1.11	0	0	0.65

### **Threshold Population Method**

#### **Primary School**

Table 3: Gap Identification of Primary School

Ward No.	Threshold Population	Existing Population	Existing	Required
4	15544	19961	2	1
11		22373	0	2
19		30558	4	2
24		49889	5	3
31		43889	7	3

For primary school facilities, it is clear that almost all the words are providing this facility with greater number. This is because, the urge for primary education is conceptualize by people from all income range. To ensure primary education, government has provided enough educational resources in terms of primary school. That clearly indicates, the primary school service is adequate in this areas with proper spatial distribution.

### Clinic

Table 4: Gap Identification of Clinic

Ward No.	Threshold Population	Existing Population	Existing	Required
4	25642	19961	0	1
11		22373	1	1
19		30558	2	1
24		49889	3	2
31		43889	0	2

In the above table, threshold population for a clinic is 25642. This number indicating that for 25642 populations, there will be at least one clinic is needed. But the spatial distribution of the service facilities are different. Some wards (19, 24) have over saturated clinic services while some of them are deprived from that service facilities. For this reason they have to travel to the other wards for getting better treatment.

### Park and Playground

Table 5: Gap Identification of Park and Playground

Ward No.	Threshold Population	Existing Population	Existing	Required
4	24901	19961	3	1
11		22373	0	2
19		30558	2	1
24		49889	1	2
31		43889	0	2

From the above table it is seen that minimum threshold population for park and playground is 24901. The total population of Khulna City Corporation is 925450 (BBS, 2011). So according to threshold population calculation Khulna city needs at least 37 parks and playgrounds. That means each of the ward need at least one park and playground. But from the above table clarifies that some of the ward have more than the required one and some of the ward have lack of proper recreational facilities like park and playground. The prime reason behind that the gradual increase of population in all over the city and lack of administrative responsibilities. On the other hand though there are few park and playground, their condition is so poor because of proper maintenance.

### Police Station

Table 6- Gap Identification of Police Station

Ward No.	Threshold Population	Existing Population	Existing	Required
4	26072	19961	0	1
11		22373	0	1
19		30558	1	1
24		49889	3	2
31		43889	1	2

According to threshold population calculation each of the ward should at least one police station and in some case two. In ward no 19 and 24 the number of police stations are satisfactory but unfortunately other wards are beyond the required number of police station. In ward no 4 and ward no 11, there are no police station. On the other hand, there are only one police station in ward no which is one of the largest wards of Khulna city. For this reason The common psychology of least occurrence of crime like

crime, hijacking, snatching etc. The irresponsibility of governing body and administratively unimportant area the reasons for this service deficit.

## **RESULTS AND DISCUSSIONS**

From the above analysis and interpretations it is obvious that the existing service facilities have quantitative and qualitative differences in each of the wards. The prime reasons behind that is the locational factors. For example ward no. 4 is located far from the city centre. For this reason the people of this ward are not getting their basic services like health and security as there is not clinic and police box. The condition of ward no. 11 is much worse than any other selected wards because there are no primary school, hospital and police station. There is a clinic in this ward but the condition is disappointing. That's why the people of this ward have to go to the other area for emergency case. The location of ward no. 19 and 24 are near to the city centre that's why the service facilities are available but in some case lack of proper management is a common occurrence. The condition of ward no. 31 is pretty similar to ward no. 4 and 11 because of its locational factors and being an administratively unimportant area.

## **CONCLUSIONS**

The analysis and discussion indicates that the services are not equally distributed. Few wards have sufficient facilities and most other are far behind the mean level of development of a city. As the population of Khulna is increasing day by day, the demand for these services will more in the coming days. Government should provide more facilities (primary school, clinic, park, playground, police box) with planning as well as necessary amenities in such a way that people of every ward get equal benefits from these. Besides Government should ensure proper maintenance and management of these facilities. Not only that alongside with government, different organizations should come forward to improve the condition of existing services. This will surely help to make the environment a livable one.

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