

## GRADING BUILT HERITAGE THROUGH MULTI CRITERIA DECISION MAKING: THE CASE OF RAJSHAHI

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### *Abstract*

*Bangladesh has one the richest and the most diverse stock of cultural and architectural heritages. But the condition of heritage structures has consistently degraded over the years due to natural and manmade causes. As a developing country commitment is given to the civic and social sectors, on the contrary renovation and maintenance of heritage buildings and sites is seen as financially non-viable proposition. Especially Rajshahi, a store house of the heritage buildings but some these have been demolished due to development courses taken by the authority. Therefore, conservation of these heritage buildings (in original form, or with suitable modifications without destroying architectural integrity) became the need of time. But selecting buildings for conservation is a matter of dispute between policy makers and stakeholders unless the process is transparent & consistent. The major concern for conservationists and authorities in creating such framework is selecting the attributes and how to evaluate these attributes numerically under which structures can be evaluated. This paper discusses the potential of Multi-criteria Decision Making (MCDM) method, to select heritage sites to be conserved. The application of this method is illustrated for several heritage buildings of Rajshahi, Bangladesh and future study can be carried out on its basis.*

**Keywords:** Built heritage; Heritage Preservation; Multicriteria Decision making (MCDM); Heritage Policy; Old Rajshahi.

### **Introduction**

The term 'built heritage' refers to any ancient object or site of historical, ethnographical, anthropological, military or scientific interest, and movable or immovable, illustrative of art, architecture. There is a considerable economic benefit in conserving-built heritage, but in developing countries this sector is kept in the blind sight by the authorities. As a result, local culture and history is fading away day by day. For instance, in Rajshahi, a historic city in Bangladesh, several heritage buildings have been demolished due to infrastructural development and also the private properties have been badly renovated or demolished to meet their needs. And the remaining ones are also not in their greatest of shapes.

At the same time the conservationist is continuously raising their voice to protect the heritage buildings as they hold history within them. But this sector is seen as a financially non-viable. Under such circumstances heritage values and history has become more a metaphysical aspect ignoring their importance to the locality or the city. An economically viable conservation policy therefore is needed for taking decisions on the heritage sites to protect.

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Selection of heritage buildings, however, is a considerable problem, as it involves many stakeholders of paradoxical views, and there is no such rules and legislation regarding selection of the heritage buildings in Bangladesh. It may also lead to disputes over which resource to conserve or which one to be given priority. This is why a gradation system should be undertaken, using an analytical and transparent framework, and on its basis, hierarchy can be maintained, or heritage buildings can be prioritized to be protected, solving the dispute. Therefore, the paper presents an alternative technique for grading heritage sites based on Multi-criteria Decision Making (MCDM) and applies it in case of the heritage buildings in Rajshahi.

#### ***Policies for grading built heritages in Rajshahi***

There are no such rules and legislation regarding the heritage conservation or grading the heritage buildings in Rajshahi, but the antiquity act of 1968 is applied here. This rule states that: if any question arises whether any product, object or site is an antiquity within the meaning of this Act, it shall be referred to the Government which shall [1], after consultation with the Advisory Committee, decide the same; and the decision of the Government shall be final [1, 2].

Advisory Committee consisting of the following members, namely [1, 2]:

- The Director, who shall also be its Chairman;
- Two Members of Parliament and
- Three other persons having special knowledge of antiquities.

But there is no mention how the heritage buildings can be graded or selected. And also, no mention of any attributes to be considered for selection. So, the selection process remains an unsolved sector in this legislation. That is why a grading system of international standard is required for Rajshahi. This should be transparent, based on some specific and relevant attributes. The following sections discuss MCDM framework which can be applied to serve this need.

#### ***Multi criteria Decision Making in public policy***

In MCDM method assessments and choices are made from several alternatives, and when each alternative has merits and drawbacks. Such merits and drawback are evaluated by multiple attributes. Thus, MCDM can be defined as a method of selecting or grading on the basis of comparative analysis of options rank differently by each of the relevant criteria where the criteria is set by the authorities.

MCDM became popular in the developed countries of Europe and USA in the early seventies. This method is also used in diverse sectors like transport planning [3], land use management [4], financial planning [5], microcomputer networking [6], information planning [7] and so on [8].

There are several processes of MCDM:

- Multi-Attribute Utility Theory can be used to undertake MCDM;
- Linear Additive Evaluation Model [9];
- Analytical Hierarchy Process (AHP) [10];
- “Fuzzy MCDM methods” [11, 12].

Despite being a successful and globally applicable method, it is rarely used in Bangladesh, especially for indexing sites with cultural heritage monuments (old architectural systems). Based on the unanimously accepted norms in the Conservation Science of historical monuments, in correlation with the structural-functional complexity, antiquity, patrimonial value and historical importance [13-15], there are several MCDM processes, but the most popular of them is the Linear Additives Model. Despite of its limitation to the scoring method its straightforward approach and independent selection of attributes has made it suitable for this paper. So, the focus is to apply the Linear Additive Evaluation Model to select or grade the heritage buildings of Rajshahi.

#### ***Study area Rajshahi***

Rajshahi is located in the northern part of Bangladesh which has witnessed several ruling powers from the ancient period to the British government in the preceding century. Right from the beginning of the British period the city was a reputed center of culture and education and

also was a trading post of Dutch and British as the mighty Ganges flows by the side of Rajshahi. Later this city became the urban center in the colonial period.

So, it can be said that the city Rajshahi possess a significant historic background and some of the structures of several time period still stand tall and bears the evidence of such historic transition. But with the course of time these structures are being deconditioning. But no steps were taken to identify or grade this heritage structures hitherto.

Preserving these heritage buildings are the need of time as the hold history within them. Selection or grading of the heritage building is the major issue of conservation. So, we will try to discuss the implementation of MCDM especially linear additive model to grade the heritage buildings of Rajshahi.

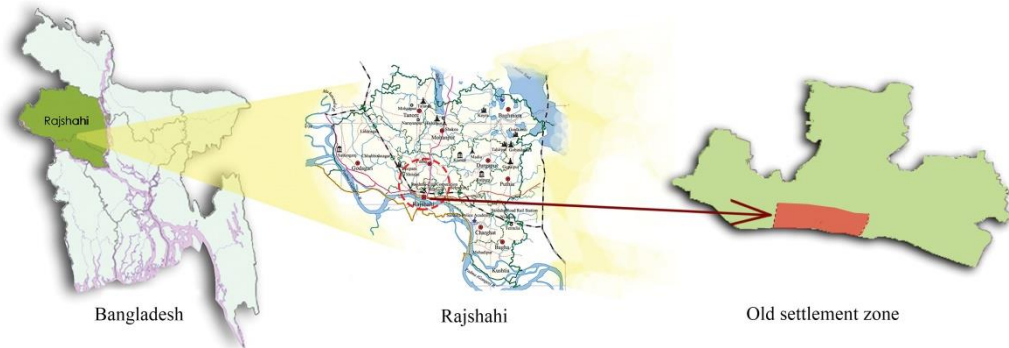


Fig. 1. Location of study area, Rajshahi (source: by author)

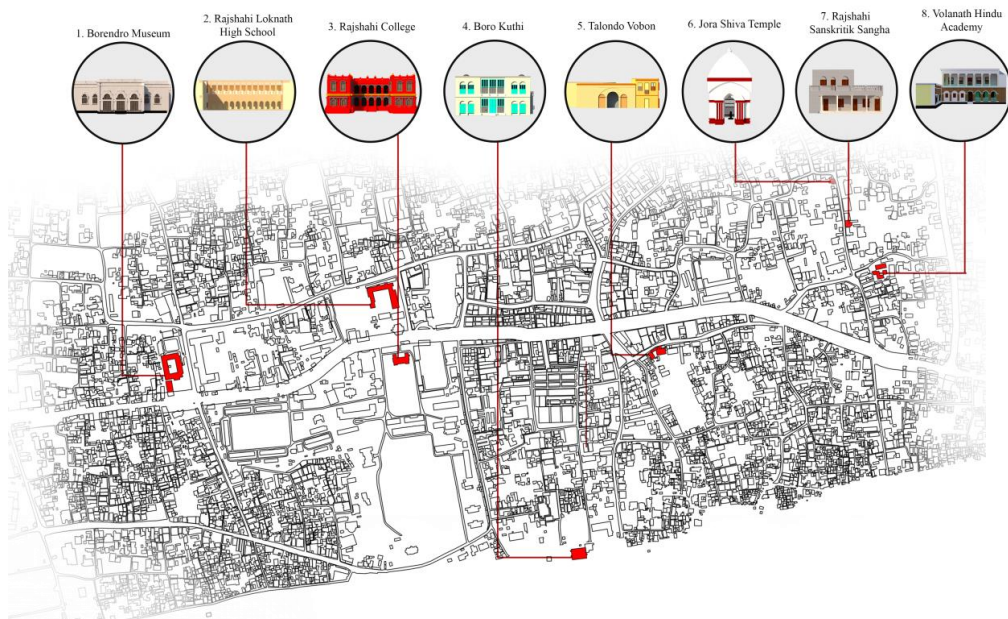


Fig. 2. Selected buildings and their location (source: by author)

**Selection of buildings**

There are numerous old structures in Rajshahi, as it was one of the epicenters from Mauryas to British rule. Among these numerous options selecting the buildings for this paper was a questioned to be solved. So, the selection process is carried out keeping the existing condition,

nature of building (administrative, educational, religious), socio- cultural values in mind. The selected build is:

- Boro Kuthi;
- Rajshahi College;
- Borendro Museum;
- Talondo Vobon;
- Volanath Hindu Academy;
- Jora Shiva Temple;
- Rajshahi Loknath High School;
- Rajshahi Snaskritik Songho.

So, in a map (of old settlement zone mentioned in the figure 1 of Rajshahi, the locations of these buildings need to be identified.

According to the existing legislation, for being antique or heritage the buildings should belong or relate to any period prior to the preceding hundred years [2]. So a timeline is needed to determine whether these structure can be consider as heritage or not.

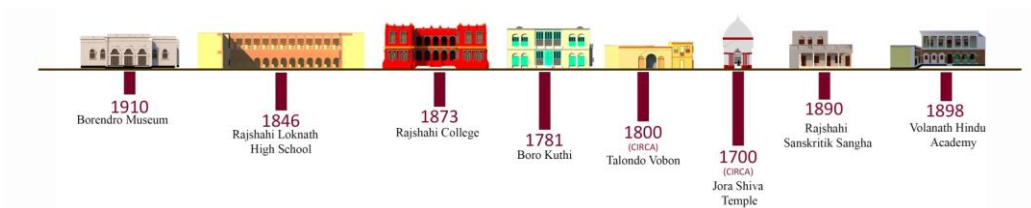


Fig. 3. Timeline of the selected buildings (source: by author)

**Attributes for grading heritage buildings of Rajshahi**

To select heritage buildings through MCDM the attributes must be selected first. The attributes can be considered as variables as they can change in accordance to time, context, location and also the priority of the authority can also be reflected in selection the attributes.

In case of the heritage buildings of Rajshahi, selection of the attributes is a major problem. But keeping the context and heritage value in mind the attributes that were selected is given below:

- Historic value (A1)
- Architectural value (A2)
- Existing condition (A3)
- Socio-cultural value (A4)
- Accessibility (A5)
- Integrity/ authenticity(A6)
- Usability (A7)
- Townscape significance (A8)

Data on all these attributes are qualitative in nature. As the goal is to grade the heritage buildings, these qualitative aspects must be converted to a numerical value. To serve this purpose the relative values of the attributes have been segregated into three categories. High, Medium and Low and the respective numerical values are given in the table.

Table 1. Numeric values of the categories (source: by author)

High	1
Medium	.5
Low	0

Thus, the numerical values of the attributes can be identified. After getting all the values the average values must be calculated, where the following formula should be applied:

$$\text{Average value (q)} = \frac{A1 + A2 + A3 + A4 + \dots \dots \dots + An}{n} \quad (1)$$

The following part of this paper focuses on the implementation of this formula to calculate the average value under some selected attributes in case of the heritage buildings of Rajshahi.

**Table 2.** Qualitative information in quantities for heritage buildings and average values (source: by author)

Buildings	A1	A2	A3	A4	A5	A6	A7	A8	Average value, q
Borendro Museum	1	.5	1	1	1	1	1	1	0.9375
Rajshahi Loknath High School	.5	.5	.5	.5	.5	.5	1	.5	0.5625
Rajshahi College	1	1	1	.5	1	1	1	1	0.9375
Boro Kuthi	1	1	1	1	.5	1	.5	.5	0.8125
Talondo Vobon	1	.5	.5	0	.5	.5	.5	0	0.4375
Jora Shiva Temple	1	1	1	1	.5	1	1	0	0.8125
Rajshahi Snaskritik Songho	1	.5	0	1	.5	1	0	0	0.5
Volanath Hindu academy	1	.5	.5	1	.5	.5	1	.5	0.6875

### Result and discussion

The paper shows how to grade heritage building using “Linear Additive Model” of MCDM. These values will be helpful to identify heritage buildings; Grade them in order of relative significance under the attributes; Select the chronology of conservation and proper document these buildings.

But it should be kept in mind that the result of this grading matrix can vary. The differences in result can be caused by the selection of attributes as there are no fixed attributes to this model. Not only that the result can also vary due to the perception of the evaluator. For example, one particular building might hold a significant or higher value under an attribute to one evaluator, can be relatively of lesser significance under same attribute to different evaluator. So, it can be said that the process followed in this paper may not give any absolute number to decide but will certainly help to categorize heritage buildings by giving an idea or tentative value under the attributes set by the evaluator, which is transparent and more analytical.

### Conclusion

The grading system based on MCDM can be very useful to authority for grading the heritage building. It can provide a strong basis to fix which structure to demolish, which one can be conserved (adaptive reuse), which one to preserve (with and without modification). This would ultimately help to organize a framework of conservation scheme in the near future and also can draw a solution to the never-ending conflict between stakeholders and authority.

However, the selection of the attributes or criteria can cause considerable confusion, but these criteria can be revised. This revision of the criteria can help the authority to think in more specific and vital dimension. But the criteria should not be added infinitely as data collection might be time consuming, difficult and costly and may raise conflict rather solving it.

Identification of the optimal set of attributes should follow a careful analysis of the alternates. This will result in a more transparent and organized model to conduct the analysis.

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