

A Methodology for Assessing Tourism Potential: Case Study Murshidabad District, West Bengal, India

Abdulla Al Mamun*, Soumen Mitra**

*Student, Master of Town and Regional Planning, Bengal Engineering and Science University, Shibpur, India

**Assistant Professor, Department of Architecture, Town and Regional Planning, Bengal Engineering and Science University, Shibpur, India

Abstract- Tourism has significant contribution in sustainable development, economic upliftment and social benefits, if planned methodically. Since the last decade it has become a major thrust area in India to address the aforesaid issues, to utilize its wide variety of destination resources and also to optimize the level of financial involvement for developing tourist infrastructure in a constraint economic domain. This article formulates a simple methodology to quantify tourism potential for a region where detail data is not readily available. ‘Weighted Sum Method’, a popular multi-criteria decision making tool, has been adopted in this study. The method selects social and physical attributes and quantifies them through ranking and scaling techniques. A concept of clusterization has been adopted for optimization of tourist infrastructure costs. The methodology has been applied to Murshidabad district of West Bengal state, India. The district is predominantly characterized by remarkable heritage precincts. The tourism potential has been quantified based on individual spots and clusters. Major limitations of the study have been discussed and relevant avenues for future research have been mentioned.

Index Terms- Heritage tourism, Multi-Criteria Decision Model, Murshidabad tourism, Tourism potential, Weighted Sum Method

I. INTRODUCTION

Tourism is considered as ‘an activity essential to the life of nations because of its direct effects on the social, cultural, educational and economic sectors of national societies and on their international relations’ [1]. Tourism boosts up economic activities through its multiplier effects and exploits local cultural and natural specialties in a positive way [2].

The Planning Commission of India has declared tourism as the second largest sector in the country in providing employment opportunities for low-skilled and semi-skilled workers. Domestic tourism contributes about 75% of tourism economy. Thus in 12th five-year plan (2012-2017) tourism has been marked as a dawn of new era for social integration and economic development [3]. In 2008, the sector contributed 200 billion US dollars which is expected to increase to 375.5 US dollars in 2018 at a 9.4% annual growth rate [4]. By default, India possesses a large variety of tourist destinations, mostly nature-based and historical spots. Statistics shows a sharp rise of decadal tourist demand but it lacks adequate tourist infrastructure, coordination in different levels, tourism master plan, and flexible circuit planning. Development of adequate tourist infrastructure requires significant financial involvement and it should be optimized in

Indian scenario due to financial constraints. Thus, prior to invest in tourism, a local government must know the condition of respective tourist resources, their attractiveness and levels of touristic demand. All these aspects are associated with the tourism potential of a region.

This study is aimed at finding out a workable methodology to quantify tourism potential through a user-friendly and easy-to-handle tool. During formulation of various steps, it has been considered that most of the tourist spots in India lack authentic tourism data. Hence, for achieving an optimized solution in this regard, the methodology is formulated based on ‘Weighted Sum Model (WSM)’, a popular multi-criteria decision making tool which incorporates ranking and scaling techniques for quantifying various attributes [5]. The methodology has been applied to Murshidabad district of West Bengal state, a district predominantly characterized by remarkable heritage precincts of various ruling dynasties and a few nature-based tourist spots. Objectives of the study have been restricted to assess strength and weakness of the spots and find out suitable developmental strategies through optimization of service infrastructure. The next sections show the glimpse of literature review, followed by methodological approach, details of case study, analysis and results and lastly a conclusion discussing further scope of work.

II. A GLIMPSE OF LITERATURE REVIEW

‘Tourism Potential’ is a widely used and accepted term in tourism domain, however, it sometimes create misunderstanding as potential expresses some territorial capabilities, which holds a little narrower domain. As prescribed by S. Formica [6] the term ‘potential’ may be replaced by ‘Attractiveness’ which clearly indicates the relations between demand and supply of tourism. However, several other researches follow the term ‘Potential’ though this may be assumed to be synonymous to ‘Attractiveness’. Mitrut et al. discusses on potential of tourism in a region by minimizing imbalances of infrastructure within the entire region. He has explained a review on tourism scenario in Romania [7].

There is a practice to assess of tourism potential i.e. to quantify all the aspects or attributes towards a single value, using various tools of Multi-Criteria Decision Methods (MCDM). A considerable numbers of studies are available based on MCDM. Iatu proposes a Multiple Linear Regression method to quantify tourist arrival based on 4 variables namely natural resources, cultural resources, tourism infrastructure and general infrastructure [8]. Ion et al. proposes a scaling technique with weight values from the variables like natural potential, anthropic potential, tourism infrastructure and technical infrastructures [9].

A cluster analysis based on Weighted Linear Combination method (WLC) with application of Principal Component Analysis (PCA) has been proposed by Ashouri and Fariyadi. They took 15 variables to assess eco-tourism potential [10]. Morimoto proposes a Stated Preference Study to Assess Tourism Potential. In this context the value of tourism resources has been obtained through conjoint analysis [11].

Another popular way to assess tourism potential and allied research is through Geographic Information System (GIS). Effat and Hegazy proposed a MCDM combined with various mapping layers those are suitably overlapped to obtain ranking and weighting of tourist attractions and infrastructures [12]. Application of GIS as spatial analyses is observed to identify tourism resource inventories, location suitability, monitoring tourism impact, visitor management and assessing potential impacts as analyzed by Yianna and Poulicos [13]. Ivan and Maria propose a methodology based on layering maps with systematic analysis to achieve tourism potential as well as future trends for district of Bourgas [14]. Merwe et al. analyzed nature-based as well as man-made features in connection with tourism potential through a detail GIS mapping process [15].

III. METHODOLOGY

Multi-criteria decision making tools are widely accepted to the researchers and decision makers for assessing tourism potential observed in literature study. Analytic Hierarchy Process (AHP), Multi-attribute Utility Theory (MAUT), Superiority and Inferiority Ranking Method (SIR), Value Analysis (VA), Weighted Product Model (WPM), Weighted Sum Model (WSM) are some common tools used in this regard. For simplicity and reliability with less quantitative data, the **Weighted Sum Method (WSM)** has been chosen in this study. The methodology is furnished here in five sequential steps.

Step 1:Level-1 Attributes and Weight (W_i) assignment

As observed in different researches, performance of tourism is dependent upon the quality of services provided as well as the socio-economic and socio-cultural background of the tourists. There is a wide range for destination choices of the tourists, though the choice-value can be enhanced only by upgrading the quality of services. Thus the analysis for assessment of tourism potential is restricted with existing tourist infrastructure and proxy data of tourist attractions. Three broad aspects namely **physical**, **social** and **environmental** have been considered as level-1 attributes in connection with assessing tourism potential. For district level or region based tourism considerations, there may be similar qualities or levels for a single parameter. Hence, depending upon the regional setting and cluster of tourist areas the weight values of each of the three aspects, mentioned above, may be assigned. This assignment of weights may be worked through expert opinion survey, tourist survey, service providers' interview or experience. The weight value for a certain parameter may be considered null (i.e. ignored) if they are similar throughout the zone. So, three different weights are considered (W_p for physical, W_s for social and W_e for environmental) in the first stage.

Step 2: Level-2 Attributes and Weight (w_j) Assignment

Each of level-1 aspect consists of set of variables those are considered as level-2 attributes. These sets are explained hereunder.

- 1) **Physical** (W_p) aspects include geographic terrain, regional connectivity and vehicular accessibility, bottlenecks in accessibility, versatility in accommodation system, guide and tourist information factors, local souvenirs, tele-communication systems, availability of quality and special foods, parking and other recreational facilities.
- 2) **Social** (W_s) factors include existing tourist influx (for existing tourist spots only), intensity of fairs and festivals, timing to visit a spot, duration of stay, compatibility of the spot with surrounding landuse, safety and security for the visitors, probability of social crimes, behavioural aspects of the operators or service providers etc.
- 3) **Environmental** (W_e) aspects are probability of natural calamity during a specific time window, natural and anthropogenic threat, hazardous landuse, quality of air and water and pollution etc.

Inclusion or exemption of any attribute may vary from case to case. For example, if there is no probability of social crimes in any tourist spot or group of spots, the attribute may be ignored to simplify the computation. Or, for a larger region, if there are two railway stations, different spots may obtain different accessibility index, hence, the existence and level of service for the railway stations may be included as an analyzing factor.

Table 1: Sample Example showing Method of Ranking

Attributes	Rank 1	Rank 2	Rank 3	Rank 4	Total
Attribute 1	18	14	9	9	50
Attribute 2	9	10	17	14	50
Attribute 3	10	20	12	8	50
Attribute 4	11	12	10	17	50

Now, every respondent is asked to rank the attributes (1, 2, 3, ...n) for each group/set separately according to their preferences. The ranking data is arranged in matrices separately for each set. A hypothetical sample has been provided for conceptualization of the method. Let us assume, there are 4 attributes for a group and 50 respondents have opined their preferences. So, every respondent will rank the parameters as 1, 2, 3 and 4. For each attribute, the sum of all ranks will be 50. Now, the columns indicate the comparative preferences for the ranks. **Table 1** explains a sample example for the ranking method. Here, highest 18 respondents have voted attribute 1 as rank 1. Attribute 3 gets the maximum vote for rank-2, attribute 2 as rank-3 and attribute 4 as rank-4. The result indicates that the weight (w_j) for attribute 1 should be maximum, followed by 3, 2 and 4. So, the values are prescribed reverse of their ranks as 4, 3, 2 and 1 respectively. Sum of these numbers is 10. After normalization (i.e. the sum of all weights will be 1), attribute 1 will obtain 4/10 i.e. 0.4, attribute 3 as 0.3, attribute 2 as 0.2 and attribute 4 as 0.1. In any case, if two votes are equal for two different attributes, the problem may be solved in two different ways (1) changing the sample size and (2) calculating the proportion of the values based on column values and choosing the larger one. If not possible,

same weight values may be provided for two or more parameters, as necessary.

Step 3: Intra-Attribute Scaling (s_j)

Level of quality or service for each attribute may not be similar for all the spots. Depending upon variations in quality / quantity, each attribute is scaled in a 5-point or 3-point scaling as required. These scales are related to grades from 1-5 or 1-3 based on logical interpretation and quantification of various levels. Hence, the step 1 and 2 indicates a global approach to be used for all parameters and step 3 is a local approach based on different variations or ranges set logically. For scaling, '1' refers to the worst/weakest quality and '5' indicates the best/strongest quality. For computation, the lowest value is considered as 0.2 followed by 0.4, 0.6, 0.8 and the highest being 1. A proper scaling sets up a common platform for both quantitative and qualitative parameters.

Step 4: Computation of Aggregate Potential Value

Potential value of a tourist spot is finally aggregated in an additive way. The expression is as follows:

Total Potential (V) = Potential Value for Physical Aspects (V_p) + Potential Value for Social Aspects (V_s) + Potential Value for Environmental Aspects (V_e)

Or, **Total Potential (V)** = $W_p * [w_1s_1 + w_2s_2 + \dots + w_ns_n]_{\text{physical}} + W_s * [w_1s_1 + w_2s_2 + \dots + w_ns_n]_{\text{social}} + W_e * [w_1s_1 + w_2s_2 + \dots + w_ns_n]_{\text{environmental}}$

Or, **Potential (V)** = $\sum W_i * [\sum w_j s_j]$ where W_i is the weight of Parameter level 1 for i^{th} attribute, w_i is weight of parameter level 2 for j^{th} attribute and s_i is the scaling grade for j^{th} attribute of level 2. Value of W_i and w_j will range from 0-1 and s_j has 5 different values (0.2, 0.4, 0.6, 0.8 and 1).

Major convenience of the equation is that it gives disaggregate values of three potential items separately alongwith a wholesome measure. All of the potential values will range from 0-1. Lower values indicate weakness compared to strength. The ultimate value works as an indicator for tourism potential; however, it may not identify the intensity of lacuna and strength in different aspects. Hence, for ease of further suggestions and proposal each of the potential values (physical, social and environmental) has been considered for further interventions and proposals. As for example, some spots may have higher social values but less infrastructural values. So, suggestions may address the issues to prepare set of minimum requirements for development.

Step 5: Grouping of Spots and Analysis

List of tourist spots and respective potential values (in aggregate and distributed) are assessed. Hereinafter, the spots are clustered in groups based on proximity to provide common infrastructure as much as possible to optimize the resource. Potential of each group is measured from mean values of the spot values. This provides a clearer scenario for setting up proposals. In this step, new tourist spots or recreational spaces may be searched out and tagged with the group to enhance the probability for revenue generation.

IV. CASE STUDY: MURSHIDABAD DISTRICT

A. Overview of the District

District Murshidabad is located at the central part of State West Bengal in eastern India. Its western boundary is attached with state of Bihar and eastern edge follows the flow-line of River Padma which touches the international boundary of Bangladesh.

Geographic terrain of Murshidabad is distributed almost symmetrically on the both banks of the river Bhagirathi which is flowing north-south. The district covers an area of 5,341 sqkm with a population touching 5.9 millions [16]. Administratively there are 27 C.D. Blocks distributed over 5 sub-divisions and Berhampore being the headquarter. The district is served by one National Highway (NH-34) and two State Highways (SH-7 and SH-11) and two major rail routes. 65% of land is dedicated to agriculture. Since centuries, it is famous for diversified mango production and extensive mulberry cultivation apart from other agricultural products. Small scale and cottage industries like ivory and silk, Indian cork, bell metal, silk garments, shell curving, jute products and local handicrafts are worth mentioning [17].

B. The Glorious Past

Murshidabad witnesses continuous evolution of rich cultural heritage through foot-prints of different ruling dynasties under various religious communities like Buddhism, Brahmanism, Vaishnavism, Islam and Christianity for centuries. Ancient evidences can be traced back during 7th century AD at 'Karnasubarna'(a small habitation of present Murshidabad), an Hindu kingdom, under patronage of great king Sasanka. As described in manuscripts and evidences from coins and statues, the Pala (Buddhism) and the Sena (Brahmanism) dynasties ruled during 11-14th century AD at Gour, the geographic centre of Bengal comprising of present Malda and Murshidabad of Bengal and Rajshahi of Bangladesh. Gour was captured by Islamic rulers (Sultani and Mughal emperors of India) during 14th-18th century AD. During this phase, the name was converted into 'Murshidabad' while Nawab Murshid Kuli Khan was permitted to rule the territory of Bengal. The ruling power of Islam was replaced by the colonial British after the crucial battle of Plassy (1757 AD). The phase continued till independence of India.

C. Existing Tourist Areas

Murshidabad is predominantly characterized by historic and heritage tourist spots. 12 existing areas have been identified in this regard. Major precincts were constructed during Hindu, Nawabi and British Colonial Period. At present, some of them are maintained by Archeological Survey of India (ASI) and local government. The face of Murshidabad is mostly connected to Hazarduari Palace, converted into museum, located at Lalbagh. The oldest precincts in the district are the excavated ruins of Karnasubarna, the ancient capital of Sasanka. Groups of remarkable terracotta temples, both Hindu and Jain, are observed in Azimgunj, Jiaganj and Panchthupi. These temples date back to local authority of Jitpur, located in the eastern part of the district. River Padma in Jalangi is one of the major scenic attractions due to her strategic international location between India and Bangladesh as well as excellent panoramic view. Apart from the artifacts and scenic spots, Murshidabad attracts significant number of local tourists during various festivals and fairs occurred in different seasons. **Table 2** and **Fig. 1** explain the zones, major tourist spots and their predominant characters.

D. Current Tourism Scenario

Murshidabad district is one of the major tourist destinations in West Bengal for years. Major concentration of tourists is observed in Lalbagh and Khosbagh zones centering the Hazarduari palace. Lakhs of local and regional tourists assemble here throughout the year. The touring initiatives are mostly

personal or private tour operators. Lack of government initiatives has compelled the tourism industry to be grown up in a piece-mill approach. Some years back, a regional river-tourism was proposed from Kolkata (almost 300 km) and it touched a few major spots of Murshidabad. However, the scheme became redundant. In spite of having rich resource potentials, the district lacks systematic tourism planning. There is a necessity for conservation / preservation of many historic exhibits, utilization of natural and anthropic resources, exploring of new destination, tagging of potential household industries and organized institutional initiatives.

Table 2: Tourist Areas of Murshidababd District

Block / Zone	Attractions	Predominant Character
1. Berhampore	Krishnanath College, English Cemetery, Grant Hall	Heritage (Colonial)
2. Cossimbazar	Cossimbazar Chhotorajbari, British and Dutch Cemetery	Heritage (Colonial)
3. Lalbagh	Hazarduari Palace, Wasef Manzil or New Palace, Kathgola Garden House, Cemetery of Azim-un-nisa, Katra Mosque, Fauti or Phuti Masjid, Jahan Kosha Canon, Moti Jheel	Heritage (Nawabi and Colonial)
4. Khosbagh	Tomb of Siraj-ud-dula, Alibardi khan and Suzauddin	Heritage (Nawabi)
5. Ajimgunj and Jiagunj	Jiagunj Museum, Jain Temples, Charbangla Temple Complex, Rani Bhawani Temple, Jagat Seth Dham, Kiriteswari	Heritage (Hindu and Jain)
6. Panchthupi	Panchupi Barkona Deul, Panchupi Siva and Durga Temple	Heritage (Hindu)
7. Karnasubarna	Excavations, Rajbaridanga, Rakkhasi Dhipi	Heritage (Hindu)
8. Lalgola	Lalgola Open Air Prison	Modern
9. Jangipur	Subhas Dweep, Kherur Mosque	Mixed
10. Farakka	Barrage and Picnic Spot	Natural
11. Jitpur	Forest	Natural
12. Jalangi	River Padma	Natural

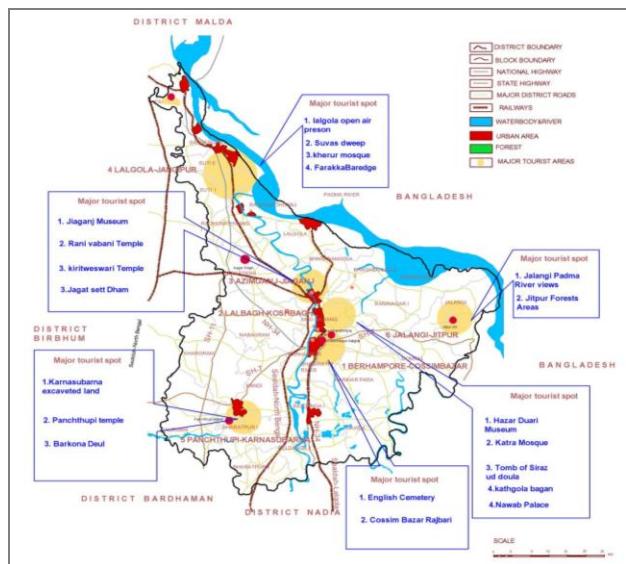


Figure 1: Major Tourist Spots of Murshidababd District, West Bengal, India

V. RESULTS OF ANALYSIS AND DISCUSSIONS

Result of Step 1: Initially the environmental aspects have been excluded due to its homogeneity in most of the spots. Hence, the study has been pursued by taking physical and social aspects. 112 respondents from various fields of economics, planning, geography, statistics, mathematics and also experienced tourists suggested their ranking on physical and social aspects as prescribed. As per the opinion, weights (W_i) for physical and social has been considered as 0.4 and 0.6 respectively. It may vary from case to case.

Result of Step 2: the attributes under social and physical aspects were selected from an elaborate list through opinion surveys.

The social aspects include three attributes in the preference order of (1) *Annual tourist influx*, (2) *Average duration of stay and* (3) *Frequency of fairs and festivals*. Data for annual tourist influx is hardly recorded in most of the cases. However, several proxy data as ticket sale in different spots, sale in restaurants, passengers in rickshaws etc. have been considered to develop a range of data to be used in this study. In most of the spots, the visitors prefer for day-tours except a few those move on a circuit designed by them. Many tourist spots are associated with traditional fairs and festivals in the district which enhance the potential. Hence, depending upon the duration and frequency, the third attribute is marked.

From the opinion survey of 112 respondents, the physical aspects have been distributed over 7 parameters. The preference order is (1) *Physical Accessibility / Connectivity* (2) *Accommodation* (3) *Vehicular Accessibility [0.178]* (4) *Food and Market* (5) *Tourist Information and Guide Service* (6) *Car parking facility and* (7) *Local Souvenirs*. **Table 3** explains the value of weights for the selected attributes.

Table 3: Weights of Attribute Level-2

Attributes and Ranks		Weights
Social Attributes		
Rank 1	Annual Tourist Influx	0.5 [3/6]*
Rank 2	Average Duration of Stay	0.33 [2/6]
Rank 3	Frequency of fairs and	0.17 [1/6]
<i>*Cumulative rank value: 1+2+3 = 6</i>		
Physical Attributes		
Rank 1	Physical Accessibility / Connectivity	0.250 [7/28]*
Rank 2	Accommodation	0.214 [6/28]
Rank 3	Vehicular Accessibility	0.178 [5/28]
Rank 4	Food and Market	0.142 [4/28]
Rank 5	Tourist Information and Guide Service	0.107 [3/28]
Rank 6	Car parking facility	0.071 [2/28]
Rank 7	Local Souvenirs	0.035 [1/28]
<i>*Cumulative rank value: 1+2+3+4+5+6+7 = 28</i>		

Result of Step 3: 5-point and/or 3-point scaling of an individual attribute has been framed on the basis of suitable logical interpretations to quantify the qualitative aspects. As mentioned previously, 1 refers to worst situation and 5 as the best. Interpretations of comparative marking of 1-5 or 1-3 are based on availability of services. **Table 4** exhibits a sample scaling of a single parameter. A color range from black to white has been

applied for 1-5 scales respectively. For ease of computation, the values from 0.2 – 1.0 has been provided. For three attributes namely Food & Market, Souvenir and Accommodation, 3-point scaling has been used where the minimum value has been

considered as 0.2 and the highest being 0.6. The values are demonstrated in **Table 5**.

Table 4: Interpretation of Scaling for a Sample Attribute

Attribute	1 (0.2)	2 (0.4)	3 (0.6)	4 (0.8)	5 (1.0)
Accessibility / Connectivity	Narrow Road, only pedestrian, no vehicle access possible, bad road condition	Narrow Road, pedestrian and vehicle, bad condition	Moderate road, vehicle allowed, bad road condition / Narrow road vehicle allowed, good condition	Wide road, vehicle allowed and moderate road condition	Wide road , vehicle allowed and good condition

Result of Step 4: Aggregate Potential Value of each tourist spot in Murshidabad district has been calculated based on the formula Potential (V) = $\sum W_i * [\sum w_j s_j]$. The adjusted formula is elaborated in following stages:

- (a) Total Potential = 0.6*Potential Value in Social Value Aspects(V_s) + 0.4*Potential Value in Physical Aspects (V_p) $V_T(\sum W_i * [\sum w_j s_j])$
- (b) Potential Value in Social Aspects $V_s (\sum w_j s_j)$ = 0.5*Grade in Tourist Influx (S_1) + 0.33*Grade in Average Duration of Stay (S_2) + 0.17*Grade in Intensity of Fairs and Festivals (S_3)
- (c) Potential Value in = 0.25*Grade

Physical Aspects $V_p (\sum w_j p_j)$ Connectivity/Accessibility (P_1) + 0.214*Grade in Accommodation (P_2) + 0.178*Grade in Vehicular Accessibility (P_3) + 0.142*Grade in Food and Market (P_4)+ 0.107*Grade in Information and Guide Service (P_5)+ 0.071*Grade in Car Parking Facility (P_6) + 0.035*Grade in Souvenirs (P_7)

Potential value for each tourist spot is furnished in Table 4. Each cell has been colored with specific code mentioned previously. As calculated, potential values of social (V_s), physical (V_p) and total (V_T) range from 0 to 1. **Table 5** explains the potentials.

Table 5: Potential Values for the Tourist Spots of Murshidabad District

Zones	Spots	S_1	S_2	S_3	V_s	P_1	P_2	P_3	P_4	P_5	P_6	P_7	V_p	V_T
Ajimgunj & Jiagunj	Neminath Temple	0.4	0.2	0.4	0.334	0.4	0.2	0.4	0.4	0.8	0.6	0.8	0.4274	0.3713
	Charbangala temple	0.8	0.2	0.4	0.534	0.4	0.2	0.4	0.2	0.6	0.6	0.8	0.3774	0.4713
	Jiaganj Musum	0.8	0.2	0.4	0.534	0.6	0.2	0.6	0.2	1	0.6	0.8	0.5058	0.5227
	Kiritewsrari temple	0.6	0.2	0.4	0.434	0.4	0.2	0.2	0.2	0.6	0.6	0.8	0.3418	0.3971
	Ranivabani temple	0.8	0.2	0.4	0.534	0.4	0.2	0.4	0.2	0.6	0.6	0.8	0.3774	0.4713
	Gangewswer temple	0.6	0.2	0.4	0.434	0.2	0.2	0.2	0.2	0.6	0.6	0.8	0.2918	0.3771
Berhampore	English Cemetery	0.8	0.2	1	0.636	0.8	0.6	1	0.6	0.6	0.4	1	0.7198	0.6695
	Krishnath College	0.4	0.2	1	0.436	1	0.4	1	0.2	0.4	0.4	1	0.6484	0.5209
Cossimbazar	British Cemetery	0.8	0.2	1	0.636	0.6	0.2	1	0.2	0.6	0.4	1	0.5270	0.5924
	Cossimbazar Chhotorajbari (Small Palace)	1	0.4	1	0.802	0.6	0.2	1	0.2	1	0.4	1	0.5698	0.7091
	Dutch cemetery	0.8	0.2	1	0.636	0.6	0.2	1	0.2	0.6	0.4	1	0.5270	0.5924
Farakka	Farakka Barrage & NTPC	0.4	0.2	0.8	0.402	1	0.2	1	0.2	0.2	0.6	0.6	0.5844	0.4749
Jalangi	Jalangi Padma River Bank& Bangladesh Boarder	0.2	0.4	0.4	0.300	1	0.4	0.8	0.4	0.2	0.6	0.2	0.6062	0.4224
Jangipur	Jangipur Suvas Dweep (Island)	0.6	0.6	0.8	0.634	0.6	0.6	0.6	0.4	0.6	0.6	0.6	0.5702	0.6084
	Kherur Mosque	0.6	0.2	0.8	0.502	0.6	0.2	0.6	0.2	0.8	0.6	0.6	0.4774	0.4921
Jitpur	Jitpur Forest	0.2	0.4	0.4	0.300	0.2	0.2	0.2	0.2	0.2	1	0.2	0.2564	0.2825

Zones	Spots	S ₁	S ₂	S ₃	V _S	P ₁	P ₂	P ₃	P ₄	P ₅	P ₆	P ₇	V _P	V _T
Karnasubarna	Karnasubarna	0.6	0.2	0.6	0.468	0.6	0.2	0.6	0.2	0.4	0.6	0.4	0.4276	0.4518
Khosbagh	Khosbagh cemetery	0.8	0.2	0.8	0.602	0.6	0.2	0.6	0.2	1	0.4	1	0.4986	0.5606
	Tomb of Sujauddin	0.8	0.2	0.8	0.602	0.6	0.2	0.6	0.2	0.6	0.4	1	0.4558	0.54352
Lalbagh	Ajimunnesa Tomb	0.8	0.2	0.8	0.602	0.6	0.2	0.6	0.2	0.6	0.4	1	0.4558	0.5435
	Hazarduari palace	1	0.4	0.8	0.768	0.6	0.6	1	0.4	1	0.2	1	0.6698	0.7287
	Jagat sett dham	0.4	0.2	0.4	0.334	0.4	0.2	0.2	0.2	0.6	0.6	0.8	0.3418	0.3371
	Jahankosa Kaman	1	0.2	0.8	0.702	0.4	0.2	0.8	0.2	0.8	0.2	1	0.4486	0.6006
	Katgola bagan	1	0.4	0.8	0.768	0.4	0.2	0.6	0.2	1	0.6	1	0.4628	0.6459
	Katra Mosque	1	0.4	0.8	0.768	0.6	0.4	0.8	0.2	1	0.2	1	0.5628	0.6859
	Motijhil (gupto ghor) & Sirajdulla Museum	0.8	0.6	0.8	0.734	0.4	0.2	0.6	0.4	1	0.6	1	0.4914	0.6369
	Wasif manjil	1	0.2	0.8	0.702	0.6	0.6	1	0.4	1	0.2	1	0.6698	0.6891
Lalgola	Lalgola King's Palace, Open jail	0.4	0.2	0.8	0.402	0.4	0.2	0.6	0.2	0.4	0.6	0.6	0.3846	0.3950
Panchthupi	Barkona Deul	0.2	0.2	0.6	0.268	0.2	0.2	0.2	0.2	0.2	0.6	0.4	0.2350	0.2548
	Panchamukhi Siva Temple	0.4	0.2	0.4	0.334	0.4	0.4	0.4	0.2	0.6	0.6	0.8	0.4202	0.3684
	Panchthupi Durga temple	0.2	0.2	0.6	0.268	0.6	0.2	0.2	0.2	0.6	0.2	0.4	0.3494	0.3005
	Panchthupi Siva temple	0.2	0.2	0.6	0.268	0.6	0.2	0.2	0.2	0.6	0.2	0.4	0.3494	0.3005

The potential value of social aspects ranges from 0.268 in Panchthupi upto 0.802 in Cossimbazar. Higher social values are obtained in different parts of Lalbagh and Khosbagh. Panchthupi, Jalangi, Lalgola and Farakka exhibit lower social value due to less number of tourist influx as well as less duration of stay for the people. Physical infrastructure has been found highest in Berhampore (0.719) and lowest in Barkona Deul of Panchthupi (0.235). The reliability of the methodology has been proved by the overall value of potential. The highest value is obtained by Hazarduari Palace (0.728) and this place is considered as the face of Murshidabad. Wasif Manzil and Katra Mosque are also famous destinations followed by Hazarduari and their potentials have been quantified as 0.689 and 0.685 respectively. Panchthupi holds precious exhibits; however, lack of infrastructure has pushed it backward. The values indicate that most of the spots located in Lalbagh, Khosbagh, Cossimbazar and Berhampore are in the higher side. Hence, least interventions are required for these spots. The precincts of Ajimgunj, Jiagunj, Jangipur, Farakka and Karnasubarna possess medium range values which indicate two strategies for intervention. Firstly, appropriate intensity of planning interventions is necessary and secondly, these spots may be connected with the higher valued zones for direct tourist inflation. Lowest values are obtained by Lalgola, Panchthupi and Jitpur. Development of tourism in these spots is tough, but possible, if new nature-based spots are identified in proximity of these areas and extensive augmentation of physical infrastructure and advertisements are done.

Result of Step 5 and discussions: Potential values for a particular tourist spot indicates the level of attractiveness and this has been quantified previously. However, proposing detail strategies of development for each spot may be uneconomic and non-feasible. So, the intensity of development proposals may be optimized by grouping / clustering of spots. Provision of common infrastructure, not only optimize the economic

involvements but also, help to keep purity of individual spots as much as possible. Hence, clustering has been designed based on proximity of the spots. Proximity is mostly dependent upon physical distance but also associates more parameters like circuit coverage, option for walking or using motorized vehicle, duration of stay per spot, probability of night stays, time windows for festivals, proximity of transport junctions, proximity of local settlement, type of trip, socio-economic and socio-cultural aspects of visitors.

Based on proximity and existing tourism pattern, the 12 identified zones have been clubbed into 6 clusters. These are **(1) Berhampore-Cossimbazar** **(2) Lalbagh-Khosbagh** **(3) Ajimgunj-Jiagunj** **(4) Lalgola-Jangipur** **(5) Panchthupi-Karnasubarna** and **(6) Jalangi-Jitpur**. Cluster based potential values have been calculated from table 4. **Table 6** and **Figure 2** explains the summary of the data. A brief discussion on the tourist clusters are furnished herewith.

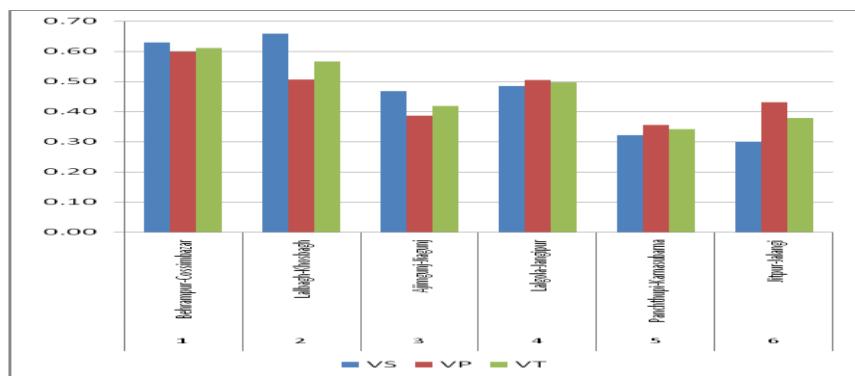
Table 6: Summary of Cluster Based Potential Data

Sl.	Clusters	V _S	V _P	V _T
1	Behrampur-Cossimbazar	0.63	0.60	0.61
2	Lalbagh-Khosbagh	0.66	0.51	0.57
3	Ajimgunj-Jiagunj	0.47	0.39	0.42
4	Lalgola-Jangipur	0.49	0.50	0.50
5	Panchthupi-Karnasubarna	0.32	0.36	0.34
6	Jitpur-Jalangi	0.30	0.43	0.38

- 1) **Berhampore-Cossimbazar** cluster obtained the highest score for overall potential. Strategic location of this

spots gets advantage of railway junctions, highways, and public amenities due to closeness of Berhampore Municipality. The spots are visited by the passers-by people and tourists. No such tourist infrastructure is provided here as the facilities are amalgamated with the

municipal infrastructure. Hence, little interventions like organized ticketing system, conservation of tonga, day-shelters with toilet facilities, light and sound systems in precincts, tagging of local souvenirs are necessary.



- 2) **Lalbagh-Khosbagh** cluster is the face of Murshidabad and attracts lakhs of tourists annually. The cluster is located outside the municipality and within a less dense area along river Bhagirathi. Hence, a clean environment is an added advantage of this area which is also reflected in the social value as 0.66, highest of all. Overall potential of this cluster has been reduced due to narrow streets, absence of rest centres and toilets in appropriate intervals, bad quality of foods, absence of organized parking space and picnic spots though having scope, absence of facilities for high income groups, foreigners and researchers, absence of recreational facilities.
- 3) **Ajimgunj-Jiagunj** is a fantastic tourist cluster comprising of ancient and medieval terracotta temples and museums. These two towns are located on the two sides of river Bhagirathi. Major travel node is not created; hence, people are to travel from Murshidabad or Berhampore town. As a result, the duration for day trip reduces with a half-hearted visit to the temples and museums. Moreover, the communication between two towns is made by hand drawn ferry service, which is risky and primitive. Lack of proper access, signages on roads, undeveloped river front, lack of guide, visual connections of exhibits, parking has pushed the cluster far backward, which should be intervened suitably.
- 4) **Lalgola-Jangipur** is located at the north eastern part of the district. Jangipur is famous for Suvas Island which attracts significant number of people annually. However, the nearest railway station, Lalgola, may be improved significantly and a suitable stretch of Padma river bank may be recast. Development of paid picnic spots with food festivals is required.
- 5) **Panchthupi-Karnasubarna**, the oldest exhibit in the district, is located mostly at the western part of the district. It severely lacks tourist infrastructure, especially for the foreigners and researchers. Though, the potential value seems to be least, however, this place may be developed by tagging any new tourist spots, especially of nature-based.
- 6) **Jitpur-Jalangi** has never been developed as a tourist spot, though; it deserves high future potential and requires extensive development in physical infrastructure and advertisement.

VI. CONCLUSION

Assessment of tourism potential is a necessity for Indian tourism. It is not just to find out any quantitative value, rather, to assess the gap of the demand and to enhance the performance of tourism. The methodology is simple but the researchers should be cautious while selecting attributes, their levels and comparative weights. For proposal of new tourist spots, there will be no tourist data and hence, significant attributes like crime rate of the zone, compatibility with surrounding landuse, visual connectivity, physical and psychological risks etc. may be suitably incorporated. Instead of 5-point scaling, a 10-point scaling may work better. Workability of a blend of multiple decision tools may also be examined. However, there are many possibilities for fine tuning for similar studies to achieve the goals of sustainable development, economic upliftment and social benefits.

ACKNOWLEDGMENT

We are thankful to the respondents (experts of different fields) for their sincere cooperation during opinion survey. We also acknowledge the officers from Berhampore Municipality, West Bengal Tourism Development Corporation, Curator of Jiagunj Museum and local inhabitants of Murshidabad district for their cordial support while conducting the study.

REFERENCES

- [1] Technical Manual, "Collection of Tourism Expenditure Statistics", World Tourism Organization, 1995 [web: wikipedia.org/wiki/Tourism]
- [2] P. Zimmer and S. Grassmann, "Evaluating A Territories Touristic Potential", LEADER seminar in Sierra de Gata, 1996 [web: http://ec.europa.eu/agriculture/rur/leader2/rural-en/biblio/touris/metho.pdf]
- [3] Report on the Working Group of Tourism, 12th Five-Year Plan (2012-17), Ministry of Tourism, Government of India
- [4] Report on India Tourism Statistics, Ministry of Tourism, Government of India, Market Research Division, 2010

- [5] E. Triantaphyllou, B. Shu, S. Nieto Sanchez, and T. Ray, "Multi-Criteria Decision Making: An Operations Research Approach", Encyclopedia of Electrical and Electronics Engineering, (J.G. Webster, Ed.), John Wiley & Sons, New York, NY, Vol. 15, pp. 175-186, 1998.
- [6] S. Formica, "Destination Attractiveness As A Function Of Supply And Demand Interaction", A PhD Dissertation submitted to the Faculty of the Virginia Polytechnic Institute, 2000
- [7] M. Constantin, C. Daniela-Luminia, G. Mihaela, "Tourism Potential and the Diminishing of Regional Disparities in Romania", pp-151-155 [web: <http://steconomice.uoradea.ro/anale/volume/2009/v2-economy-and-business-administration/25.pdf>]
- [8] C. Iatu, M. Bulai, "New Approach in Evaluating Tourism Attractiveness in the Region of Moldavia (Romania)", International Journal of Energy and Environment, Issue 2, Vol 5, pp-165-174, 2011
- [9] I-V. Ciurea, R. Mihalache, G. Ungureanu, S. Brezuleanu, "Studies Regarding the Evaluation of the Tourist Potential of Oituz Hydrographical Basin – Bacau County", Bulletin UASVM Horticulture, 68(2)/2011, Print ISSN 1843-5254; Electronic ISSN 1843-5394, pp-49-54, 2011
- [10] P Ashouri, Sh. Fariyadi, "Potential Assessment of Nature-Based Tourism Destinations Using MCA Techniques (Case Study: Lavasan-e Koochak)", Journal of Environmental Studies, Vol. 36, No. 55, Dec., 2010
- [11] S. Morimoto, "A Stated Preference Study to Evaluate the Potential for Tourism in Luang Prabang, Laos", [web: <http://www.pigliaru.it/chia/Morimoto.pdf>]
- [12] H. Effat and M.N.Hegazy, "Cartographic Modeling and Multi Criteria Evaluation for Exploring the Potentials for Tourism Development in the Suez Governorate, Egypt", Environmental Issues, Sustainable Development, Millennium Development Goals, pp-11-18
- [13] F. Yianna and P. Poulicos, "GIS Contribution for the Evaluation and Planning of Tourism: A Sustainable Tourism Perspective", [web: <http://www.gipsynoise.gr/HellasGI/KoinonikesPraktikes/papers/Farsaki.pdf>]
- [14] I. Tcholeev and M. Vodenska, "Spatial Analysis of The Tourism Potential in Bourgas District", [web: http://www.datamap-bg.com/conference_cd/pdf/P1_316_Tcholeev_Vodenska.pdf]
- [15] JH Van der Merwe, SLA Ferreira, A Van Niekerk, "A Spatial Gap-Analysis Of Tourism Development Opportunity In The Western Cape Province", Centre for Geographical Analysis, Stellenbosch University, 2008
- [16] Web: http://en.wikipedia.org/wiki/Murshidabad_district
- [17] District Statistical Handbook Govt. of west Bengal, Murshidabad , Bureau of Applied Economics and Statistics, Series-2001

AUTHORS

First Author – Abdulla Al Mamum was a student of Master of Town and Regional Planning, Department of Architecture, Town and Regional Planning, Bengal Engineering and Science University, Shibpur during 2011. He has graduated and post-graduated in the field of Geography. At present he has started doctoral research on regional planning.

Contact: mamunbesu@gmail.com

Second Author – Soumen Mitra is working as Assistant Professor in Department of Architecture, Town and Regional Planning, Bengal Engineering and Science University, Shibpur. He has 11 years of experience in architecture and planning profession, institutional consultancy projects, academic research and teaching. His domain of interest includes tourism planning, urban public transportation planning, environmental planning and application of GIS.

Contact: mitrasmen@yahoo.co.in [Corresponding Author]