The Social Science Review A Multidisciplinary Journal. July-August, 2025. Vol. 3. Issue 4. 322-331

Published by: Pather Dabi Educational Trust, (Regn No: IV-1402-00064/2023), Under Govt. of West Bengal, India

The Social Science Review
A Multidisciplinary Journal
ISSN: 2584-0789
(Open-Access, Peer-Reviewed, Refereed, Bi-Monthly, International e-Journal)
Homepage: www.tssreview.in

A STUDY ON ENVISIONING CULTURAL TOURISM AND SUSTAINABLE DIGITIZATION – A CASE STUDY OF JHARGRAM DISTRICT IN WEST BENGAL

Anirban Hatial [1], Dr. Kathakali Bandopadhyay [2] & Dr. Arunava Praharaj [3]

RESEARCH ARTICLE

Author Details:
[1] Assistant Professor (Stage-II), Department of Geography, Manbhum Mahavidyalaya, Manbazar, Purulia, West Bengal, India;
[2] Assistant Professor, Department of Geography, Subarnarekha Mahavidyalaya, Jhargram, West Bengal, India;
[3] Assistant Professor, Department of Commerce, Subarnarekha Mahavidyalaya, Jhargram, West Bengal, India

Corresponding Author:
Anirban Hatial

DOI:
https://doi.org/10.70096/tssr.250304049

Abstract

Sustainable tourism is evolving as a key approach to balancing economic growth, environmental conservation, and community well-being. Over the last ten years, eco-certifications have significantly advanced the field. This includes responsible tourism policies and community-led initiatives that promote cultural preservation and economic inclusivity. Advances in green technology, such as renewable energy use in hotels and low-impact transportation, further support sustainability efforts. However, several challenges hinder widespread adoption. Overtourism strains natural and cultural resources, while inconsistent policy enforcement and limited stakeholder cooperation result in slow progress. India can highlight its intangible cultural assets, such as dance, music, festivals, and culinary diversity, attracting global tourists interested in meaningful engagement. Simultaneously, digitalisation is greatly helping to improve the sustainability and accessibility of travel experiences. Emerging digital technologies – such as virtual reality, augmented reality, and online historic tours – allow the travel industry to lower environmental effects while aiding sustainable development. Furthermore, enabled by AI-powered recommendation systems and the Internet of Things (IoT), are tailored visitor experiences matching with environmental preservation. Emphasising how the combination of cultural tourism and sustainable digital techniques might drive change in the area, this study investigates the present trends, difficulties, and prospects in Jhargram's tourism industry. The study employs analytical instruments like cluster analysis, the weighted sum method (WSM), and the tourism potential index to gain a deeper understanding. Ultimately, the study proposes a strategy to position Jhargram District as a leader in sustainable and cultural tourism, thereby fostering economic growth while preserving cultural heritage and significantly minimising environmental impact.

Keywords: *Sustainable Tourism, Cultural Heritage, Digital Innovation, AI, IoT, Tourism Potential Index*

Introduction

Cultural tourism, defined as travel driven by an interest in a destination's heritage, arts, architecture, food preparation, and lifestyle (Richards, 2001), is essential for global sustainable development. It promotes cultural interchange, protects intangible cultural resources, and encourages local economic development (UNESCO, 2016). The emergence of sustainable digitisation employs technologies to augment cultural tourism by enhancing tourist interaction, safeguarding cultural sites, and fostering inclusivity in cultural experiences. India exemplifies the importance of cultural tourism, since many international tourists integrate cultural activities into their itineraries. The nation's abundant customs and historical variety substantially enhance its tourism attractiveness. To guarantee the future success of cultural tourism, it is imperative to evaluate socioeconomic trends and comprehend the complex connections between heritage, customs, local values, and modern lifestyles. Despite its advantages, cultural tourism encounters several obstacles, including overtourism, cultural commodification, and marginalising local viewpoints (Smith, 2009). Resolving these difficulties is crucial for creating significant and sustainable cultural tourism experiences that advantage both tourists and host communities while maintaining cultural identities for future generations. Sustainable digitisation refers to the intentional use of digital technologies – such as virtual reality, augmented reality, digital archives, and interactive media – to advance, safeguard, and share cultural heritage while maintaining its authenticity (Buhalis & Amaranggana, 2015). These tools improve accessibility and participation, particularly in distant or marginalised regions, and they are essential for linking global audiences to cultural heritage places. Digitalisation in tourism enhances information dissemination and infrastructure development while promoting local engagement and capacity enhancement. Tourism is the largest global industry, accounting for 10.3% of global GDP and anticipated to attain a valuation of 500 billion USD by 2029 (Kant, 2020). Tourism, unlike distinctly defined sectors, overlaps with multiple industries – including hospitality, transportation, and cultural services – rendering it highly linked and complicated. NITI Aayog (2019) highlights that India's vast collection of

over 500,000 monuments and buildings showcases its rich cultural legacy. This list comprises 3,691 buildings designated as nationally important by the Archaeological Survey of India and 38 UNESCO World Cultural Heritage Sites. In "Cultural Tourism as a Business Model in India," Raja Sarkar examines the feasibility of cultural tourism as a sustainable business model and assesses the obstacles it encounters. The study argues that India continues to be a significant cultural tourism destination for international visitors, highlighting the nation's considerable potential for expansion in this industry. (Sarkar, 2018). The success of digitisation in India's tourist industry, as analysed by Shigaonker (2018), explores the concept of digitisation in travel and tourism, emphasising the impact of mobile technology, online travel portals, and social media, while also discussing the challenges faced by these platforms. These statistics underscore the magnitude of India's cultural values and the essential function of sustainable digitalisation in their proper management and promotion. This paper investigates the advancement of cultural tourism in different contexts via the perspective of sustainable digitalisation. It meticulously examines the role of digital tools in promoting cultural heritage while ensuring environmental, economic, and social sustainability. This study explores the Jhargram area in West Bengal to analyse how a balanced and inclusive strategy for digital production might empower local communities, protect cultural identities, and sustainably promote regional tourism.

Objectives of the study

1. To conserve and promote indigenous knowledge, culture, and traditional artistic forms.
2. To make a comprehensive appraisal of the tourism sector in Jhargram through various models.

Materials And Methods

Study Area

The Jhargram region is culturally rich and colourful. Karam, Tusu, Bandna, and Sohrai are tribal festivals celebrated with joy, and Chhau and Jhumur are the traditional dance forms enjoyed during these events. Such customs not only represent what the indigenous believe but also help connect and define the communities. Tribal paintings, wood carvings, and terracotta pieces are among the art and craft traditions found in this region.

Regarding biodiversity, Jhargram is of enormous importance from an ecological view. The main vegetation in its forests is Sal and mixed deciduous trees, which support many animals, including elephants, deer, wild boars, and a variety of birds. Even so, there are serious problems to the region's sustainability, caused by human-wildlife conflict, deforestation, and land degradation. Tourism has reached its zenith, as in due time Jhargram has emerged as a core area of tourist attraction with multiple tourist destinations. Jhargram is located at a latitudinal extent of 21° -52′ to 22° -48′ North and a longitudinal extent of 86° -34′ to 87° -20′ East. Jhargram truly stands out for its unique location of lush green fields and other religious and cultural tourism branding.

Data Sources

Firsthand observations and survey questionnaires are the main form of data used in this paper. By working directly with the target population, mainly tourists and commuters, this method helps us obtain valuable, environment-specific details. By using primary data, the research aims to examine current and genuine reactions, actions, and opinions from the participants, which has strengthened the sample size. This way of collecting data gives a richness to the information and leads to a fuller understanding of the topic. A separate survey for the local stakeholders, including hotel owners, local artisans, etc., has been carried out. The secondary sources mainly include pre-existing published or official data. Government Reports of the West Bengal Tourism Development Corporation (WBTDC) and the District Statistical Handbook of Jhargram have been referred to in a few instances.

Methodology

This study assessed tourist potential using quantitative mathematical models to evaluate the heritage of culture of Jhargram district in West Bengal. The study also uses various other models and has tried to interpret it with the establishment of the AHP model, cluster analysis, and multiple regression analysis. The use of various models along with a concrete stratified sample has triggered the use of these quantitative techniques, which has paved a way for further research. Questionnaire survey responses, both door-to-door and with the help of Google Forms, have been recorded. An N value of 100 has been considered, where stratified random sampling has been adopted for further query. The questionnaires were collected between January and March and October and December of 2024. The sub-indicators' significance was determined using the results. The Likert scale was employed to construct questions that were used to collect data regarding the attitudes and satisfaction of visitors. Since this paper primarily relies on primary data, the relevance of secondary data is considered negligible in this section.

Result And Discussion

Model 1

The Analytical Hierarchy Process (AHP) is a structured decision-making tool that helps prioritise options when multiple criteria are involved. In the Analytic Hierarchy Process (AHP), the diagonal elements of the pairwise comparison matrix are always set to 1. This reflects the fundamental principle that any criterion or alternative is as important as itself. This self-comparison establishes a consistent baseline for evaluating the relative importance of different elements. For instance, when assessing criteria such as cost, attractions, accessibility, and safety in tourism destination selection, assigning a value of 1 to the diagonal elements ensures that each criterion is considered equally important in relation to itself. This standardisation is crucial for maintaining the

integrity of the pairwise comparison matrix and facilitates accurate normalisation and priority vector calculations in subsequent AHP steps.

This model has been a fascinating criterion for Jhargram as it will help us to compare the four basic indicators that initiate a tourist's endeavour for a particular destination. So, a Pairwise Comparison of Criteria using Saaty's scale (1 to 9), do compare the importance of each criterion relative to others. Table 1 illustrates a pairwise comparison of criteria utilising Saaty's scale.

Table 1: Pairwise Comparison of Criteria using Saaty's scale

Criteria	Cost	Attractions	Accessibility	Safety
Cost	1	1/3	1/2	1/3
Attractions	3	1	2	1
Accessibility	2	1/2	1	1/2
Safety	3	1	2	1

Table 2 displays the normalised matrix for the collected data. This matrix provides a clear overview of the relationships between the variables, highlighting trends and patterns that may be significant for further analysis. By examining these correlations, one can derive insights that will inform future studies and decision-making processes.

Table 2: After normalizing the matrix

Criteria	Cost	Attractions	Accessibility	Safety
Cost	0.111	0.118	0.091	0.117
Attractions	0.333	0.353	0.364	0.353
Accessibility	0.222	0.176	0.182	0.176
Safety	0.333	0.353	0.364	0.353

Source: Computed from Primary Survey, 2024-25

An average tourist always engulfs themselves into their own ease and tries to avail the opportunities of CAAS (Cost, Attraction, Accessibility, safety) It is true, that comparative monetary advantages, focussing on both physical and aesthetical attractions, has been a comprehensive consciousness from the viewpoint of a tourist. No doubt, spaces of attraction has emerged as the most significant concern, followed by budget, as a tourist do require a self-appraisal of basic amenities of CAAS**.**

Then as per the Priority Vector analysis, the following values (Table 3) have been derived for each criterion by making average across the row.

Table 3: Different values as per Priority Vector analysis

Criteria	Priority
Cost	0.109
Attractions	0.351
Accessibility	0.189
Safety	0.351

Analysis for Jhargram assessed as per Table 3:

- Cost: 0.109 (Jhargram weight under Cost)
- Attractions :0.351 (Jhargram's attraction exceeds beyond the other indicators, proving the positive benefits, that even the tourists require to adjust to the other factors, they will adjust with those, and will cherish the beauty of Jhargram.)
- Accessibility: 0.189 (Jhargram's weight under Accessibility) which shows that it is of moderate influence.
- Safety: 0.351 (Jhargram's weight under Safety)
- Attractions and safety has emerged as the most important factors which indicates the significance of Jhargram, both as a tourist destination and as a safer place. The significance of safety is profoundly important for tourists as Jhargram is situated in Jungle mahal area. However, the result do indicates that in the last few years, Jhargram has gained the confidence of tourists. With rising urbanization, Jhargram has emerged as a best tourist destination in recent times.

The attractiveness for visiting and revisiting Jhargram, has proved beyond our expectation as the result signifies a positive outlook for revisiting Jhargram as a tourist destination. Accessibility is moderately important. This aspect is clear from using Pearson Correlations Co-efficient.

This place recently has emerged as the major tourist core. Moreover, constructions of multiple homestays and private bungalows within forests have promoted growth of tourists. With introduction of various Melas and other tourist attractions Jhargram has emerged as one of the spots, which can be easily accessible, safety has been established with well connected rails and roads and adequate staycations. Table 4 displays different values with respect to two variables. These values illustrate the relationship between the variables and highlight potential trends that could be significant for further analysis.

Table 4: Different values in respect of two variables

Tourist	X (Satisfaction)	Y (Revisit Intention)
A	8	9
B	6	5
C	7	7
D	9	9
E	5	4

As per the means of X and Y

The satisfaction levels of tourists provide a highly optimistic response as derived from the primary Survey. Jhargram has recently emerged as a single day trip planning spot with tourists commuting either from Kharagpur or Kolkata. With the combined amalgamation of natural beauty and rich tribal culture, a beautiful blend has taken place in Jhargram. Moreover, the urban nodality along with rural traces, rivers, springs and picturesque hills has created the intention of revisiting the area. Moreover, making Jhargram as the core tourist residing spot, tourists also move around the various other tourist spots of Odisha and Jharkhand**.**

Table 5: Calculation of Pearson correlation coefficient (r) between two variables, X and Y.

Tourist	X	Y	X−7	Y−6.8	(X−7) (Y−6.8)	$(X-7)^2$	$(Y-6.8)^2$
A	8	9	1	2.2	2.2	1	4.84
B	6	5	-1	-1.8	1.8	1	3.24
C	7	7	0	0.2	0	0	0.04
D	9	9	2	2.2	4.4	4	4.84
E	5	4	-2	-2.8	5.6	4	7.84

Computed by authors based on Primary survey (2024-25)

Applying the Pearson formula, $\mathbf{r} = \frac{n(\sum xy)-(\sum x)(\sum y)}{\sqrt{[n\sum x^2-(\sum x)^2][n\sum y^2-(\sum y)^2]}}$.....(1)

Pearson's correlation coefficient r ≈ 0.97, indicating a very strong positive relationship between tourist satisfaction and revisit intention (Table 5). Pearson's correlation coefficient r ≈ 0.97, indicating a forceful positive relationship between tourist satisfaction and revisit intention. This suggests that as tourist satisfaction increases, the likelihood of them returning to the destination also rises significantly. Such a strong correlation highlights the importance of enhancing visitor experiences to foster loyalty and encourage repeat visits.

Model 2

Table 6: Butler's Tourism Area Life Cycle (TALC)

Year	Stage	Tourist Arrivals
1	Exploration	500
2	Involvement	1,000
3	Development	2,500
4	Consolidation	3,000
5	Stagnation	3,200
6	Decline	2,000

Source: Based on Primary survey on perception of hotel owners (2018-24)

Figure 1 illustrates tourist arrivals according to Butler's Tourism Life Cycle. This model depicts the evolution of tourist sites over many phases, from exploration to decline. Understanding these phases enables stakeholders to make informed decisions to sustain and rejuvenate tourism in their individual regions.

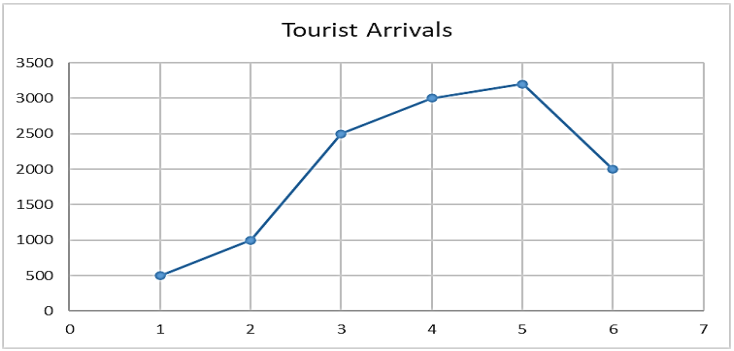

Figure 1: Tourists arrival based on Butler's Tourism Area Life Cycle (TALC)

The destination reached its peak in Year 5 and began to decline in Year 6, indicating a need for rejuvenation strategies. This suggests that Jhargram, currently an emerging tourist spot, should be mindful of future tourism (Fig. 1) to avoid being overshadowed by the decline stage proposed by Butler.

Model 3

Objective: To examine how multiple factors (e.g., tourist satisfaction and expenditure) influence revisit intention. We surveyed 5 tourist families and recorded the following: Table 7 depicts data of five tourist families. Table 8 depicts data for five tourist families. Each family's spending habits reveal intriguing trends, highlighting preferences for local attractions, dining, and accommodation. This information could be invaluable for businesses seeking to tailor their offerings to enhance the tourist experience.

Table 7: Data of 5 tourist families based on primary survey

Tourist	Satisfaction (X_1)	Expenditure (X_2, in $)	Revisit Intention (Y, score out of 10)
A	8	200	9
B	6	150	6
C	7	180	7
D	9	220	10
E	5	130	5

Let's predict the revisit intention for Tourist Family C:

- Satisfaction = 7
- Expenditure = 180

A tourist in Jhargram with satisfaction = 7 and expenditure = Rs.180 is predicted to rate revisit intention at **7.7** out of 10.

This signifies that at least 77% of tourists' beliefs that they will return to Jhargram for a revisit, which itself indicates a provocative and positive biasness. The Jhargram tourism has recently tried a lot and moreover with construction of luxurious hotels and resorts, attractions of foreign tourists are at hike. The perception as derived from primary survey, do depicts a constant booming of luxurious arena of tourism, which directly boosts the allied sectors associated with tourism. Table 8 depicts β values. These values are crucial for understanding the relationships between the variables in our analysis. They offer explanations for the strength and direction of the associations we are exploring.

Table 8: β Values calculated as regression coefficient

Variable	Coefficient (β)
Intercept (a)	-1.5
Satisfaction	0.8
Expenditure	0.02

- **Satisfaction** and **expenditure** both positively affect revisit intention.
- The model allows destination managers to predict future behaviour based on observed factors.

The figure below does show a multiple regression model, which clearly indicates the direct relationship between satisfaction and expenditure in monetary terms. Though satisfaction can be considered as a relative variable, yet its absoluteness can be derived from the positive correlation between revisit, satisfaction and expenditure.

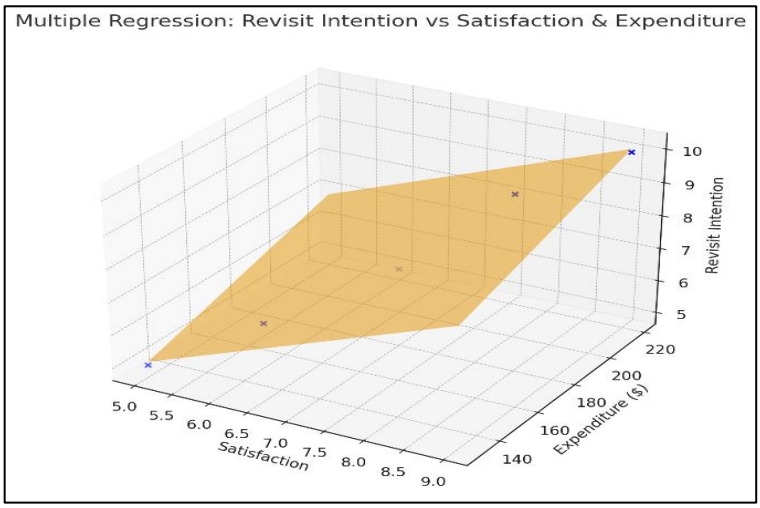

Figure 2: Multiple Regression Analysis considerably estimating 3 variables based on perception

Figure 2 illustrates a multiple regression analysis that significantly estimates three variables based on perception. The results indicate that each variable contributes uniquely to the overall model, highlighting the complicated relationship between them. This analysis not only enhances our understanding of individual perceptions but also suggests potential areas for further research.

Model 4

Cluster Analysis Model in Jhargram Tourism

Objectives: To identify distinct groups (clusters) of tourists visiting Jhargram based on shared characteristics – useful for targeted marketing, planning, and product development.
Cluster analysis is a statistical technique used to group tourists into segments based on selected variables such as:

- Demographics (age, origin)
- Behaviour (activities, length of stay, spending)
- Preferences (cultural, nature, adventure)

Each cluster represents a homogeneous group. Table 9 depicts tourist expenditure and stay. This data highlights the varying patterns of spending based on length of stay, underscoring the importance of understanding tourist behaviour for effective marketing strategies. Such insights can aid local businesses in tailoring their services to better meet the needs of visitors.

Table 9: Tourist Expenditure details and stay

Tourist	Age	Expenditure (₹)	Stay (Days)	Interest
T1	25	1500	1	Nature
T2	42	5000	3	Tribal culture
T3	30	1200	1	Trekking
T4	55	6000	4	Heritage & temples
T5	27	1700	1	Nature
T6	40	5500	3	Tribal culture

Table 10 depicts K-means cluster analysis. The results indicate distinct groupings within the dataset, highlighting key patterns and trends. This analysis will be instrumental in guiding further research and decision-making processes.

Table 10: K-Means Cluster Analysis (2 Clusters)

Cluster	Features	Tourist Types
Cluster 1	Young, low-spending, short stay, nature/trek	Backpackers, eco-tourists
Cluster 2	Older, higher spending, cultural interest	Cultural explorers, heritage seekers

Jhargram can develop eco-lodges and tribal experiences for Cluster 1, and cultural circuits for Cluster 2

The district Jhargram can improve in

- Marketing: Target specific clusters via social media (young) or heritage magazines (older)
- Product Design: Short nature trails for one-day visitors, cultural homestays for longer stays.
- Policy: Infrastructure aligned with cluster demands (budget vs premium).

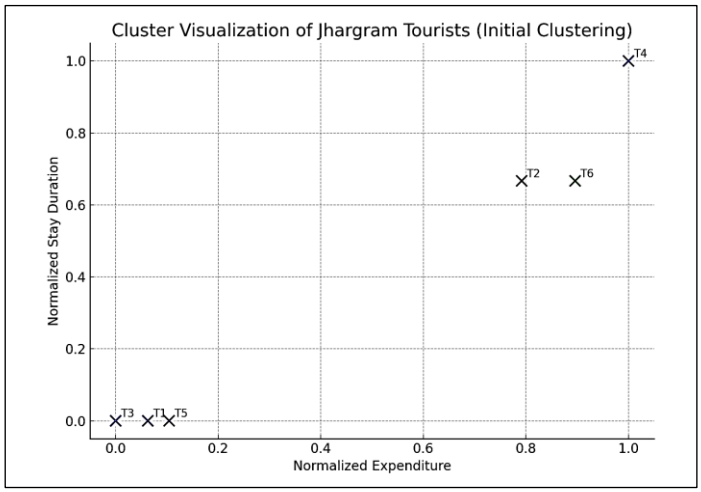

Figure 3: Cluster Visualization diagram based on primary survey of Tourist Arrivals (October 2024 – March 2025)

Figure 3 shows a cluster visualisation diagram based on a primary survey of tourist arrivals (October 2023-March 2024). The diagram highlights key trends in visitor demographics and preferences, allowing for a more profound understanding of the factors influencing travel patterns during that period.

Cluster 1 is basically for people of lower spending and shorter stays, mostly related to Budget travellers, youth, local day-trippers etc.
Cluster 2 is basically for people of higher expenditure and longer stay duration mostly related to cultural tourists, heritage or tribal tourism seekers. If it is being divided into segments such as

Segment A (Budget/Short stay (bottom left)); Many tourists fit in this segment. Actions: economy products, day tour packages, short-trips programs and fast food/transportation services. Segment B - Mid/High-spenders (middle-right cluster): Valuable customers who have a longer and more sufficient spend. Activities: multi-day packages, hotel affiliation, high-end experience, and upsell excursions.

Outlier - Ultra high / long stay: Work around this. Real? Use high-end/long-term promotions; data mistake? recode (it will skew centroid clustering).

Insights for Tourism Planning in Jhargram

- Tailored Experiences:
  Cluster 1 tourists may prefer eco-tourism, short trails, and budget homestays.
  Cluster 2 tourists are likely to enjoy tribal village stays, heritage site tours, and multi-day itineraries.
- Marketing Strategy:
  To promote nature-based weekend getaways for Cluster 1 via social media and for Cluster 2, market curated cultural packages through travel agents or tourism fairs will be ideal for people in cluster 2.
- Infrastructure Needs:

Cluster 1 needs low-cost infrastructure (bike rentals, forest paths) whereas cluster 2 would expect guided tours, clean lodging, and curated tribal/cultural programs.

The preliminary phase necessitates that authors identify the indicators and sub-indicators, which will later be assessed and scored by tourists. The study's evaluation was based on two indicators: resource value and development status, each of which comprised seven sub-indicators (Ristić et al., 2020). Aesthetic value, historical value, awareness level, ambience, complementarity with adjacent attractions, material value, and authenticity were among the seven sub-indicators that were implemented to evaluate resource values (Li & Lo, 2004; McKercher & Ho, 2006; Yeung, 2012).

Seven sub-indicators – accessibility, closeness to other attractions, availability of tourist amenities (Li & Lo, 2004), personal experience of the site, availability of tourist information, length of stay – McKercher & Ho, 2006 – were used to assess the development status. Quality of catering services was also evaluated.

Tourism Potential Index (TPI)

Level 2 sub-indicators comprise collections of variables that constitute each Level 1 indicator. Experts initially verify and validate the selected indicators and sub-indicators prior to incorporating survey respondents into the subsequent phase of the research. Using a 7-point scale (1 being the least influential and 7 the most), survey respondents are then asked to score the sub-indicators depending on their estimated influence on tourism growth based on their personal judgement (Al Mamun & Mitra, 2012). Usually, more consistent results follow from a bigger sample size. There were 100 respondents for this survey; every participant evaluated each of the seven sub-indicators. Every sub-indicator so gets 100 ratings; the total number of rankings for every attribute comes to 100 as well.

In the survey, Attribute 2 had the highest number of votes for second place, but most respondents designated Attribute 1 as their primary choice. Values are allocated in descending order – 7 for rank 1, 6 for rank 2, and continuing to 1 for rank 7 – as seen in Table 2 by Al Mamun & Mitra, 2012, to quantify the ranks. These values taken overall come to 28. Dividing each attribute's score by 28 then gives it a weight. Attribute 1 gets a weight of 7/28 (0.250), Attribute 2 gets 6/28 (0.214), and so on, so assuring that the total weight equals 1 (Al Mamun & Mitra, 2012).

We used the following formula to calculate the measured value of each rank: The subsequent formula was employed to determine the measured value of each rank: the process involved assigning a numerical value to each rank based on its position within the dataset.

By doing so, we could effectively analyse the data and identify patterns or trends that might otherwise remain obscure.

$$R_i = \big(MAX(i)\big)+1-i)/\sum I \ldots\ldots\ldots (2)$$

The numerical number of the rank is denoted by i.
An explanation of the weighted average for the selected attributes is provided in Table 11.

Table 11 shows the weighted values for the ranks of each sub indicator. These values provide a comprehensive overview of the relative importance of each sub indicator in the overall assessment. By analysing these weights, we can identify which factors significantly influenced the final rankings.

Table 11: Weighted values for the sub-indicator ranks

Resource Value		
Rank	**Attributes**	**Importance**
1	Artistic value	7/28=0.250
2	Ancient Value	6/28=0.214
3	Perception level	5/28=0.179
4	Ambiance	4/28=0.143
5	Supplementary to adjacent attractions	3/28=0.107
6	Physical value	2/28=0.071
7	Accuracy	1/28=0.036
Cumulative rank value: 1+2+3+4+5+6+7=28		
State of development		
1	Accessibility	7/28=0.250
2	The nearness of additional attractions	6/28=0.214
3	Tourism infrastructure	5/28=0.179
4	Individual experience of the location	4/28=0.143
5	Visitor information	3/28=0.107
6	Duration of stay at the location	2/28=0.071
7	Catering services	1/28=0.036
Cumulative rank value: 1+2+3+4+5+6+7=28		

Source: Computed from Primary Survey of Tourist Arrivals (October 2023 - March 2024)

The weight of the sub-indicator was determined by utilising all valid responses from the survey, employing the following formula for calculation:

$$W_{ji} = \sum(C_{ji} * R_i)/N \ldots\ldots\ldots\ldots (3)$$

Let j be a constant corresponding to a certain indication, representing the ordinal position of the sub-indicator. Ci signifies the frequency of the i-th rank for the designated sub-indicator, while N indicates the sample size. The sub-indicator's weight is presented in Table 11.

Following the establishment of the weighted values for the attributes, the scaling of the attributes constitutes step three. A periodic scale with five categories has been developed based on the quality of services utilised to assess each attribute. Each category possesses a value ranging from a minimum of 1 to a maximum of 5, with values between 0.2 and 1.0 utilised for computational simplicity (Al Mamun & Mitra, 2012; Yan, Wendy Gao, & Zhang, 2017).

Greater attention was paid to resource-related elements since resource value is so important for the growth of tourism; then, the degree of development came second.

Table 12: Value categories

Mark	1 (0.2)	2 (0.4)	4 (0.8)	5 (1.0)
Value	Low	Satisfactory	Very good	high

Source: (Al Mamun & Mitra, 2012; Yan, Wendy Gao, & Zhang, 2017)

During the last phase of their investigation, the authors classified the features into two primary groups: level of development and resource value, thereby evaluating the tourism value potential of the investigated sites. They used the following formula to figure a resource's whole possible value.

$$V = \sum W_i \ (W_{ji} * S_{ji}) \ldots\ldots (4)$$

This is where Sji represents the average score for the i-th indicator out of the j-th set of indicators.

The religious sites can be categorized into three groups based on their tourist potential: low (V < 0.4), mean (0.4 ≤ V < 0.7), and high (0.7 ≤ V < 1) (Yan et al., 2017; Ristić et al., 2020).

Table 13: Mean values of sub-indicators

	Chilkigarh Rajbari	**Kanaka Durga Temple**	**Rameshwar Temple**	**Jhargram Rajbari**	**Sabitri Temple**
Sub-Indicators	N=50	N=50	N=50	N=50	N=50
Artistic value	0.84	0.87	0.83	0.86	0.91
Ancient Value	0.83	0.81	0.81	0.84	0.90
Perception level	0.78	0.90	0.75	0.79	0.89
Ambiance	0.83	0.83	0.81	0.83	0.85

	Chilkigarh Rajbari	Kanaka Durga Temple	Rameshwar Temple	Jhargram Rajbari	Sabitri Temple
Aesthetic value	0.82	0.66	0.70	0.84	0.88
Awareness level	0.77	0.74	0.72	0.78	0.84
Supplementary to adjacent attractions	0.73	0.66	0.68	0.74	0.77
Personal experience	0.85	0.86	0.85	0.85	0.88
Availability	0.68	0.77	0.77	0.79	0.84
Visitor information	0.73	0.66	0.66	0.78	0.82
Tourism infrastructure	0.66	0.55	0.55	0.72	0.72
Proximity of other attractions	0.61	0.49	0.51	0.72	0.73
Catering facilities	0.69	0.48	0.50	0.70	0.67
Duration of stay at the location	0.60	0.50	0.52	0.62	0.66

Source: (Computed from Primary Survey of Tourist Arrivals (October 2023- March 2024)

By applying formula (3), we were able to determine the tourist potential values of the six research locations such as- Chilkigarh Rajbari, Kanak Durga temple, Rameshwar temple, Jhargram Rajbari and Savitri temple are the chosen sites, and their tourist potential is shown in Table.

Table 14: Calculated values of Tourism potential

Indicator	Chilkigarh Rajbari	Kanaka Durga Temple	Rameshwar Temple	Jhargram Rajbari	Sabitri Temple
Resources value	0.800	0.784	0.758	0.810	0.861
State of development	0.687	0.613	0.623	0.740	0.760
Total	0.744	0.699	0.691	0.775	0.811

Table 14 shows that underdevelopment of cultural heritage sites inside the Jhargram district cultural tourism zone: the development value is much less than the resource value in all six sites. Lower development values lower the total possible value. The overall tourist potential of the Jhargram district cultural and tourist zone is (0.756), which belongs to the category of high potential (Table 15) (Yan, Wendy Gao, & Zhang, 2017; Ristić et al., 2020)

Table 15: Potential value scale

Potential	Low	Medium	High
Value	<0.4	0.4	0.4>

The values indicate that the following study places have a medium level of tourist potential: Chilkigarh Rajbari (0.744), Kanaka Durga Temple (0.699), Rameshwar Temple (0.691), Jhargram Rajbari (0.775), Sabitri Temple (0.811).

Conclusion

This study underscores the transformative potential of sustainable digitisation in revitalising cultural tourism, particularly within emerging heritage-rich destinations in Jhargram district. Through a multi-model approach – including AHP, Pearson correlation, TALC, multiple regression, cluster analysis, and Tourism Potential Index – the research demonstrates how digital tools, when strategically employed, can preserve indigenous heritage, promote inclusive tourism, and generate socio-economic benefits for local communities.

The analytical hierarchy model amply demonstrated how much attraction value influences tourist preferences for Jhargram beyond other considerations, including cost, accessibility, and safety. The high positive connection (r = 0.97) between tourist satisfaction and revisit intention guarantees that improving visitor experiences directly promotes repeat visits.

Butler's TALC model showing a clear need for innovation and digital intervention since it showed that the area runs the danger of stagnation. Analogous results from regression analysis revealed that a visitor's likelihood to return is much influenced by both pleasure and expenditure, so offering a useful prediction model for destination management. The cluster analysis identified different segments, such as eco-tourists and cultural explorers, which allowed for more focused infrastructure construction and marketing plans.

Moreover, the Tourism Potential Index (TPI) revealed that the tourism development of Jhargram depends mostly on accessibility and artistic value. Legislators use these realisations to prioritise high-impact sectors, allowing for a more efficient distribution of resources.

In conclusion, the integration of technology with cultural conservation – when backed by data-driven decision-making – has the power to reshape regional tourism landscapes. For Jhargram, this means fostering a balanced, sustainable, and inclusive tourism model that not only preserves its rich heritage but also empowers local communities, encourages repeat visits, and strengthens its identity on both national and global tourism maps.

Acknowledgment: No
Author's Contribution: *Anirban Hatial*: Data Collection, Literature Review, Methodology, Analysis, Referencing; *Dr. Kathakali Bandopadhyay:* Data Collection, Literature Review, Methodology, Analysis, Referencing; *Dr. Arunava Praharaj*: Drafting, Referencing.
Funding: No
Declaration: All the authors have given consent for the publication.
Competing Interest: No

References

1. Roy, S. (n.d.). *Digitalisation of India's travel and hospitality sector*. News, Kolkata
2. Kapila, S. (2017, September 5). *Indian tourism ministry goes digital*. B2B Travel News.
3. Tiwari, A. (n.d.). *Technology takes over, changing the landscape of travel & tourism in India*.
4. KPMG. (n.d.). *FICCI: Travel and hospitality gone digital*. https://assets.kpmg.com/content/dam/kpmg/FICCI-travel-hospitality-gone-digital.pdf
5. Ganesh, A., & Madhavi, C. (2013). Impact of tourism on Indian economy – A snapshot. *Journal of Contemporary Research in Management, 1*(1). https://www.psgim.ac.in/journals/index.php/jcrm/article/view/181/0
6. Honey, M., & Gilpin, R. (2009). *Tourism in the developing world: Promoting peace and reducing poverty* (Special Report).
7. KPMG. (2018, March 20). *FICCI expedition: Travel innovation*. https://home.kpmg.com/.../ficci-expedition-travel-innovation
8. FICCI. (2017). *FICCI Tourism and Hospitality Committee*. https://ficci-thtc.com/2017
9. World Travel & Tourism Council. (2018). *India 2018: Economic impact report*. https://www.wttc.org//media/files/reports/economic-impact-research/.../india2018
10. Travelport. (2019). *2018 Global Digital Traveler Research*.
11. Richards, G. (2001). Cultural attractions and European tourism. CABI Publishing
12. UNESCO. (2016). *Culture: Urban Future – Global Report on Culture for Sustainable Urban Development*. United Nations Educational, Scientific and Cultural, https://unesdoc.unesco.org/ark:/48223/pf0000245999
13. Smith, M. K. (2009). Issues in cultural tourism studies (2nd ed.). Routledge.
14. Buhalis, D., & Amaranggana, A. (2014b). Smart Tourism Destinations Enhancing tourism experience through personalisation of services. In *Information and Communication Technologies in Tourism* (pp. 377–389). https://doi.org/10.1007/978-3-319-14343-9_28
15. Tussyadiah, I., & Inversini, A. (2015). Information and Communication Technologies in Tourism 2015. In *Springer eBooks*. https://doi.org/10.1007/978-3-319-14343-9
16. Al Mamun, A., & Mitra, S., 2012. A methodology for assessment of tourism Potential: Case study Murshidabad District, West Bengal, India. *International Journal of Scientific and Research Publications, 2*(9), 1-8.
17. Mamun, A. A., & Mitra, S. (2012). A Methodology for assessing Tourism potential: Case study Murshidabad District, West Bengal, India. *International Journal of Scientific and Research Publications, 2*(9), 1–8.
18. Yan, L., Wendy Gao, B., & Zhang, M., 2017. A mathematical model for tourism potential assessment. *Tourism Management,* Vol. 63, p. 355-365.
19. Li, Y., & Lo, R. L. B. (2004). Applicability of the market appeal—robusticity matrix: a case study of heritage tourism. *Tourism Management, 25*(6), 789–800. https://doi.org/10.1016/j.tourman.2004.06.006
20. McKercher, B., & Ho, P. S. (2006b). Assessing the tourism potential of smaller cultural and heritage attractions. *Journal of Sustainable Tourism, 14*(5), 473–488. https://doi.org/10.2167/jost620.0