



**SITE SUITABILITY ANALYSIS FOR POTENTIAL ECO-TOURISM
SITES WITH FUZZY MULTI CRITERIA DECISION ANALYSIS IN
NASHIK DISTRICT**

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Introduction:

Tourism is a multifaceted industry that significantly contributes to economic growth, social benefits, and sustainable development. The growth of tourism in any region depends on various attributes including natural, social, behavioral, economic, psychological, religion etc. in the present study tourism potential and suitability for the Nashik District has been analyzed using Analytic Hierarchical Process (AHP), Weighted Overlay Method (WOM) and Multi Criteria Decision Making (MCDM). Many countries across the world rely heavily on revenue gained by tourists as their principal economic activity. Tourism itself is a very dynamic activity which depend on the variety of factors, these contributing factors serves some uniqueness as well as diverseness which vary from place to place and time to time. The magnetic factors for the two places which same origin and common set of attributes can be differ. For the present study multiple factors were analyzed these factors are broadly categories into Tourism Intensity Measure (TIM), Climatic,

Physiographic, Social, Amenities and environmental.

Study Area:

Nashik district lying in the Northwest part of the Maharashtra state located between 19° 35' 18" N to 20°53'07" N latitude and 73°16'07" E to 74°56'27" E longitude with an area of 15,582 sq. km. at an elevation of 565 meters above mean sea level, this Rhomboidal in the shaped district is ranked 3rd in terms of area, 4th in terms of population, and 7th in terms of density among 35 districts of Maharashtra. Nashik is one of the important districts of Maharashtra and the headquarters of the administrative division.

Material and Methods:

Selection of the Criteria and Sub-criteria:

For the present study based on expert opinion and existing literature six major criteria's namely Tourism intensity measurement (TIM), Climate, Physiography, Social, Amenities, and environmental. Along with these criteria's,

twenty-three sub criteria were also used for eco-tourism potential site analysis. The

list of the sub criteria and sub criteria is given below.

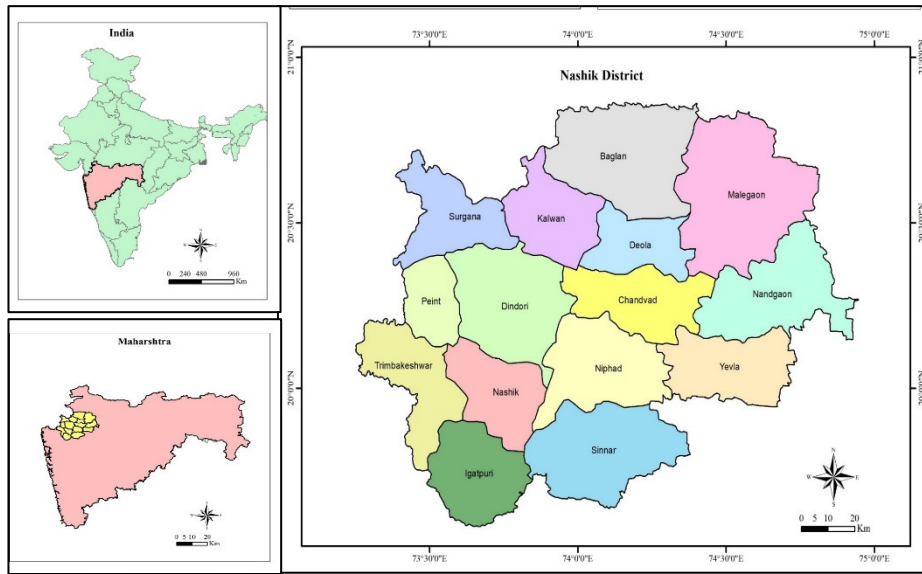


Figure 1: Location Map of the Study area

Table 1: Major Criteria for the Tourism Potential of Nashik District

Sr. No.	Criteria	Factor	Weight	Rank
1.	Tourism Intensity Measurement (TIM) CW=0.35	Tourist Function Index	0.25	1
		Density of Tourist Destinations	0.20	2
		Tourist Density	0.18	3
		Road Density	0.15	4
		Road Proximity	0.11	5
		Hotel Density (HD)	0.07	6
		Average Length of Stay	0.04	7
2.	Climatic CW=0.18	Mean Max Temperature	0.30	1
		Mean MinTemperature	0.30	2
		Precipitation	0.25	3
		Humidity	0.15	4
3	Physiographic CW=0.18	Geomorphology	0.30	1
		Relief	0.25	2
		Slope	0.20	3
		Aspect	0.15	4
		Drainage Density	0.10	5
4	Social CW=0.12	Population Distribution	0.40	1
		Population Density	0.35	2
		Sex Ratio	0.18	3
		Literacy	0.12	4
5	Amenities CW=0.10	Basic Amenity Index	1.0	1
6	Environmental CW=0.09	LULC	0.60	1
		NDVI	0.40	2

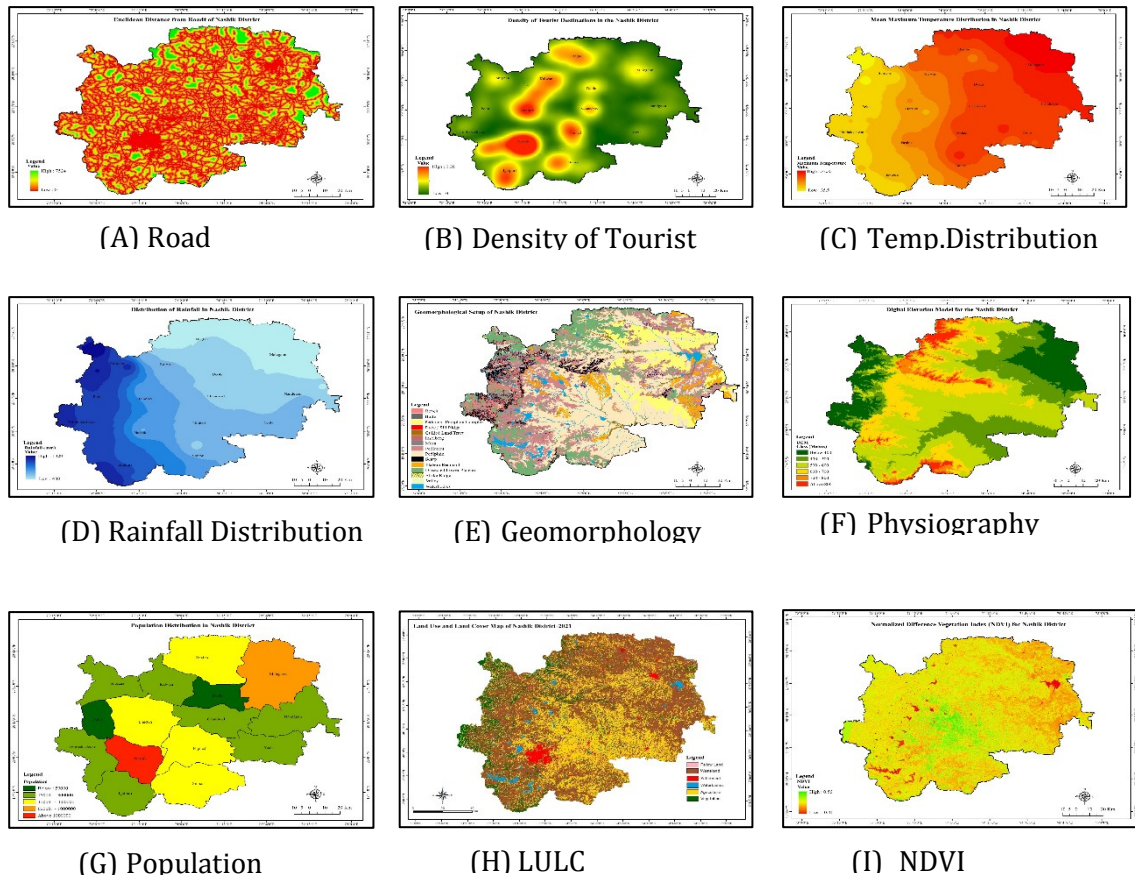


Figure 2: Thematic Layers Used for Analysis

Assigning Weight and Rank for the Criteria's:

For the selection of the criteria and sub-criteria opinions of the expert and references were considered. Tourism Intensity Measure (TIM) obtained highest weightage i.e., 35 percent, followed by climate and physiography i.e., 18 percent each, while weightage for social, amenities and environmental were 12, 10 and 09 percent respectively. The relative scale of all these parameters is given based on different criteria and preferences (1. equally important; 3. moderately important; 5. strongly important; 7. Very strong importance; 9. extremely important; 2, 4, 6 and 8 are intermediate values). For

the analysis, all sub-variables were reprojected and reclassified. The reclassification was done by assigning suitability scale values for each class, which was assigned after expert opinions. It is very crucial to prepare all the variables and sub variables for the weighted overlay method which represent relative weight and suitability scale.

Pair wise Comparison Matrix:

Both the ranks of the influential factors and the weights were determined using the Pairwise Comparison Matrix. The rankings of the influential factors were determined based on the views of the experts. The Pairwise Comparison Matrix,

which is required for the AHP approach, is based on the concept of making judgments according to two criteria at the same time as attempting to prioritize an extensive list of elements (Saaty, 1997). Through the use of the pairwise comparison analysis, decision-makers are provided with the option to rate the relevance of the different land suitability factor contributors (Elaalem, 2012).

Result:

About 08.95 percent of the TGA of district has very high eco-tourism potential, this zone is scattered over

Nashik tahsil, Trimbakeshwar Tahsil and Igatpuri tahsil. About 13.72 percent of the TGA of district has high eco-tourism potential this zone has scattered over Nashik tahsil, Trimbakeshwar Tahsil, Paith tahsil, Surgana tahsil, and Igatpuri tahsil. 20.13 percent of the TGA of the district has moderate potential for eco-tourism, while 26.82 percent of TGA has low and 30.38 percent of the TGA has very low eco-tourism potential. The western and south-western territory of the district has highest potential of the eco-tourism while the eastern region has lowest potential of the eco-tourism.

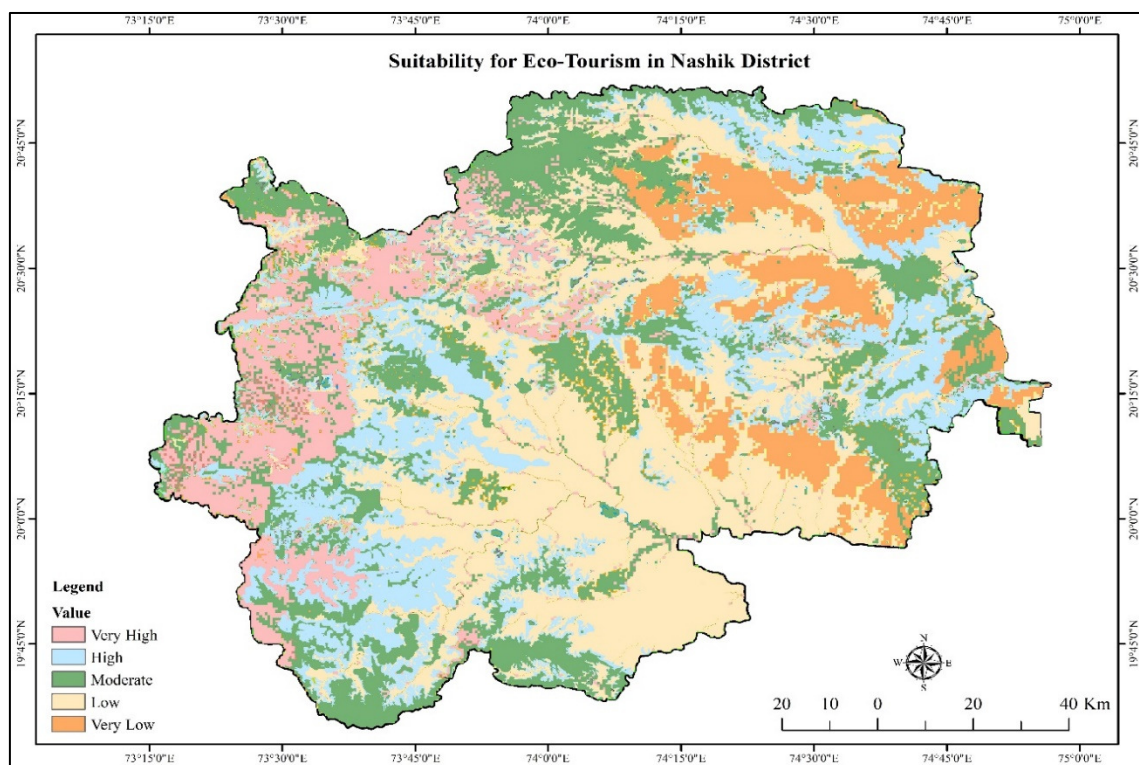


Figure 3: Eco-Tourism Suitability in the Nashik District

Conclusion:

Nashik District present vast physiographic, climatic, cultural, social and religious diversity and its often called

as ‘Mini Maharashtra’ due to its diversity. Its great historic, cultural and religious values can be traced in many epics, ancient monuments, historical evidences. Nashik

is important religious site in the India, and also a place of Kumbha Mela, millions of devotee visits Nashik yearly. But in recent years tourism in Nashik district shown a great transition in sectors of agro-tourism, Wine tourism, adventure tourism and monsoon tourism etc. Being located on margins of Deccan Plateau and Sahyadri the diverse landscape and significant physiographic, climatic, faunal diversity of the district points a great potential for the sustainable eco-tourism. In the present paper attempt has made to evaluate the eco-tourism potential for the Nashik district using advanced and effective GIS and RS tools.

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