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Development of Mountain-Based Rural Tourism: A Case Study of Dhotrey Village of Darjeeling, West Bengal

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Abstract: ***Mountain-based rural tourism has emerged as a sustainable alternative for economic development in remote and ecologically sensitive areas. This study explores the developmental problems and prospects of rural tourism in Dhotrey, a small Himalayan village located in the Darjeeling district of West Bengal. Dhotrey has seen increasing tourist interest due to its natural beauty and trekking opportunities. However, the growth of tourism in the region is constrained by inadequate infrastructure, poor connectivity, limited healthcare, environmental pressures, and the lack of trained manpower. Through field surveys, interviews, and secondary data analysis, this study identifies these challenges and evaluates the village's potential for sustainable tourism development. The SWOT-AHP analysis have been used to find out the strengths, weakness, opportunities and threats of Dhotrey, which concludes by recommending a participatory development model that combines government support, local community involvement, and environmental conservation to harness tourism as a tool for rural upliftment.***
Keywords: Rural tourism, sustainable, community development, SWOT-AHP, environmental conservation.

I. INTRODUCTION

Tourism is traveling to relatively undisturbed natural regions with the specific objective of studying, admiring, and enjoying nature and its virgin flora and animals, as well as the existing cultures of the tourist destinations' original inhabitants (Paul, 2013). Remote locations offer rural tourism, which meets travelers' requirements for information, amusement, and a chance to get back in contact with nature (Li et al., 2025). Tourism is the fastest expanding sector of the economy, focusing on the development of economic impacts. For many years, tourism was considered a magic formula for promoting regional development and reducing poverty in developing countries. The continued inclusion of tourism in national and international strategy for regional development is based on the idea that over the past few decades, tourism has emerged as most dynamic economic sector globally. But natural resources and the environment were not taken into account in past tourist development periods. One way to think about tourism is as an open network that is susceptible to external events, which are typically beyond the control of individuals and even the destination government (Jiao et al., 2025). Contemporary trends imply that there is an increasing need for maintaining natural resources and an ecologically pure environment. This tendency has resulted in sustainable tourist development, indicating an advantageous connection between tourism growth and environmental preservation (Kostic et al., 2018). Modern notions of tourist development also highlight additional consequences of tourism that are not primarily economic but may greatly boost the value of both tourism and the place in which it develops. The most significant consequences are undoubtedly tourism's social and cultural effects on the destinations where it grows, which lead to a rise in the level of awareness of the specific destination location and create prospects for the growth of other sectors. The growth of tourism also attracts more stakeholders. Keeping this in mind, tourism symbolizes a certain type of network created up of concerned participants, which significantly alters the function that tourism has served in earlier times. All stakeholders are growing more involved in the sustainable growth of tourism. It is essential to continuously assess the growth and impact of tourism in order to prevent over tourism, which may deteriorate the quality of resources unique to a certain area. This is especially crucial in areas predominantly known for their natural charms, which would be irretrievably lost as tourism potential if unrestricted exploitation occurred (Milićević et al., 2021). Sustainability is an essential trait in the tourist industry. Offering distinctive goods and services with a specific wellness focus, like therapeutic massages, meditation, nutritious eating, and beauty therapy, sets wellness tourism apart from other forms of travel. In other words, gaining a competitive position for wellness destinations depends on the distinctive qualities of wellness tourism as seen by travelers (Al-Ansi et al. 2025).

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It ensures a long-term vision of tourist operations by protecting the tourist and human resources that have been committed to a specific location (Nagy and Segui, 2020). The impact of recreation on global corporate travelers' trip satisfaction, which can be essential to their job loyalty, job satisfaction, job performance, and ultimately, physical and mental well-being, is significantly underappreciated. This calls for the capacity to quantify, monitor, comprehend, and elucidate the causes and effects of consumer and visitor behavior. Automated text analysis has emerged as a crucial instrument for accomplishing these goals (Bi et al., 2024). These studies, however, primarily take the tourism industry's perspective on meeting the spending potential of this niche market and turning it into future leisure travelers (Ramsey et al., 2024).

Since community support and involvement are important to the success of tourism development, many contemporary approaches emphasize local community empowerment and participation, ecological and cultural preservation, and sustainable community development (Witchayakawin et al., 2020). This idea, termed ‘community-based tourism’, has been adopted in development collaboration in recent years and has been used as aregional development strategy (Scheyvens 2002; Blackstock 2005; Okazaki 2008). Now a day’s adventure tourism tends to be a common method of structuring visitor experiences. Adventure travel is a method of tourism in which the customer explores isolated locations and expects the unexpected. Trekking is a type of soft adventure tourism that is extremely popular because to its low risk factor. The Himalayan mountain range is also regarded as a haven for hard adventure tourism, also offers a range of possibilities including river rafting, rock climbing, and mountaineering (Gyimo'thy & Mykletun, 2004).

In the last few years the modern trend have been established in the Himalayan Region: rafting , kayaking, canyoning, rock climbing , mountain biking, bungee jumping, paragliding etc (Nepal Tourism Board, 2000). Adventure tourism in the alpine scenery improves the host population's welfare and well-being by increasing income and job options (Bhutia, 2014). Growth in infrastructure and an improvement in living standards are essential components of sustainable development, which the tourist sector supports locally and regionally (Kurdoglu, 2007). It helps to safeguard of these resources, stimulates the economy, which adds new natural and cultural attractions (Alrwajfah et al., 2019). Through a methodical analysis of the destination's available features, such as accessibility, lodging, land-use requirements and environmental carrying capacity, sustainable tourism has emerged as a solution to safeguard the environment and cultural sensitivities (Chakrabarty and Sadhukhan, 2023). It is important to highlight that adventure tourism and eco-tourism are closely tied to the phrase ‘serious leisure’. This is because ecotourism and adventure tourism are not mainstream tourist offerings focused on enjoyment. The goal of travel in both situations is to observe and gain knowledge of the dynamics of natural systems. On the leisure continuum, adventure tourism might be considered a serious leisure-oriented activity, whereas casual leisure represents the opposite pole.

A. Selection of the Study Area

Dhotrey is the study area which is situated in Southern Singalila Range of Darjeeling District of West Bengal. Dhotrey village is situated in buffer zone of Singalila National Park at an altitude of 8550 ft. Dhotrey is situated 105 km north of New Jalpaiguri railway station which is an important railway junction of North Bengal and also the North-East India. The distance between Darjeeling main town and Dhotrey village via Sukia-Manebhanjyang by road is 44 km (Figure 1). Dhotrey is situated near about 19 km north from Manebhanjyang.

Manebhanjyang is the popular base station of Sandakaphu-Phalut trekking corridor. Generally trekkers hire porters and guides from Manebhanjyang for their 6 days complete trekking activities. The motorable road of Sandakaphu-Phalut also started from Manebhanjyang where travelers also can hire registered Land Rover. Dhotrey is well connected with metalled road with Manebhanjyang and Rimbick. Dhotrey, a picturesque village is an ideal destination for nature enthusiasts due to its abundance of natural beauty. Dhotrey not only offers quite peaceful stay for tourists and trekkers but also provides a picturesque backdrop for the trekkers. Dhotrey is also a bird watcher's and photographer's paradise, with the settlement home to a diverse range of Himalayan birds.

The pristine hamlet of Dhotrey is surrounded by lush, thick pine trees. On a clear day, tourists may see the stunning landscapes of India and Nepal from Dhotrey. Dhotrey's native culture and traditions are very admirable. Some tome can be spent in local Shiva Temple. The 360 degree view of mountain range can be visible from nearby viewpoint. The views of sunrise and sunset are mesmerizing form Dhotrey. Most of tourist comes in the month of March to May to see the variety of flowers like Rhododendron (locally called *Guras*), Magnolia and variety of orchids.

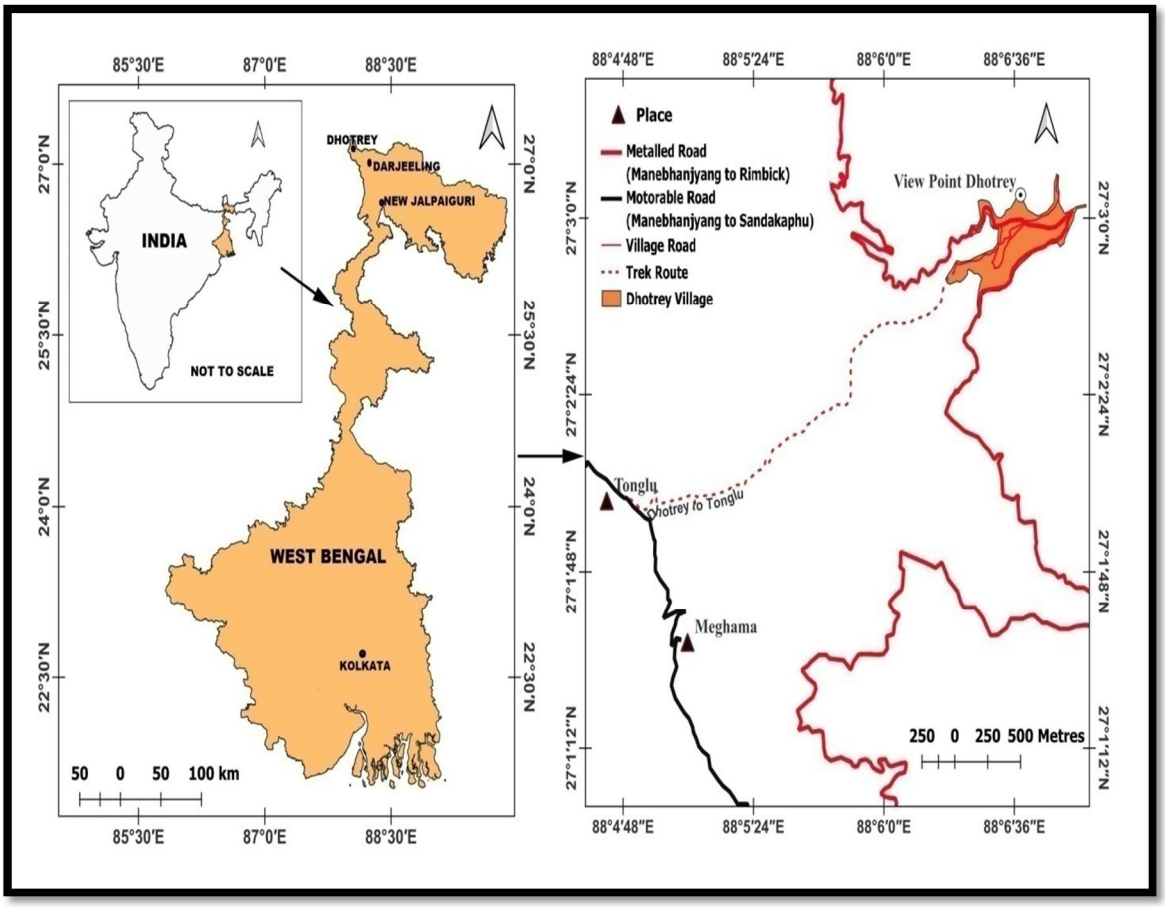


Figure 1: Location map of the study area (Source: Prepared by Authors, 2025)

Dhotrey is the entry point for the Dhotrey-Tonglu-Manebhanjyang trek route (Table 1), and it's also the beginning point for the Sandakaphu-Phalut trekking corridor. Trekking is the only way to enter the Southern-Singalila Pass trek route, and there is a watch-tower where trekkers can enjoy the beautiful snow-clad mountain views of the High Himalayan region. Trekkers must hire a guide from here, and those wishing to visit Sandakaphu-Phalut must register their names and obtain permission to enter Singalila National Park at the forest range office. The entire trek route from Dhotrey to Tonglu passes through lush forests of Rhododendron, Fir and Pine trees, which is excellent for nature enthusiasts.

Table 1: Trekking Segment of Dhotrey-Tonglu corridor. (Source: Field Survey, 2025)

Day-wise Trekking Segment	Distance in Km.	Maximum elevation in metres	Minimum elevation in metres	Major Attraction	Intermediate Halt Stations
Dhotrey to Tonglu	7	3060	2570	Rhododendron, snow-clad mountain views of Mount Khangchendzonga.	-
Tonglu to Manebhanjyang	12	3060	1700	Meghama monastery, Chitre monastery,	Meghama, Lameydura, Chitre

The slope of the trek route from Dhotrey to Tonglu is moderate to steep. The total length of the trek route is about 4.5 km, which usually takes 3 to 4 hours to cover. The slope angle of the first 2 km of the trekking route from Dhotrey is steep, near about 30 degrees or more. The rest of the slope of the trekking track is gentle to moderate (Figure 2). The absence of motorable roads and also the absence of land rover tourism activities have made Dhotrey a rapidly growing attraction for nature lovers and trekkers, resulting in an increasing demand for homestay accommodation in the area, which raises two research questions,

a. What is the current status of accommodation conditions in Dhotrey forest village?

b. How can sustainable trekking and tourism be developed in Dhotrey forest village with the involvement of the local community?

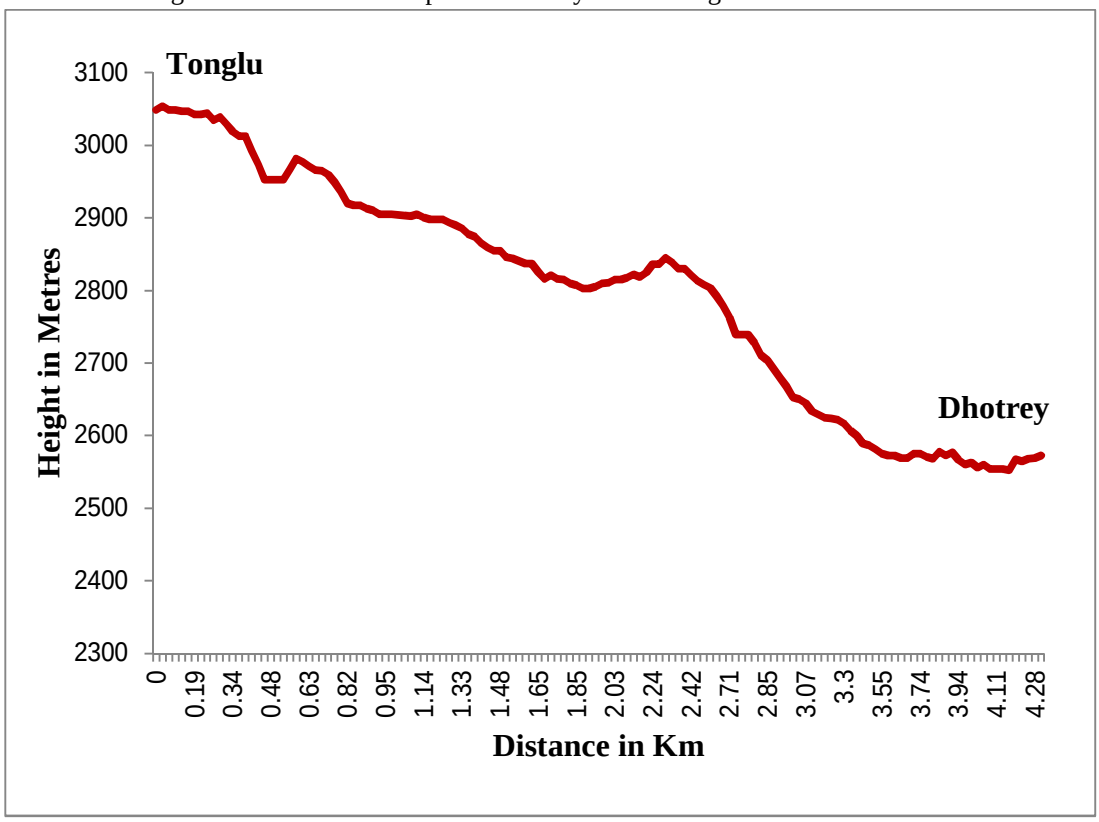


Figure 2: Elevation profile from Tonglu to Dhotrey (Source: Field Survey, 2025)

B. Objectives of the Study

The main objectives are

1) To evaluate strength, weakness, opportunity and threats of tourism promotion of Dhotrey village.

2) Developing sustainable tourism activities in Dhotrey forest villages through the involvement of local communities.

II. MATERIALS AND METHODS

The nature of this paper is explorative and the whole work has been done by descriptive as well as analytical methods. SWOT analysis, remote sensing and GIS analytical processes have been used to evaluate the attraction level and environmental consequences of the study area. An extensive field survey has been conducted of the existing trekking route from Dhotrey to Tonglu with structured and unstructured questionnaires. A door-to-door survey has been conducted in the village to find out the impact of tourism on the local communities and evaluate the economic conditions of the villagers and the socio-cultural status of the villages.

The scope of sustainable potential tourism development in the study area has been analysed using a combined SWOT-AHP (strength, weakness, opportunity, and threat and analytic hierarchy process) approach (Saaty, 1977). The SWOT-AHP model is a combination to decision making which incorporates both qualitative and quantitative aspects. Before advising any strategic planning, a SWOT-AHP analysis is really performed as a useful technique for situation evaluation and to highlight important aspects (Celik, 2017). On the basis of responses to systematic surveys and group discussion with selected visitors and professionals, the first SWOT variables have been determined. The AHP (Analytic Hierarchy Process after Saaty, 1977) is developed under SWOT analysis.

Through a focus group inquiry, each element is exposed to pair-wise comparison as part of the hierarchical SWOT matrix development process. The nine-point scale of perceived importance, which is a square or reciprocal matrix, can represent the basis for all these pair-wise comparisons. After that, each matrix is normalized and ranked. Consistency ratios (CR) are also computed for each SWOT matrix, and the outcome demonstrates the coherence of the expert's conclusions. It is important to remember that opportunities and threats are known as exterior components of the site, whereas strengths and weaknesses are regarded as internal variables. The SWOT evaluation supports the development of alternative strategic goals for the future that assure the most efficient use of resources, as well as the most successful approach for maintaining, restoring, and promoting the selected tourist region as a trekking destination. (Aslan et al., 2014).

The GIS-based analytical processes have been used to identify the changes in vegetation cover. The raster calculation method of QGIS software has been used to prepare the maps of NDVI (the normalized difference vegetation index). Bands 3, 4, and 5 of LANDSAT-5 and 7 and band-4, 5, and 6 of LANDSAT-8/9 have been taken into consideration for image processing. Images of LANDSAT Thematic Mapper (TM) and Enhanced Thematic Mapper (ETM+) with 85% cloud-free data have been downloaded with 30m spatial resolution. The spectral resolution of the Red band is 0.63- 0.69 µm, the Near-Infrared band is 0.77 - 0.90 µm and Short-Wave Infrared (SWIR) band is 1.55 – 1.75 µm. High reflectance in the NIR (Near Infrared) band and high absorption of the Red band is used to calculate NDVI in remote sensing process. The result of NDVI calculation has been categorized on the basis of value. Generally, -0.1 to +0.1 represents barren land, sand, or snow-covered areas; +0.1 to +0.2 represents shrubs and grassland, +0.2 to +0.4 represents sparse vegetation; and +0.4 to +0.6 represents dense vegetation. The equation for band calculation for generating the NDVI image is

NDVI = (NIR band - Red band) / (NIR band + Red band).

III. RESULT AND DISCUSSION

Dhotrey is an eco-tourism activities related forest village which is become a popular hiking destination for visitors travel to Tonglu, Sandakaphu. 68 households living in this village, out of which 28 are joint families and the rest, are nuclear families. Most of families of these villages belong as tribal communities of Gorkha, Nepali, Tibetans and Lepcha. Currently, the total population of this village is 196, of which 115 are males and 81 are females. Male inhabitants of this forest village work as guides and porters for the travelers. Female villagers play a vital role in Dhotrey by maintaining their homestays through a self-help group. Both males and females have crucial responsibilities in maintaining the homestay. Women are mostly responsible for cooking and household duties in the homestay of Dhotrey.

Many of them are currently struggling with financial issues related to homestays. Tribal women also serve as porters while male members are away from home for work. They continue to stay in touch with travelers who wish to enjoy rural tourism in mountains through social media. However, due to adverse weather during particular months, travelers do not visit the entire year to enjoy their stay and rural tourism in mountain areas. The ideal months to visit Dhotrey for the trekking activities to Sandakaphu-Phalut via Tonglu are October to mid-December and February to mid-April. From March to May, the surroundings of Dhotrey village become particularly lovely owing to the full bloom of various colored rhododendron blossoms. The accommodation crisis in Manebhanjyang has begun to increase in the present decade due to a high influx of tourists. Manebhanjyang village is considered a base station only for trekkers because most trekkers come here to hire guides and porters before starting their journey. Trekkers who are not able to reach Manebhanjyang in the early morning on that very day usually stay in Manebhanjyang for the night before starting the trekking activities.

Land Rover travelers mostly come from some other places in the Darjeeling district or other areas and hire a registered Land Rover from the Manebhanjyang Land Rover Association and start their journey to Sandakaphu-Phalut in the same day, so they do not need to stay overnight in Manebhanjyang. Now, trekkers are choosing Dhotrey forest village as a base camp for trekking activities in the Sandakaphu-Phalut corridor due to the increased traveler gathering problem in the Manebhanjyang. Besides this, the trekkers can enjoys the snow-clad mountain view of mount Khangchendzonga and the presence of dense forest of Pine, Fir and varieties Rhododendron floral communities which also added the additional attraction of the Dhotrey village which is absence at the Manebhanjyang village.

Currently, the number of trekkers coming to the Dhotrey forest village is increasing rapidly in each trekking season, causing the number of homestays to steadily increase (Figure 3).

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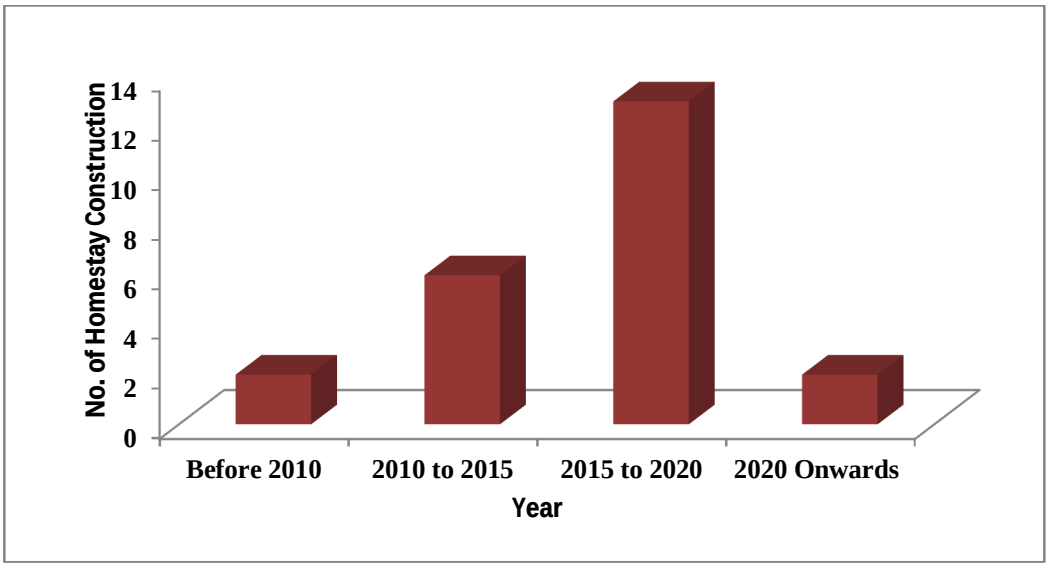


Figure 3: Homestay Construction Scenario at Dhotrey Forest Village (Source-Field Survey, January 2025)

The construction of new homestays have been increasing rapidly since 2010, and after 2015, most of the families of the village established their own homestays. 23 registered homestays and one GTA Forest Bungalow have been developed in Dhotrey since 2010. That can accommodate of an average of 200 tourists per day. Currently, an average of 50 trekkers starts their trekking activities from Dhotrey every day during each trekking season. Most trekkers trek up to Sandakaphu-Phalut, while a very small number of trekkers complete their trekking activity from Dhotrey via Tonglu and return to Manebhanjyang. Besides this, many tourists come only to enjoy the beauties of Dhotrey and do not take participate in any trekking activities. Such activities are encouraging the establishment of ecotourism centers in Dhotrey that are also encouraging the local communities in this village to create involvement in tourism by making accommodations and other tourism-related infrastructure. Most of the men in this village work in other towns, and some are employed as car drivers. However, men and women are seen to contribute jointly in tourism-related work. Men are involved in porter and guide-related work, while women are involved in homestay management, cooking activities and running local shops (Table 2).

Table 2- Homestay Operation of Dhotrey (Source: Field Survey 2025)

Homestay Operation	Number of Homestay
Women Operated	12
Men Operated	6
Jointly Operated	5
Total	23

SWOT analysis has been incorporated to analyze the viability of strengths, opportunities, weaknesses, and threats of Dhotrey village from the standpoint of the potentiality of tourism-related work. The sustainable development of ecotourism heavily relies on community participation, particularly from the perspective of the protection of the environment.

Table 3- SWOT analysis factors for Dhotrey (Source: Field Survey, 2025)

Strengths	Weakness
1. Scenic beauty with snow-clad Mountain View. 2. Adequate accommodation facilities. 3. Conservational and cleanliness awareness. 4. Offers beginner friendly trekking route	1. Seasonality 2. Lack of adequate marketing. 3. Underdeveloped transport infrastructure. 4. Unplanned development of Homestay

Opportunities	Threats
1. Encouraging trekking tourism. 2. Safe and secure visitor friendly environment 3. Nature based tourism 4. Vibrant local culture.	1. Less community involvement. 2. Non-availability of emergency medical services. 3. Forest degradation 4. Lack of registered guides and trekking related infrastructure.

Table 4- Pair wise Comparison Matrices for SWOT factors (Source: Prepared by the Authors, 2025)

SWOT Group	Strengths (S)	S1	S2	S3	S4	Priorities of SWOT factors
Strength	Scenic beauty with snow-clad Mountain View.	1	6	3	1/2	0.409412
	Adequate accommodation facilities		1	3	4	0.251783
	Conservational and cleanliness awareness			1	3	0.15378
	Offers beginner friendly trekking route				1	0.185025
C.I= 0.68091, λmax = 6.04273						
Weakness	Weakness (W)	W1	W2	W3	W4	Priorities of SWOT factors
	Seasonality	1	2	1/2	1/3	0.174411
	Lack of adequate marketing		1	1/2	1/2	0.137245
	Underdeveloped transport infrastructure			1	1/2	0.265564
	Unplanned development of Homestay				1	0.42278
C.I= 0.0477099, λmax = 4.14313						
Opportunities	Opportunities (O)	O1	O2	O3	O4	Priorities of SWOT factors
	Encouraging trekking tourism	1	3	5	1/2	0.337963
	Safe and secure visitor friendly environment		1	4	1/3	0.174372
	Nature based tourism.			1	1/2	0.0895982
	Vibrant local culture				1	0.398066
C.I= 0.154112, λmax = 4.16234						
Threats	Threats (T)	T1	T2	T3	T4	Priorities of SWOT factors
	Less community involvement.	1	2	1/2	2	0.265564
	Non-availability of emergency medical services.		1	1/2	1/2	0.137245
	Forest degradation			1	3	0.42278
	Lack of registered guides and trekking related infrastructure.				1	0.174411
C.I= 0.0477099, λmax = 4.14313						

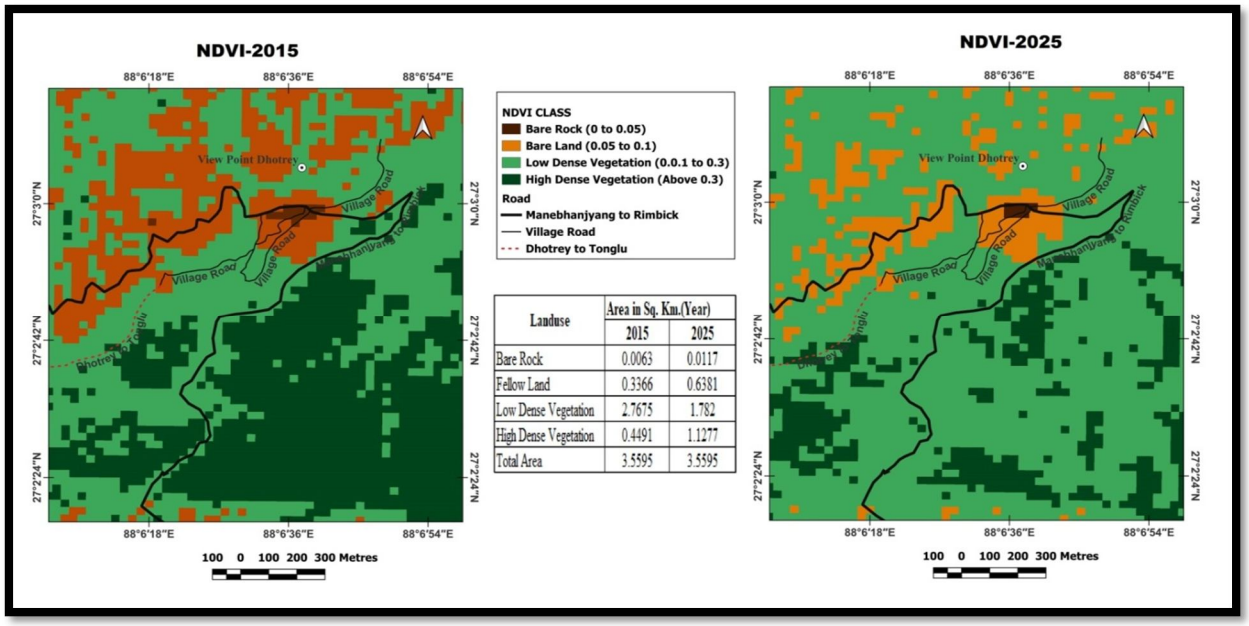
The quality of tourists' experiences is one of the most important factors in ensuring and monitoring sustainability in the tourism industry (Mascardo and Woods, 1998), which is why ecotourism packages, which combine geotourism and trekking tourism, have been highlighted as an opportunity.

SWOT analysis has been used to assess the current situation of Dhotrey village, considering its strengths, opportunities, weaknesses and threats. From SWOT analysis it can be depicted that snow-clad mountain-view and the scenic beauties of Dhotrey village are now attracts to travelers. In the tourism market, Dhotrey now become an off-beat place where tourist spends one or two nights enjoying the mountainous villages and the scenic beauty of the wilderness of fir and pine forests and snow-clad mountain views. Adequate accommodation in this village also promotes home-tourism which is one of the strengths of this village.

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Besides this, there are some opportunities for the village such as environment-friendly local village culture and also the trekking activities from Dhotrey to Tonglu. Nowadays the trek route from Dhotrey to Tonglu is getting very much priority due to the rapid development of Land Rover tourism in Manebhanjyang.

The unplanned development of homestays and transportation factors are the main threats of the village which leads the forest degradation. Due to the less community involvement in tourism activities also are the main cause of overall environmental degradation. The strategic lacuna on protecting nature and culture has obtained the lowest rank in threat perception, which might be due to the fame of the village on environmental concerns. The construction of new tourism infrastructure, hotels, and ecotourism centers is destroying large amounts of forest, which is also reducing the density of forest surrounding the region. NDVI analysis of the years 2015 and 2025 shows that (Figure-4) in this village where new homestays have been constructed, the density of forest has decreased and the amount of fallow land has doubled in this period.



Landuse	Area in Sq. Km.(Year)	
	2015	2025
Bare Rock	0.0063	0.0117
Fellow Land	0.3366	0.6381
Low Dense Vegetation	2.7675	1.782
High Dense Vegetation	0.4491	1.1277
Total Area	3.5595	3.5595

Figure-4: NDVI analysis of Dhotrey and Surrounding Area of 2015 and 2025
(Source- Prepared by the Authors using LANDSAT images)

Though the government has been recently criticized on various platforms for its recent conservation failures (for which this has been enlisted as a threat), still there is faith in respondents in government policies, as revealed from SWOT findings. To overcome weaknesses in marketing a new product like Trek to Tonglu and Sandakaphu-Phalut and the threat arising from less community involvement, raising a trained guide force from local youth may be a sustainable strategy. Such guides, along with their specialized job experiences, simultaneously encourage tourists to acquire local products and promote host-guest interactions (Tătar et al., 2018). Since the unplanned growth of homestays comes out as the most serious weakness from SWOT analysis, exploration of rural tourism potentials at micro-regional and local spatial levels to take the area out of geographical isolation through sustainable utilization of existing infrastructure (Dezsi et al., 2014) can be the only strategic option that can ensure optimal use of resources in trek circuit development.

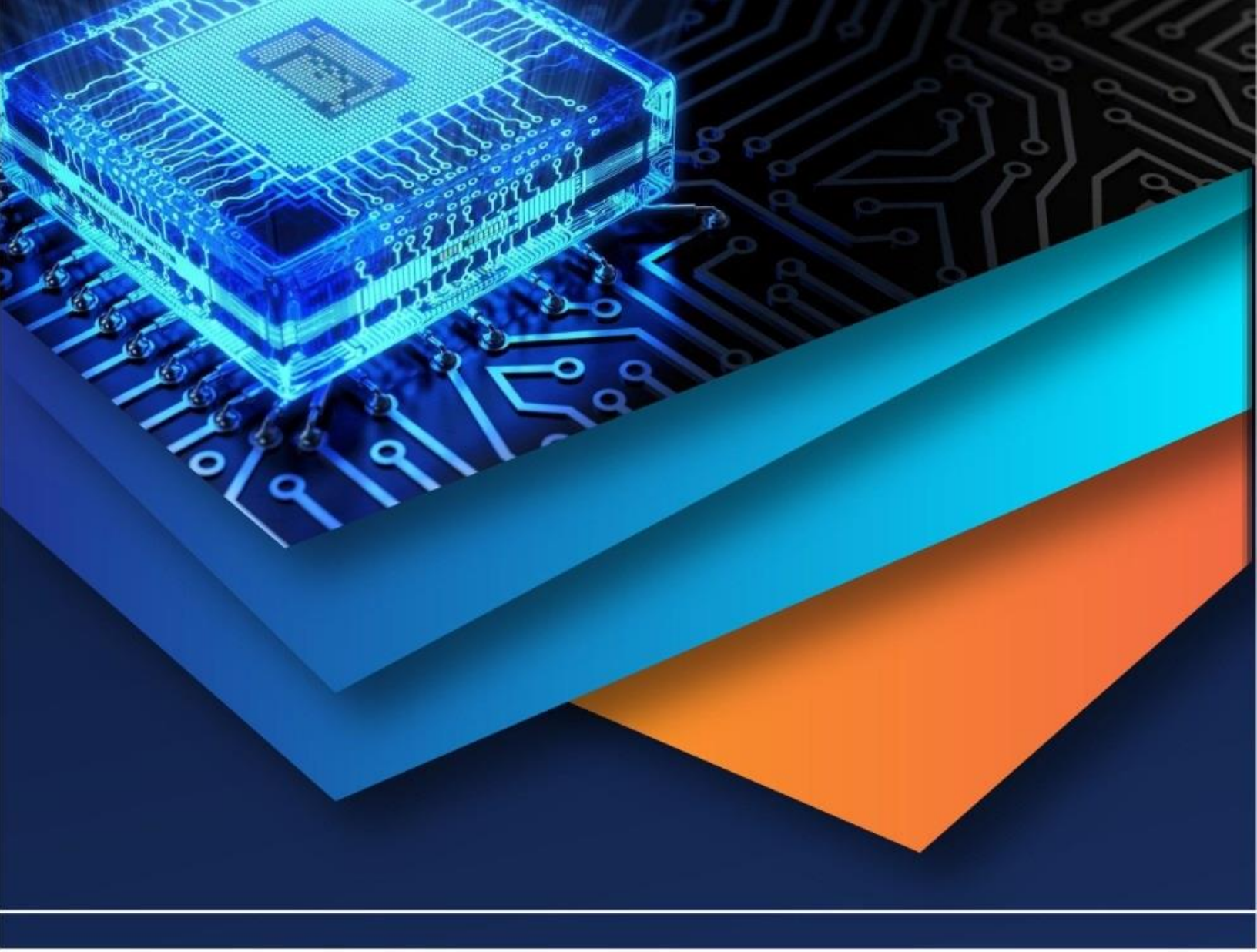
IV. CONCLUSION

Mountainous tourism always presents a unique blend of challenges and opportunities and the concept of sustainable tourism has also gone through some fundamental changes. Concept of sustainable tourism have changed to incorporate these additional elements as the focus for tourists growth changed from the 1960s, when it was primarily focused on economic gains to the 1980s and 1990s when it was more concerned with environmental issues and community involvement. Now community development and environmental conservation are viewed with equal importance to attain long term sustainability. Promotions that offer presents to customers in order to encourage reservations are on the other end of the spectrum. These kinds of promotions don't have a real financial component, and thus don't have the negative performance repercussions that come with promotions that are more closely tied to real money (Sharma et al. 2025).

Over the past decade the appeal of mountain based rural tourism has led to a significant increase in Dhotrey and surrounding regions. As the dependence of local people of the study area on tourism is high due to limited farming opportunities for livelihood, increasing tourism has two benefits , it encourages local to use natural resources less excessively which give them more sources for employment. So, it was worthwhile to study the SWOT analysis and community development with equal importance. Its strength lies in the breathtaking natural landscapes, adventure opportunities and rich cultural experiences that attract tourists with various interests. Consequently mountain based rural tourism contributes significantly to the region's economic development. However weakness such as limited infrastructure, accessibility issues and seasonal limitations may hinder consistent growth of the study area. Although the area presents significant opportunities for sustainable tourism development, soft trekking and improved connectivity, all of which can boost the local economy and promote conservation. On the other hand threat to environmental degradation and overtourism poses serious threat to long term sustainability of the region.Overall success in mountainous tourism depends on careful planning, sustainable practices and collaboration among stakeholders to balance development with preservation.

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