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Roads to Culture - The Role of Infrastructure in Shaping the Untouched Cultural Landscape of Jhunjhunu District, Rajasthan

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Abstract: ***This paper explores the inclusive cultural landscapes of the Jhunjhunu district in Rajasthan, focusing on road connectivity patterns and the challenges associated with them. It discusses broader state-level trends in road development. It investigates how infrastructure can influence heritage preservation and related commercial development at the district level, despite Jhunjhunu being an administrative headquarters and a commercially successful town. Despite the establishment of government bodies for the preservation of heritage with the inflow of road infrastructure, the lack of adequate planning has hurt the sustainable growth of the district. The lesser-known issue of poorly organized roads negatively impacts the district's image of well-known heritage sites, particularly concerning accessibility and recognition. On the other hand, the study highlights the role of government projects in fostering cultural development with commercial activities. A key focus is the comprehensive analysis of year-based road network patterns, followed by the important temporal trends. Utilizing secondary data, including maps, flow charts, and supporting materials from QGIS and other spatial data, the study examines both challenges and opportunities. It demonstrates how infrastructure can benefit heritage-rich yet overlooked districts like Jhunjhunu. This study is motivated by the need for heritage preservation and infrastructural development for robust sustainability in these sectors, and it aims to inform government officials, administrators, urban planners, and policymakers about how road development can harmonize modern needs with cultural preservation in historically and economically significant areas.***
Index terms: Jhunjhunu, Road Development, Infrastructure, Cultural Development, Heritage Preservation, Sustainability

I. INTRODUCTION

Rajasthan, the largest state of India, known as the “Land of Kings,” offers a blend of rich culture with amiable locals, diverse cuisines, majestic palaces, elegant forts and intricately carved temples. The rich heritage of Rajasthan makes it the most iconic destination for travelers, historians, and those who are interested in the cultural tapestry of India. Every other region in Rajasthan provides a unique cultural ambiance with vivid elegance, including Jhunjhunu. This district comes under the Shekhawati region of Rajasthan, along with the other two districts, Sikar and Churu. Rich, artistically frescoed havelis with murals and adorned temples are the testimony of the richness in the past. The main attraction for tourists and pilgrims is Harshnath in Sikar, the mural towns of Churu, including the frescoed havelis of Mandawa and Nawalgarh, which are visible in official and travel literature. However, despite having tourism circuit towns in Jhunjhunu like Mandawa and Nawalgarh, other towns did not receive considerable recognition and were left on the leeward side of heritage growth and infrastructure development. For instance, the number of tourists, both domestic and international, who visit Mandawa is higher than the proportion of visitors who come to Rani Sati temple, which is the iconic and revered spiritual site in Jhunjhunu. Suppose we overlook a historically significant destination in a culturally diverse town like Mandawa and only focus on pilgrimage sites. In that case, the Khatu Shyam temple, which is also a highly popular spot for devotees, draws more visitors than the Rani Sati temple. The reason is simple, along with its more religious significance, Khatu Shyam is well-connected via state highways, buses, and roads from major cities like Jaipur, Delhi, and Ajmer. In contrast, Jhunjhunu is lesser-known for its long route pilgrimage circuit, despite being connected. Roads offer more than just travel destinations; they also provide various commercial amenities. Farmers and artisans use rural roads to reach *mandis* in Jhunjhunu, Chirawa, Khetri, etc. Students commute daily to nearby towns for secondary or higher education via these roads. Healthcare and medical services are easily accessible during emergencies, and road quality directly affects survival chances. However, the connectivity, expansion, and quality have changed over time. Pradhan Mantri Gram Sadak Yojana (PMGSY), launched on 25 December 2000 by the then Prime Minister Atal Bihari Vajpayee, was the rural roads development programme by the Government of India.

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The purpose of this project was to provide all-weather road connectivity to unconnected habitations in rural areas. In 2001, the total road length was 2.00 km, while in 2023 it was around 101 km under this scheme. The significance of the World Bank Group in supporting PMGSY cannot be overstated, as it has been helping to connect far-flung, remote rural areas in Rajasthan, including Shekhawati, since 2004. Nevertheless, the World Bank Group has observed that the sandy and rocky terrain of this area is not ideal for cultivation. Consequently, herders focused on raising and selling cattle, which required them to cross the bushes and sand. During the monsoon, the unpaved roads were clogged with water. The purpose of this external support was to connect habitations to the country's road grid. Along with uneven terrain and sparsely scattered settlements, road connectivity to remote areas also impacts heritage accessibility. Central and state-level programs focus on building new roads but often overlook maintaining and restoring older roads and cultural sites. The best research often emphasizes national highways and major city roads, making these areas more culturally appealing and officially recognized. District-level cultural landscapes and related aspects remain understudied, making Jhunjhunu a unique part of the research.

II. REVIEW OF LITERATURE

Roshan Mishra (2025) emphasized the importance of incorporating renewable energy and heritage-sensitive design into infrastructure development to support sustainable tourism. The study highlighted that balancing economic growth with the preservation of cultural heritage ensures that tourism growth does not compromise the historical and environmental integrity of sensitive areas.

Shukla and Sankar (April 2025) highlighted that India's road infrastructure faces challenges such as inadequate funding, poor management, and the urgent need for modernization. They emphasized that addressing these issues through targeted measures can improve road quality, safety, and overall transportation efficiency, which is particularly relevant for regions like Shekhawati, where connectivity can support economic and cultural development.

Grazuleviciute-Vileniske and Matijosaitiene (August 2010) emphasized that roads interact closely with cultural heritage, both tangible and intangible. Roads can themselves be historically or technically significant, appear in artistic or literary works, and influence the aesthetic and historical value of surrounding landscapes. They also often encompass built heritage objects that may be functionally related or unrelated to the road. The authors classify cultural heritage in road contexts into three types: road landscapes as cultural heritage, roads as cultural heritage within landscapes, and cultural heritage present in road landscapes. This framework highlights how roads are not merely functional structures but also integral elements shaping cultural and historical landscapes.

Mouratidis (December 2020) observed that the recent boost in road construction has been largely driven by innovation and technological progress. The introduction of new materials, advanced products, modern equipment, and innovative construction techniques has significantly enhanced the capabilities of the road engineering industry. Complex constructions such as tunnels, viaducts, bridges, and extensive earthworks have become more feasible, enabling the creation of new road links, including motorways, ring roads, and international corridors, which now offer high levels of safety and serviceability. Despite these advancements, Mouratidis cautioned that these improvements do not fully reflect the challenges faced in many developing and industrialized countries. Economic crises have created difficulties in financing new projects and upgrading existing infrastructure, limiting the potential benefits of technological progress. Furthermore, the rapid expansion of road transport operations has led to substantial direct, indirect, and cumulative environmental impacts, which have grown increasingly important in recent years. These observations highlight that while technical innovations have improved road construction and operational standards, there is a pressing need for sustainable planning and management to address financial, environmental, and operational challenges in road infrastructure development.

Yasin, Gebbisa, and Bacsi (December 2024) highlighted that rural tourism in Ethiopia is hindered by poor road connectivity, inadequate accommodations, limited marketing, and weak coordination among stakeholders. These infrastructure and institutional gaps reduce tourism competitiveness and restrict economic benefits to local communities. Similar challenges are observed in Jhunjhunu, where poor last-mile connectivity, scarcity of quality lodging, and limited promotional efforts constrain the growth of cultural and heritage tourism despite the region's rich historical assets

III. METHODOLOGY

This study is based on state-level tourism transport patterns reported in the Rajasthan tourism reports, as well as passenger data and statistics from rail and road surveys. By evaluating case studies, theoretical models, existing research, this study utilizes transport mode proportions derived from Rajasthan tourism surveys, including qualitative and quantitative analysis using secondary data from peer-reviewed journals, annual budget, maps, geospatial tools and software like QGIS, annual SDG reports of PWD department, public reviews and publications from state and district-level government departments, as well as departments of road infrastructure

and culture to examine the connectivity changes over the last decades from 2015 to 2023. Percentage change analysis compares the number of passengers and tourists visiting Jhunjhunu over the years. Inclusive data consists of bar diagrams, flow charts, statistics, and geospatial maps to show recent trends of infrastructure with cultural mobility, with distinct challenges and opportunities. This study also accounts for internal and external infrastructural development and advancement by the government-aided commercial cum infrastructural projects and schemes, with the support of the World Bank group rural road project, assisted by Pradhan Mantri Gram Sadak Yojana since 2004, comprehensively.

IV. FINDINGS AND DISCUSSION

Considering the pattern of annual trends based on the distribution of roads and highways, along with visitor movement, the descriptive data reflect slight yearly increases or decreases, with modest state-level trends in road growth. The following diagrams detail the implementation and demonstrate the shifting influence of cultural access as the number of tourists in the district steadily rises.

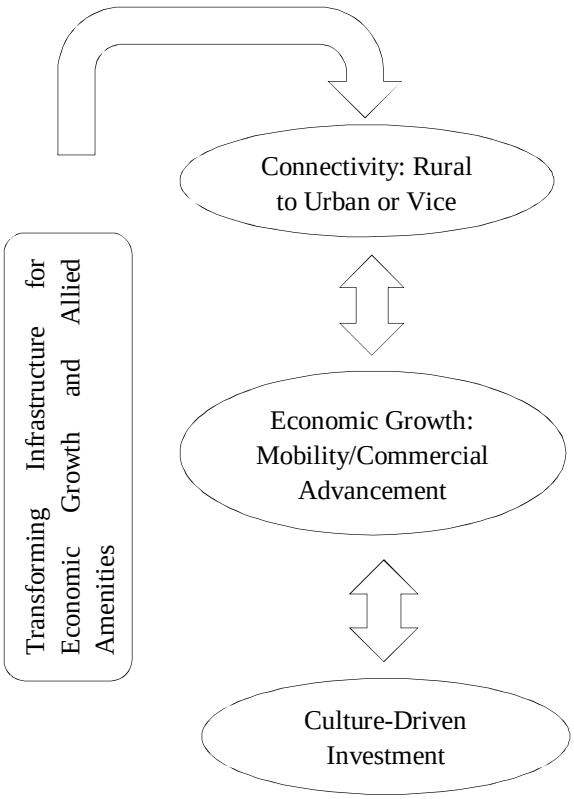
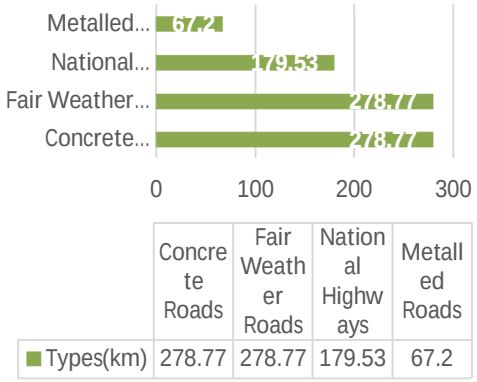


Figure 4: Infrastructure flow and Related Outcomes

A. Comparative analysis of road types (2023)

The clustered bar diagram illustrates the data, classifying the distribution of road types in Jhunjhunu in 2023. As of 2023, the length of roads totals 6084.13 km. The majority comprises marked roads, which are 5580.16 km in length, followed by concrete and fair-weather roads, each measuring 278.77 km in length. Additionally, the district includes 179.53 km of national highways and 67.2 km of metalled roads.

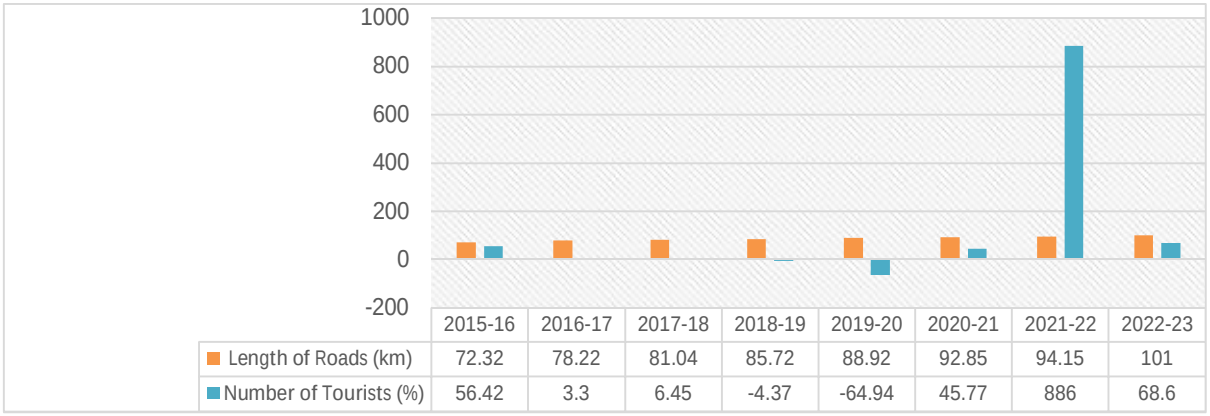


	Concrete Roads	Fair Weather Roads	National Highways	Metalled Roads
Types(km)	278.77	278.77	179.53	67.2

Figure 4.1: Distribution of road types in Jhunjhunu in 2023 (km)

B. Road length distribution based on annual tourist arrivals(domestic/foreign)

The total length of road in Jhunjhunu has witnessed consistent growth from 2015-2023, showcasing the cumulative growth of transportation in the district. In 2015-2016, the district had 72.32 km of roads per sq. km, followed by an increase of length by 78.22 km and 81.04 km in 2016-17, 2017-18. This number steadily continued in 2018-19, 2019-20, and 2020-21 by 85.72 km, 88.92 km, and 92.85 km, followed by consecutive years of 2021-22, 2022-23 by 94.15 km, and 101.00 km. The yearly enhancement of road length demonstrates the role of state and central initiatives in improving connectivity, which in turn supports the cultural and economic development of the region. The graph illustrates the direct correlation of road infrastructure with the arrival of tourists over the decades from 2015 to 2023. As road length steadily improved, the proportion can be observed, indicating that improved road connectivity can pave the way to regional upliftment and heritage accessibility. However, in 2019-20, a sharp decline in tourism occurred despite the continued expansion of the road network in Jhunjhunu. This indicates that, where infrastructure is a critical factor, other external constraints can also disrupt tourism inflow. Additionally, in 2022, with 886% compared to previous years, tourist arrivals spiked dramatically. This snowballing arrival indicates travel demand, transport services, promotion of domestic tourism and culture by government schemes, projects, and initiatives.



	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Length of Roads (km)	72.32	78.22	81.04	85.72	88.92	92.85	94.15	101
Number of Tourists (%)	56.42	3.3	6.45	-4.37	-64.94	45.77	886	68.6

Figure 4.2 Development of road infrastructure with the arrival of tourists (2015-2023)

C. Connectivity: Harming Heritage or Helping Tourism

While road infrastructure is crucial to improve accessibility and regional tourism significantly but it also damages the physical and aesthetic value of historical heritages. Due to poor and uneven sustainable planning connectivity, the district has witnessed various threats at the regional level. One such report, published by the Rajasthan Tourism Department Corporation (RTDC) in 2021, stated how improved connectivity has boosted rural tourism but also cautioned about the threats to murals due to traffic pollution in towns like Nawalgarh and Mandawa of Jhunjhunu.

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Unregulated construction, encroachment by commercial activities, traffic pollution, poor waste management, lack of urban planning, use of inappropriate materials to restore Havelis, over-pressure tourism and lack of government consideration are such serious risks the district is currently facing. Every year, it's common for Havelis to make headlines about the demolition of these century-old frescoes, which are synonymous with Shekhawati culture. These frescoes were constructed by the Marwari community in Jhunjhunu and Sikar over the years and are now making way for roads and modern buildings of concrete in the absence of a solid policy and trustworthy implementing agency. The state local self-government had proposed to constitute a Heritage Development Council (HDC) to preserve the ancient Havelis. However, no heritage preservation work or policy implementation happened under it.

D. Heritage and Road Development Initiatives

The government programmes of conservation, with boosting connectivity, offered a better understanding of interventions in cultures and communities for this culturally rich but remote area. For instance, Amrita Haat, a series of fairs organized across Rajasthan, aimed at empowering women from Self-Help Groups (SHGs) by providing them a platform to showcase and sell their handmade products, serves as a notable example of cultural blending, where improved road connectivity has enabled women from Uttar Pradesh and Haryana to participate, bringing diverse crafts and traditions together. Initially, the Haat had no stalls in Jhunjhunu for eight years, but today it features more than 100 stalls with a plastic-free theme, generating crores of income and highlighting the potential of cultural markets to boost local businesses and artisans. Several initiatives appeared as a keystone to heritage preservation, specifically after 2020, the COVID-19 pandemic, to encourage citizens to visit lesser-known destinations in India. The Rajasthan government's policies also emphasized cultural tourism and pilgrimage connectivity in regions like Shekhawati, and other key initiatives launched by the Ministry of Tourism, Government of India.

The Government of India and the Government of Rajasthan have introduced a series of initiatives to improve infrastructure and boost tourism, directly impacting regions like Shekhawati. The Green Highways Policy, launched in 2015, focused on developing green belts along national highways to create environmentally friendly corridors. In the same year, the Swadesh Darshan Scheme was introduced to develop theme-based tourism circuits; within this framework, Shekhawati falls under the Desert Circuit. To expand large-scale road connectivity, the Bharatmala Pariyojana was also initiated in 2015, aiming to connect border areas, rural regions, and tourist destinations. For pilgrimage sites, the PRASAD Scheme (Pilgrimage Rejuvenation and Spiritual Heritage Augmentation Drive) was launched in 2014–15 to improve infrastructure and enhance visitor experiences. To further promote domestic tourism, the government introduced the "Dekho Apna Desh" initiative, although its exact starting year is not documented. At the state level, the Rajasthan State Highway Program, supported by the World Bank, was carried out in two phases, first in 2014 and again in 2019, to upgrade and modernize the state's road network. Additionally, the Shekhawati Heritage Route has been proposed to connect Mandawa, Nawalgarh, and Jhunjhunu through better infrastructure and tourism connections.

Schemes/Initiatives	Purpose
Green Highways Policy	Greening of National Highways
Swadesh Darshan Scheme	To develop a theme-based tourism circuit (Shekhawati falls under Desert Circuit)
Bharatmala Pariyojana	Large-scale highway project to connect rural, border areas and tourist places
PRASAD Scheme	Improve infrastructure at pilgrimage destinations.
Dekho Apna Desh Initiative	To promote domestic tourism
Rajasthan State Highway Program	Road network upgradation with World Bank support
Shekhawati Heritage Route Proposal	To connect Mandawa, Nawalgarh and Jhunjhunu through improved Infrastructure

Figure 4.4: Number of Schemes/Projects initiated by GoI

[Source: Ministry of Tourism (GoI, 2014–2020); Ministry of Road Transport & Highways (2015); PIB Press Releases (2015, 2019, 2020); World Bank (2014, 2019).]

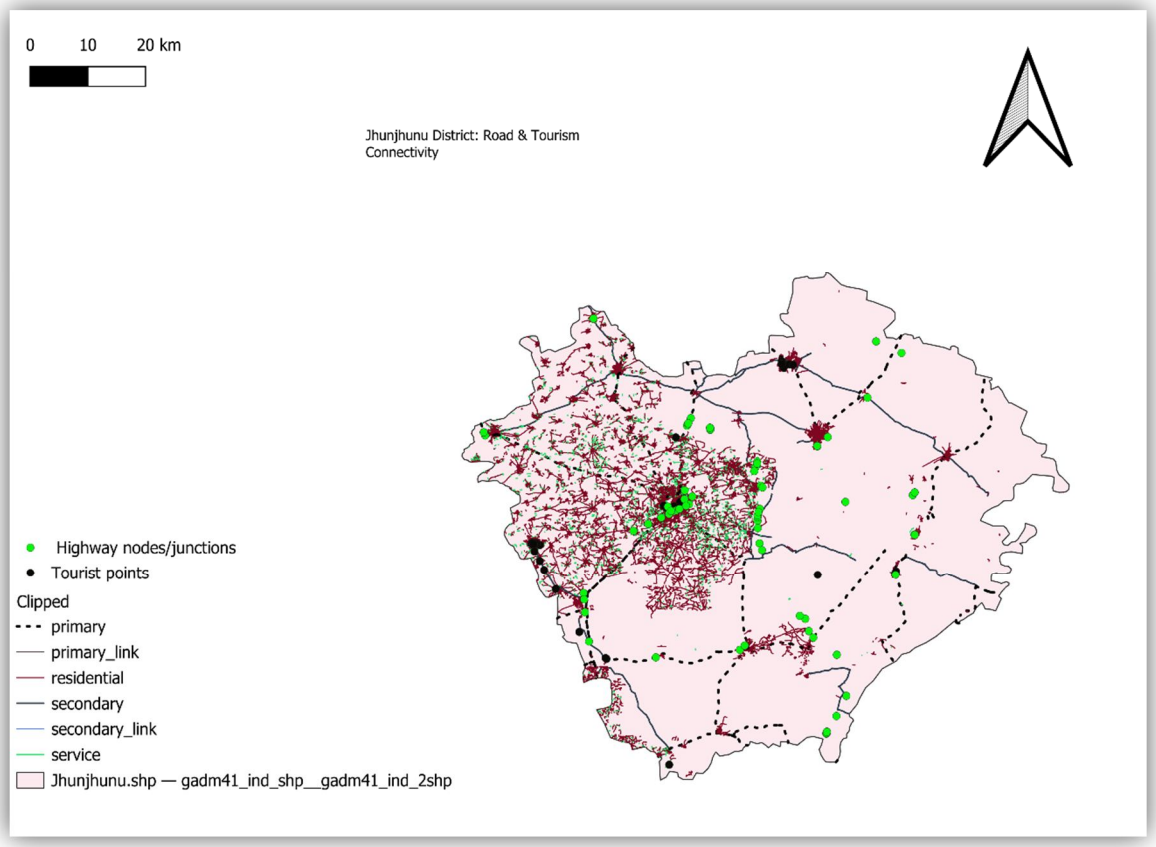


Figure: Jhunjhunu: Roads and Tourism Connectivity
Source: GADM Database of Global Administrative Areas & OpenStreetMap (OSM), processed using QGIS (2024). Author's compilation.

V. RECOMMENDATIONS

Based on the findings of this study, it is recommended that road and transport connectivity in the Jhunjhunu district, especially in remote villages and cultural sites, be further strengthened to support sustainable tourism and local economic growth. Additional infrastructure, such as more roads and transport routes, is needed to connect Jhunjhunu efficiently with other cities, while the contribution of the railway, with new trains recently introduced, should be further promoted. Integration with luxury tourism options like the Palace on Wheels can also boost visitor numbers. Improved infrastructure, including additional roads and transport routes, is essential for better connectivity, and recent railway expansions should be utilized. However, the lack of an airport limits quick accessibility, highlighting the need for comprehensive planning. Heritage preservation policies, community involvement, and GIS-based monitoring of environmental and cultural impacts should be integrated to promote inclusive and sustainable development.

VI. CONCLUSION

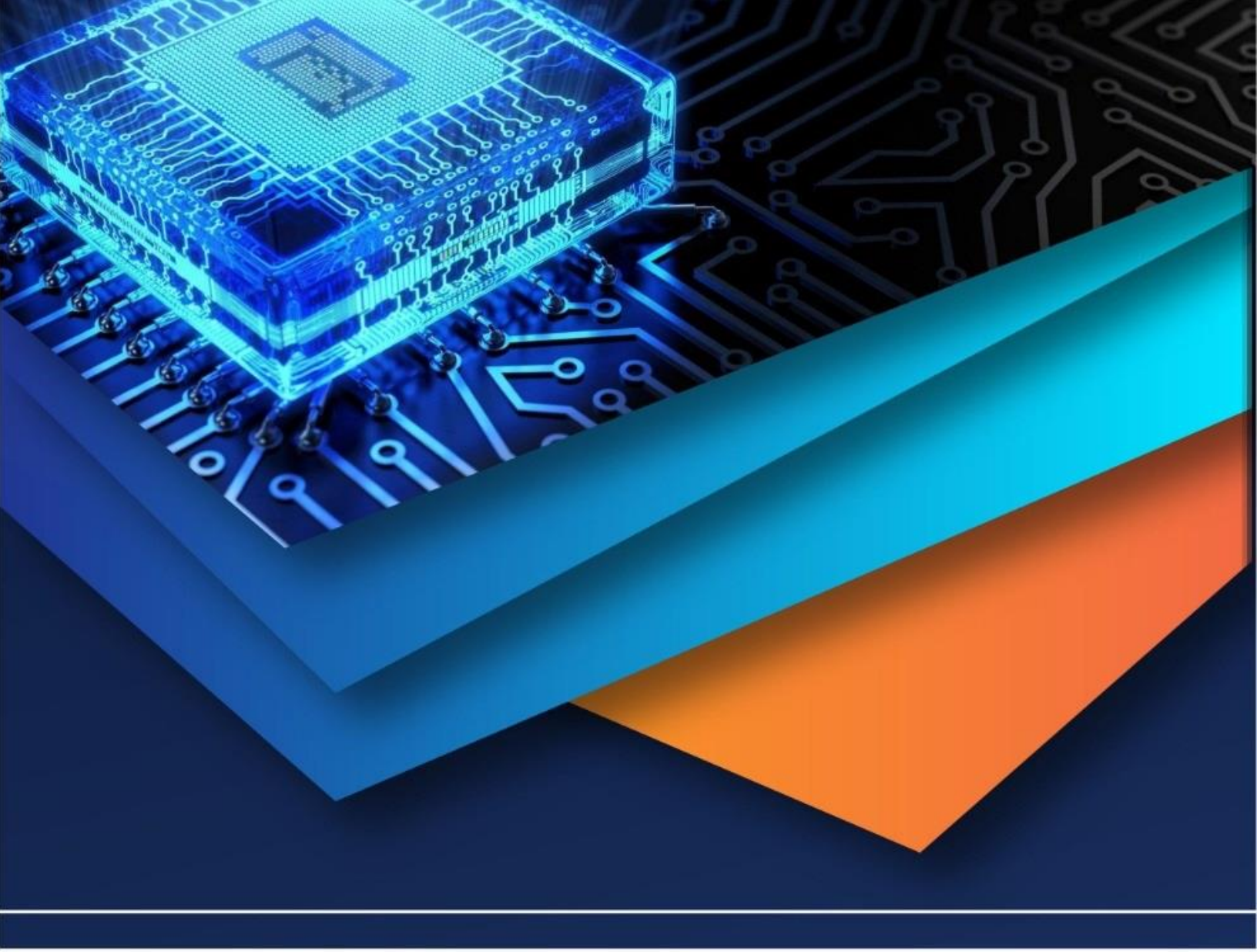
Road infrastructure has played a transformative role in shaping the cultural and economic landscape of the Jhunjhunu district. Improved connectivity has enhanced access to heritage sites, pilgrimage routes, rural markets, and educational and healthcare facilities, thereby fostering tourism and supporting local livelihoods. The growth of road networks from 2015 to 2023 reflects the impact of sustained government efforts. However, unplanned expansion and inadequate preservation of heritage continue to threaten historic havelis and frescoes. This study emphasizes that infrastructure alone cannot guarantee sustainable cultural growth. A balanced approach that integrates modern road development with heritage-sensitive planning is essential to protect Jhunjhunu's unique cultural identity while promoting tourism and regional development. Thus, roads serve not only as pathways for mobility but also as critical instruments for harmonizing economic progress with cultural preservation.

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