

A Geospatial Outlook on Ecotourism Sustainability - In Western Rajasthan

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Abstract

An Ecosystem is a large community of living organisms in a particular area. The Ecosystem Services Framework (ESF) is a powerful tool for understanding the relationship between nature and society. Tourism is an important expression of this. Development of ecotourism is a comprehensive approach, so it needs attention. Fun and adventure in any ecosystem is Ecotourism. Besides travelling to any ecosystem, conservation and protection of the specific ethnicity and culture of the locality is also a vital attribute of Ecotourism. Hence Ecotourism is the most important way for securing the tourism sector in a sustainable way. The main objective of writing this paper is to figure out the tourist spots and related infrastructures taking the help of Geospatial technology. Moreover their potential for development in western Rajasthan. Further the quantification of inflow of domestic and international tourists in the studied area, their frequency of visits to specific tourist spots and the government policies in the interest of stakeholders have been analysed at the backdrop of sustainability of ecotourism in the desert tourist circuit of Rajasthan comprising cities of Jodhpur, Jaisalmer, Bikaner and Barmer.

Keywords: GIS, Ecotourism, Stakeholders, Sustainability, Infrastructure, Desert Circuit.

Introduction

The term ecotourism emerged in the late 1980s and derived from two words "Eco" and "Tourism" where Eco means "*Environment friendly*" and Tourism means "*Travel*" (Jamal & Stronza, 2009). The concept has an element of sustainability and got originated as an opposite of mass tourism. Western Rajasthan occupies significant place on the world map taking into consideration the most favoured destinations for tourism in the whole world. In Rajasthan, tourism is being commercially developed. Rajasthan has a glorious place in the annals and geography of India the history of the state echoes with tales of chivalry, gallantry and brave deeds for, in their efforts to preserve Indian culture and heritage, the people of Rajasthan resisted all destructive or corruptive invasions from outside (Erlet, 1993). That's why a large number of tourists visit Rajasthan which is the most famous in the whole world for the magnificent strongholds atop the hills. Record number of tourists arrived in Rajasthan in the year 2006 (Sharma, 2008).

The semi-arid and arid conditions of Western Rajasthan present a different profile of wild life to the tourists. Rajasthan state has immense opportunities to attract the tourists from all over world. Over the years, Rajasthan has come up with well developed tourism infrastructure it includes accommodation, transportation and sense of security. In nutshell it can be said that Rajasthan is the only state in India to attract domestic and foreign tourist because of government policies and its strong culture and heritage.

In 2016, India's tourism industry was expected to directly contribute 91.3 billion U.S. dollars to the country's economy, and this value was forecasted to rise to 148.2 billion by 2027. Tourism has been one of the biggest revenue generators for the state for a long time (Wearing & Neil, 2009).

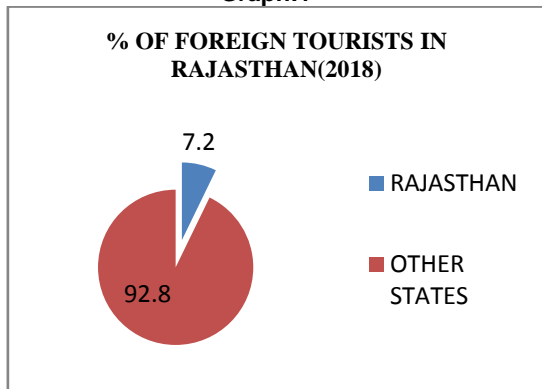
With an increase of 5.21% of tourists in India in general and 8.97% in Rajasthan in particular, tourism in India is important for the country's economy and is growing rapidly. The World Travel and Tourism Council calculated that tourism generated 16.91 lakh crore (US\$240 billion) or 9.2% of India's GDP in 2018 and supported 42.673 million jobs or 8.1%

Remarking An Analisation

of its total employment. After the government of Rajasthan has granted the status of industry to tourism sector in the year 1989 all the facilities and concessions available to industries in the state would also be available to tourism units in the state as per rules in force.

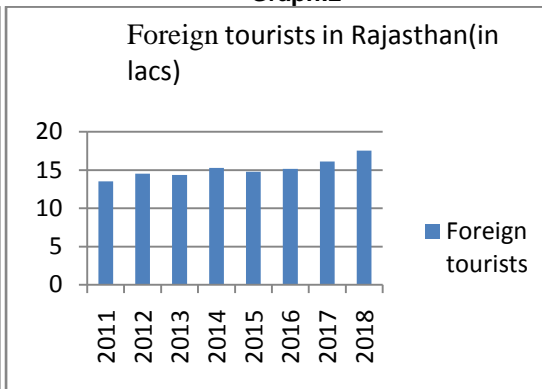
According to the Ministry of Tourism, Rajasthan, tourism accounts for 2.7% in Gross State Domestic Product and 1.9% in state employment. The importance tourism upholds in the economy of Rajasthan has been depicted in the following graphs and charts.

Graph:1



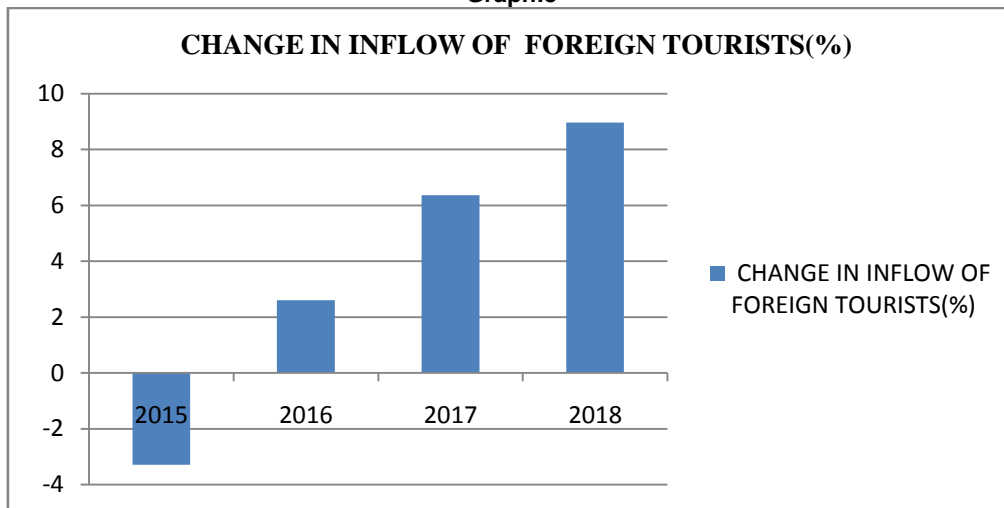
Source: Rajasthan tourism annual report 2018

Graph:2

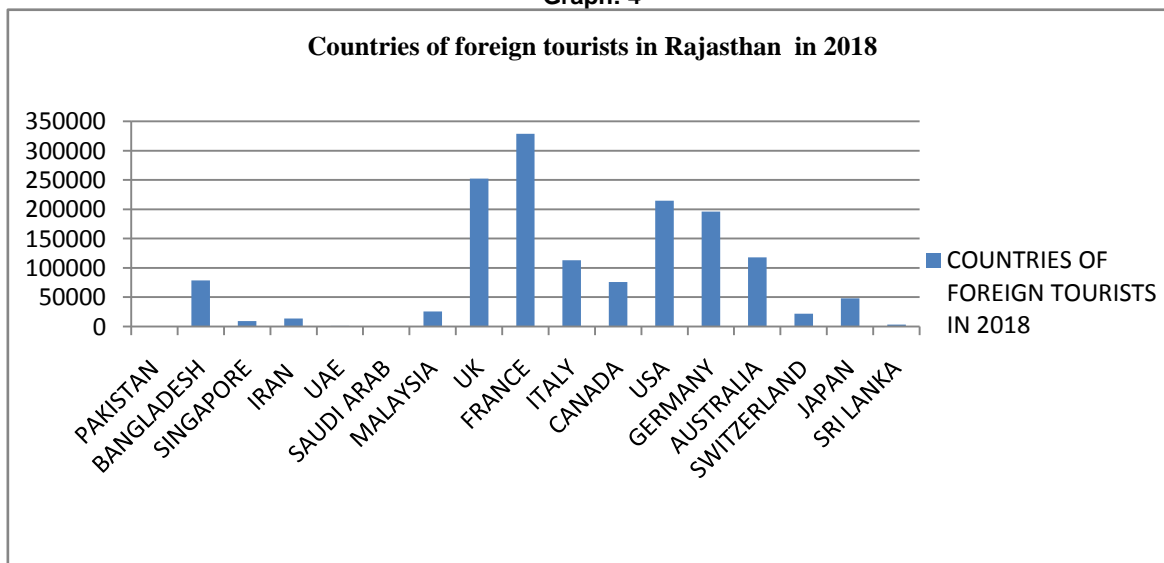


Source: Rajasthan tourism annual report 2018

Graph:3



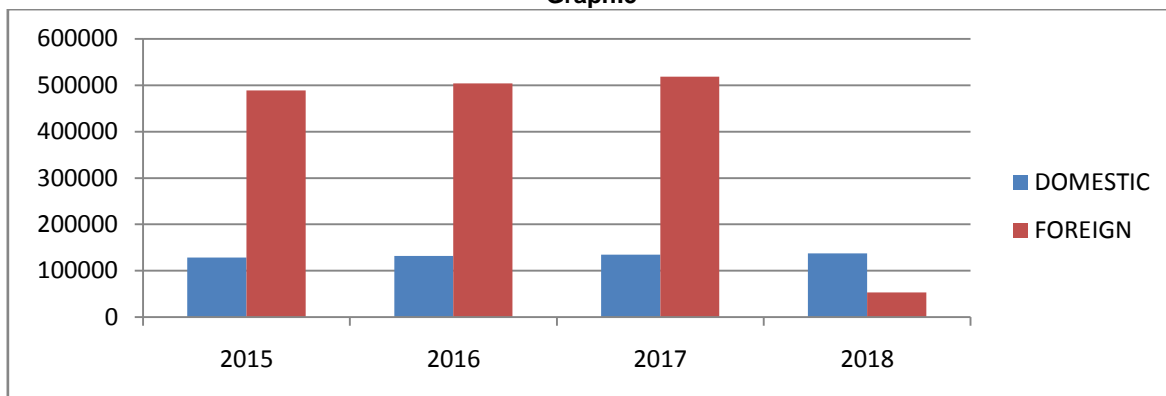
Graph: 4



Source: Rajasthan tourism annual report 2018

Jodhpur Tourists Arrival

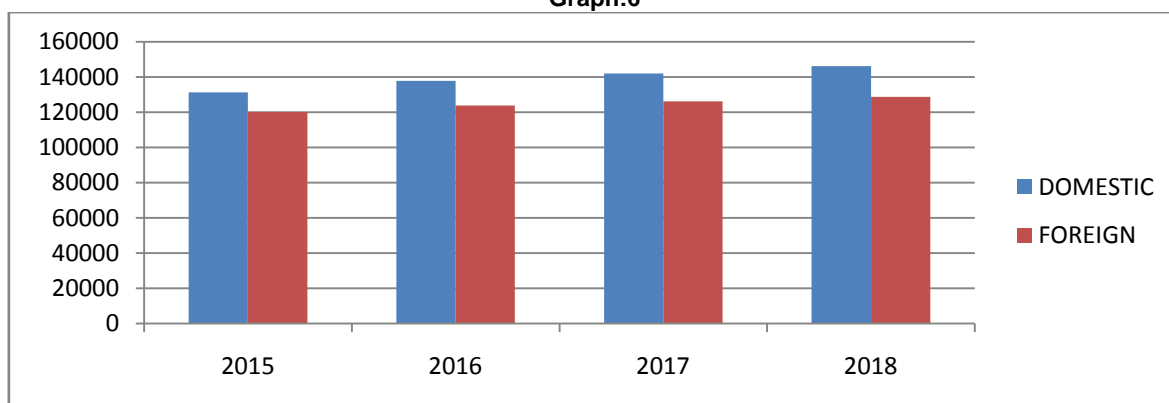
Graph:5



Source: Rajasthan tourism annual report 2018

Jaisalmer Tourists Arrival

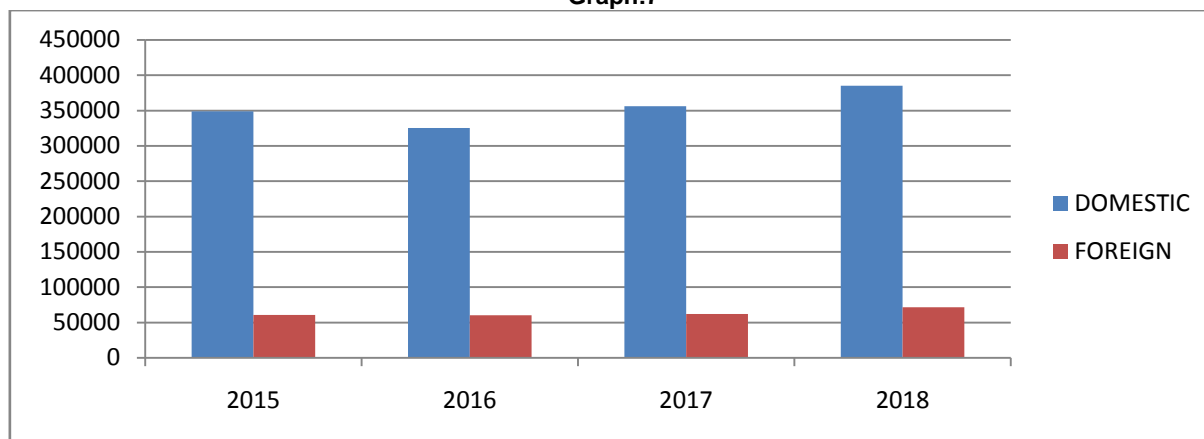
Graph:6



Source: Rajasthan tourism annual report 2018

Bikaner Tourists Arrival

Graph:7



Source: Rajasthan tourism annual report 2018

The above mentioned pie chart and graphs clearly depicts the share of foreign tourists in the state of Rajasthan which is 7.2% of the country. Year 2018 has seen the maximum of tourist's movement in the state in consequent of the various national and state tourism lucrative policies. In the same year France has topped the list of foreign tourists followed by UK and U.S.A. in Rajasthan. Except the year of 2015, there has been a constant rise in the inflow of foreign tourists in the state and Jodhpur boasts of having

excelled the foreign people on its magnificent tourist destinations in comparison to other desert cities like Bikaner, Jaisalmer and Barmer

Review of Literature

Over the past six decades, tourism has experienced continued expansion and diversification, to become one of the largest and fastest-growing economic sectors in the world (Terzidou et al., 2008).

Tourism in Rajasthan is culture (Kanga et al., 2014).

*Ecotourism continues to be embraced because of its promise of achieving sustainability through conservation mindedness, community development,

education and learning, and the promotion of nature-based activities that were sensitive to both ecological and social systems (Fennell, 2015)

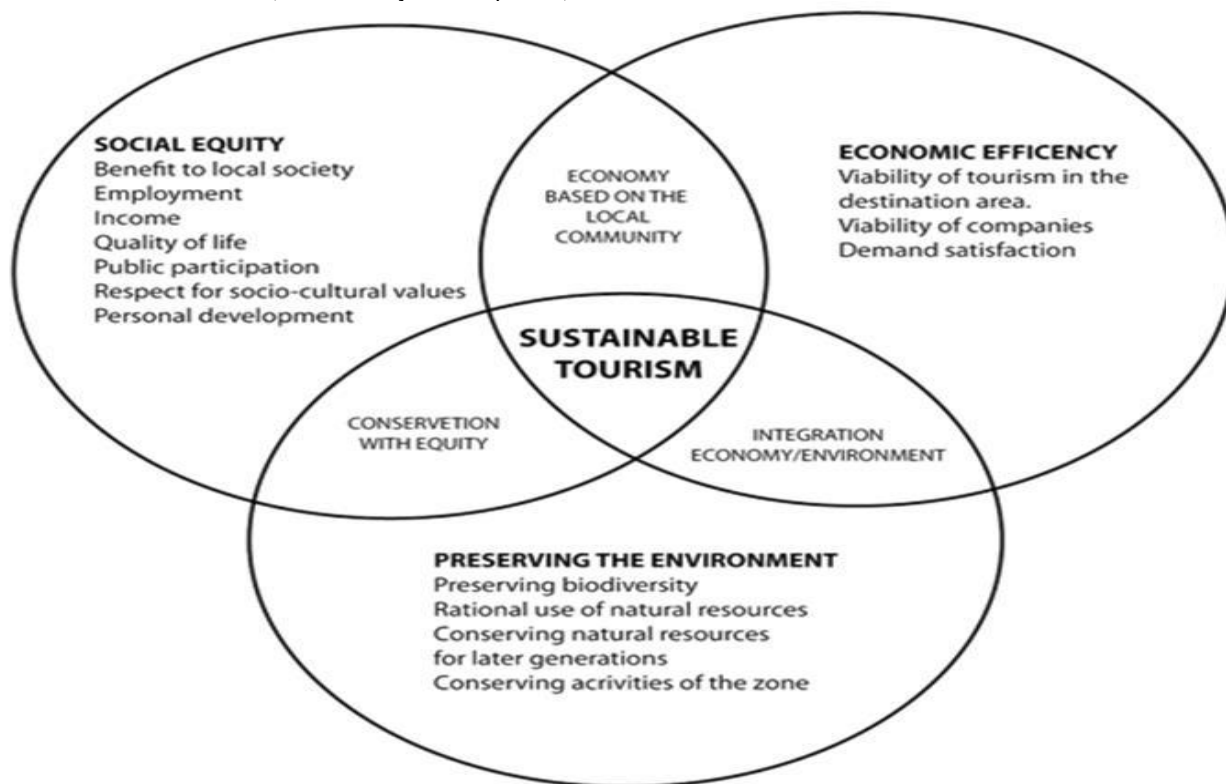


Figure:1.

Sustainable Ecotourism Development Model (Source: Dorobantu & Nistoreanu, 2012)

*Tourism industry today has turned into a key driver of socio-economic progress (Kanga et al., 2013), through which the creation of jobs, enterprises and infrastructure are being developed globally (Stausberg, 2012).

Dr. Subas T. in his research paper titled "Tourism in India: Potentials, Challenges and Opportunities" (2015) says that "The travel and tourism industry has emerged as one of the largest and fastest growing economic sectors Globally"

Rajasthan is a premium tourism destination that attracts tourists for its versatility. Tourism shares the largest portion of revenue for Rajasthan. In the year of 2013 total tourist visits are 31.735 million (30.3 million domestic and 1.43 million foreign tourists) (MoT, Govt. Of India 2015)

A report on "Adventure tourism market study in India" published by Ministry of tourism (2016) Underlines that "Tourism remains one of the largest employers accounting for 9% of global GDP and accounts for one in every 11 jobs."

The industry of tourism is rapidly becoming the leading of economic in the most developing countries (Singh et al., 2017).

Tourism is a growing industry in India, with people from all over the world travelling there to

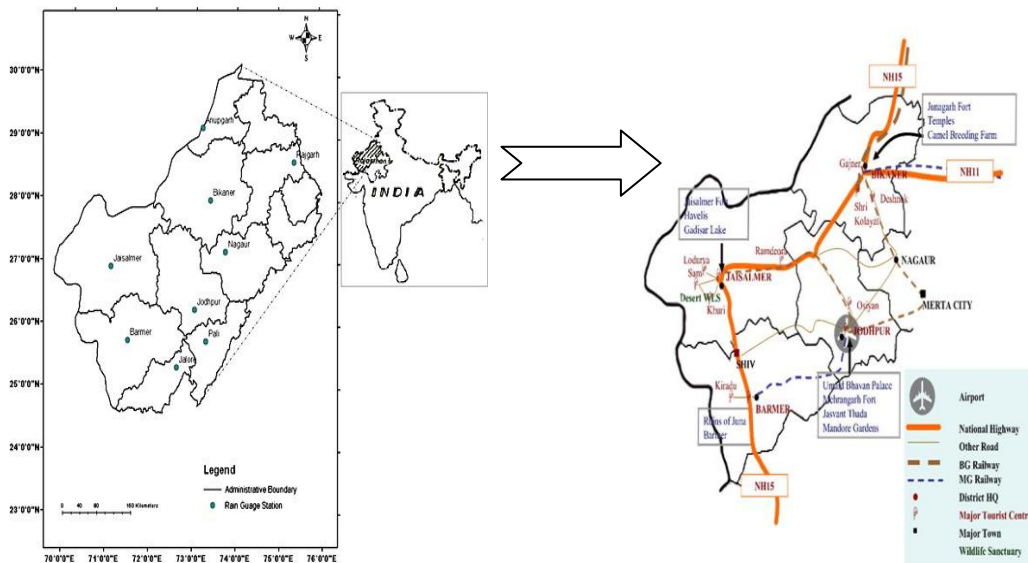
experience the country's natural beauty and visit its vast array of states and their differing cultures and climates (Chakrabarty & Mandal, 2018).

Historic palaces, especially those in Jaipur and Udaipur, offer opportunities to expand the luxury ecotourism segment (Singh Chandel & Kanga, 2018).

Study Area

The area of Great Indian desert lies in the north-western part of the Indian subcontinent (23° 30' and 30° 11' North latitude and 69° 29' and 78° 17' East longitude), Rajasthan is bordered on the west and northwest by Pakistan, on the north and northeast by the Indian states of Haryana Punjab, and Uttar Pradesh, on the east and southeast by Madhya Pradesh and Uttar Pradesh and on the southwest by the state of Gujarat. The Thar Desert is characterised by shifting sand dunes and high summer temperatures of more than 50°C during summer and sub-zero in winter and high summer winds (>30 km/ h during sandstorms in summer) . Western Rajasthan is one of the major parts of the Rajasthan in terms of Ecotourism

The ecotourism specific approach of the study encapsulated in the research paper circumbulates cities of Jodhpur, Bikaner, Jaisalmer and Barmer. This mode of tourism is today's necessity for future generation. Western Rajasthan mainly includes Four District Bikaner, Barmer Jaisalmer & Jodhpur. The locations are depicted in the given figure.



Map not to scale

Figure:2. Location map of the studied area (Source: Scholar)

climatic profile of the Desert circuit the tourist season is limited to the winter months and almost the entire tourist traffic comes from October to March.

The Desert circuit is the largest though the most sparsely populated region in the state. Given the Some facts of four districts (study area) are as follows:

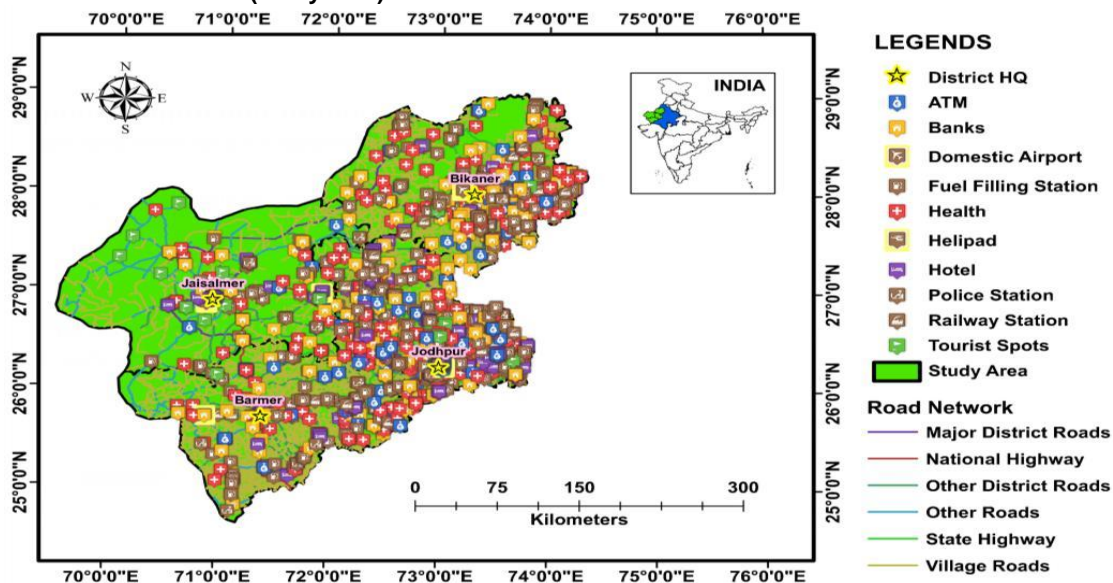


Figure:3. Location Map of Western Rajasthan (Source:Scholar) Demography of the studied area:

Table : 2

City	Area (km ²)	Population	Increase (%)	Sex Ratio	Literacy (%)	Density of Population
Jodhpur	22850	3687165	27.74	916	65.94	161
Barmer	28,387	2603751	35.52	902	56.53	92
Bikaner	30,247.90	2363937	41.19	905	65.13	78
Jaisalmer	38,401	669919	31.81	852	57.22	17

Source: census,2011 Govt. of India

Road network of the western region:

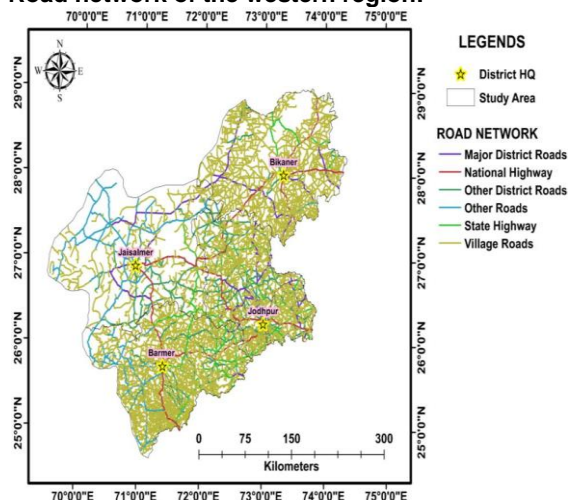


Figure: 4.
(Source: Scholar)

Travel Links

The Desert region is well connected by roads with National Highway (NH15) passing through Bikaner, Jaisalmer and Barmer. Jodhpur is connected to all the three places by state highways and district roads.

Objectives of the study

The main objectives of writing this paper are: (i) Arising a sense of mutual respect between tourists and local people. (ii) To support the tourist spot with a sense of sustainability, which further enhance the employment opportunity to the concerned stakeholders; (iii) Respecting environment and cultural peculiarities of the area; (iv) Minimizing negative impact of tourists which ultimately enhance the tourism Industry.

Database and Methodology
Geography of the Studied Area

Table: 1

City	Elevation (msl)	Latitude	Longitude	Average annual rainfall (mm)	Drainage
Jodhpur	231 m	26.23° N	73.02° E	362	Luni & Mithadi
Barmer	227 m	25.75° N	71.39° E	277	Luni ,Sukri,Mithadi
Bikaner	242 m	28.0229° N	73.3119° E	241	-----
Jaisalmer	225 m	26.9157° N	70.9083° E	209.5	Kakni,Chingan

Jodhpur

Jodhpur is the second-largest city in the state and officially the second metropolitan city. It is a popular tourist destination, known as Blue city and Sun city all over India. It lies on the edge of the arid tract

and is the link between the desert on the west and the semi-arid but cultivable regions to the East (Sharma & Bisht, 2018). As per census population of Jodhpur is more than 10 lakhs which is the largest city in the western region.

City	Major Tourist Spots	Major Events
Jodhpur	Mehrangarh fort, Umaid Bhavan palace, Jasvant Thada, Mandore, Osiyan, Jain and Brahmanical temples.	Marwar festival

Jaisalmer

Jaisalmer is a major tourist spot located in western Rajasthan in India. The city is an amalgam of exotic Indian desert culture, heritage and adventure. The handicrafts and havelis of Jaisalmer gives a glimpse of Rajasthan's never say die spirit. The colour

of sand dunes and the sand stones found here connote the city as 'golden city' of Rajasthan. The annual desert festival amidst dunes during winter season mesmerises and redefines the heritage potential of the city.

City	Major Tourist Spots	Major Events
Jaisalmer	Jaisalmer fort, Jain temples, Patwon ki Haveli* and the Salim Singh ki Haveli, Gadisar Lake, Lodurva Jain temples, Sam sand dunes, the Desert National Park and the Khuri village safari.	Desert festival

Bikaner

The Bikaner is situated in the northern region of Rajasthan. The palaces and forts here are made of red sand stones. The city is nicknamed as 'camel country' is famous for the world's best riding camels.

The magnificent, lively and colourful annual camel festival organised by the Department of tourism (DoT) Rajasthan has its own reason to attract the domestic and foreign tourists here.

City	Major Tourist Spots	Major Events
Bikaner	National research centre on camel, Rampuria haveli, Ganga government museum Laxmi niwas palace Prachina museum Deshnok karni mata temple Jain temple bhandasar Kodamdesar temple Shri laxminath temple Shiv bari temple Gajner palace and lake Devi kund Rajasthan state archives Junagarh fort, museum, the Lallgarh palace. The Karni Mata temple in Deshnok (Rats temple), the Gajner Palace and wildlife sanctuary and Shri Kolayat temples.	Camel festival

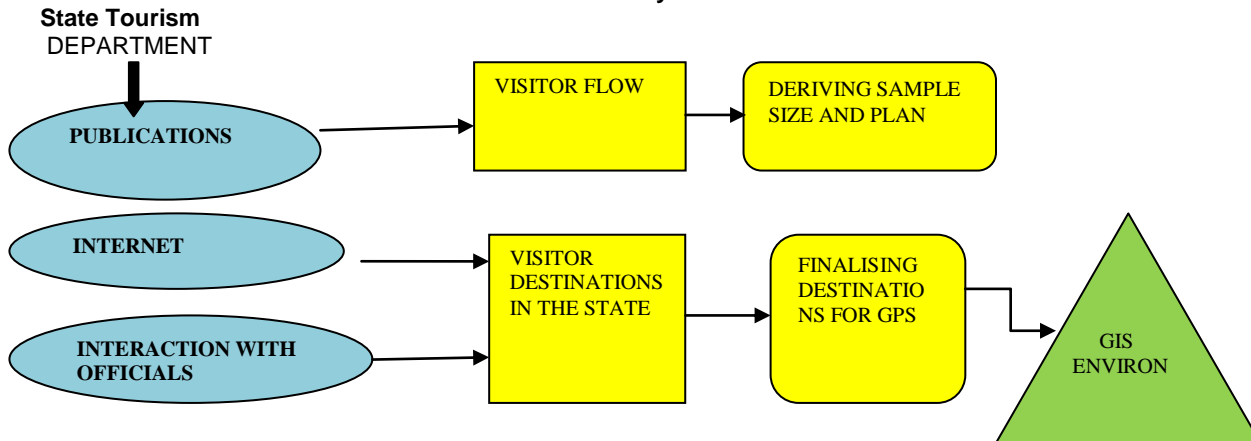
Barmer

The city is a major part of Thar Desert located 153 km from Jaisalmer. Though the land is barren and contains a very harsh climate with tough terrain historical sites, motif decorated mud houses

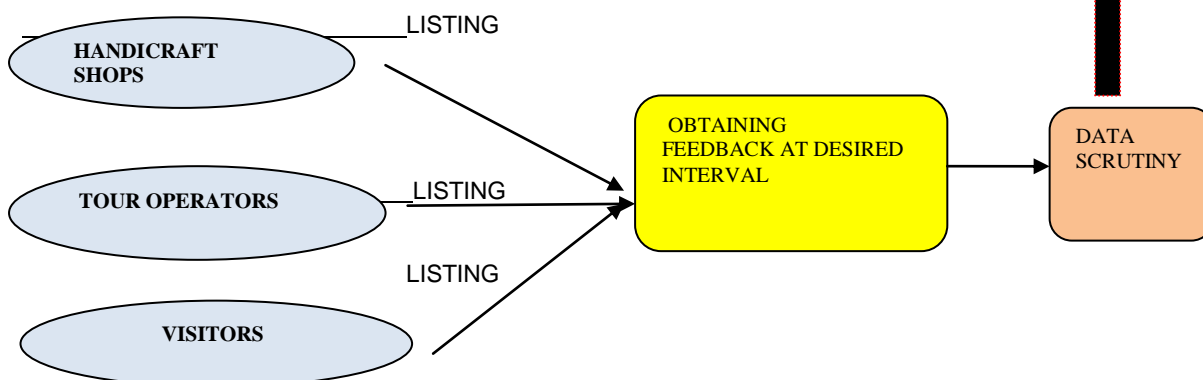
along with some architectural buildings are tourist worthy. Barmer is known for its rich crafts, dance and music.

City	Major Tourist Spots	Major Events
Barmer	Famous for its carved wooden furniture and hand block printing ruins of Juna Barmer and the Kiradu temples, Khed and Jasol are also known for their temple architecture	The Barmer Thar Festival and Cattle Fair

Secondary Research



PRIMARY RESEARCH



ANALYSIS

The Digital Elevation model (DEM) has been generated taking the help of georeferenced map of western Rajasthan as per the latest map available with Planning Department of the state.

Through DEM the digital representation of the land surface elevation with respect to the referred datum in order to digitise the topographic surface has been taken out. Moreover the flow direction and

potential sinks to further generate the stream network of the research area was finalised. The contour map generated through the DEM and the data procured through GPS for the tourist hotspots, transport network, financial locations like banks, ATMs etc got merged and hence the sustainable tourism map of the studied area has been generated in the GIS environ.

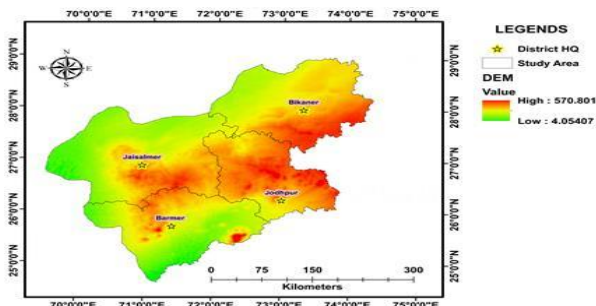


Figure 5. Elevation Map

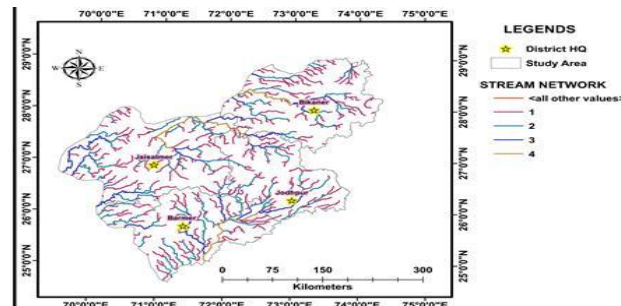


Figure 6. Stream Network Map

(Source: Scholar)

Flow chart of Methodology

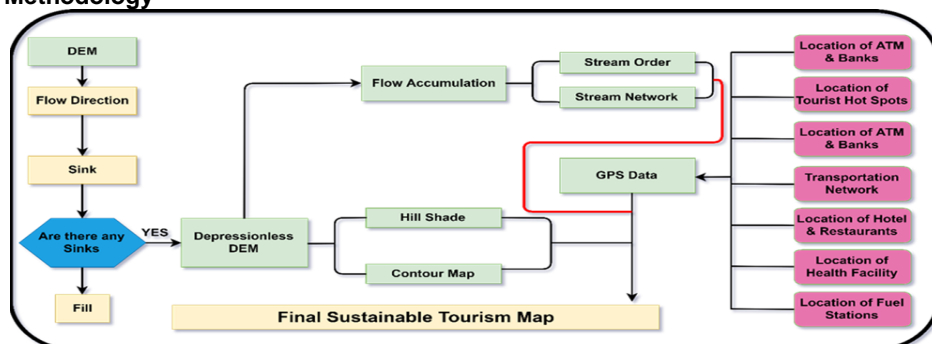


Figure 7. Methodology Adopted (Source:Scholar)

Source: Geo journal of tourism and Geosites Chandel et.al)

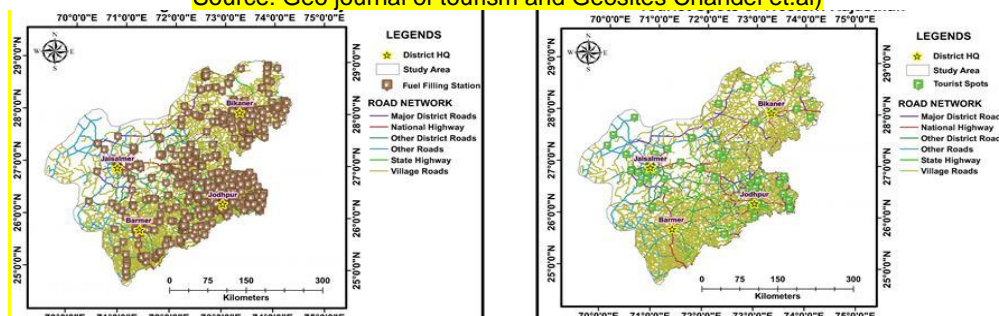


Figure 8. Fuel Filling Station Map

Figure 9. Major Tourists Spots Map

(Source:Scholar)

Domestic Tourist Traffic

The domestic traffic is highest in Jodhpur city. The approx figure (4.5 Lakhs) followed by Bikaner (1.9Lakhs) and then Jaisalmer (1 Lakhs). Although Jaisalmer traditionally ranks behind Jodhpur and Bikaner in terms of domestic tourist arrival numbers, it has recorded an impressive 5% growth in domestic arrivals in the past five years. The other cities have either shown a decline or have grown at a lower rate during the same period. Though there are other tourist spots in the region such as Barmer, Osiyan, etc. none of them currently have significant tourist traffic (Strydom et al., 2019)

Foreign Tourist Traffic

Jodhpur receives the highest number of foreign tourists and has also shown 8% growth in the number of tourist arrivals in the past years. Bikaner has also recorded 9% growth in the number of foreign tourists, although it ranks behind both Jodhpur and Jaisalmer currently. Jaisalmer, the traditionally popular destination with the foreigners has, however, shown a decline in the number of arrivals in the same period. This decline is attributed to its proximity to the Pokhran nuclear test site, and to the India-Pakistan border.

Factors affecting tourism in Rajasthan



Figure: 10.

(Source: Tourism - Sustained Development and Management by S. Das et. al 2012)

Religious intolerance, relations with neighbouring countries, lack of international representation, government incentives to hotels etc are some political factors affecting tourism industry. Likewise elements like per capita income, disposable income and exchange rate issues are categorised under economic factors. Amongst the social factors include the inclusion of festivals, exhibitions, aspiration to travel the world etc. Moreover the growth of e- tourism, skype and face time etc are allocated under technological factors.

Findings

1. Despite the richness of tourism in western Rajasthan, the harsh geographical conditions entail comparatively less inflow of tourists (domestic and foreign).
2. The state since year 1989 after the declaration of tourism as a status of industry the mode of transportation and communication particularly in the western Rajasthan is underdeveloped. The modernisation of important railway stations and terminals to lodge the tourists temporarily should be the prime concern along with special reservation facilities.
3. Besides banking facility the medical, postal and communication amenities should be readily available. Similarly the road network ought to be upgraded to the satisfaction of the tourists. The road network should be further supplemented with additional luxury and deluxe busses.

Barmer-Jaisalmer parliamentary area alone is almost equal to the area of Kerala State.To visit the remote quarters of the western Rajasthan the limitation of

short span stay for the foreign tourists should have consideration.

4. The quality of accommodation and lodging vis-à-vis influx of the tourists in the Western Rajasthan along with the gradual grim level of hospitality and the mode of behaviour by the unscrupulous local people should be taken care of.
5. The frequent demand of the people to provide the air connectivity to Jaisalmer, Osian etc. should be materialised.
6. The efforts to protect and conserve the historical heritage through good means of audio-visual system, exhibition etc.
7. The food and drink menu should invariably incorporate a list of the ingredients of the Rajasthan delicious in French and English language. Similarly nobody can understand ones cultural tradition only by reading the name of restaurants as Ghoomar, Dholamaru and Moomal. For this expertise knowledge is essential. Only those persons be appointed as guides who are well versed in the history and culture of Rajasthan.
8. The handicrafts purchased by the tourists should be made imperative on the Government and tourism department to organize the selling of

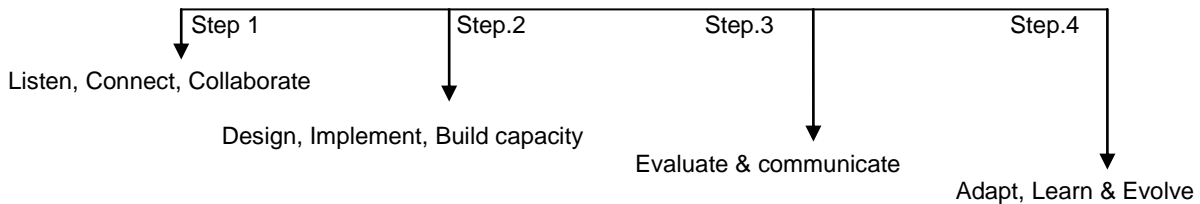
these commodities through their agencies at reasonable cost.

9. Perhaps Western Rajasthan is the only place in the world where protection of wild life and trees is regarded as a sacred duty or religion. The Bishnoi community is famous for its supreme sacrifices in this regard. Therefore, it is suggested that the entire region of Jodhpur, Jaisalmer and Bikaner be converted into wild life sanctuaries. Sardar Samand in Jodhpur and Sharda in Pali district attract birds of Central Asia and South Europe. Similarly Guda, about twenty five kilometers away from Jodhpur is famous for its prized possession of Chinkara and black buck.

Conclusion

Ecotourism is about uniting, conservation and sustainable travel. The concept should be cherished particularly in western Rajasthan for which the Ecotourism policy of the state government 2010 has been drafted. The sustainability factor has been the key objective. The role of education and the inclusion of local dwellers around the tourist spots for the attainment of Ecotourism objective cannot be ruled out. This means those who implement and participate in ecotourism should follow following principles:

Sustainable Tourism



1. Minimize impact
2. Build environmental and cultural awareness and respect.
3. Provide positive experiences for both visitors and hosts.
4. Provide direct financial benefits for conservation.
5. Provide financial benefits and empowerment for local people.
6. Raise sensitivity to hosts' political, environmental and social climate.

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