

PLANNING FOR SUSTAINABLE TOURISM OF BODHGAYA

**A Thesis
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Requirements for the Degree of
MASTER OF ARCHITECTURE**

**In
Field of Specialization**

**by
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LUCKNOW
June, 2023**

CERTIFICATE

It is certified that the work contained in this thesis entitled “**Planning for Sustainable Tourism of Bodhgaya**”, by **VANDANA RANI** (Roll No 1210106020), for the award of **Master of Architecture** from Babu Banarasi Das University has been carried out under my/our supervision and that this work has not been submitted elsewhere for a degree.

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PLANNING FOR SUSTAINABLE TOURISM OF BODHGAYA

VANDANA RANI

ABSTRACT

The purpose of this thesis was to find out the role of sustainable tourism in the Bodhgaya to promote environmental, social and economic sustainability. Bodhgaya is important for understanding the impact of tourism on the site and its surrounding communities.

The study can serve as a valuable tool for policy makers, non-profits and other organization involved in the development and management of Bodhgaya.

Planning and sustainable tourism of Bodhgaya is concerned with the negative effect of tourism and ensuring that it is economical, socio cultural and environmentally sustainable.

On the case study of Bodhgaya the research revealed that Bodhgaya have to be continued investment in proving infrastructure which is essential to support the growing no. of tourists by upgrading transportation network, improving road connectivity making efforts in the heritage conservation, focusing on promoting sustainable tourism practice to minimize the impact on the environment.

ACKNOWLEDGEMENT

It gives us a great sense of present the report of the **MURP** seminar undertaken during MURP Final Year. We owe special debt of gratitude to Kunwar Ghanshyam Yadav, Department of Architecture & Planning of Babu Banarasi Das University, Lucknow, for his constant support and guidance throughout the course of my work. His sincerity, thoroughness and perseverance have been a constant source of inspiration for me. It is only his cognizant efforts that my endeavors have seen light of the day.

I also take the opportunity to acknowledge the contribution of all faculty members of the department of their kind assistance and cooperation.

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Thesis

by Vandana Rani

CHAPTER 1: INTRODUCTION

Bodhgaya is located strategically between major tourist destinations. A number of countries like Japan, Burma, China, Sri Lanka, Korea, Nepal, etc., where Buddhism is an important faith, have built their respective monasteries and temples in Bodhgaya. The town of Gaya is 13 km from Bodhgaya, which is also located on the Falgu River. As Bodhgaya is for the Buddhists, Gaya is an important pilgrim place for the Hindus. Tourism in Bihar is set to get a massive boost as Bodh Gaya. According to reports, Bihar Chief Minister was presented a detailed plan regarding this by the tourism department of Bihar. Bodh Gaya, the sacred town and pilgrimage centre for Buddhist, is well-known for its Mahabodhi temple (a World Heritage Site, enlisted in 2002) that serves as nucleus for all events in the town. It is a unique property of archaeological significance that documents the evolving worship since Emperor Asoka built the first temple in the 3rd century. The complex includes the grand temple, the Vajrasana, the sacred Bodhi Tree, six other sacred sites of Buddha's enlightenment, and numerous ancient Votive stupas. The Bodhi Tree is considered to be a direct descendant of the original Bodhi Tree under which Buddha had his enlightenment. This led to develop infrastructure to support the visitors, which further led to socio-economic changes.

PROBLEM STATEMENT

Bodhgaya is a culturally and religiously significant site for Buddhism located in Bihar, India. However, the town is one of the poorest and least developed states, leading to tensions between stakeholder groups over the development of the site. According to the idea, tourism at places with a rich cultural legacy, like Bodhgaya, should support the three pillars of sustainability: social, environmental, and economic. The study investigates the motivations and expectations of international visitors and other stakeholders driving Bodhgaya development, revealing that pilgrimage and tourism are major drivers of economic development but also cause conflicts. The lack of governmental foresight and action has resulted in NGOs and non-profits leading development efforts. A hypothesis statement suggests that tourists' perception of state government initiatives for sustainable tourism development in Bihar is good.

NEED FOR STUDY

The need for sustainable tourism in the area is crucial to promote environmental, social, and economic sustainability. The study on the motivations and expectations of visitors and stakeholders in Bodhgaya is important for understanding the impact of tourism on the site and its surrounding communities. It can help identify areas where sustainable tourism practices can be implemented to promote economic growth while preserving cultural and natural resources. Additionally, understanding the perspectives and needs of different stakeholder groups can help facilitate dialogue and collaboration towards a common goal. Overall, the study can serve as a valuable tool for policymakers, non-profits, and other organizations involved in the development and management of Bodhgaya as a UNESCO World Heritage Site.

AIM AND OBJECTIVE

AIM

Planning for sustainable tourism of Bodhgaya

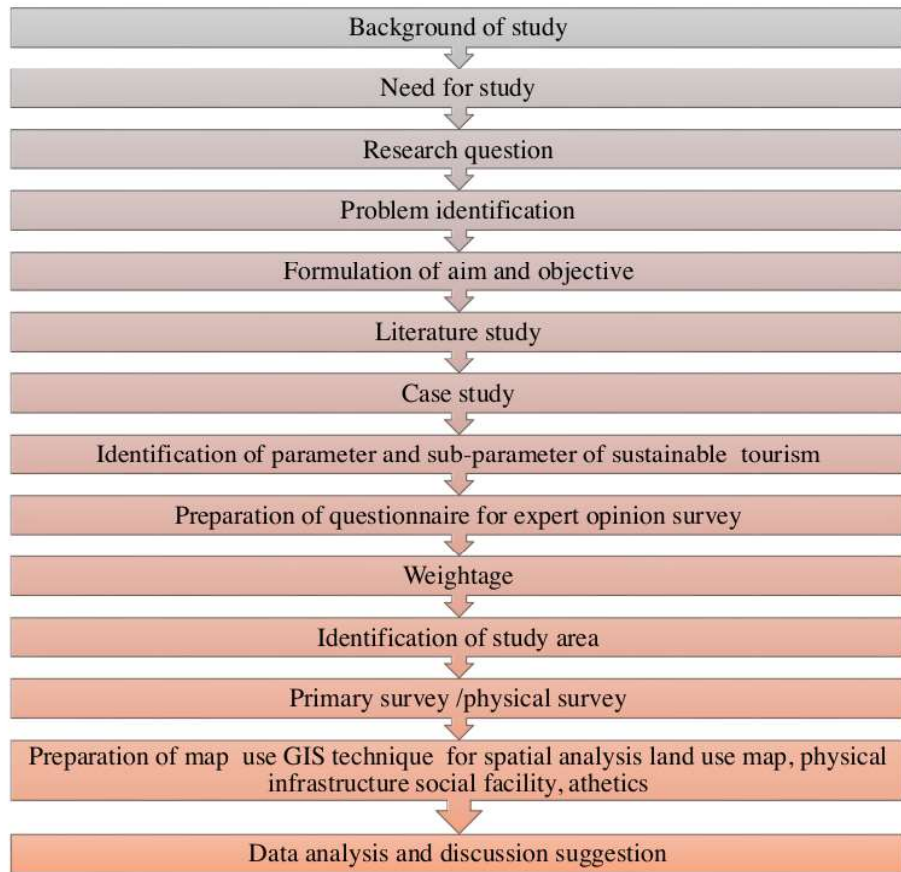
OBJECTIVE

- To identify the parameter and sub-parameter of sustainable tourism
- To analyze the impact of tourism on three pillars of sustainability.
- To correlate the existing tourism infrastructure with norms and standards.
- To provide policy frame work guideline for sustainable tourism development of Bodhgaya.

SCOPE AND LIMITATION

planning for sustainable tourism of Bodhgaya is concerned with lessening the negative effects of tourism and ensuring that it is economically, socio culturally and environmentally sustainable. the scope is limited to the evolution of land use changes in the concerned location with the help of GIS and technology only, in consideration with the appropriate margin of mirrors. Planning perspective of the area would only be considered in the study. research has been able to shed some light on the significance of the site and the production of imagery.

METHODOLOGY



CHAPTER 2: LITERATURE REVIEW

INTRODUCTION

This chapter deals with the different literature studies through books, journals and articles collected and review over the entire dissertation period. particularly four interest areas of Research Paper (author-Katerina Angelevska-Najdeskaa, Gabriela Rakicevikb_2012, Research Paper (Author- Dr. Mukul Kumar (Gold Medalist) Issue - 13 May 2020, Research Paper (Author - Rana P.B. Singh & Devesh Kumar_2011), Research Paper (Author – Dev Malya Dutta And Nisha Saha_july 2011) literature review will explore the role of non-canonical literature in studying Buddhist imagery and ritual technologies in Bodhgaya, with a focus on the form of the Buddha touching the earth. the dissertation is mainly focused more on secondary research data.

Planning of sustainable tourism development

Aim

Planning of sustainable development can be analyzed from two aspects:

In terms of the local community and concept of the quality of tourism.

Objective

The first step is the careful preparation through the entire planning process and the next step for tourist development.

Methodology

The method of planning is based on basic principle – environmental ,social, cultural and economic sustainability.

Conclusion

Only when the four elements of sustainable development—economic, social, cultural, and environmental—are given roughly equal strength and condition can it operate successfully.[1]

Eco-tourism's sustainable development in north Bihar

Aim

To develop infrastructure to support the visitors, which further led to socio-economic changes. Based on field survey and participatory observations the perception of people (both native and visitors) concerning heritages and their preservation are documented and analyzed.

Objective

- To determine how North Bihar's existing tourist centers are distributed in relation to the environment.
- To learn about various tourist destinations.
- To investigate the causes of the current poor performance as well as the variables that will ensure healthy growth in the foreseeable future.
- To observe the relevant environmental component.
- To examine the types of jobs, diets, and social acceptance..

Methodology

The investigator and a few trained fellows conducted a sample survey on the socioeconomic state of a few families at randomly chosen existing tourist destinations and the locations with development potential in order to support the concept of sustainable development.[2]

Conclusion

Process of physical economic development is the most visible ways in which tourism affects host areas. These vary from place to place depending upon levels of economic development but it includes a range of impacts upon levels balance of accounts, economic growth, creation of employment etc.

A world heritage site is Bodh Gaya: tourists' and natives' perceptions of heritage and its value

Aim

Planning of sustainable development.

Objective

- A call for openness and a suggestion box.
- A proper railway connection to Bodh Gaya.
- Meditation spaces and parks shouldn't be commercialized and should be open to everyone. [3]
- The Bodh Gaya region's parks and green spaces should be established as part of the heritage zone/trails. In addition, Heritage Week will be observed
- Meditation spaces and parks shouldn't be commercialized and should be open to everyone.[4]

Methodology

Take a historical perspective and orientation of the heritage site then do the survey and analyze the data. View on other uses, issues and planning[5]

Conclusion

Like in case of Lumbini, the birthplace of Buddha, in Bodh Gaya also differences in values, interests, expectations and priorities among stakeholders, a major source

of dissonance, may create conflict in heritage and can be a challenge for its preservation and management.

Poverty Alleviation through Sustainable Tourism in the City of Kolkata

Aim and objective

- A call for openness and a suggestion box.
- A proper railway connection to Bodh Gaya.
- The heritage zone/trails should construct and include green spaces and parks in the surrounding areas of Bodh Gaya with no money being taken from the meditation sites and parks, and they should be open to everyone. In addition, Heritage Week will be observed.
- Meditation spaces and parks shouldn't be commercialized and should be open to everyone.

Methodology

Take a historical perspective and orientation of the heritage site then do the survey and analyze the data. View on other uses, issues and planning

Conclusion

Like in case of Lumbini, the birthplace of Buddha, in Bodh Gaya also differences in values, interests, expectations and priorities among stakeholders, a major source of dissonance, may create conflict in heritage and can be a challenge for its preservation and management.[6]

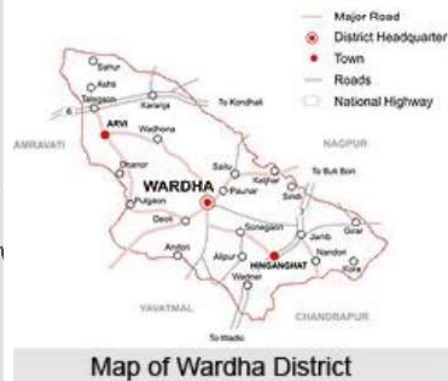
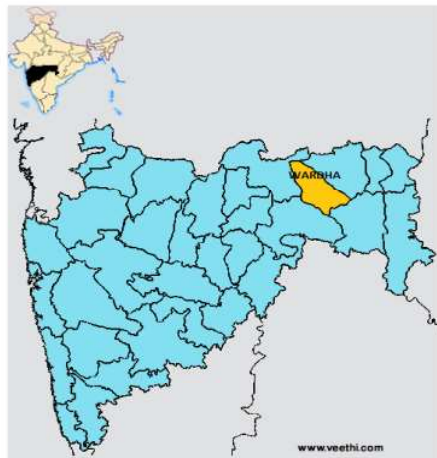
“Agro-tourism: a sustainable tourism development in Maharashtra - a case study of village inn agro tourism (Wardha)”

Indian economy is largely agro- based. The state's economy benefits from tourism, but it also has socio-cultural and environmental effects, all of which may be favorable or

harmful. One type of tourism that is becoming more and more popular among unconventional travelers is "agro-tourism".

The growth of agro tourism is desired because

- It is a type of tourism that is sustainable.
- Agro tourism is a source of additional income for farmers in areas where there are few opportunities for families dependent on agriculture to generate additional cash.
- It also elevates the rural community and generates employment at the local levels.
- It offers urban tourists a chance to get away from their busy schedules and reconnect with their roots.
- Local residents' quality of life may be improved.
- It provides visitors with a taste of the local cuisine, culture, and art.



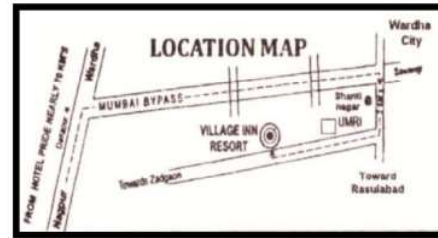


Objectives:

- To research the creation and administration of Wardha's Village Inn Agrotourism.
- To determine how tourism development has affected the region's sociocultural and environmental characteristics.
- To determine the destination's long-term viability.
- To assess the project's economic viability.

Locations of interest nearby are,

1. Mahatma Gandhi's Residence "Sevagram" 16 kilometers.
2. Vinoba Bhave's Famous Pavnar Aashram 12 kilometers.
3. Geetai Mandir 7 kilometers.
4. Shanti Stup 7 kilometers.
5. Magan Sangrahalaya 4.5 kilometers.
6. Hindi Vishvavidyalaya 4 kilometers.
7. Tadoba wildlife Sanctuary (Project Tiger)



Location Advantage: Located in Umri (Meghe), Wardha, near Zaidgaon Road. It is only 2 kilometres from Mumbai Highway and about 5 kilometres from Wardha Railway Station.

- Local Scenario: Although he was an outsider living in the Umri village, the villagers appreciated his helpful personality. He has gained recognition for his sincerity in efforts and love of agriculture.

- **Economic Implications:** Since agriculture is the foundation of all other occupations, he has conducted numerous agricultural experiments. His original concepts are a top draw for travellers. Agriculture is the primary source of income.
- **Seasonality:** Because the summers are so hot, few visitors arrive in April and May, leaving these two months with a fairly consistent flow of visitors for the remainder of the year.
- **Marketing Plan:** He is attempting to draw Ayurveda college students to the farm to study the therapeutic plants he has grown. Visitors from the day as well as the night are targeted. Families, the elderly, and field excursions for schools are the main targets.

Tourism's impact on the region's economy and other factors

- Although the owner's primary source of revenue is agriculture, he has found innovative ways to increase it through businesses like gulkand processing, dairy (and dairy products), and tourism. Tourism's impact on the region's economy and other factors
- Local residents are trained to operate the farm's dairy and other processing equipment and are employed for all farm-related tasks.
- Sustainable development of a destination is possible through agrotourism. By providing additional income at a cheap cost of investment, it helps the farmer's financial situation. Additionally, it offers the farmer an opportunity to gain recognition for his line of work.[7]

Conclusion:

The growth of Village Inn Agro Tourism is consistent with the rural and cultural history of the area.

The destination's socio-cultural and environmental impact is favourable because:

- Because the visitors are interested in purchasing farm-fresh goods, the crops and vegetables are nevertheless treated with contempt. The cultivation is 100 percent organic..
- Farm products are grown without the use of pesticides or other chemicals..
- Plastic is not allowed on the property.
- This type of tourism also helps farmers maintain their economic viability by providing them with financial support during difficult agricultural seasons.

CHAPTER 3:

Study area



source 1: internet



source 2: internet

As Per The Census 2011:

population of 38,439 of which 19,908 are males while 18,531 are females. Female Sex Ratio is of **931** against state average of **918**. Moreover Child Sex Ratio in Bodhgaya is around 958 compared to Bihar state average of **935**. Literacy rate of Bodhgaya city is **70.04 %** higher than state average of **61.80 %**. In Bodhgaya. The population of Children of age 0-6 years in Bodhgaya nagar panchayat is **6854** which is **17.83%** of the total population.

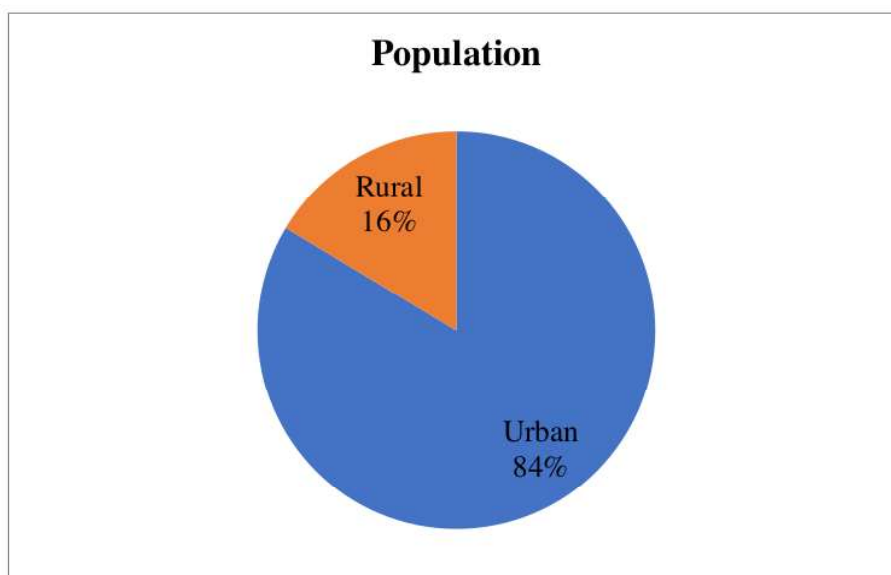
Bodhgaya Nagar Panchayat has total administration over **6,303**. The Morhar and Phalgu rivers both pass close to the settlement. Agriculture and tourism are the main

sources of income for the vast majority of the population. In 2001, Bodh Gaya was designated as a nagar panchayat.

The city has 19 wards, with ward No. 4 being the least populated with a population of 1,229 and Ward No. 17 being the most populated with a population of 3,386. The town has a population density of 2647 people per square kilometer.

The total slum population of Bodhgaya is 17,704 which is 46.05 % of the total population.

Total area – 21.06 square km



source 3:census 2011

chart 1:percentage of rural and urban population

Population Of Children Of Age 0-6 Years

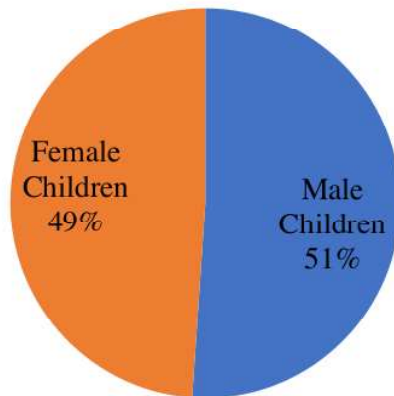
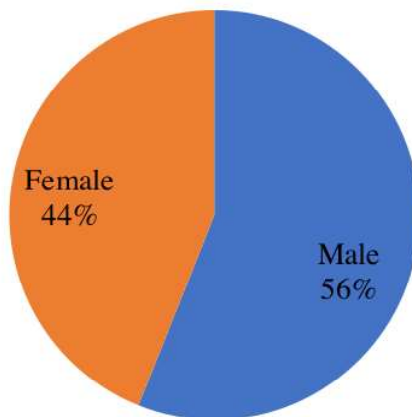


chart 2:percentage of children of age 0-6 years

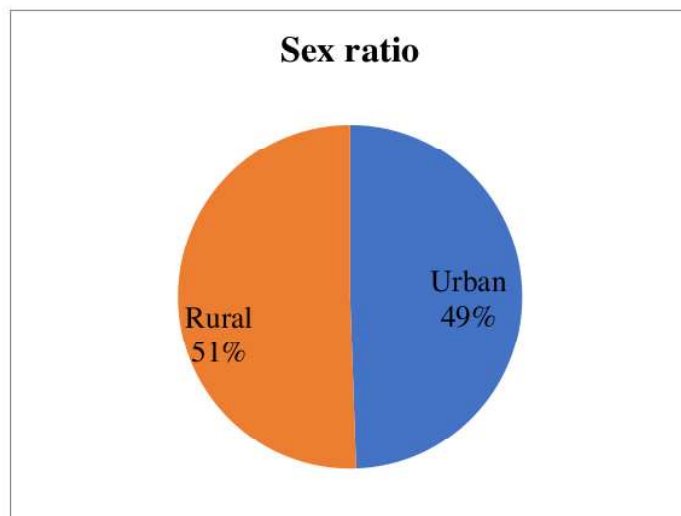
source 4:census 2011

Literacy Rate is 60.1



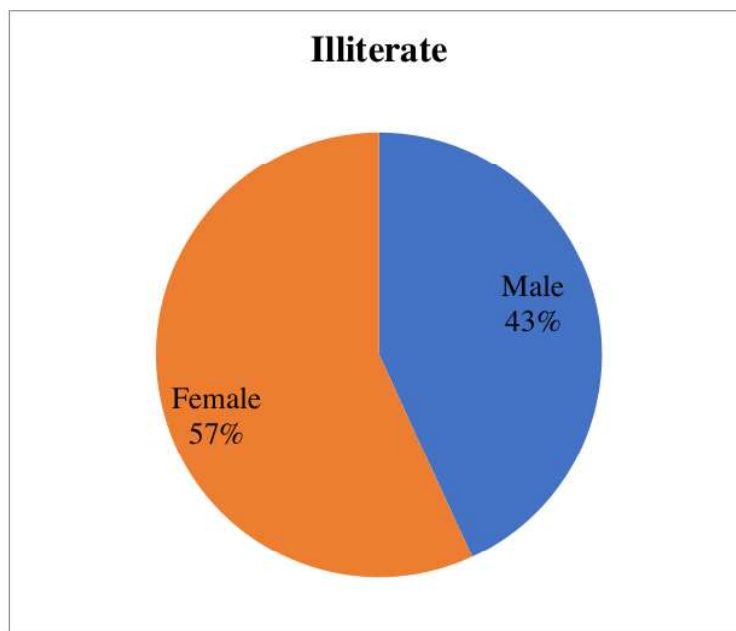
source 5:census 2011

chart 3:percentage of literacy rate of male and female



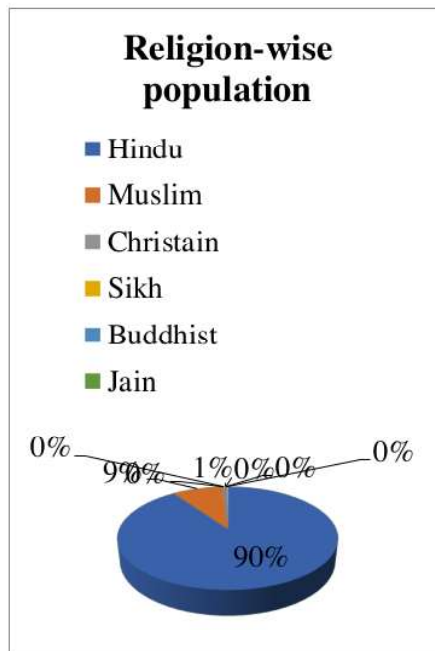
source 6:census 2011

chart 4:percentage of sex ratio of rural and urban



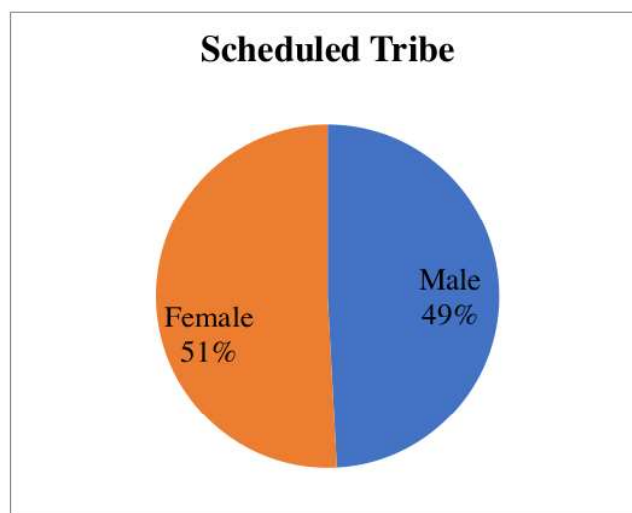
source 7:census 2011

chart 5:percentage of illiterate of male and female



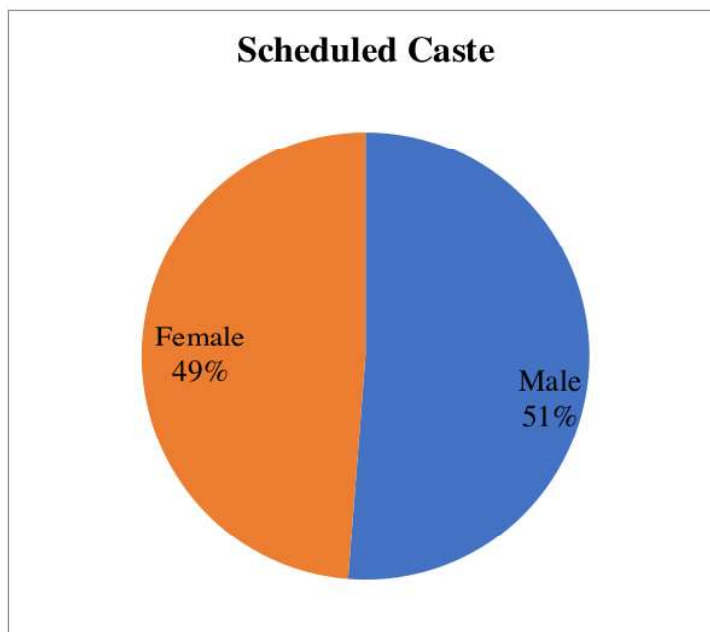
source 8:census 2011

chart 6:percentage of region wise population of ward



source 9:census 2011

chart 7:percentage of scheduled tribe population



source 10:census 2011

chart 8:percentage of scheduled caste of male and female

POPULATION GROWTH RATE

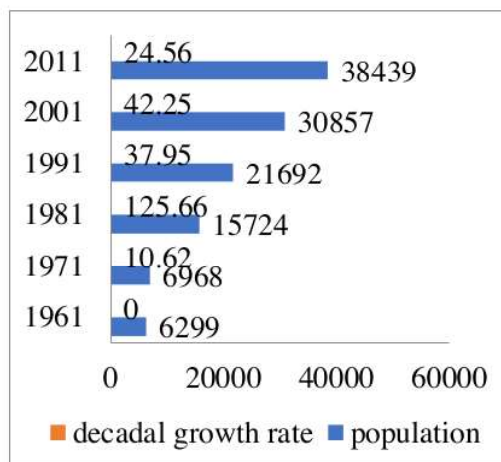


chart 9:population and growth rate

Tourist arrival during five years

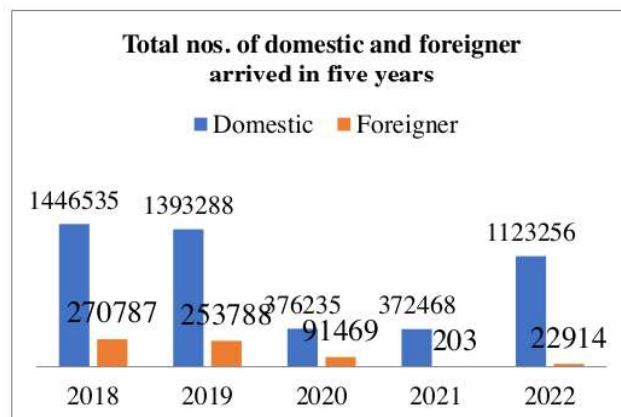


chart 10:tourist arrival in five years

Geography

The Gaya International Airport, also known as Bodh Gaya International Airport, is located just 5 kilometres from Bodhgaya. Bodhgaya is a significant location for Buddhism due to its association with the Buddha's enlightenment and is considered one of the most important pilgrimage sites for Buddhists worldwide. Pilgrims visit the site in two different ways: by going on pilgrimage to the site and by simultaneously transporting the sacred geography of Bodhgaya to their homeland.

- Geographically, Bodhgaya is situated in the north-eastern part of India. Here are some details about its location and surrounding geography:
- Latitude and Longitude: Bodhgaya is located at approximately 24.7° North latitude and 84.9° East longitude.
- Gaya District: Bodhgaya is a part of the Gaya district in Bihar. The district is bordered by the Nawada district in the west, the Jharkhand state in the south, the Jehanabad district in the north, and the Bihar Sharif district in the east.
- River System: The Phalgu River, also known as the Niranjana River, flows near Bodhgaya. This river has religious significance as it is believed that Gautama Buddha bathed in the river after attaining enlightenment.

- **Climate:** Bodhgaya experiences a subtropical climate. Summers (April to June) are hot, with temperatures reaching up to 45°C (113°F). Monsoons (July to September) bring heavy rainfall to the region. Winters (October to February) are mild and pleasant, with temperatures ranging from 5°C to 25°C (41°F to 77°F).
- **Vegetation:** The region around Bodhgaya is predominantly agricultural. The fertile soil supports the growth of crops such as rice, wheat, pulses, and sugarcane. The landscape is dotted with farmlands and green fields.

Urban local body

The urban local body responsible for governing Bodhgaya is the Bodhgaya Nagar Panchayat. A Nagar Panchayat is a local self-government institution in India that is responsible for the administration of small towns and urban areas. The Bodhgaya Nagar Panchayat functions as the primary authority for the local governance and development of the Bodhgaya region.

Addressing these limitations requires coordinated efforts from the local government, tourism authorities, and community stakeholders. By focusing on infrastructure development, environmental sustainability, cultural preservation, and visitor management, Bodhgaya can enhance its potential while mitigating the challenges associated with tourism development.

Bodhgaya Nagar Panchayat responsibilities

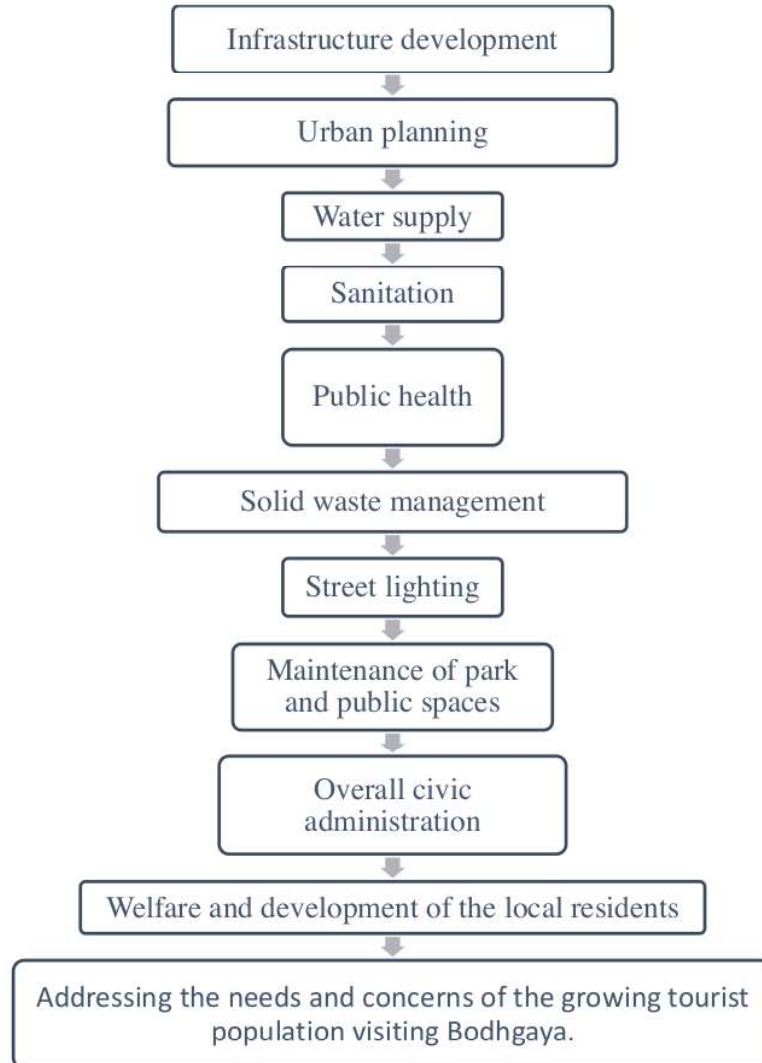


chart 11:table form of nagar panchayat work

Key aspects of the infrastructure

Bodhgaya, being a prominent pilgrimage site and tourist destination, has developed its infrastructure to cater to the needs of visitors

The infrastructure of Bodhgaya has developed over the years to accommodate the increasing number of visitors and ensure a comfortable and enriching experience for pilgrims and tourists.

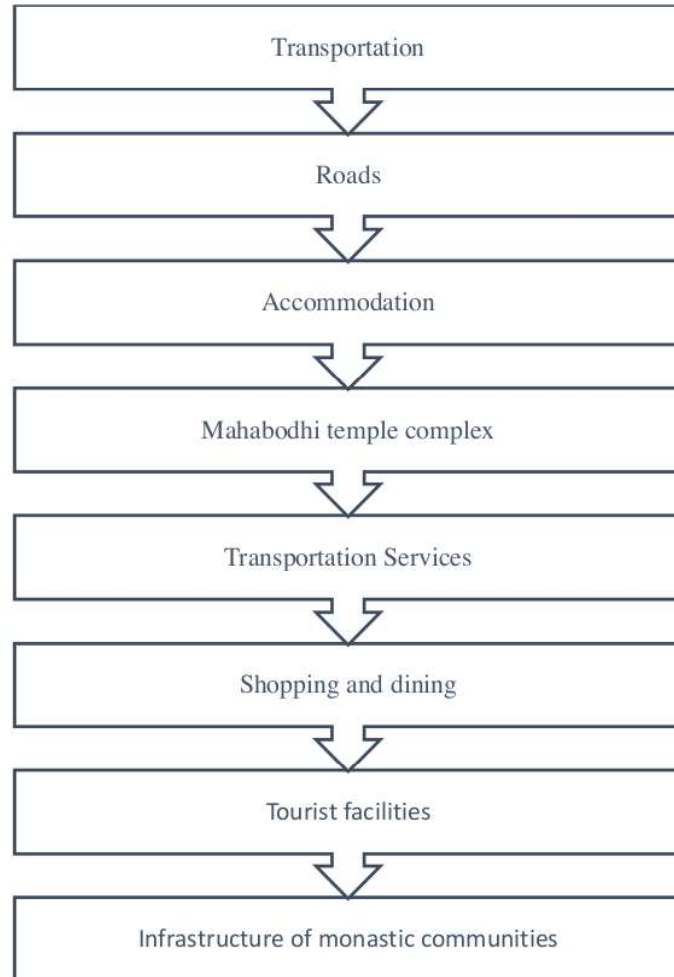


chart 12:key aspects of infrastructure

CONNECTIVITY AND TRANSPORTATION

MAJOR ROADS – GAYA-BODHGAYA ROAD

- **How to reach:**
- **AIR:** Bodhgaya is located 7 kilometers (4 miles) away from Gaya Airport, while Gaya Junction Railway Station is around 10 kilometers (6 miles) away.
- **Rail:** Gaya (a 17-kilometer away) is the closest station
- **Bus-** regular direct bus services are available from Gaya, Patna, Nalanda, Rajgir, Varanasi. The BSTDC has started running buses from Patna to Bodhgaya through Rajgir. The Bihar tourism administration has launched a unique caravan service dubbed wonder on wheel between Patna and Bodhgaya

² TOURIST CIRCUITS IN BIHAR

Bihar is the land of origin of many religions and the land, which was the seat of great empire.[4]

Buddhist Circuit

Bodhgaya – Rajgir – Nalanda – Patna – Vaishali – Lauriya Nandangarh –Lauriya Areraj - Kesariya – Vikramsila (Refer Map 2.2)

Buddhist Pilgrimage Circuit

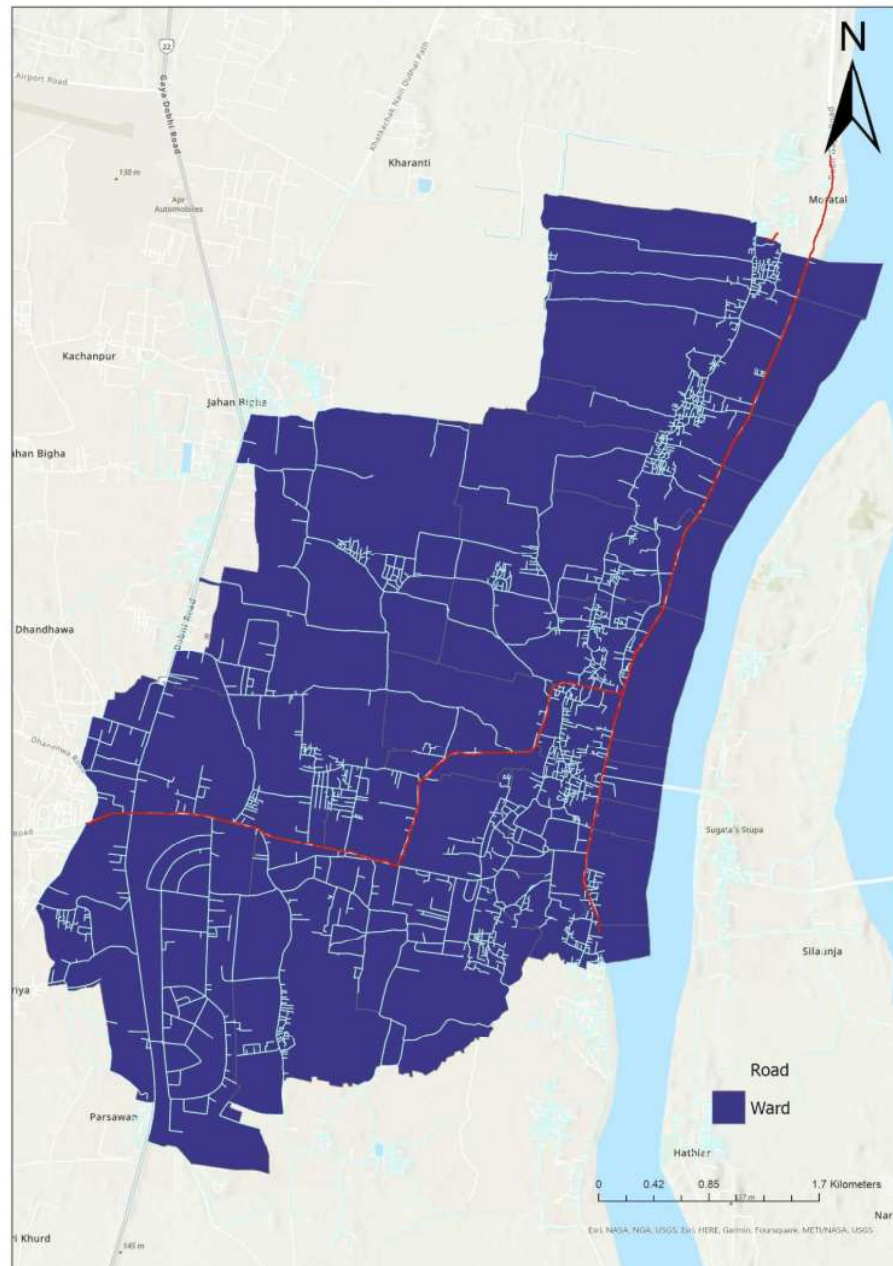
Patna – Vaishali – Rajgir – Nalanda – Bodhgaya – Patna (3 days)

² Tourism potential of candidate sites

A list of potential candidate sites capable of attracting more tourists along-with types of attractions and district where they are located obtained through opinion of local people, which are existing, underutilized and/or unexplored is given below.

Serial no.	Tourist centre	district	Tourism potential
1	Gusei	Gaya	Buddhist
2	Balu karam	Vaishali	Buddhist
3	Ashok dham	Lakhisarai	Buddhist
4	Amethi	Gaya	Buddhist
5	Bakraur	Gaya	Buddhist
6	Sanda	Nalanda	Buddhist

source 11: ministry of tourism and culture

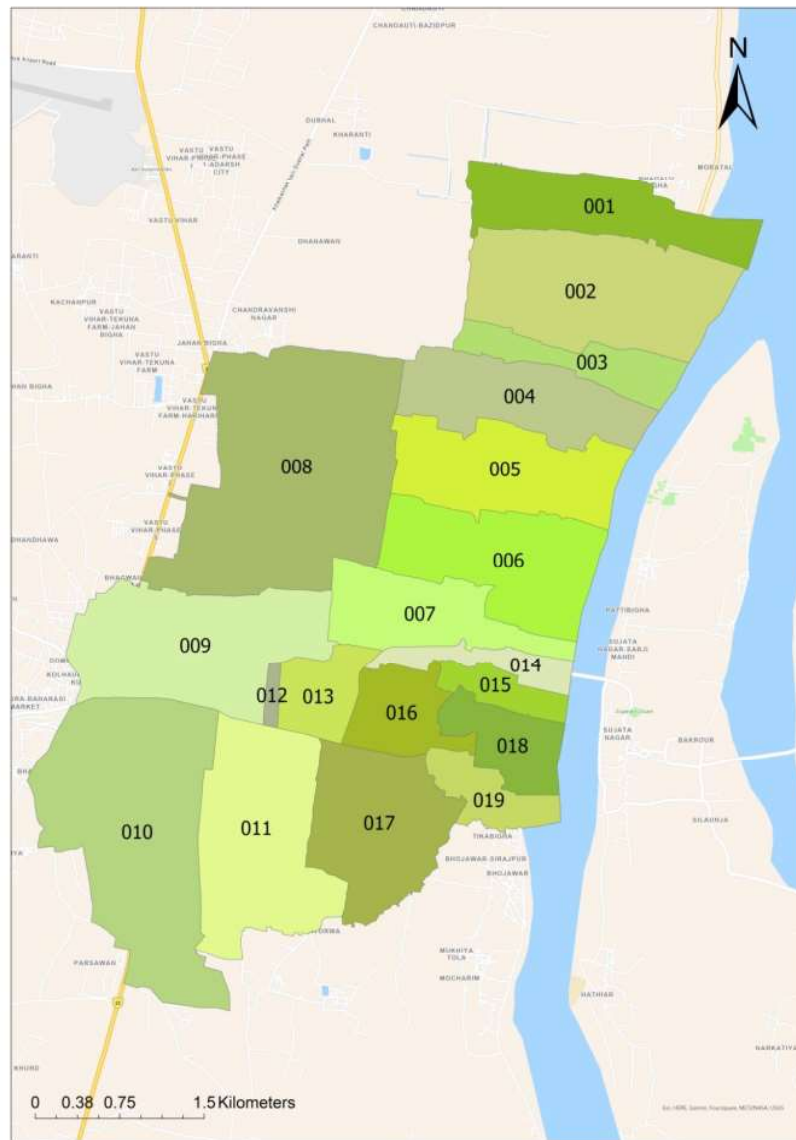


source 12: Author

Figure 1:ward map of road network

CHAPTER 4: SITE ANALYSIS

Map of ward



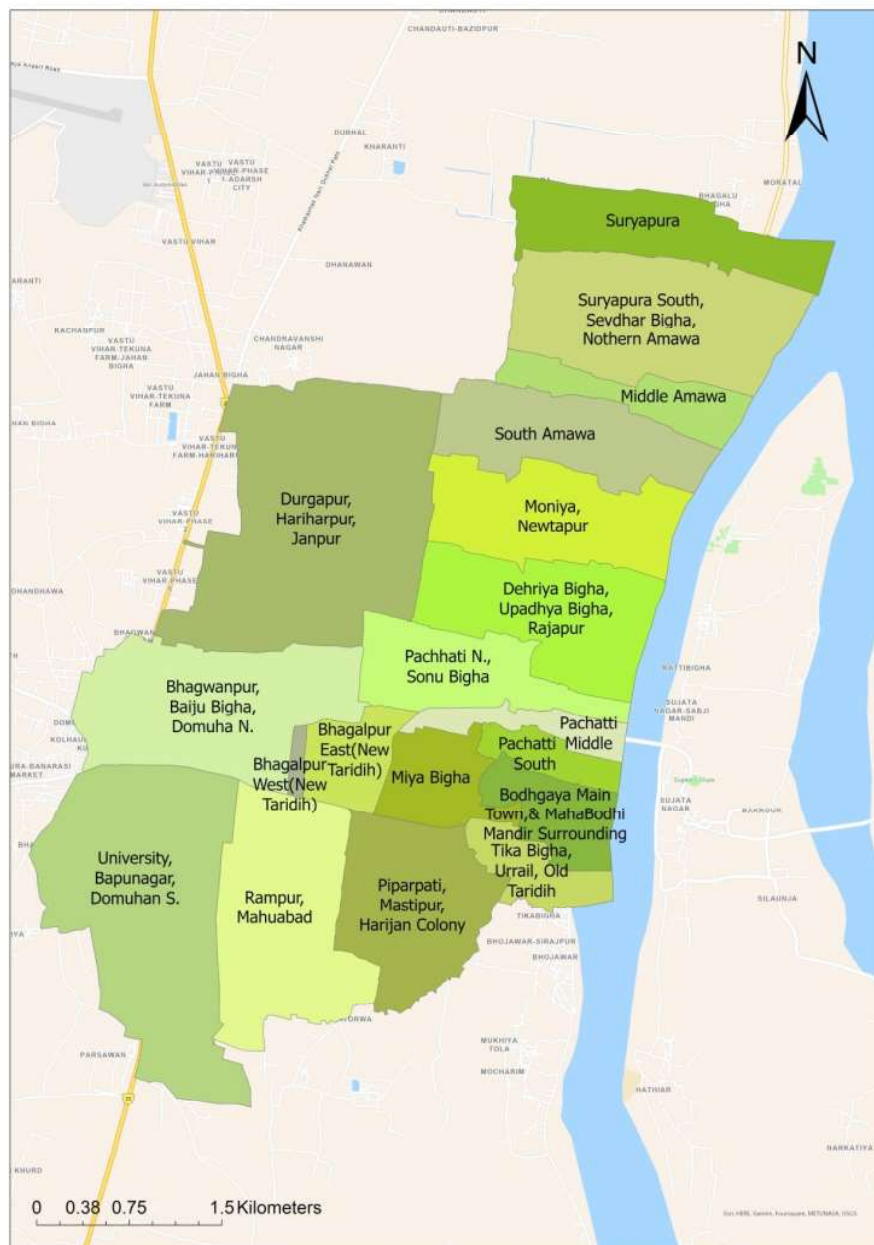
source 13:AUTHOR

Figure 2:ward map of Bodhgaya nagar panchayat

Figure 3 distribution of ward name, zone and land use

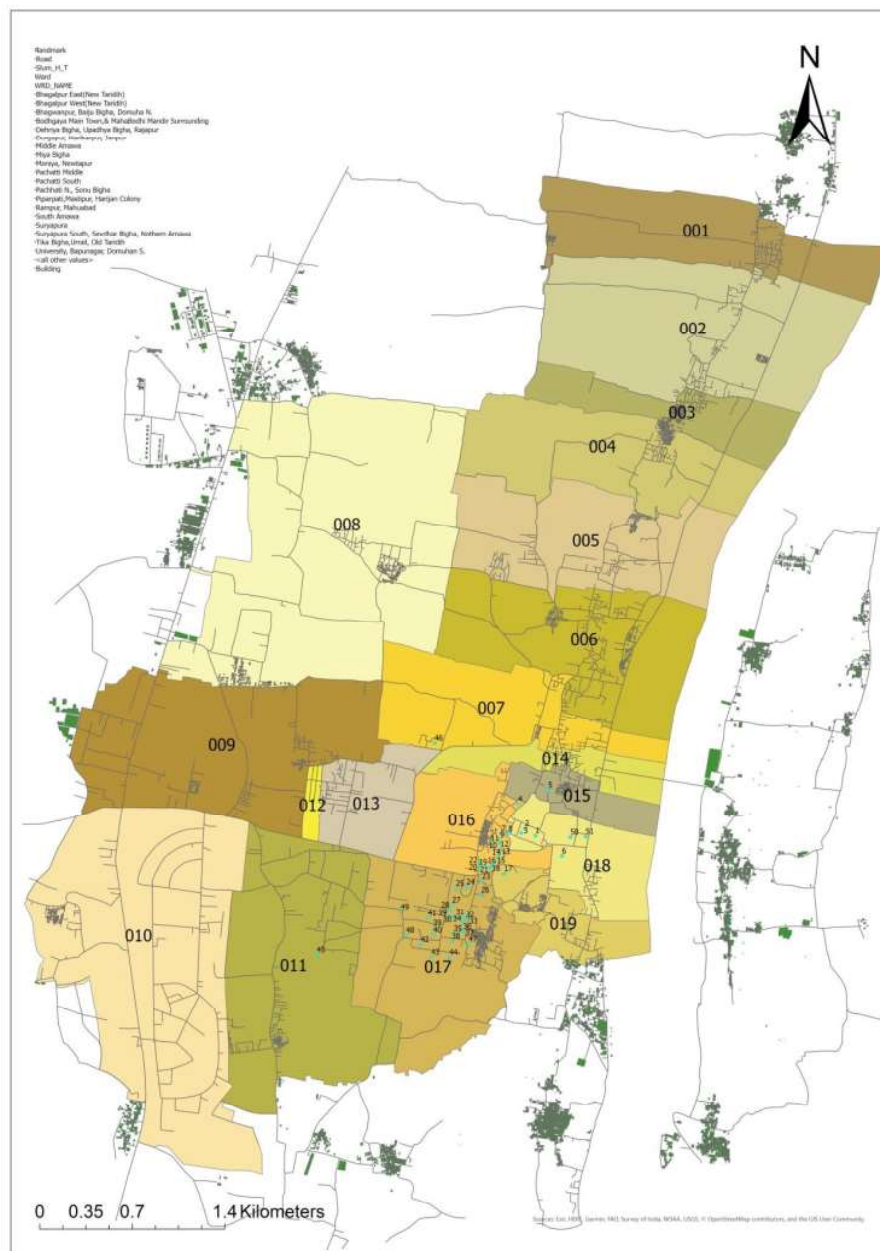
Ward no.	Ward name	Zone	Residential/commercial
1	Surajpura	North	Residential
2	Amwa	North	Residential
3	Amwa	North	Residential
4	Amwa	North	Residential
5	Sewdhar bigha	North	Residential
6	Rajapur	North	Residential
7	Pachhatti	North	Mixed
8	Hariharpur,janpur,durgapur	North	Residential
9	Baijubigha	South	Residential
10	Bapunagar	South	Residential
11	Rampur	South	Residential
12	Newtaridih Bhagalpur	South	Mixed
13	Bhagalpur	South	Mixed
14	Pachhatti	South	Commercial
15	Pachhatti	South	Commercial
16	Miyan bigha	South	Commercial
17	Mastipur	South	Mixed
18	Bodhgaya bazar	South	Commercial
19	Tikabigha	South	Commercial

source 14:Nagar panchayat



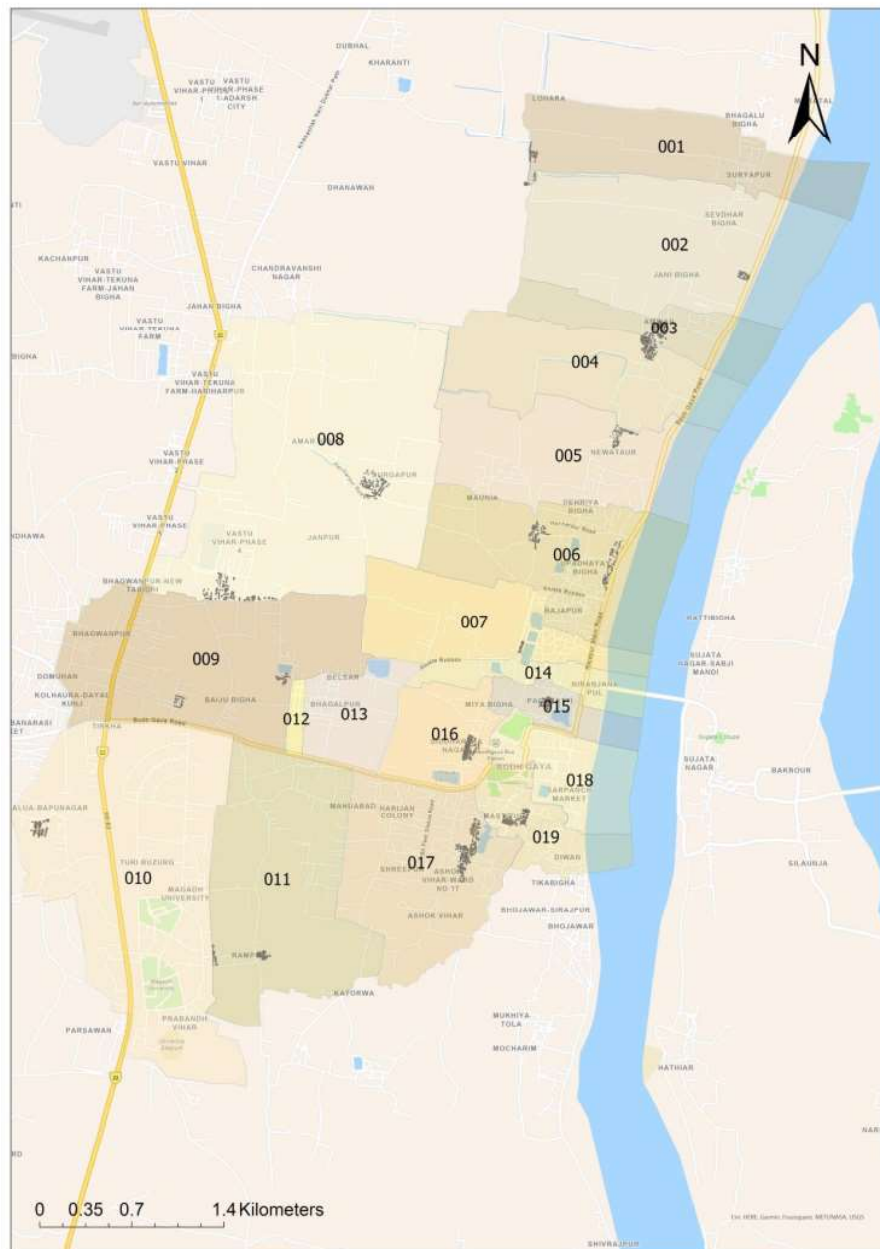
source 15: Author

Figure 4: ward map



source 16:Author

Figure 5: land use map of ward



source 17:Author

Figure 6:map of slums

Slums

Bodhgaya has 17,704 slum dwellers, or 46.05% of the city's total population (Census, 2011). In Bodhgaya, there are 18 slums with 3,109 households each (BNP, 2016). The lined pit with semi-permeable walls is the most typical type of containment device seen in the slums. The majority of slum residents practice open defecation despite the fact that toilets are present in many homes (UDHD, 2014).

According to the 2011 Census, Bodhgaya total slum population was 17,704, or 46.05% of the city's total population. Bodhgaya has 18 slums with 3,109 households altogether (BNP, 2016). In the slums, lined pits with partially permeable walls are the most prevalent type of containment device. Although there are toilets in many homes, the majority of slum inhabitants still use open defecation (UDHD, 2014).

Currently, 534 individual toilets have been built as part of SPUR. The women of the Samuhik Vikas Samithi in Bodhgaya commission the construction of the individual family toilets for slum dwellers. Additionally, 16 hand pumps for SPUR have been installed (BNP, 2016).



Figure 7: Slums in ward no. 10:

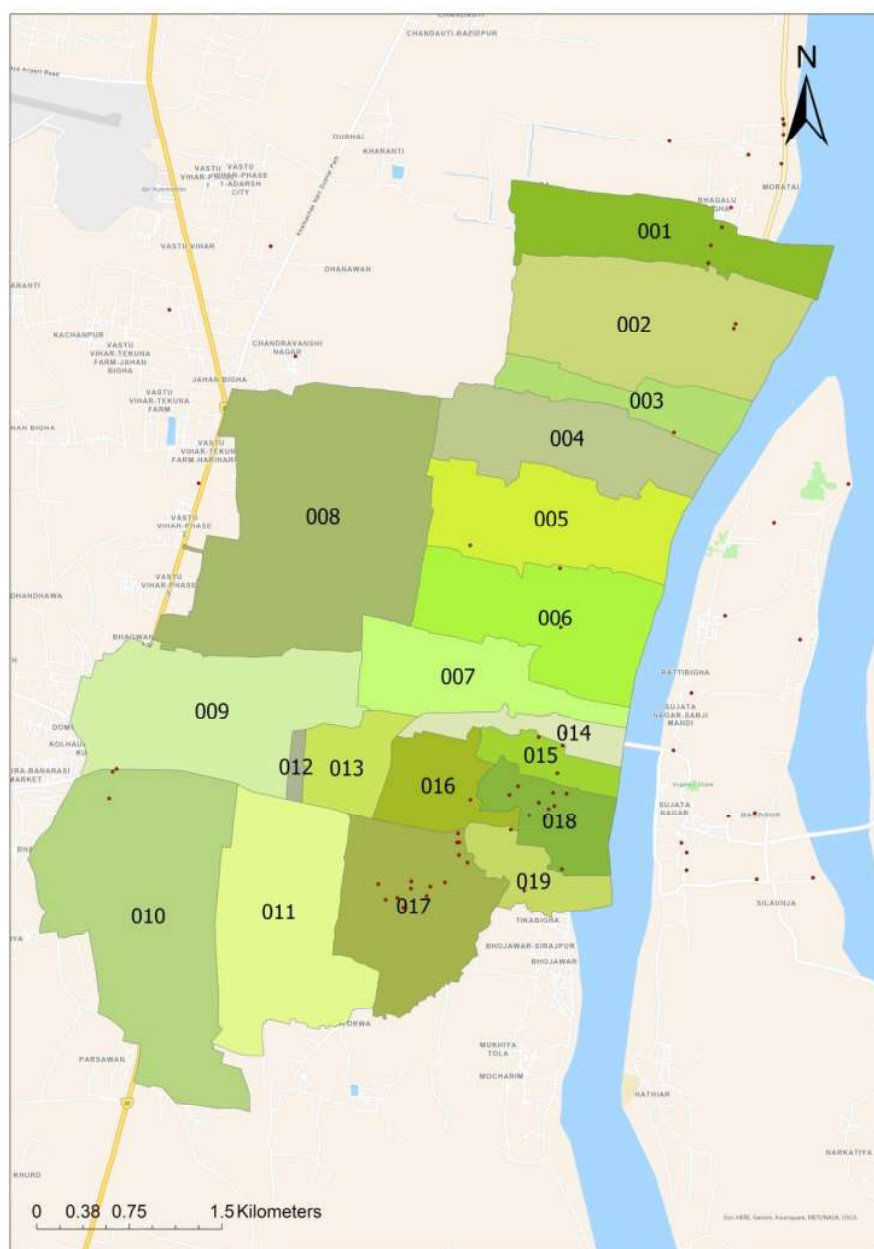


Figure 8: ward map of landmark

There are more than 28 nos. of temples, 55 nos. of monastery (Indian and foreign) in Bodhgaya. Maximum no. of Bodh temple and monasteries are exist in ward 14 to 19.

The current Mahabodhi Temple Complex at Bodhgaya consists of the 50-meter-tall great Temple, the Vajrasana, the sacred Bodhi Tree, and other six sacred locations of the Buddha's enlightenment. It is encircled by countless historic votive stupas and is well-maintained and protected by inner, middle, and outer circular bounds.

Through the Advisory Board and Bodhgaya Temple Management Committee (BTMC), the State Government is in charge of the property's management and security. The Committee meets once every three to four months to examine the status of the property's upkeep and preservation efforts and to control the flow of pilgrims and tourists. To handle the Temple's duties like office staff, security guards, gardeners, and sweepers, the Committee is staffed with 85 regular employees and more than 45 casual labourers.

Donations from devotees are the main source of funding for the property. The Temple Complex can be kept in good condition and visitor traffic can be effectively handled thanks to the management system's continued functioning.

The Bodhgaya Temple Management Committee also aims to maintain the property in a sustainable manner, for example, by using solar energy and maintaining a clean atmosphere.

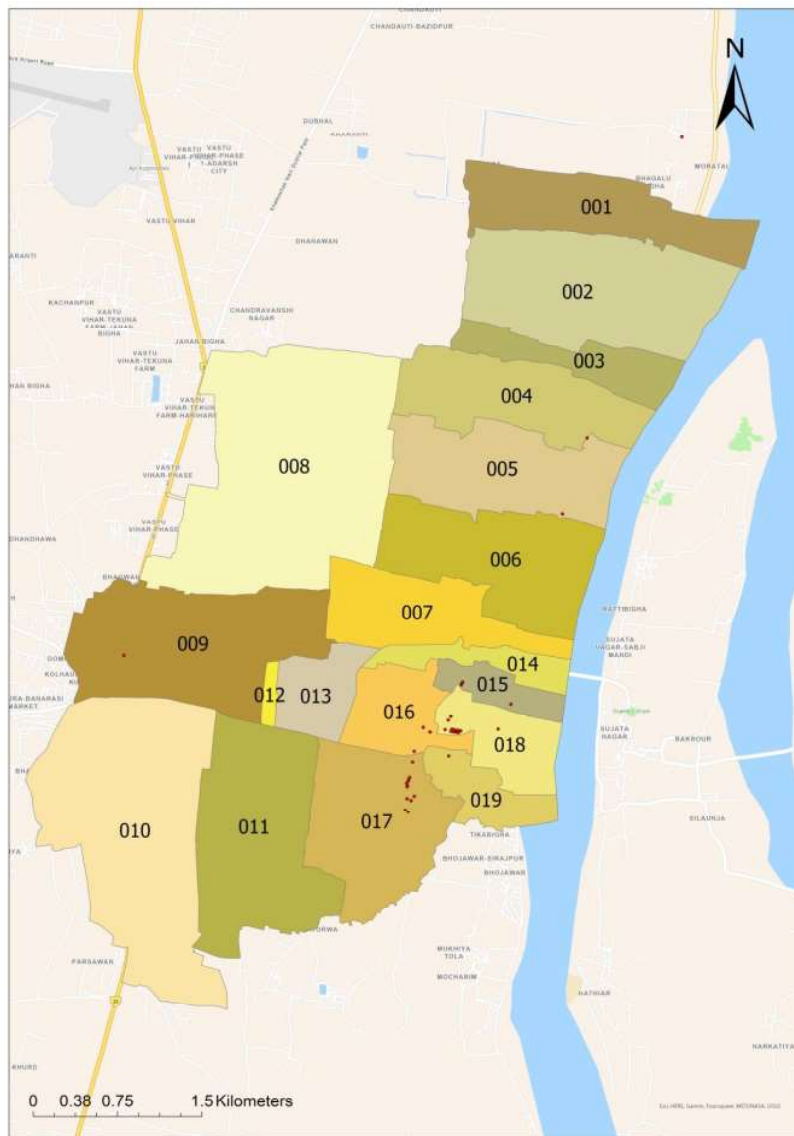




In Bodhgaya, there are several resorts that offer a comfortable and luxurious stay for visitors. Here are a few well-known resorts in Bodhgaya:

- Lotus Nikko Hotel
- Bodhgaya Regency Resort
- Royal Residency Resort
- Oaks Bodhgaya
- The Royal Residency Bodhgaya
- Kundan Bazaar Resort
- Maya Heritage

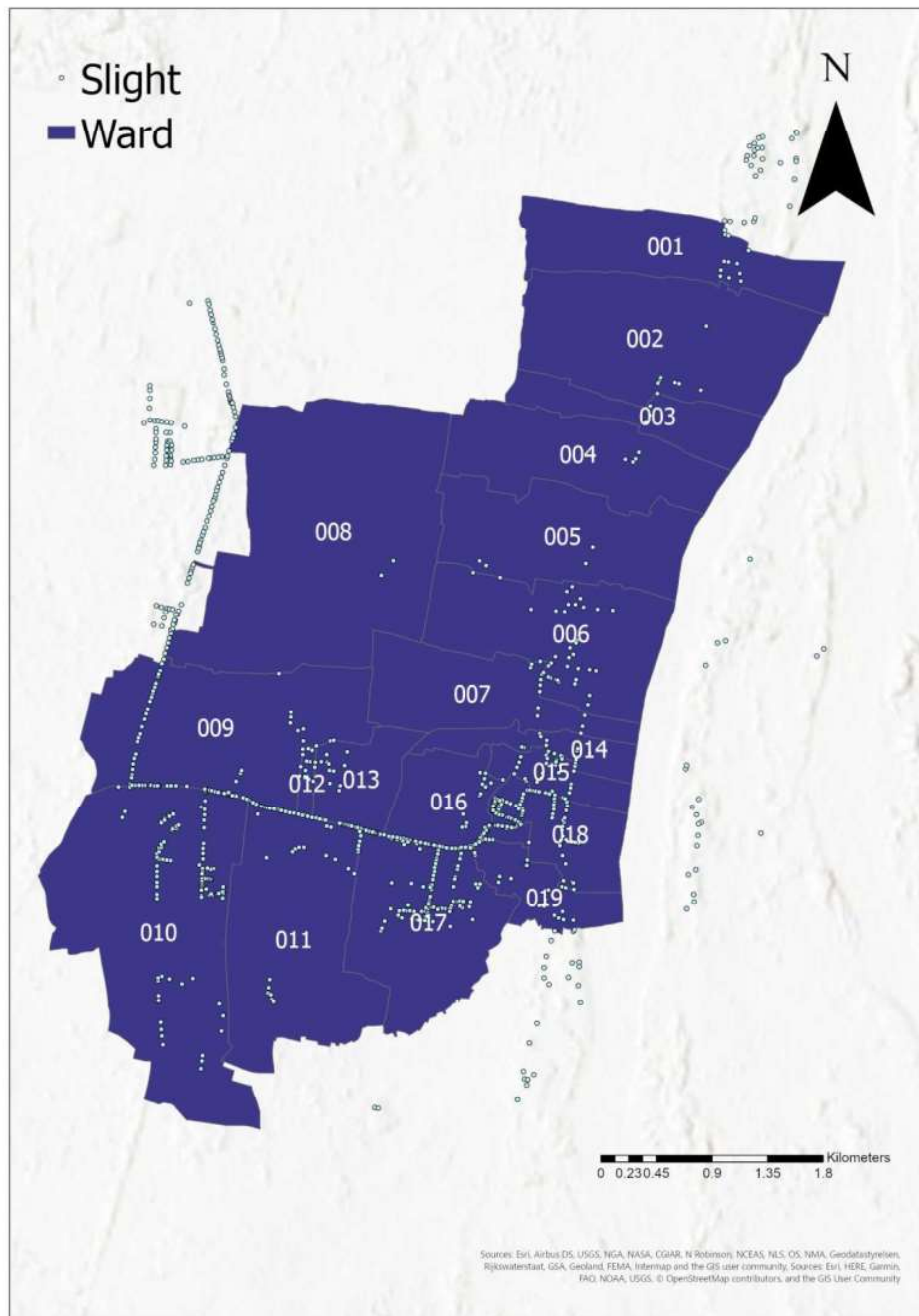




source 19:Author

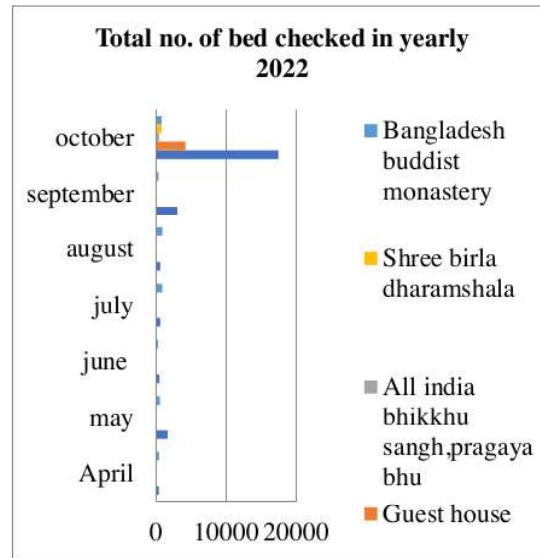
Figure 9: gis map of hotel and guest house

There are 54 nos. of registered guest houses , 54 nos. of hotels registered in Bodhgaya. there is a list or data of yearly checked in hotel and guest houses.



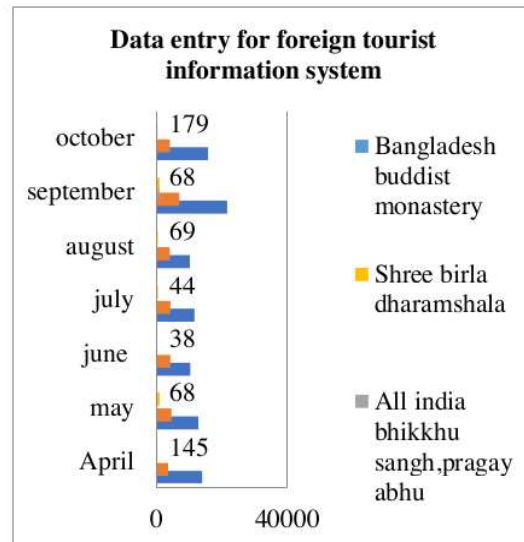
source 20:author

Figure 10: street light map of ward



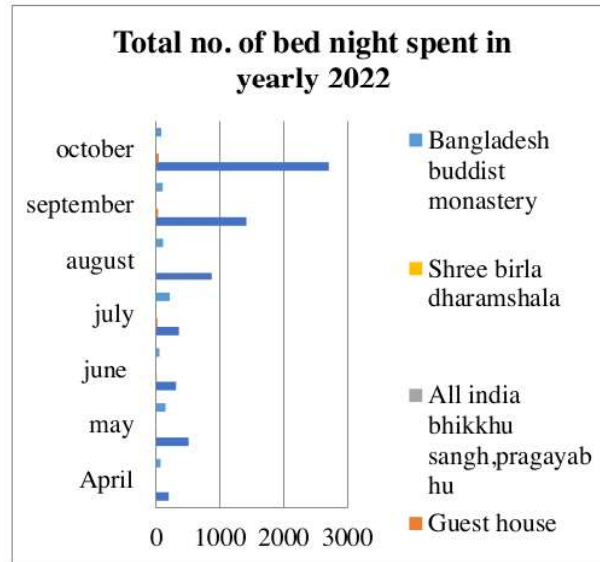
source 21:tourist information centre

chart 13:Data entry for domestic tourist information system



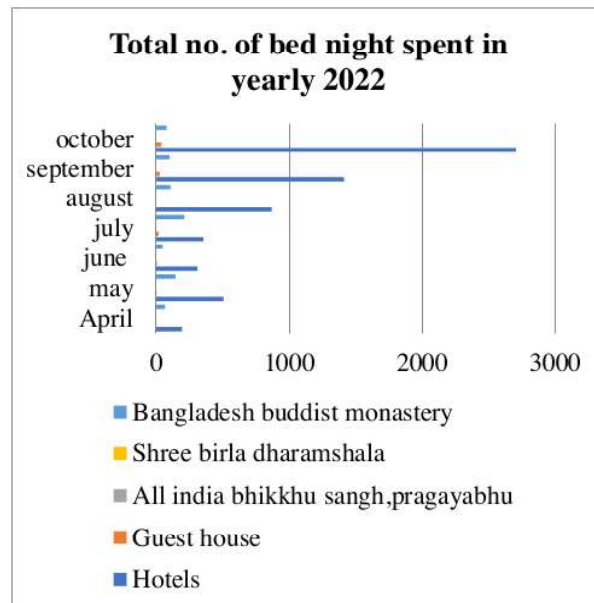
source 22:tourist information centre

chart 14:Data entry for foreign tourist information system



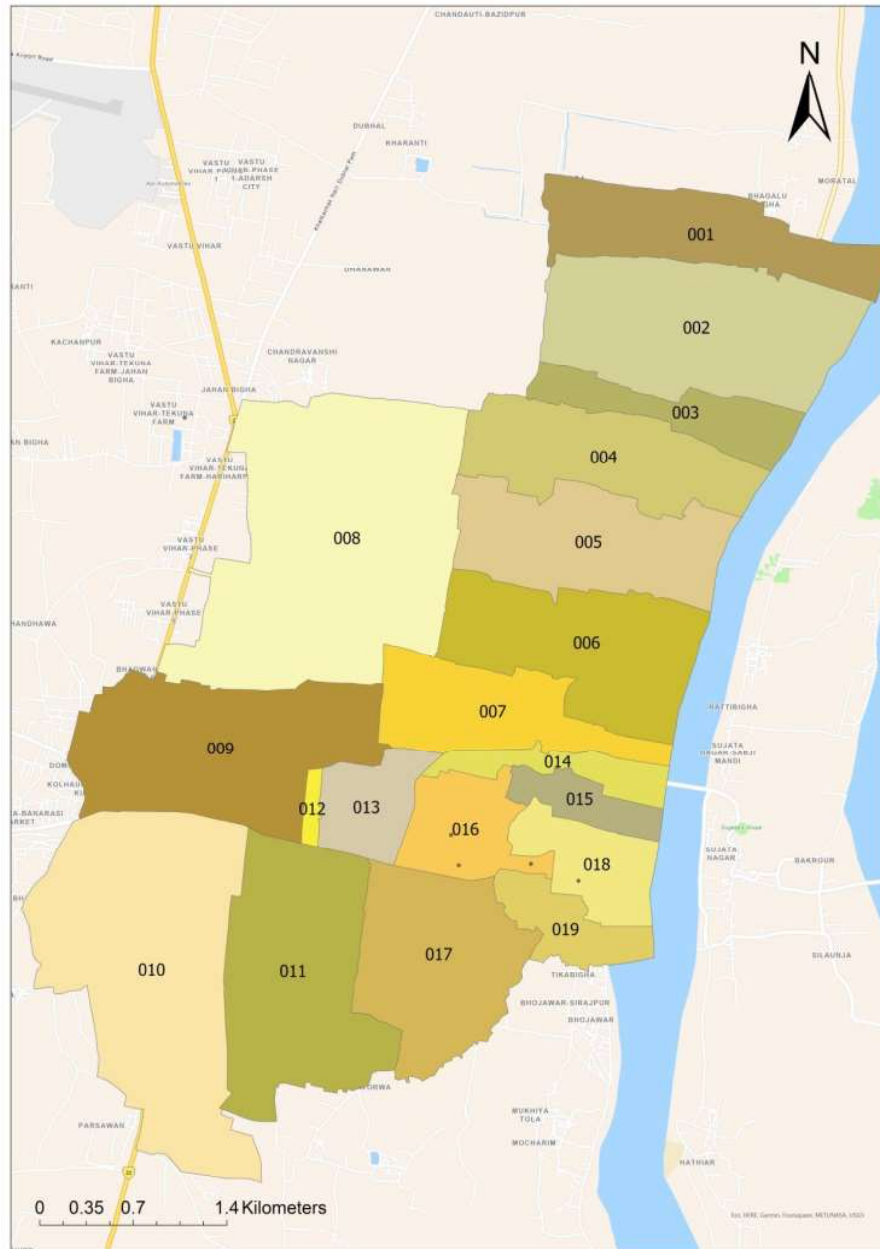
source 23:tourist information centre

chart 15:Data entry for domestic tourist information system



source 24:tourist information centre

chart 16:Data entry for foreign tourist information system



source 25:author

Figure 11:map of park



Figure 12:maya sarovar park, ward no.16



Figure 13:jai prakash narayan udhyan, ward no. 16

Maya Sarovar is a lush green park situated in the land of Buddha “Bodh Gaya” to give you a soothing experience. Park Campus is spread in about 5 Acres of Land; the Pond of the park is always open during visit time for amusement and entertainment.

The light and sound program on the life of Buddha is organized on a water screen created by a water fountain. This show is famously named Laser Show. This Park also witnesses many cultural events on different occasions.

Bodhgaya is known for its serene and peaceful environment, and there are several parks and gardens in and around the city where visitors can relax and enjoy the surroundings. Here are a few notable parks in Bodhgaya:

- Mahabodhi Temple Complex: The Mahabodhi Temple Complex itself is surrounded by beautifully landscaped gardens and lawns, providing a peaceful atmosphere for visitors to sit and meditate.
- Japanese Peace Pagoda Park: Located near the Mahabodhi Temple, the Japanese Peace Pagoda Park features a stunning white pagoda and well-maintained gardens. It's a popular spot for meditation and peaceful walks.
- Indosan Nippon Japanese Temple and Park: This park, situated a short distance from the Mahabodhi Temple, offers a serene environment with lush greenery, manicured lawns, and a Japanese temple.
- Muchalinda Lake: Muchalinda Lake, located near the Mahabodhi Temple Complex, has a small park area surrounding it. It's a tranquil spot where visitors can relax and enjoy the serene surroundings.
- Tibetan Monastery Park: The Tibetan Monastery in Bodhgaya has a small park adjacent to it. It provides a peaceful atmosphere with prayer flags, statues, and seating areas.

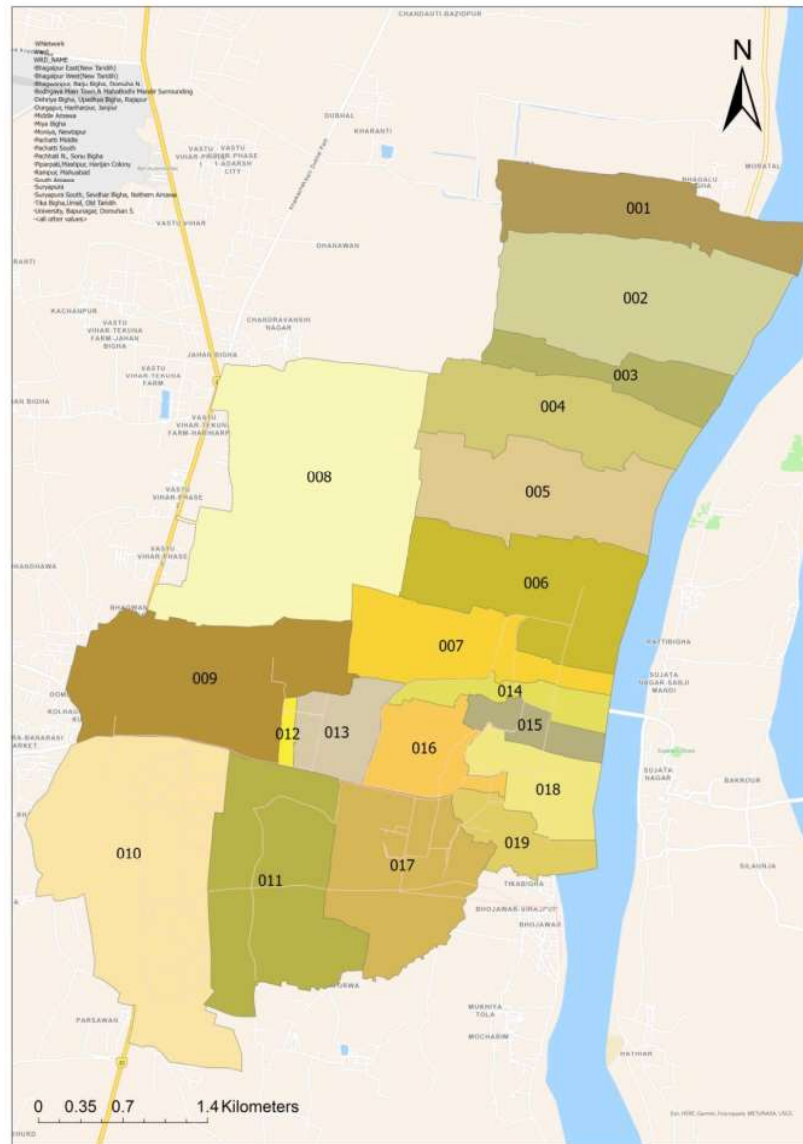
These are just a few examples of parks in Bodhgaya. The city is known for its spiritual ambiance and natural beauty, so there may be other smaller parks or green spaces that offer peaceful retreats as well. Exploring the local area around the Mahabodhi Temple Complex will provide opportunities to discover more serene spots and beautiful gardens.



Figure 14: Mahabodhi Temple Complex



Figure 15: Muchalinda Lake

WATER SUPPLY:

source 26:author

Figure 16map of :water supply network

5.1.1.1: WATER SUPPLY AND SANITATION ARRANGEMENTS

¹ With the assistance of a commercial contracting firm, Jindal water infrastructure limited (JWIL), piped water supply (PWS) was first implemented in Bodhgaya in 2017 by Bihar urban infrastructure development company limited (BUIDCO). Water resource development, providing water to consumers, and operations and maintenance for the first three years are JWIL's three key responsibilities.

¹ Pws services have been implemented in 15 out of the 19 wards, delivering water to 7,890 households via a combination of pws and 150 stand-post connections. Pipelines are still being laid in the four wards (2,106 HH) that are left.

¹ The Sanitation Task Force looks into issues connected to water and sanitation in towns, whereas the nagar panchayat employs BUIDCO as a grievance redressal process there.

¹ During the peak tourism season, especially during the 'kalachakra puja' and 'Bodh mahotsav' when thousands of tourist flock Bodh Gaya, the nagar panchayat makes temporary supply arrangements at ten marketplaces and pilgrimage sites.



SANITATION

¹ According to the ward 6 responders, "most of the containment structures are connected to the open drains, causing faecal matter to be discharged in the open." The effective management of faecal sludge is crucial.

In the past, 90.6% of the toilet pits remained in place. Bodh Gaya lacks a sewerage collection and treatment facility, which increases the risk of faecal management-related contamination of the groundwater and surface water bodies.

Currently, wastewater from individual homes, monasteries, temples, and other institutions is dumped into the neighbouring agricultural fields or storm drains either without any treatment or after only a minimal amount of treatment, while sewage from these locations makes its way into the nearby river Phalgu.

¹ The minimum safe horizontal distance of ten metres between the principal groundwater source and the closest toilet pit has not been maintained by 31.7% of households.[8]

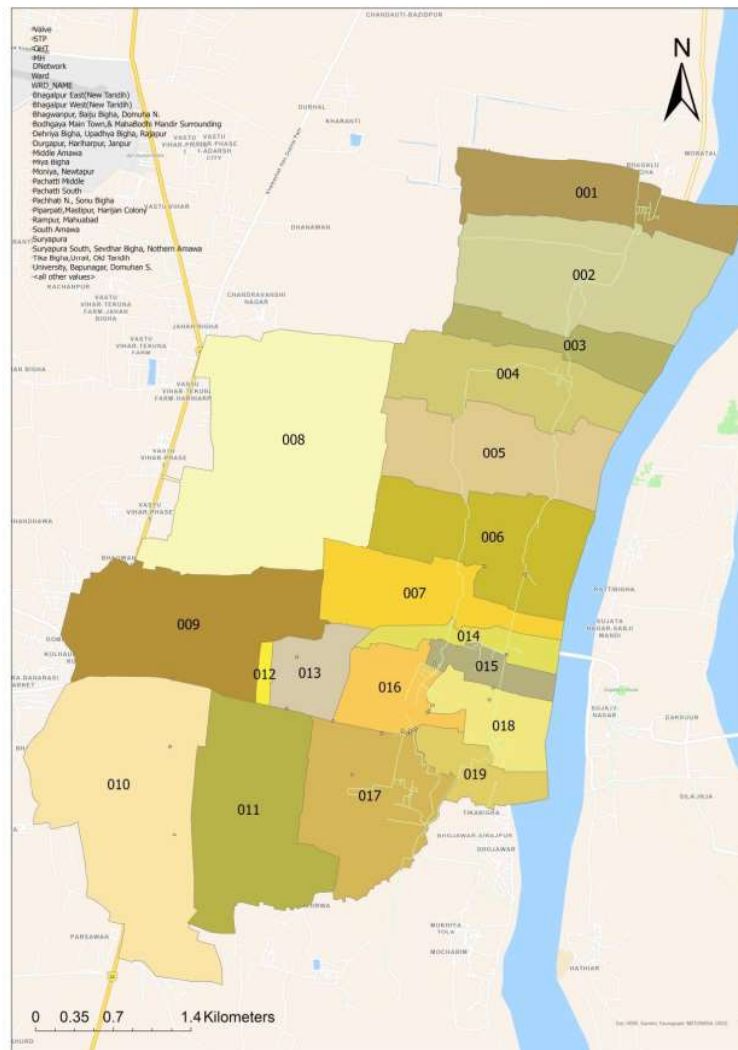
INTERVENTIONS NEEDED

- Given that the town's piped water supply system has just been installed, ¹ its operations and maintenance system need to be planned with the roles and duties of the implementing agency, operating agency, and nagar panchayat being clearly specified.
- In Bodh Gaya, it is not customary to monitor the water quality at household or public water sources. ¹ Since contamination has been found in both public and private water sources, it is advised that state-level protocols for monitoring urban water quality be created and followed by the ULBs.
- The State contamination Control Board should develop a thorough plan to avoid, manage, or reduce stream and pond contamination.
- Because the PWS and private water sources are also ¹ reliant on groundwater, the community relies heavily on it. Thus, ¹ in accordance with the 2014 Bihar Building By-laws, groundwater recharge should be given top priority, and

strategies like rainwater collecting should be encouraged in public spaces and at the home level.

- The State contamination Control Board should develop a thorough plan to avoid, manage, or reduce stream and pond contamination.

DRAINAGE NETWORK



source 27:author

Figure 17:map of drainage network

In Bodhgaya, the drainage network likely consists of a combination of surface drains, underground sewer lines, and other associated infrastructure. Here are some key components that are typically part of a drainage network:

- **Surface Drains:** These are open channels or gutters constructed along roads and streets to collect rainwater and direct it towards designated outlets or natural water bodies. Surface drains often have concrete or brick-lined sections and may incorporate grates or covers at certain points to prevent debris from entering.
- **Sewer Lines:** Underground sewer lines are used to collect and convey wastewater from buildings, households, and other sources to treatment facilities or disposal points. These sewer lines are typically made of pipes, which are either made of materials such as PVC (polyvinyl chloride), concrete, or other suitable materials.
- **Manholes:** These are access points located at various intervals along the sewer lines. Manholes provide entry points for maintenance personnel to inspect and clean the sewer lines. They are usually covered with heavy lids or grates to prevent unauthorized access and ensure safety.
- **Storm water Management:** In addition to wastewater, the drainage network also includes provisions for managing storm water runoff. This may involve the use of storm water drains, retention ponds, or other techniques to control and manage excess rainwater during periods of heavy rainfall.

Solid waste management

- Solid waste management in Bodhgaya, like in many other cities, is an essential aspect of maintaining cleanliness and environmental sustainability. Proper waste management practices aim to minimize the impact of waste on public health, sanitation, and the overall environment. Here is an overview of the solid waste management system in Bodhgaya:
- **Waste Collection:** The Bodhgaya Municipal Corporation or a designated waste management authority is responsible for the collection of solid waste from households, commercial areas, and public spaces. They employ waste

collection vehicles and personnel to collect the waste and transport it to appropriate disposal facilities.

- **Segregation:** Waste segregation at the source is an important step in solid waste management. Residents are encouraged to separate their waste into different categories such as biodegradable, non-biodegradable, recyclable, and hazardous waste. This helps in efficient handling, treatment, and recycling of different types of waste.
- **Transfer Stations:** Transfer stations are intermediate facilities where waste is temporarily stored before being transported to final disposal sites. These stations serve as consolidation points for waste collection vehicles, enabling efficient transportation and reducing the number of direct trips to disposal sites.
- **Solid Waste Treatment and Disposal:** The waste collected in Bodhgaya is usually transported to designated waste treatment and disposal facilities. Common methods include land filling, composting, and recycling. Landfills are used for non-biodegradable and residual waste that cannot be recycled or treated further. Composting is employed for the organic waste to produce nutrient-rich compost. Recycling facilities may handle materials such as paper, plastic, glass, and metals.
- **Awareness and Education:** Public awareness campaigns and education programs play a crucial role in promoting responsible waste management practices among residents and businesses. These initiatives aim to raise awareness about waste segregation, recycling, and the importance of reducing waste generation.

Sewage management

Sewage management is a crucial aspect of maintaining public health and environmental sustainability in any city, including Bodhgaya. I can provide a general overview of sewage management practices typically employed in urban areas.

Sewerage Network: Bodhgaya likely has a sewerage network consisting of underground sewer lines that collect and transport wastewater from residential,

commercial, and public establishments. These sewer lines are typically connected to individual buildings and lead to centralized treatment facilities or disposal points.

- **Wastewater Treatment:** The collected sewage is treated in wastewater treatment plants to remove pollutants and harmful substances before it is discharged into natural water bodies or reused for non-potable purposes. The treatment processes may involve physical, chemical, and biological treatment methods to ensure the water is safe for the environment.
- **Septic Tanks and On-site Systems:** In areas where a centralized sewerage system is not available, septic tanks and on-site sewage treatment systems may be used. These systems treat and store wastewater on individual properties before it is disposed of or transported to treatment facilities.
- **Maintenance and Operation:** Regular maintenance and operation of the sewage infrastructure, including cleaning and repairs, are essential to ensure proper functioning and prevent blockages or leaks. Municipal or local authorities are responsible for the management, maintenance, and operation of the sewage system.
- **Environmental Impact:** Proper sewage management aims to minimize the environmental impact of untreated or poorly treated wastewater. By treating sewage, potential pollution of water bodies, groundwater contamination, and the spread of waterborne diseases can be mitigated.

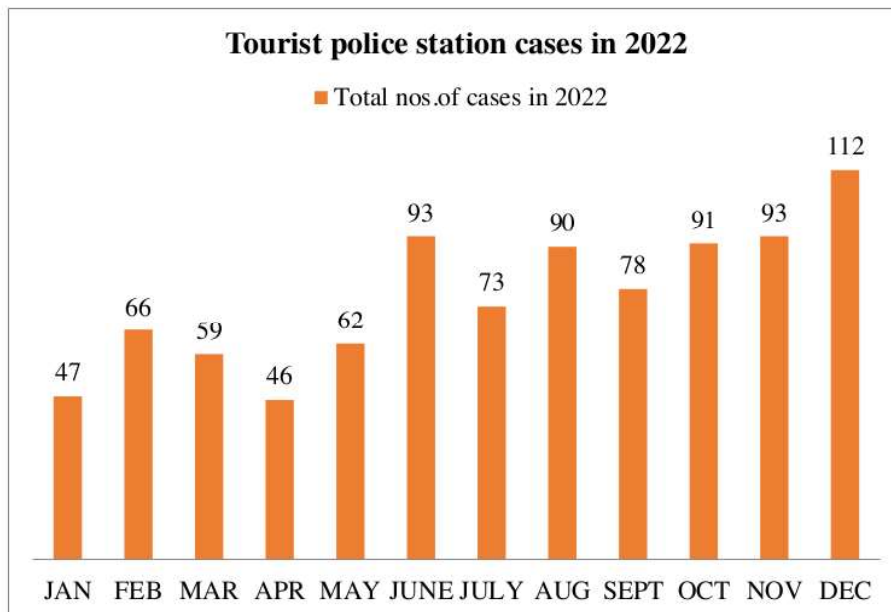
Crime rate

Crime cases of Bodhgaya have maximum n0.of domestic cases. There is no any tourist attack in that area. many cases done near to residential areas.

High Rate – Domestic Violence And alcoholism

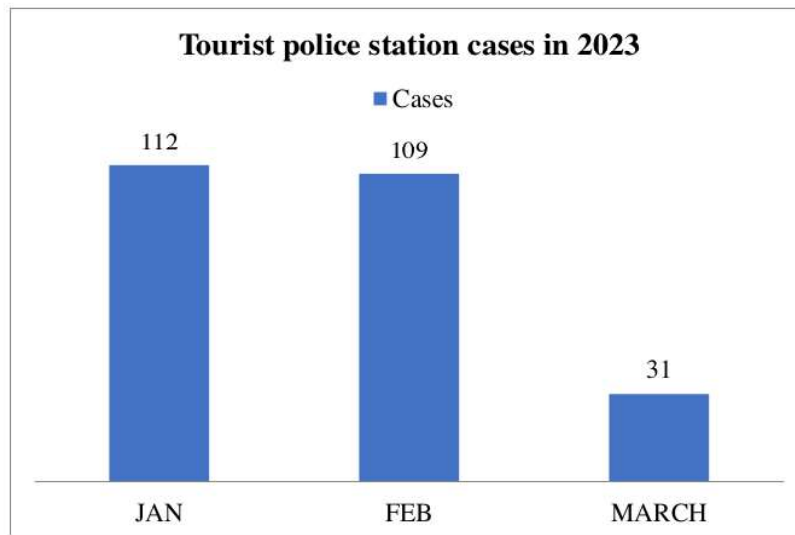


source 28:internet



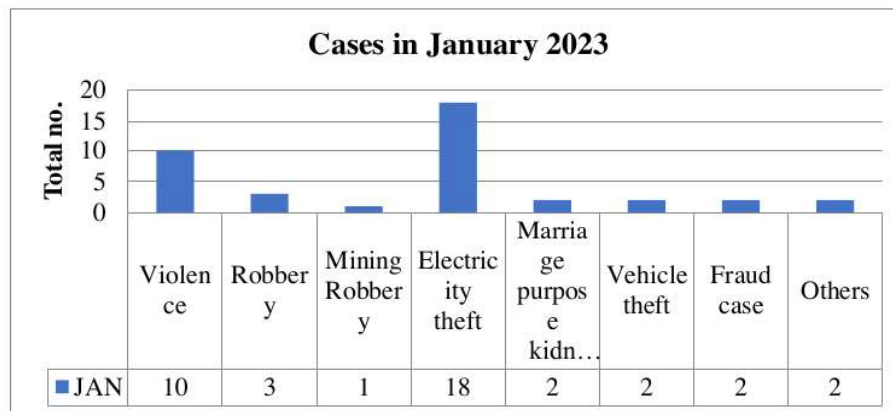
source 29:police station

chart 17:crime cases in 2022



source 30:police station

chart 18:crime cases in 2023 in three month



source 31:police station

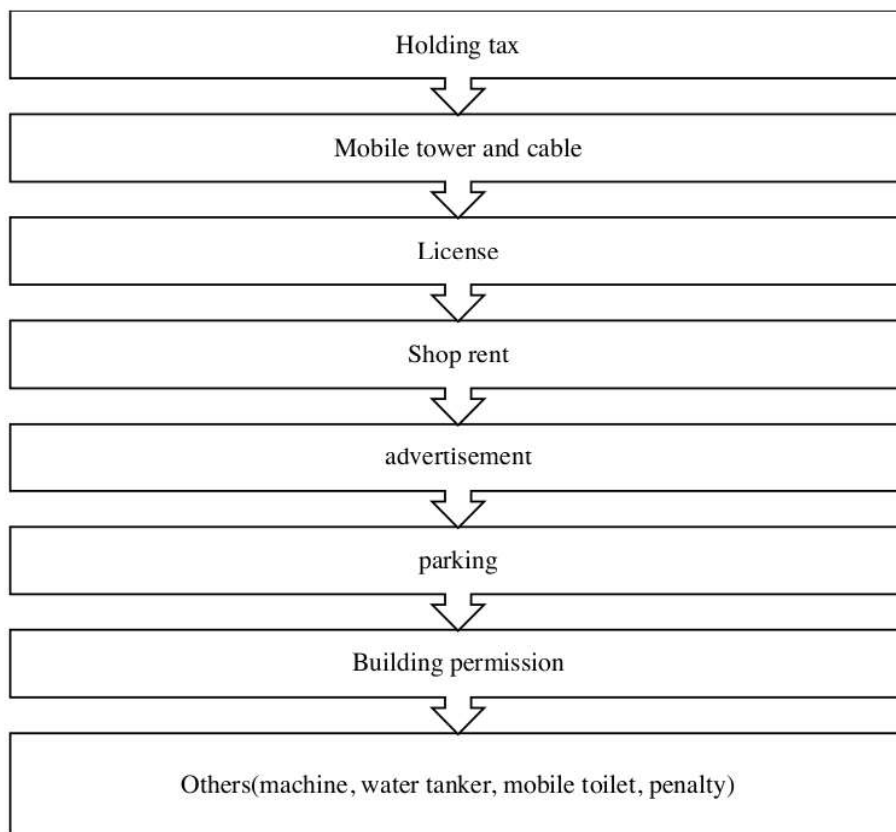
chart 19:crime case in January 2023

We can see there is maximum no. Of cases of electricity theft and violence. There is no any tourist cases.

CHAPTER 6: ECONOMIC AND FINANCE

Employment generation:

- It hires workers according to their degree and qualification.
- Income have distribute with the help of sanitation, water resources, electricity and infrastructure...
- Main source for economic revenue generation is donation.



source 32:Bodhgaya nagar panchayat

chart 20:revenue generation in nagar panchayat

Revenue generation

key contributors to the revenue generation

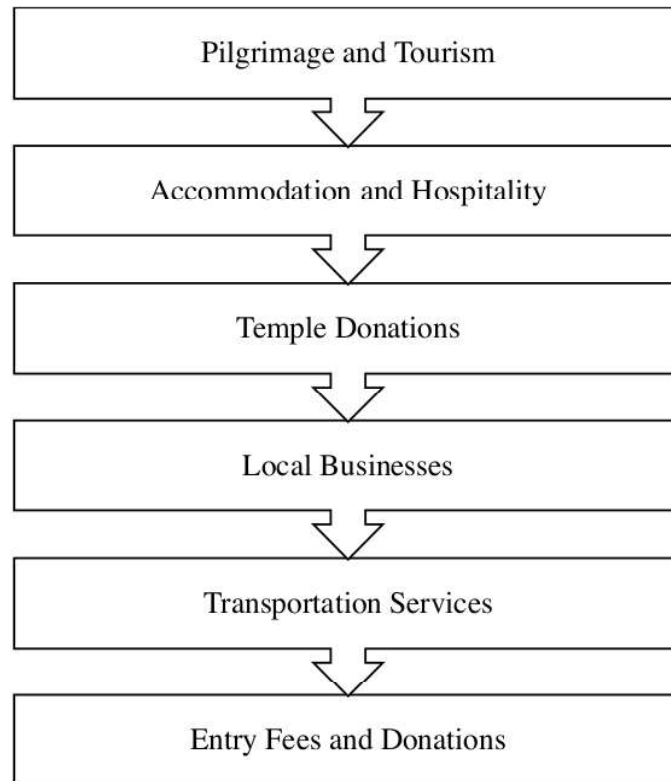


chart 21:key contributors to the revenue generation

The revenue generation in Bodhgaya primarily stems from various sources related to tourism, religious activities, and local businesses. Here are some key contributors to the revenue generation of Bodhgaya:

- Pilgrimage and tourism: Bodhgaya is a major pilgrimage site for Buddhists, attracting a significant number of domestic and international tourists. Pilgrims and tourists contribute to the local economy through accommodation, transportation, food and beverages, souvenir purchases, and donations to the temples and monasteries.

- **Accommodation and hospitality:** the hospitality sector plays a crucial role in revenue generation in Bodhgaya. Hotels, guesthouses, resorts, and home stays cater to the accommodation needs of the visitors. The revenue is generated through room bookings, dining services, and other facilities offered by these establishments.
- **Temple Donations:** The Mahabodhi Temple and other Buddhist monasteries in Bodhgaya receive donations from pilgrims and devotees. These contributions, made in the form of offerings, monetary donations, and support for various rituals and ceremonies, contribute to the revenue generation of the religious institutions.
- **Local Businesses:** Bodhgaya has a thriving market where local vendors and businesses sell a variety of products, including handicrafts, religious items, textiles, and souvenirs. The revenue is generated through the sale of these goods to the tourists and pilgrims.
- **Transportation Services:** Transport services, such as taxis, auto-rickshaws, and cycle rickshaws, contribute to the revenue generation by providing transportation options for tourists within Bodhgaya and for commuting to nearby attractions.
- **Entry Fees and Donations:** Some attractions within Bodhgaya may charge entry fees for visitors, which contribute to the revenue. Additionally, donation boxes are often placed in temples and monasteries where visitors can voluntarily contribute funds for the upkeep and maintenance of the sacred sites.

It is important to note that the revenue generation in Bodhgaya is subject to fluctuations based on factors such as tourist influx, seasonal variations, and the overall economic climate. The revenue generated is utilized for the maintenance and development of the town, infrastructure improvement, conservation of heritage sites, and welfare initiatives for the local community.

Agriculture

Agriculture plays a significant role in the local economy of Bodhgaya and the surrounding areas. Here are some key aspects of the agriculture sector in Bodhgaya:

- **Cropping Patterns:** The agriculture in Bodhgaya is characterized by a mix of rain-fed and irrigated farming practices. Farmers cultivate a variety of crops based on the prevailing climatic conditions and soil types. Common crops grown in the region include paddy rice, wheat, maize, pulses (such as lentils and chickpeas), oilseeds, vegetables, and fruits.
- **Irrigation:** As Bodhgaya is situated in the Gangetic plains, irrigation is essential for agriculture. Farmers rely on various sources of irrigation, including wells, tube wells, canals, and tanks. The availability of water plays a crucial role in determining crop yields and patterns.
- **Farming Techniques:** The agriculture practices in Bodhgaya are a mix of traditional and modern techniques. While some farmers still follow traditional farming methods, there is an increasing adoption of modern techniques such as improved seed varieties, mechanization, and the use of fertilizers and pesticides to enhance productivity.
- **Land Holdings:** Agriculture in Bodhgaya is predominantly based on small and marginal landholdings. The majority of farmers are small-scale farmers who depend on their land for sustenance and income. However, there are also larger farms that employ modern agricultural practices.
- **Livestock Rearing:** Livestock rearing, including cattle, goats, and poultry, is an integral part of the agricultural economy in Bodhgaya. Livestock provides additional income for farmers through milk production, meat, and other dairy products.
- **Agricultural Economy:** Agriculture contributes significantly to the local economy by providing livelihoods to a large section of the population. It generates employment opportunities for farmers, farm laborers, and those involved in allied activities such as transportation, storage, and processing of agricultural produce.
- **Government Support:** The government of Bihar has implemented various agricultural schemes and initiatives to support farmers in Bodhgaya and across the state. These include subsidies on inputs like seeds and fertilizers, access to credit, insurance coverage, and agricultural extension services.

It's important to note that the specific crops, agricultural practices, and socio-economic factors may vary within the Bodhgaya region based on factors such as soil fertility, rainfall patterns, and the preferences of individual farmers.

key aspects of the agriculture sector in Bodhgaya

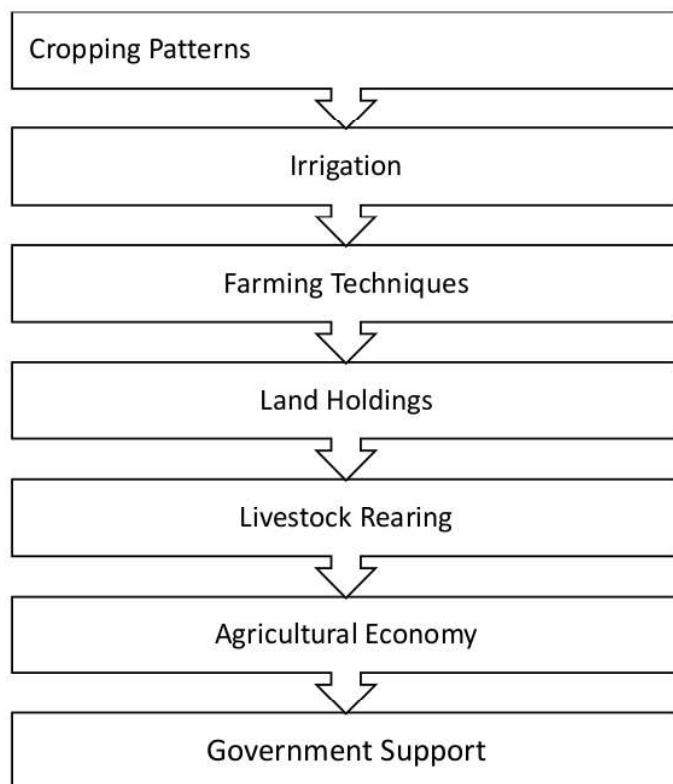


chart 22:key aspects of the agriculture sector in Bodhgaya

7.7 GOVERNMENT PROJECTS

6.1.1.1: HAR GHAR GANGA JAL SCHEME

- The scheme will harvest the excess water in the ganga during the monsoon flooding season, to be treated, stored, and piped to Rajgir, Gaya, and Bodhgaya,

regions that have for long depended on tankers of drinking water from adjoining districts.

- Har ghar ganga jal is part of the Bihar government's jal, jeevan, hariyali scheme.
- The initiative would use new, rebuilt, and existing water connections to get to every beneficiary family, and its first phase will cost 4,000 crore rupees to implement.
- The project's second phase, which is scheduled to begin in 2023, will supply ganga water to nawada.



source 33:internet

6.1.1.2: PILGRIMAGE REJUVENATION AND SPIRITUAL, HERITAGE AUGMENTATION DRIVE (PRASHAD)

PRASHAD is a central government scheme aimed at the development and beautification of pilgrimage sites in India, including those of religious and cultural importance. Under this scheme, initiatives may be undertaken to improve infrastructure, tourism facilities, and amenities in and around Bodhgaya.

6.1.1.3: SWADESH DARSHAN SCHEME

Swadesh Darshan is another central government initiative that focuses on the development of thematic tourist circuits across the country. Bodhgaya, being a significant Buddhist pilgrimage site, could be a part of the Buddhist Circuit under this

scheme, leading to infrastructure development, signage, interpretation centers, and other amenities to enhance the tourism experience.

6.1.1.4: HERITAGE CITY DEVELOPMENT AND AUGMENTATION YOJANA (HRIDAY)

HRIDAY is a scheme by the Ministry of Housing and Urban Affairs that aims to preserve and develop the heritage and cultural aspects of specific cities. While Bodhgaya is not specifically mentioned in the list of HRIDAY cities, it's possible that nearby heritage cities or towns could benefit from this scheme, indirectly impacting the region.

6.1.1.5: STATE GOVERNMENT SCHEMES

The government of Bihar may have its own schemes and initiatives targeted at the development of Bodhgaya and the surrounding areas. These could include infrastructure development, tourism promotion, conservation efforts, and community welfare programs. Checking with the Bihar state government or relevant local authorities would provide more accurate and detailed information on such schemes.

It's important to note that government schemes and initiatives are subject to change and evolve over time. Therefore, staying updated with the latest announcements and developments from the relevant government bodies is advisable for accurate information on current schemes in Bodhgaya.

CHAPTER 7: PROBLEM STATEMENT

- The surrounds have been significantly impacted by tourism. Consumerism is contributing to contamination of the land, water, and air, which has an impact on the health of local residents and animals.
- Bodhgaya is under a great deal of strain from litter and pollution brought on by negligence or apathy. Problems like plastic pollution are a common threat to the general well-being of those who live in or visit Bodhgaya.
- The amount of rubbish entering the area doubles from the beginning of winter (October to March).
- The locals of Bodhgaya frequently take care of the disposal of village rubbish by burning it every evening or dumping it in open landfills.



source 34:author



source 35:author

Impacts of sustainable tourism of Bodhgaya

Sustainable tourism can have several positive socio-cultural effects on a destination. Here are some of the key benefits:

- **Preservation of Cultural Heritage:** Sustainable tourism emphasizes the preservation and appreciation of a destination's cultural heritage. It encourages the protection of historical sites, traditions, customs, and artistic expressions. By promoting respect for local cultures and involving local communities in tourism development, sustainable tourism helps safeguard and celebrate the unique socio-cultural identity of a place.
- **Cultural Exchange and Understanding:** Sustainable tourism fosters cultural exchange and interaction between visitors and the local community. It provides opportunities for visitors to learn about the local customs, traditions, and way of life, promoting mutual understanding and appreciation. This cultural exchange enriches the experiences of both visitors and locals, leading to greater tolerance, respect, and cultural harmony.
- **Empowerment of Local Communities:** Sustainable tourism prioritizes the involvement and empowerment of local communities. It encourages their active participation in decision-making processes, tourism planning, and the sharing of benefits. Through community-based tourism initiatives, local residents can preserve and showcase their cultural heritage, generate income, and develop skills that contribute to their socio-economic well-being.
- **Revitalization of Traditional Arts and Crafts:** Sustainable tourism can revitalize traditional arts, crafts, and cultural practices that may have been declining. By creating demand for authentic local products, sustainable tourism provides opportunities for artisans and traditional craftsmen to showcase their skills, preserve traditional techniques, and earn a living. This contributes to the cultural vibrancy and economic sustainability of local communities.
- **Preservation of Indigenous Knowledge:** Sustainable tourism encourages the recognition and preservation of indigenous knowledge and practices. It values the wisdom and expertise of indigenous communities and promotes their

involvement in sharing their traditional knowledge with visitors. This helps protect indigenous cultures, promotes intergenerational learning, and contributes to the overall cultural diversity of a destination.

- **Community Pride and Cultural Revitalization:** Sustainable tourism can instill a sense of pride and revitalization within local communities. When communities actively participate in tourism development and witness the positive impacts it brings, they become more motivated to preserve and showcase their cultural heritage. This can lead to cultural revitalization, increased community pride, and a stronger sense of identity.
- **Enhanced Cultural Awareness:** Sustainable tourism fosters greater cultural awareness among visitors. Through immersive experiences, cultural performances, guided tours, and interaction with locals, visitors gain a deeper understanding of the host community's values, beliefs, and way of life. This heightened cultural awareness promotes respect, empathy, and cross-cultural learning.
- **Support for Cultural Revival and Festivals:** Sustainable tourism can contribute to the revival and celebration of cultural festivals and events. Visitors' participation and interest in local festivals provide economic opportunities for communities, encourage the continuation of traditional celebrations, and help sustain cultural practices that may have been declining.



Socio cultural negative effects of sustainable tourism

- **Cultural co modification:** The demand for authentic cultural experiences may sometimes lead to the commercialization and co modification of local traditions, rituals, and artifacts. This can result in the distortion or dilution of cultural practices, as they are altered to meet tourist expectations. Local communities may feel pressured to conform to tourist stereotypes and compromise the authenticity of their traditions.
- **Loss of privacy and sacredness:** Increased tourism can infringe upon the privacy and sacredness of local religious sites and practices. Bodhgaya is a significant Buddhist pilgrimage site, and the influx of visitors may disrupt the peaceful and contemplative atmosphere that pilgrims seek. The constant presence of tourists may limit access or disturb the spiritual practices of local monks and devotees.
- **Disruption of traditional lifestyles:** The introduction of tourism can bring changes to the traditional lifestyles and social fabric of local communities. Increased economic opportunities may lead to a shift away from traditional livelihoods towards more tourism-oriented activities, altering the dynamics of community relationships and potentially causing social tensions. Traditional occupations and cultural practices may decline as people adapt to meet the demands of the tourism industry.
- **Social inequality and gentrification:** The benefits of sustainable tourism may not always be distributed equitably among the local community. Economic disparities can arise as wealthier individuals or outside investors dominate the tourism sector, leading to social inequality. Gentrification can occur when rising property prices and the development of upscale accommodations displace local residents, changing the socio-cultural character of the area.
- **Environmental impact:** While the focus here is on socio-cultural effects, it is worth mentioning that unsustainable tourism practices can have indirect socio-cultural consequences. Environmental degradation, pollution, and the strain on natural resources can harm the physical surroundings that hold cultural and

spiritual significance, negatively impacting the cultural identity and well-being of local communities.



Economical positive effects of sustainable tourism

Sustainable tourism in Bodhgaya has brought about several positive economic effects, benefiting the local community and the region's economy. Some of the key economic benefits of sustainable tourism in Bodhgaya include: Bodhgaya tourism include improved tax revenue and personal income, increased standards of living, and more employment opportunities.

- Increase in wealth/reduction in poverty, improved health, education and infrastructure and technology.
- Mahabodhi temple is one of the Buddhist temple which creates high economy because of donation.
- **Job Creation and Employment:** Sustainable tourism has generated employment opportunities for the local community in Bodhgaya. The growth of tourism-related businesses such as hotels, restaurants, tour operators,

transportation services, and handicraft industries has created jobs across various skill levels. This has reduced unemployment rates and provided income-earning opportunities for individuals and households.

- **Diversification of the Local Economy:** The development of sustainable tourism in Bodhgaya has helped diversify the local economy, reducing dependency on traditional sectors. Tourism-related businesses contribute to the economic growth and stability of the region, allowing for a more balanced and resilient economy. This diversification can provide alternative income sources and enhance economic sustainability.
- **Income Generation and Local Business Development:** Tourism expenditure in Bodhgaya generates income for local businesses. Local entrepreneurs, artisans, farmers, and service providers benefit from the demand for accommodations, souvenirs, local products, guided tours, and cultural experiences. This income circulation within the local economy stimulates business development, encourages entrepreneurship, and contributes to the growth of small and medium-sized enterprises.
- **Infrastructure Development:** Sustainable tourism development often necessitates investments in infrastructure and public services. In Bodhgaya, the growth of tourism has led to the improvement of transportation networks, construction of hotels and accommodations, development of visitor facilities, and enhancement of public amenities. These infrastructure developments not only support the tourism industry but also benefit the local community by improving access to services and promoting overall development.
- **Revenue Generation and Taxation:** Sustainable tourism contributes to the local and regional government's revenue through various forms of taxation and fees. This revenue can be reinvested in community development, infrastructure upgrades, conservation efforts, and the provision of public services. The economic benefits generated by sustainable tourism can support the overall socio-economic well-being of the local community.
- **Preservation of Traditional Livelihoods:** Sustainable tourism often emphasizes the preservation and promotion of traditional livelihoods. In Bodhgaya, local communities engaged in agriculture, handicrafts, and cultural

practices can benefit from tourism by showcasing their traditional skills and products. This encourages the continuation of traditional occupations, helps preserve cultural heritage, and provides income opportunities for individuals and communities reliant on these livelihoods.

- **Economic Spillover Effects:** Sustainable tourism can generate economic spillover effects, benefiting sectors beyond tourism. Increased visitor demand for local products, services, and cultural experiences can boost agricultural production, handicraft industries, food and beverage establishments, transportation services, and other sectors indirectly linked to tourism. This creates multiplier effects, stimulating economic growth and enhancing the overall economic vitality of the region.



Economical negative effects of sustainable tourism

Some potential negative effects of sustainable tourism on the economy include:

- **Leakage of Tourism Revenue:** In some cases, a significant portion of tourism revenue may leak out of the local economy. This can occur when large international tourism companies or outside investors dominate the tourism industry and repatriate profits to their home countries, leaving limited economic benefits for the local community. Leakage can hinder the economic growth and development potential of the region.
- **Seasonal Nature of Tourism:** Tourism in Bodhgaya may be subject to seasonality, with peak periods attracting a high number of visitors while other times experiencing lower tourist demand. This seasonality can result in fluctuations in income and employment opportunities, creating economic

instability for businesses and workers dependent on tourism-related activities. It may also lead to underutilization of resources during off-peak periods.

- **Dependency on Tourism:** Overreliance on tourism as the primary economic sector can make the local economy vulnerable to external factors beyond its control. Changes in global travel trends, geopolitical events, natural disasters, or economic downturns can significantly impact tourism demand, resulting in a downturn for businesses and a loss of income for the local community. Diversification of the economy becomes crucial to mitigate this risk.
- **Unequal Distribution of Benefits:** While sustainable tourism aims to benefit the local community, there is a risk of uneven distribution of economic benefits. Large-scale tourism infrastructure development and investment may disproportionately benefit larger businesses or outside investors, while smaller local enterprises and communities may struggle to access the benefits. This can exacerbate economic inequalities and hinder inclusive economic growth.
- **Increased Cost of Living:** The growth of tourism in Bodhgaya can lead to an increased cost of living for local residents. As demand for accommodations, goods, and services rises, prices may escalate, making it more challenging for the local community to afford basic necessities and housing. This can particularly impact vulnerable groups, exacerbating socio-economic disparities within the community.
- **Loss of Traditional Livelihoods:** The introduction of tourism and associated changes in market demand can disrupt traditional livelihoods in Bodhgaya. Local communities may transition away from traditional occupations and cultural practices to cater to tourism-related activities. This shift may lead to the loss of traditional knowledge, practices, and skills, impacting the cultural fabric of the community and potentially diminishing the unique character of the destination.
- **Environmental Costs:** Although primarily an environmental concern, unsustainable tourism practices can have indirect economic consequences. Environmental degradation, pollution, and resource depletion can damage the natural assets that attract tourists to Bodhgaya, impacting the long-term

sustainability of the tourism industry. Restoration efforts and the management of natural resources can incur economic costs.

Environmental positive effects of sustainable tourism

Sustainable tourism in Bodhgaya has brought about several positive environmental effects, contributing to the conservation and preservation of the region's natural resources. Some of the key environmental benefits of sustainable tourism in Bodhgaya include:

- **Conservation of Natural Landscapes and Biodiversity:** Sustainable tourism practices emphasize the protection of natural landscapes, including forests, rivers, and wildlife habitats. Efforts are made to minimize the impact of tourism activities on these areas, ensuring their preservation for future generations. This conservation helps maintain the biodiversity of Bodhgaya, protecting rare and endangered species of flora and fauna.
- **Sustainable Resource Management:** Sustainable tourism promotes responsible resource management practices. This includes reducing energy and water consumption, minimizing waste generation, and promoting recycling and waste management initiatives. These practices contribute to the conservation of resources and reduce the overall ecological footprint of tourism in Bodhgaya.
- **Promotion of Ecotourism:** Sustainable tourism in Bodhgaya often encourages the development of ecotourism initiatives. Ecotourism focuses on nature-based experiences that foster environmental awareness and conservation. Visitors are encouraged to engage in activities that have minimal impact on the environment, such as nature walks, bird watching, and guided tours that educate about the local ecosystem. This form of tourism supports the protection of natural areas and can generate revenue for conservation efforts.
- **Awareness and Education:** Sustainable tourism provides opportunities for environmental education and awareness-raising. Visitors to Bodhgaya can learn about the region's natural heritage, ecosystems, and environmental challenges. This knowledge promotes a sense of responsibility and encourages

visitors to make more sustainable choices both during their trip and in their daily lives. Increased environmental awareness among tourists can have a positive ripple effect beyond the destination.

- **Support for Local Conservation Initiatives:** Sustainable tourism often supports local conservation initiatives and organizations. Visitors can contribute to conservation efforts through donations, participation in volunteer programs, or by directly engaging with local conservation projects. These contributions can provide financial and human resources for environmental protection, helping to safeguard the natural beauty and ecological integrity of Bodhgaya.
- **Sustainable Transportation Practices:** Sustainable tourism encourages the use of environmentally friendly transportation options. Bodhgaya can promote the use of public transportation, cycling, and walking as alternatives to private vehicles. This helps reduce carbon emissions, air pollution, and traffic congestion, leading to improved air quality and a lower environmental impact.
- **Preservation of Cultural Landscapes:** Sustainable tourism recognizes the intrinsic link between cultural and natural heritage. Bodhgaya cultural landscapes, such as historic sites, monasteries, and temples, are often intertwined with the natural environment. By promoting sustainable tourism, the preservation of cultural landscapes is prioritized, ensuring their integrity and authenticity are maintained for future generations.



Environmental negative effects of sustainable tourism

Solid waste generate near to residential areas. Municipal taken penalty for that act but no one serious about that.



source 36:author

Figure 18:solid waste near to residence

Some potential negative environmental effects of sustainable tourism include:

- **Increased Carbon Footprint:** The transportation of tourists to and from Bodhgaya, particularly through air travel, contributes to carbon emissions and climate change. Despite efforts to promote sustainable transportation options, the overall increase in visitor numbers can lead to a higher carbon footprint, especially if adequate measures to offset or reduce emissions are not in place.
- **Pressure on Natural Resources:** Sustainable tourism can still place strain on local natural resources. Increased water consumption for hotels, restaurants, and visitor facilities can deplete local water sources, especially in areas already experiencing water scarcity. Additionally, the demand for construction materials, energy, and food supplies to cater to tourism can further strain local resources if not managed sustainably.
- **Habitat Degradation and Fragmentation:** The development of infrastructure and visitor facilities to support tourism can lead to habitat degradation and fragmentation. Construction activities, road expansion, and other forms of

infrastructure development may encroach upon natural habitats, disrupt ecosystems, and contribute to habitat loss for wildlife in and around Bodhgaya.

- **Waste Generation and Management:** The influx of tourists can lead to increased waste generation in Bodhgaya. Improper waste management practices, inadequate waste disposal facilities, and limited recycling options can result in environmental pollution, particularly if the waste is not properly managed and disposed of. This can have negative impacts on local ecosystems, water bodies, and wildlife.
- **Disturbance to Wildlife:** The presence of tourists, particularly in sensitive natural areas, can disrupt wildlife behavior and habitat. Noise pollution, habitat encroachment, and direct interaction with wildlife can disturb their natural patterns, potentially causing stress, changes in behavior, and ecological imbalances. Proper regulations and visitor education are essential to minimize these disturbances.
- **Cultural and Heritage Impacts:** Sustainable tourism in Bodhgaya may still have indirect environmental effects on cultural and heritage sites. Increased visitor numbers and associated infrastructure development can put pressure on these sites, potentially causing physical damage, erosion, or alteration of their natural surroundings. Balancing tourism activities with the conservation of cultural and heritage assets is crucial for long-term sustainability.
- **Water and Air Pollution:** Tourism-related activities, such as transportation, accommodation, and waste disposal, can contribute to water and air pollution in Bodhgaya. Improper waste management, sewage discharge, and vehicle emissions can degrade air and water quality, impacting the health of local communities, ecosystems, and the overall environmental integrity of the region.

To mitigate these potential negative environmental effects, it is important to adopt and enforce sustainable tourism practices that prioritize environmental conservation and responsible resource management. Implementing waste management systems, promoting renewable energy use, supporting local conservation initiatives, and raising

visitor awareness about the importance of environmental protection are essential for minimizing the environmental impacts of tourism in Bodhgaya.

Problems identified near to bus stand of Bodhgaya



source 37:author



source 38:author

Figure 19:bad condition of road and pathway



source 39:author

Figure 20:construction elements near to Mahabodhi sanskritik centre

RECOMMENDATION:

- Water mist or fine spray from nozzles to prevent dust at the site from re-suspension.
- Depending on the amount of dust produced, C&D wastes or building materials should preferably be covered when being stored or carried (on tractors or in trucks).
- Sprinklers with water, ideally treated waste water, should be used to smother transport vehicle routes across the building site.
- The simultaneous planting of green buffers around building sites would help to stop the spread of dust (preferably shrubs and trees with low water requirements).
- It is forbidden to dump (unload) or dispose of C&D wastes on any non-designated sites, including the sides of roads, vacant lots, water bodies, and drains.



source 40:author

Figure 21:water logging near to Mahabodhi sanskritik centre



source 41:author

Figure 22:lack of infrastructure and waste management near to market



source 42:author

Figure 23:everywhere dusting

There are several issues and challenges that have been identified in Bodhgaya. Some of these problems include:

- **Infrastructure:** Bodhgaya faces infrastructural challenges, including inadequate roads, lack of proper drainage systems, and limited accommodation facilities. The existing infrastructure often struggles to cope with the influx of tourists, leading to congestion and inconvenience.
- **Waste Management:** Waste management is a pressing issue in Bodhgaya. The large number of visitors generates a substantial amount of waste, which strains the existing waste management systems. Proper waste disposal and recycling facilities are required to maintain the cleanliness and environmental sustainability of the area.
- **Pollution:** Bodhgaya experiences various forms of pollution, including air and noise pollution. The increasing number of vehicles and inadequate emission control measures contribute to poor air quality. Noise pollution from traffic and

commercial activities can disrupt the peaceful atmosphere that is sought after by visitors.

- **Preservation of Heritage Sites:** Bodhgaya is home to several ancient Buddhist temples, monasteries, and archaeological sites of immense historical and cultural significance. However, the conservation and preservation of these heritage sites face challenges such as insufficient funds, inadequate maintenance, and encroachments. There is a need for better preservation efforts to safeguard these invaluable landmarks.
- **Economic Disparities:** Despite being a popular tourist destination, Bodhgaya faces economic disparities. The benefits of tourism are not evenly distributed, with some sections of the local population struggling to benefit from the industry. More inclusive development strategies and initiatives can help address these disparities and promote sustainable livelihoods for the local communities.
- **Seasonal Fluctuations:** Bodhgaya experiences seasonal fluctuations in terms of tourist arrivals. While it receives a significant number of visitors during peak seasons, there are periods of low tourist footfall. This fluctuation impacts the local economy and makes it challenging for businesses to maintain a stable income throughout the year.

Addressing these problems requires a collaborative effort between the local government, community organizations, and stakeholders involved in Bodhgaya development. Initiatives focused on infrastructure development, waste management, heritage preservation, sustainable tourism practices, and community empowerment can help overcome these challenges and ensure the long-term sustainability of Bodhgaya as a sacred and culturally significant destination.

RECOMMENDATION:

Water necessary

1. Water will be needed for drinking and residential purposes, for plantation irrigation, and for dust suppression. There will be no fresh water requirement for dust suppression.

2. Use of 'treated waste water' (preferably) in sprinklers for dust suppression

- In order to comply with ambient air quality standards, any man-made intervention (such as dust-generating activities in C & D waste management) must adopt necessary dust suppression measures, such as water sprinklers using treated waste water (controlling the airborne dust particles is just as important as minimizing water usage). Site operators must show that they have both (a) control over "visible" dust in particular and (b) fine dust generated by activities on their property.
- The use of treated waste water (sprinklers) in highways, loading zones, and washing areas to reduce dust Whenever possible, import treated waste water from other STPs for sprinklers or dust suppression.

Waste water management

- Adopt a ZERO effluent discharge system.
- All vehicle and equipment washing must take place in designated places, and wash water must be cleaned for reusing inside the facility to reduce dust.

Disposal of leftover waste

- Solid waste generation and management in C & D waste activities - leftovers to be transferred to the closest landfill in consultation with relevant authorities
- v. Diesel use

Diesel use

Emissions are produced when diesel is used in machinery, gensets, or moving vehicles: To reduce emissions, necessary pollution control measures must be implemented. If possible, import treated waste water from other STPs for sprinklers or dust suppression.

Plantations and greenery (low water intake and usage of native species)

- To improve aesthetics, maintain water fountains, water bodies, and manicured areas whenever possible.
- Plantation helps to reduce fugitive of emission and noise control. • Grow trees at the periphery.

- According to ³ Schedule I Criteria for Site Selection for Construction and Demolition Waste Storage and Processing or Recycling Facilities [See Rule 7(1)], : SI#15: To reinforce the buffer zone, a vegetative barrier must be created around any processing or recycling facilities or sites

Facilities for emergencies: Resources & Infrastructure:

- Mobiles; emergency medical help; firefighting gear
- Safety equipment, such as goggles, a helmet, a face shield, and hand gloves for dust and noise. First aid stations will be available.

Programme for training and awareness:

- Staff members receive training on the following at all levels
- Training in first aid; understanding of operating machinery; emergency reporting procedures; where to find ³ and use fire fighting equipment; and knowledge of alarm systems
- Environmental head must periodically conduct environmental awareness and safety programmes for employees, supervisory staff, and contract workers. ³ Environmental head should be aware of the requirement for correct maintenance and operation of equipment, machines, etc.

Green belt plantation

- Green belts have been acknowledged as a powerful barrier against pollution, particularly from activities that produce DUST. A reference document for identifying native species in relation to climatic zones is the publication "Guidelines for Developing Greenbelts" (CPCB March 2000). The following plant species should meet the requirements for the formation of a green belt:
- ³ They should be fast-growing and native to the area;
- They should have a dense canopy cover, ideally perennial.

SWOT ANALYSIS:

7.1.1.1: STRENGTH

- Due to its status as a World Heritage Site, Bihar has many popular and foreign tourism destinations.
- The ability for all age groups in a smooth area
- There is sufficient security in the area, domestic and foreign tourists arrive year-round, and people are very motivated to visit the area.
- October to march month are the best season to visit.
- good connectivity(road, railway and airways). international airport connecting through Nepal, Srilanka and Thailand
- Religious importance
- Cultural and historical diversity
- Abundance of water pond or sarovar
- Mahabodhi temple is one the major benefit for increment of Bodhgaya economic
- Donation is the another beneficial part to boost social and economic infrastructure
- City government at all levels attach importance to the development of tourist attractions
- Tourism economic potential
- Tourism to bring vitality to the local economy
- Presence of a quiet environment without noise
- Proper parking space, no traffic
- Export native products and handicraft

7.1.1.2: WEAKNESS

- Dusting is the major issue for the environment
- Aware people's disregard for the ward area's solid waste management
- Hot and humid climate
- Covid

- Social inequality
- Dependency on tourism by local community. One of the example is Covid

7.1.1.3: OPPORTUNITIES

- Making an effort to keep and emphasise on conserving native culture and preventing the traditional context from alteration
- Using the future income from tourism to enhance the area conservation level
- Developing tourist facilities as one of the strategies of tourism development
- Generating jobs and direct benefits for the local community.
- Cultural fusion
- Government panoramic planning
- Revival of ponds leads to the recharge of underground water
- Centralized system for tourist will leads to the transparency and safe environment

7.1.1.4: THREATS

- Changes in the social structure of the area
- more people generate more solid waste
- solid waste generation may contaminate soil, underground water and river bed
- ² Social Problems: Social problems like causes of insurgency etc. should be curbed or resolved and provisions to give complete security cover for the tourists.
- Poor infrastructure and basic amenities: Infrastructures, if not improved, specially roads, solid waste management, power and accommodation, it would create major hindrances in the development of tourism.
- Lack of Awareness of Tourism Activity: General public requires be educating and informing about tourism and their supports to its developments.

Questionnaire survey data for Tourists, Local Communities and tourism business operators

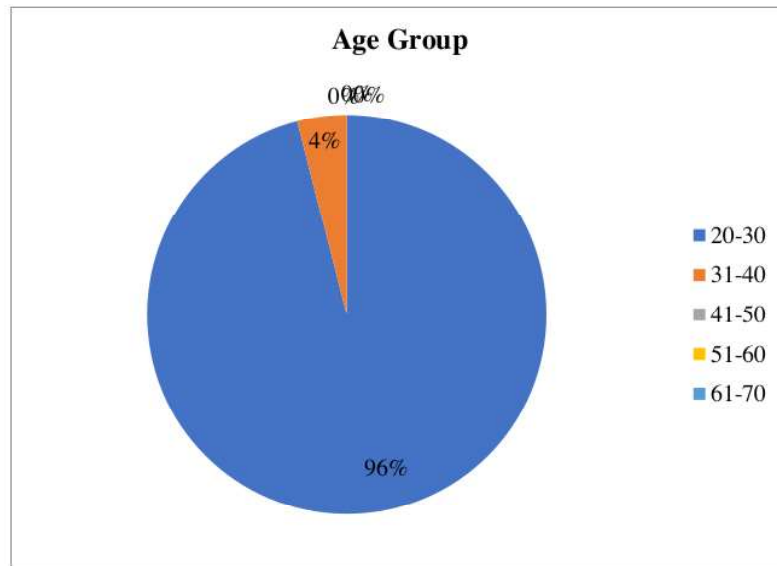


chart 23:age group distribution

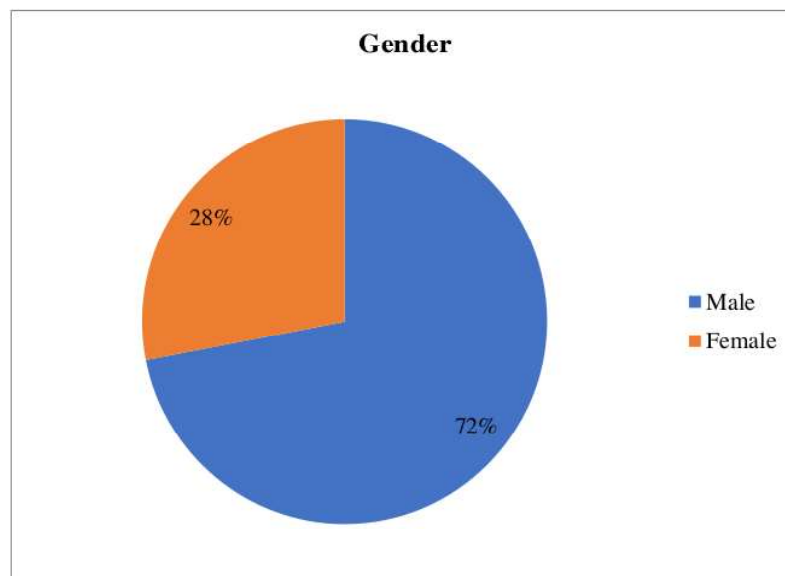


chart 24:percentage of male and female

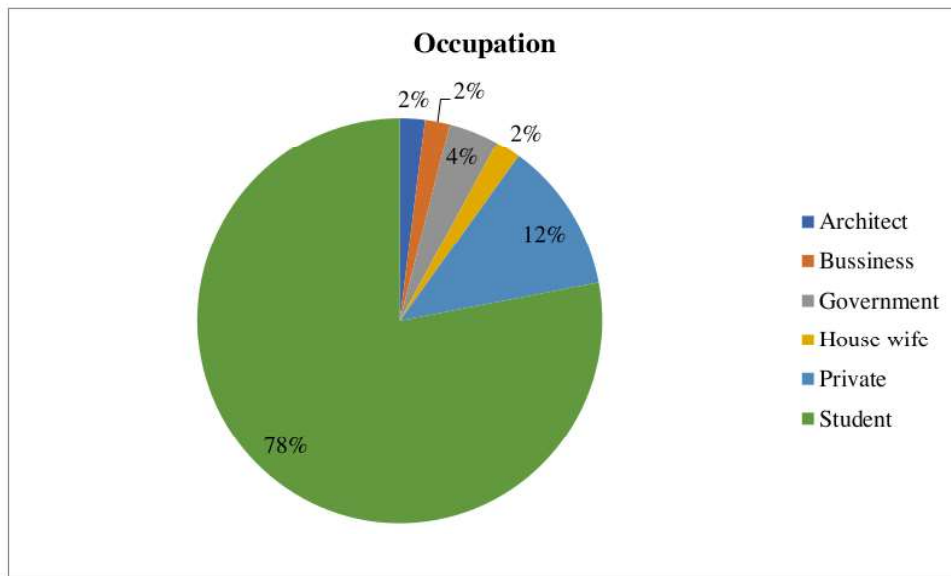


chart 25:percentage of occupation

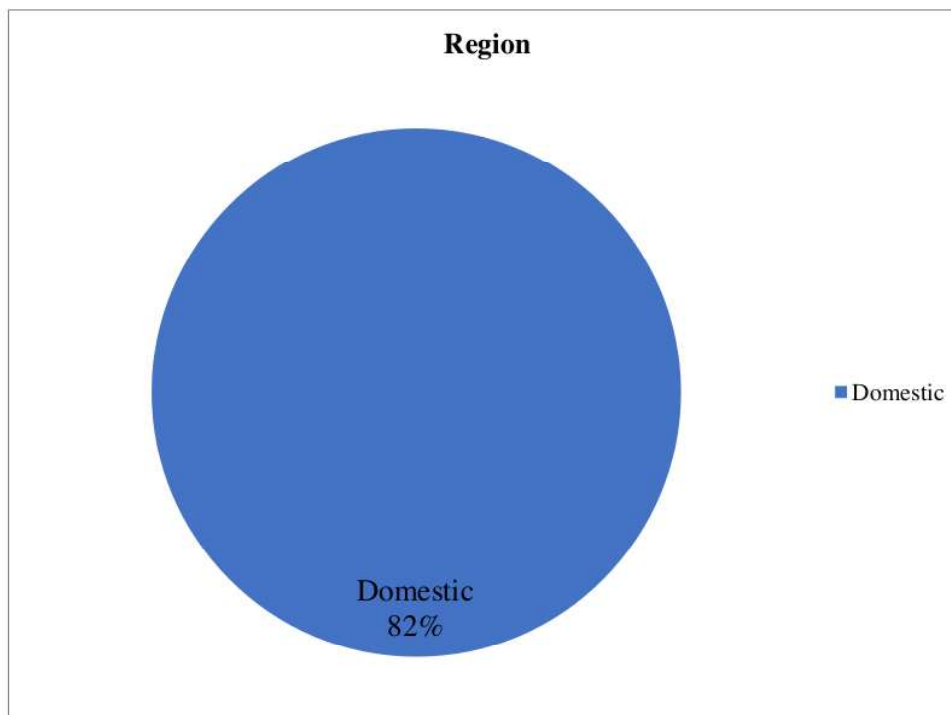


chart 26:percentage of domestic and foreigner

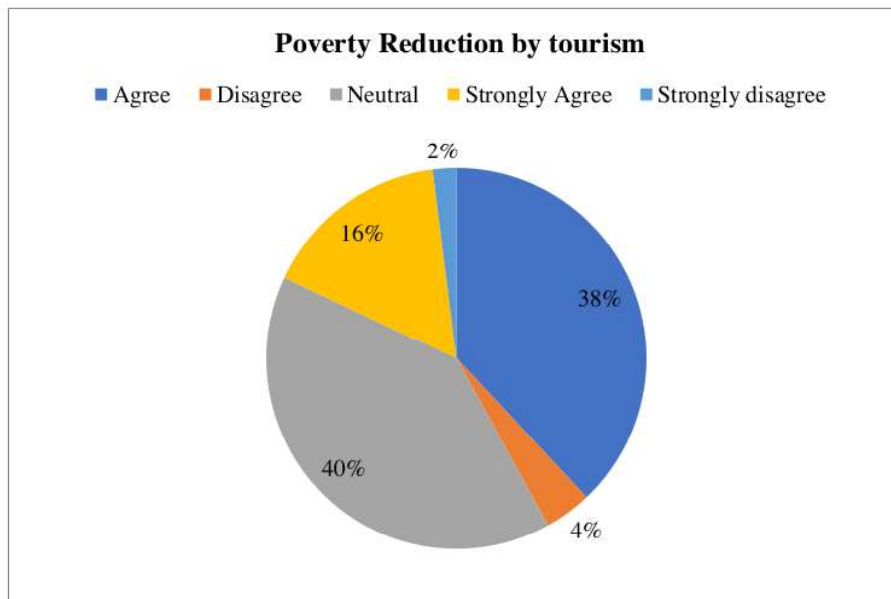


chart 27:percentage of poverty reduction by tourism

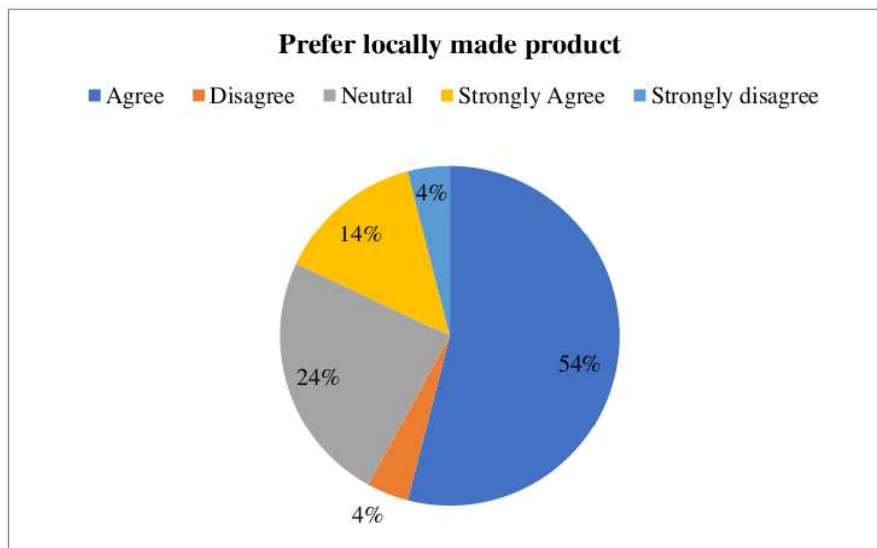


chart 28:percentage of prefer locally made product by visitors

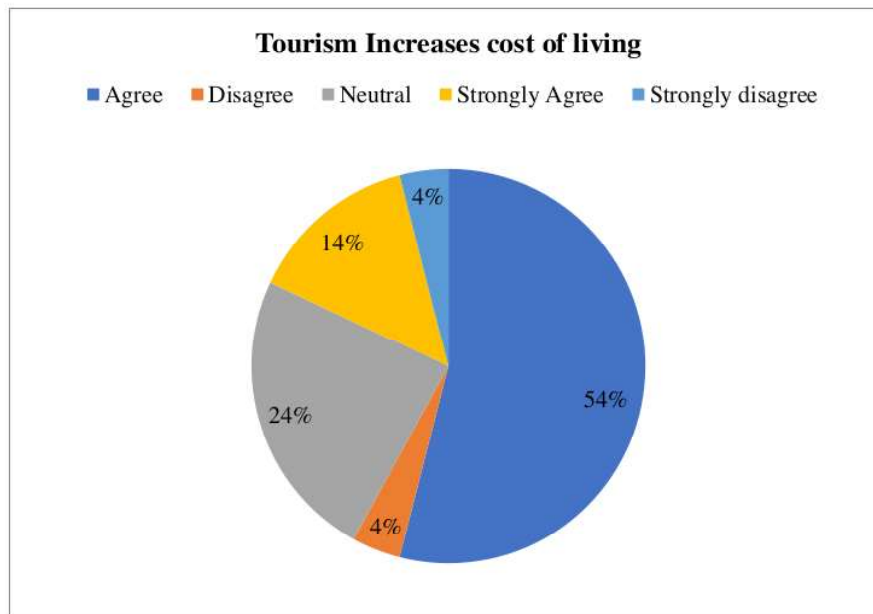


chart 29:percentage of tourism increases cost of living of site

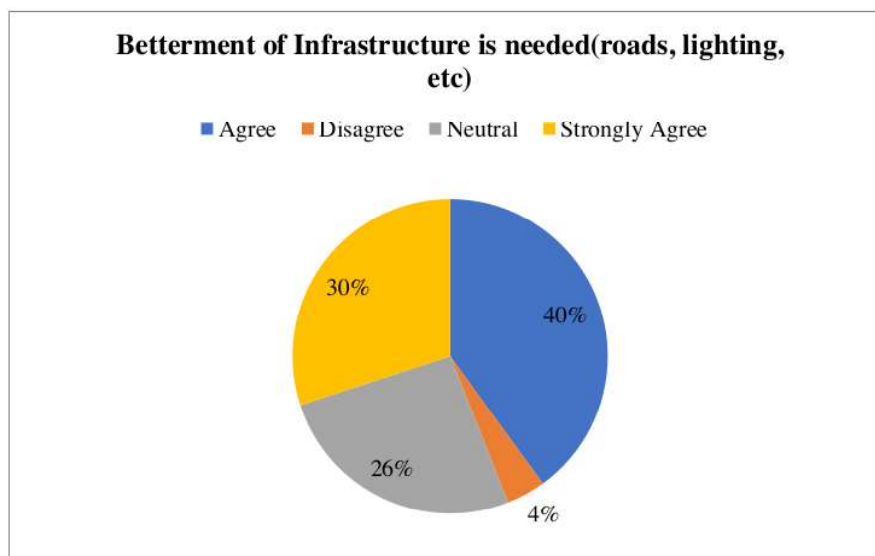


chart 30:progress of infrastructure is needed

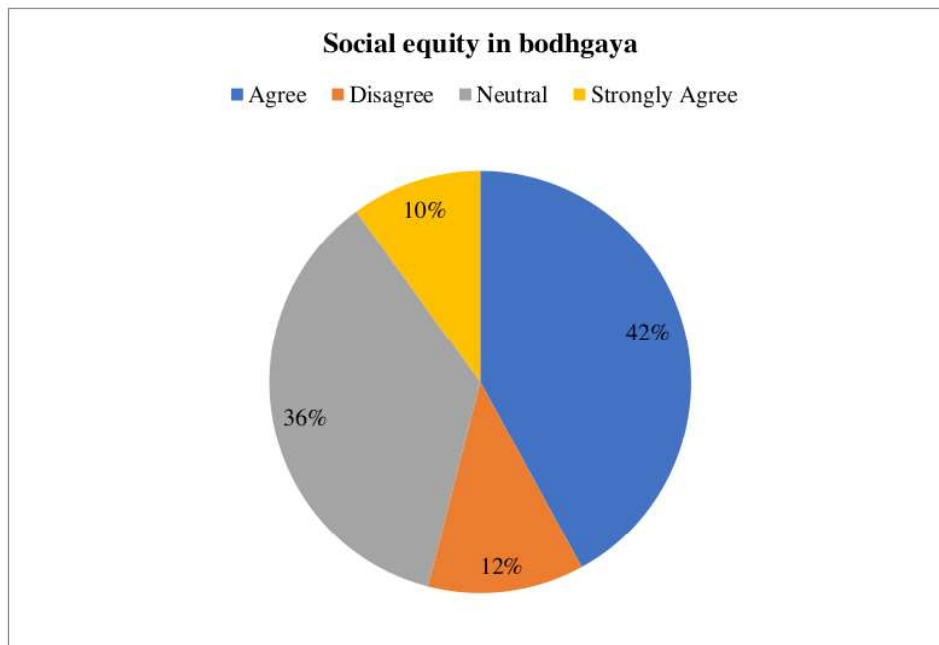


chart 31:social equity in Bodhgaya

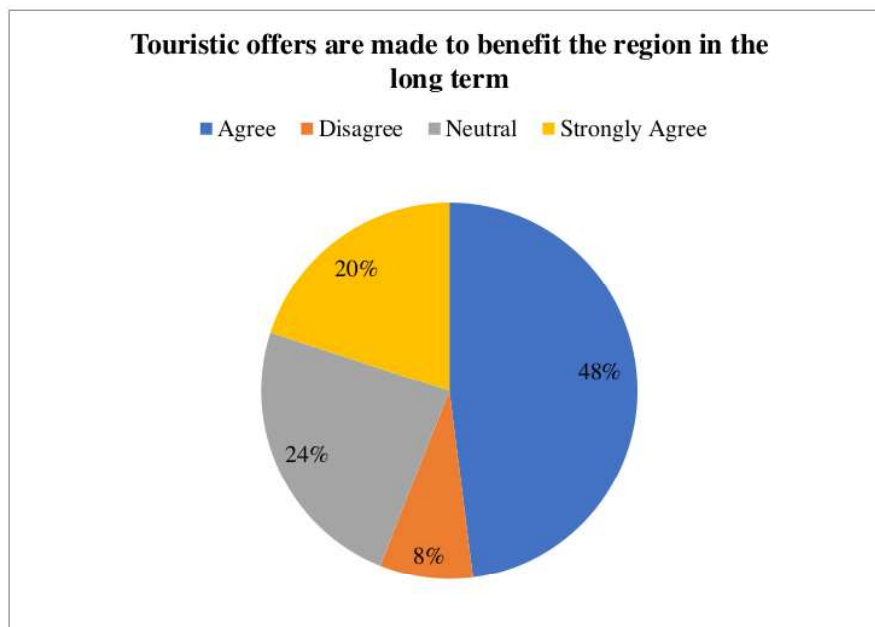


chart 32:visitor offers are made to benefit the site in the long term

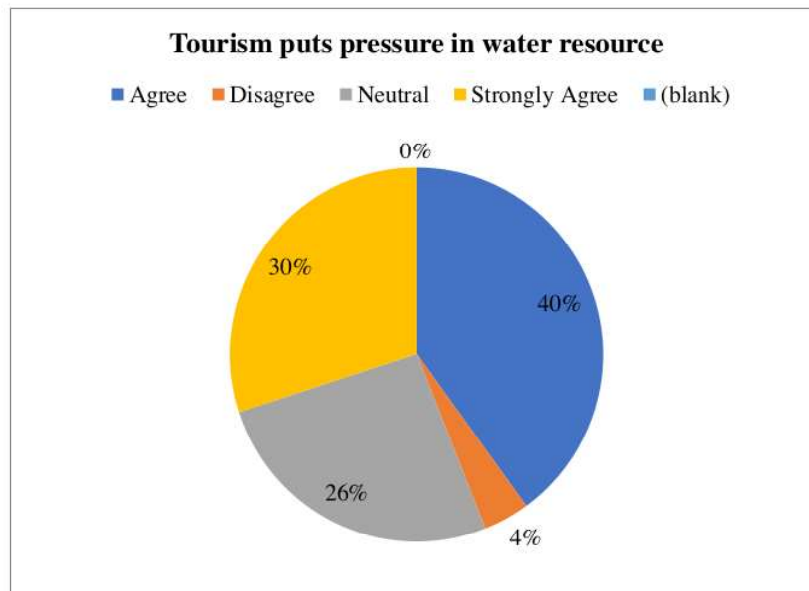


chart 33:percentage of tourism puts pressure in water resource in region

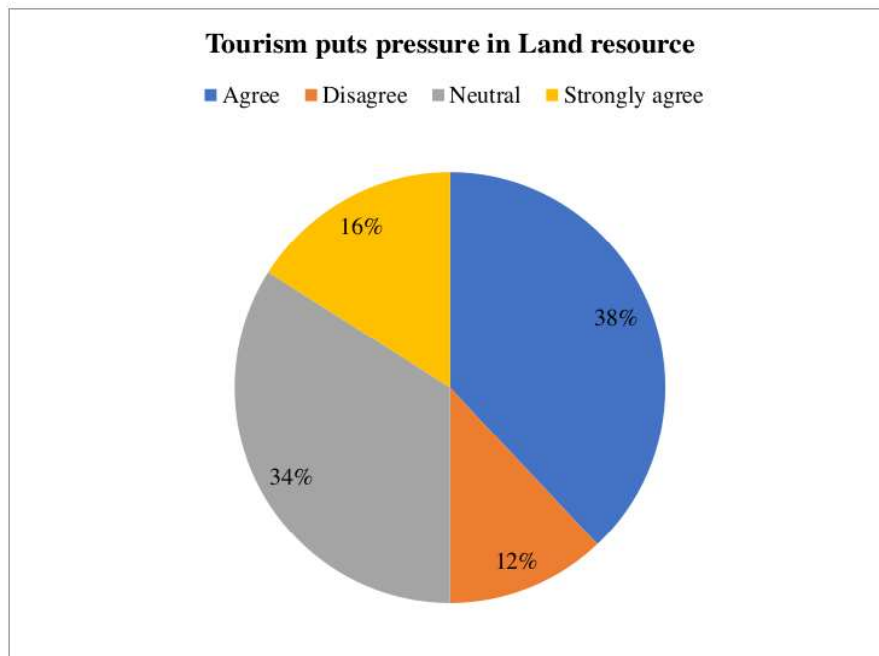


chart 34:percentage of tourism puts pressure in land resource

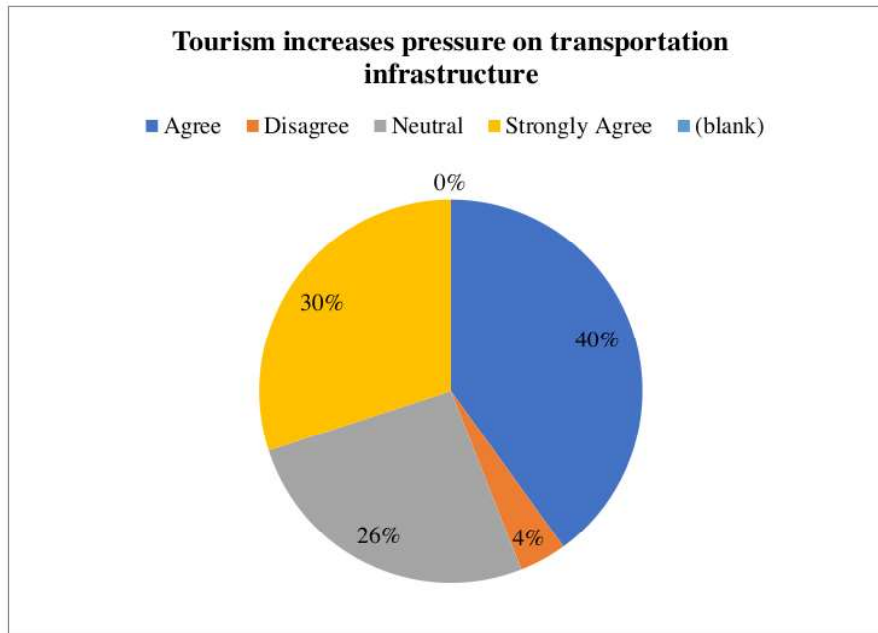


chart 35:tourism increases pressure on transportation

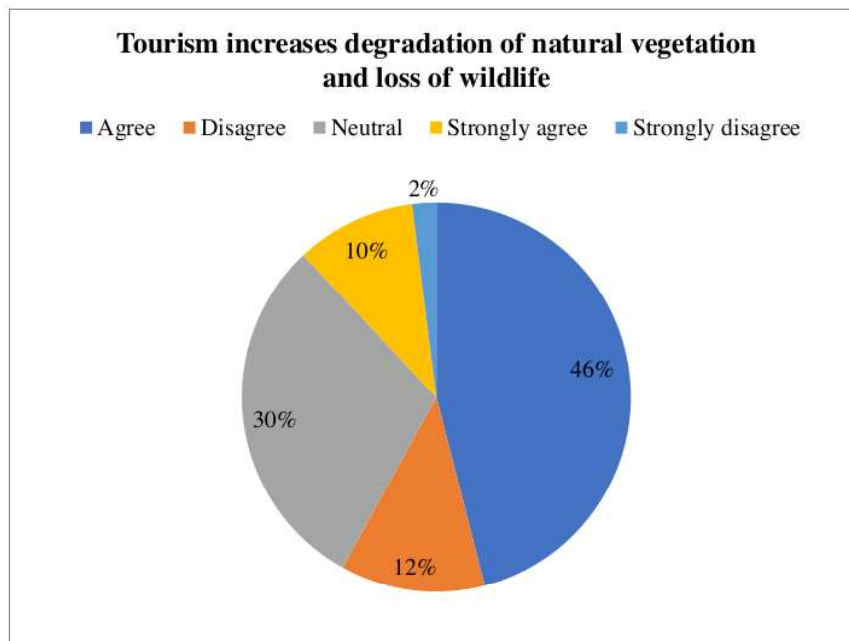


chart 36:tourism increases fall of natural vegetation and loss of wildlife

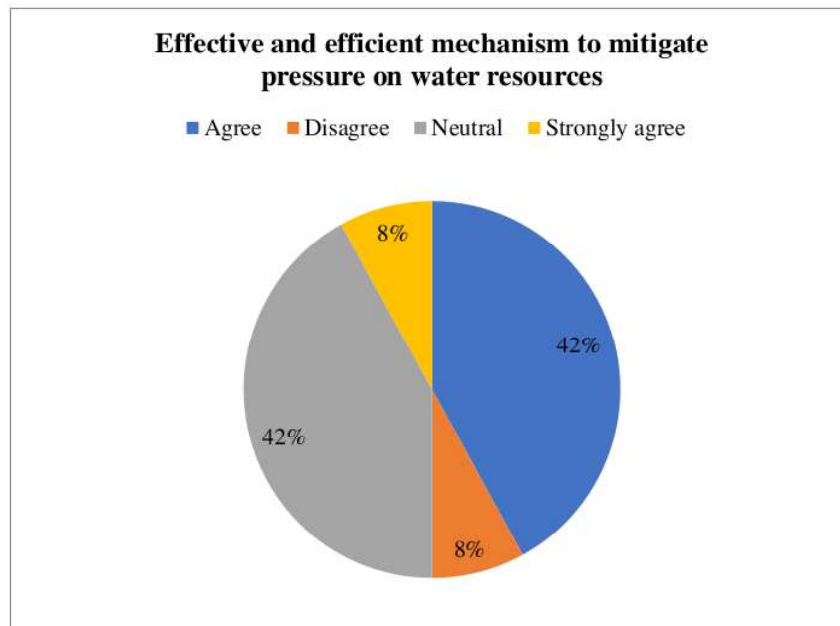


chart 37:percentage of efficient and effective mechanism to mitigate pressure in water resources

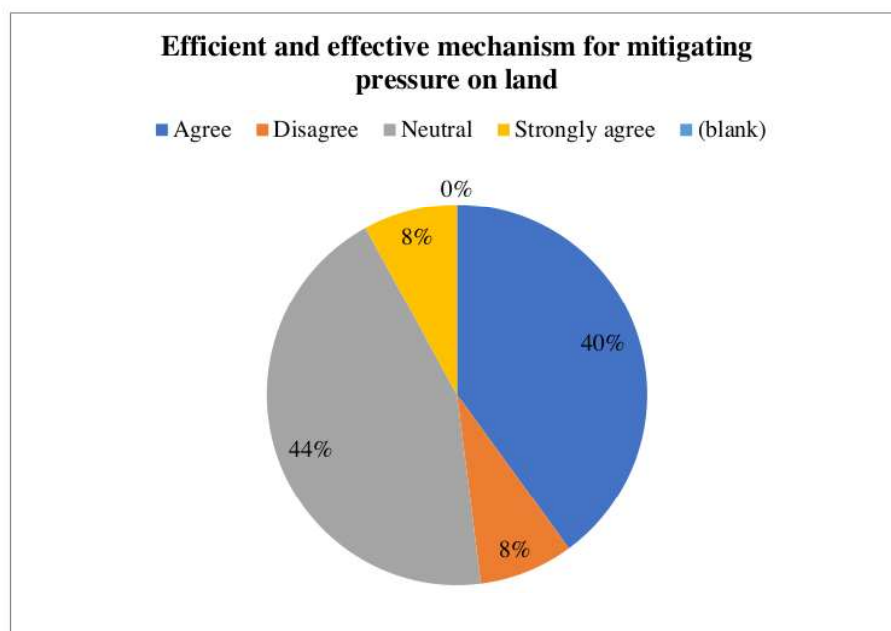


chart 38:percentage of efficient and effective mechanism to mitigate pressure in land

Effective and efficient system to mitigate adverse impact of tourism on transportation infrastructure

■ Agree ■ Disagree ■ Neutral ■ Strongly agree ■ (blank)

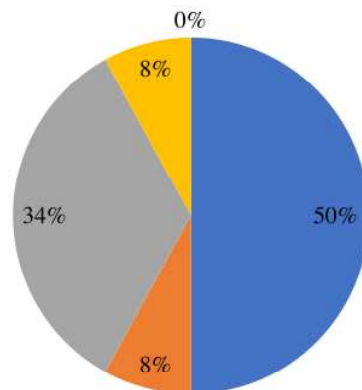


chart 39:percentage of capable of producing a result mechanism to relieve impact of tourism on transport facility

Efficient and effective mechanism for reducing degradation of natural vegetation and wildlife

■ Agree ■ Disagree ■ Neutral ■ Strongly agree ■ (blank)

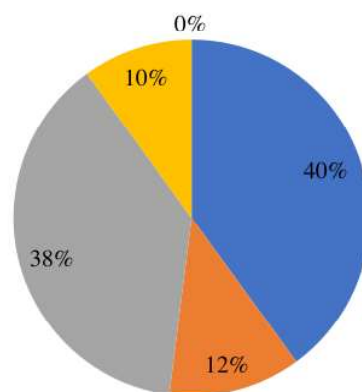


chart 40:percentage of capable of producing a result mechanism for reducing degradation of natural vegetation and wildlife

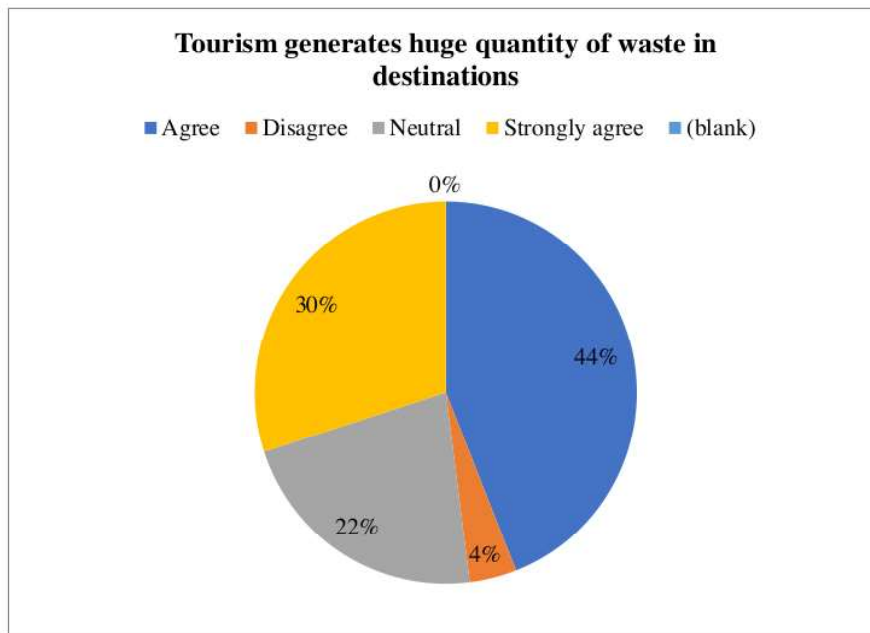


chart 41:percentage of tourism generates of waste in destinations

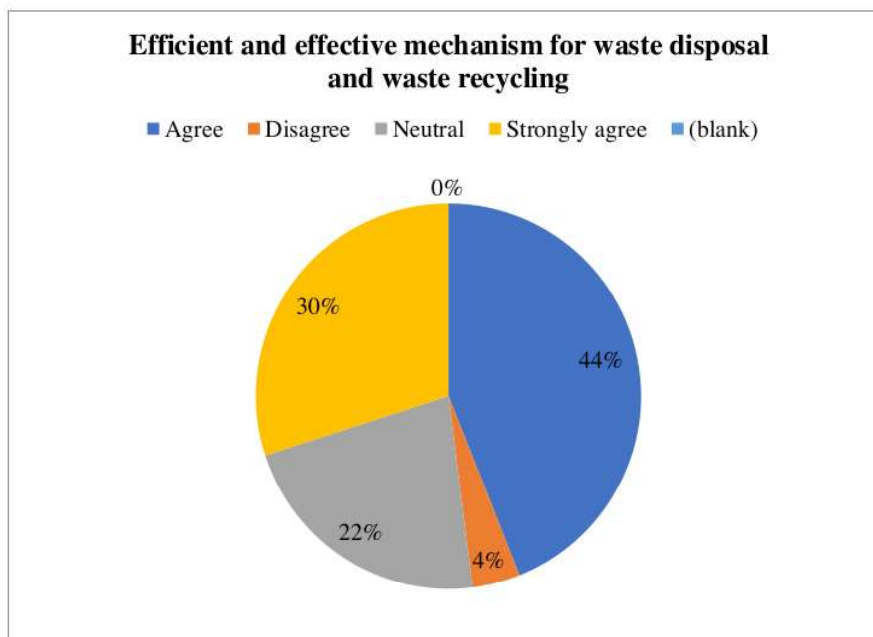


chart 42:percentage of efficient and effective component for waste disposal and recycling

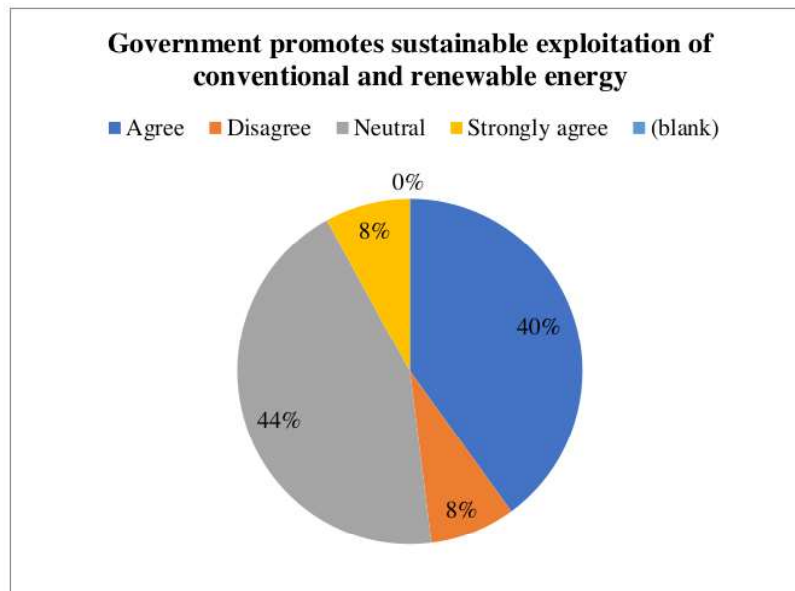


chart 43:percentage for government promotes sustainable exploitation of conventional and renewable energy

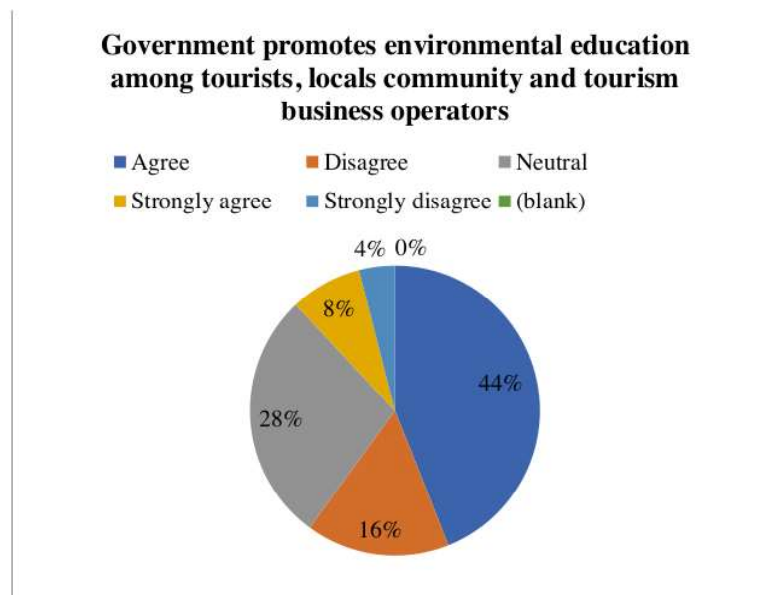


chart 44:percentage of government promotes environmental education with respect to tourists, locals and business operators

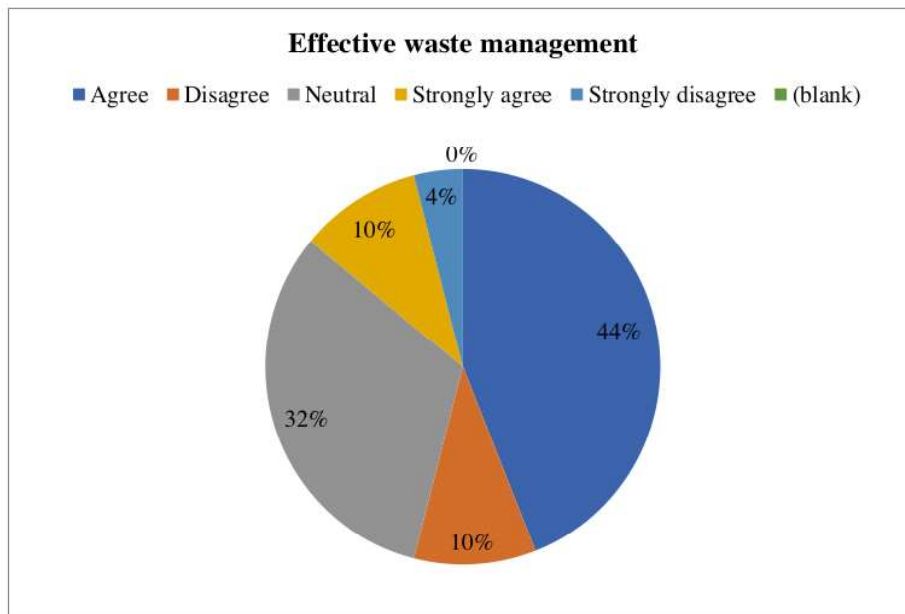


chart 45: survey result for effective waste management

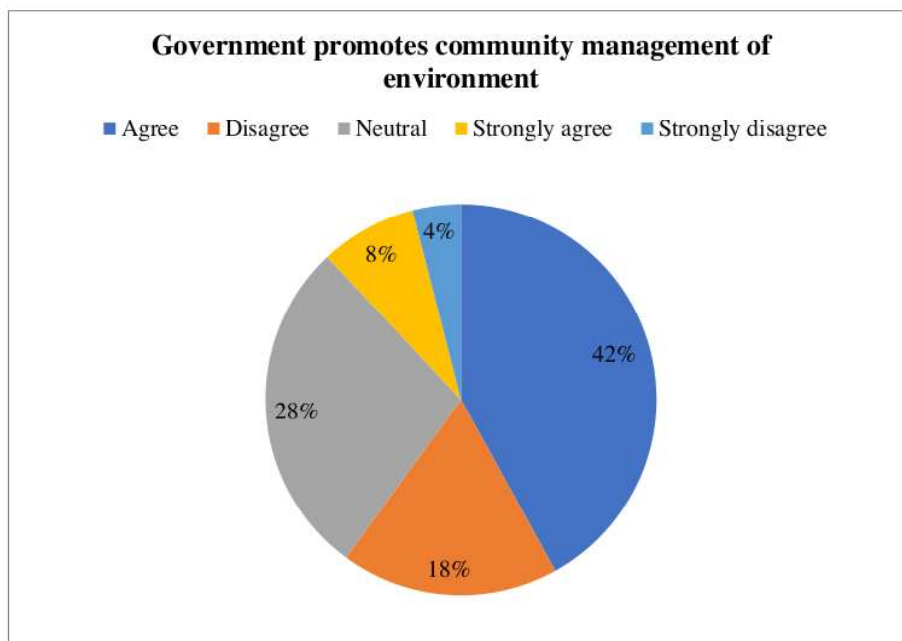


chart 46: government promotes community management of environment

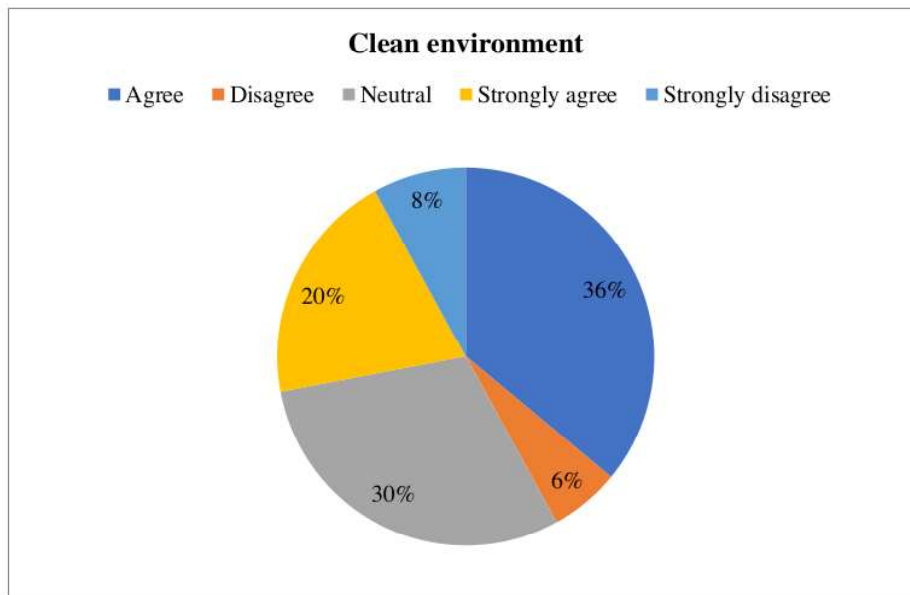


chart 47:percentage chart for clean environment

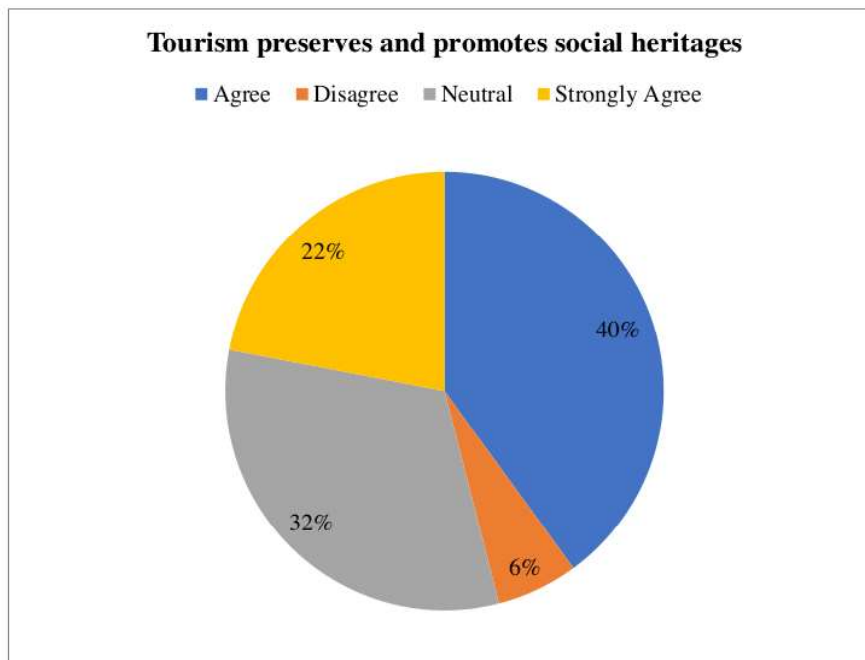


chart 48:percentage of tourism preserves and promotes social heritages

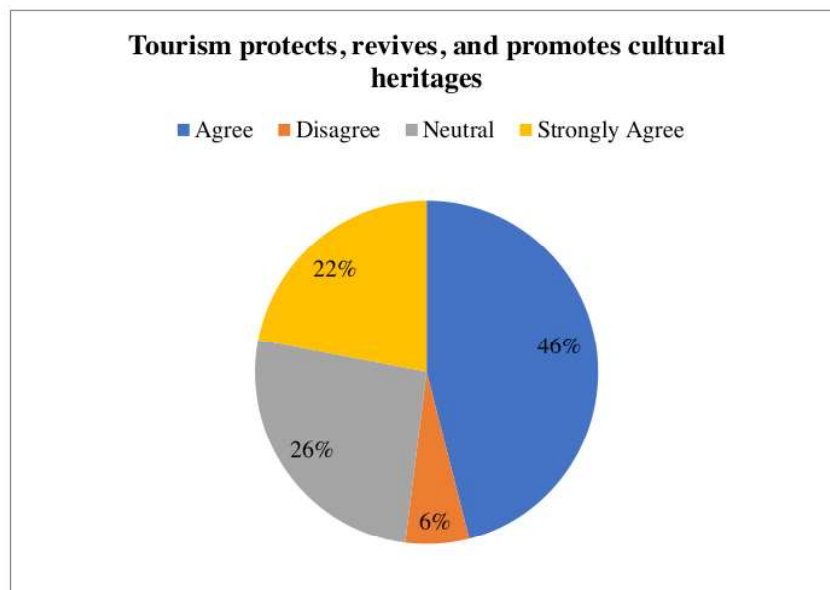


chart 49:percentage of tourism protects and promotes cultural heritages

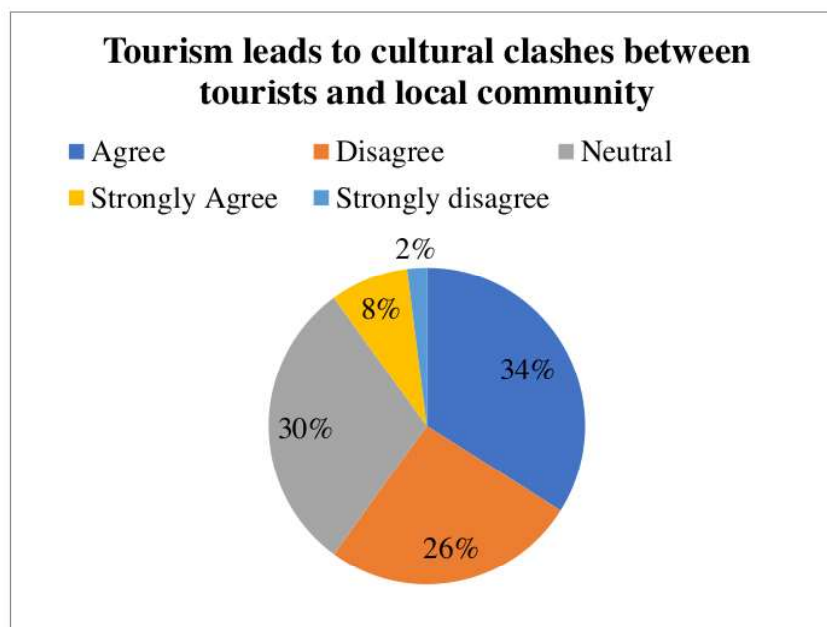


chart 50:tourism leads to cultural clashes between tourist and local community

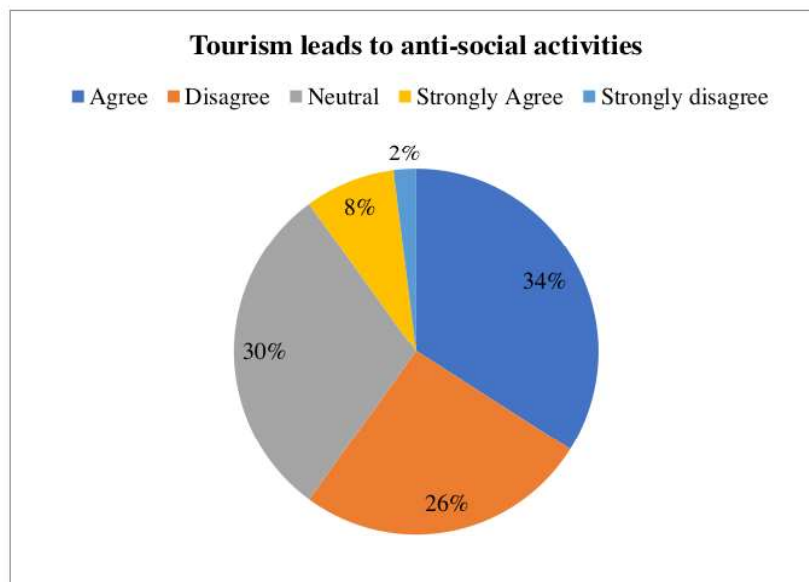


chart 51:tourism leads to anti social activities

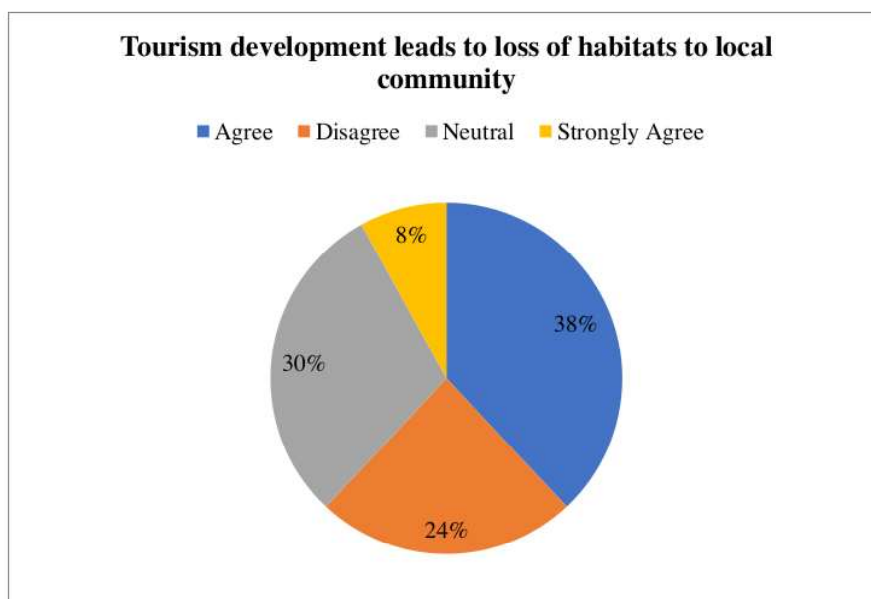


chart 52:tourism development leads tools of habitats to local community

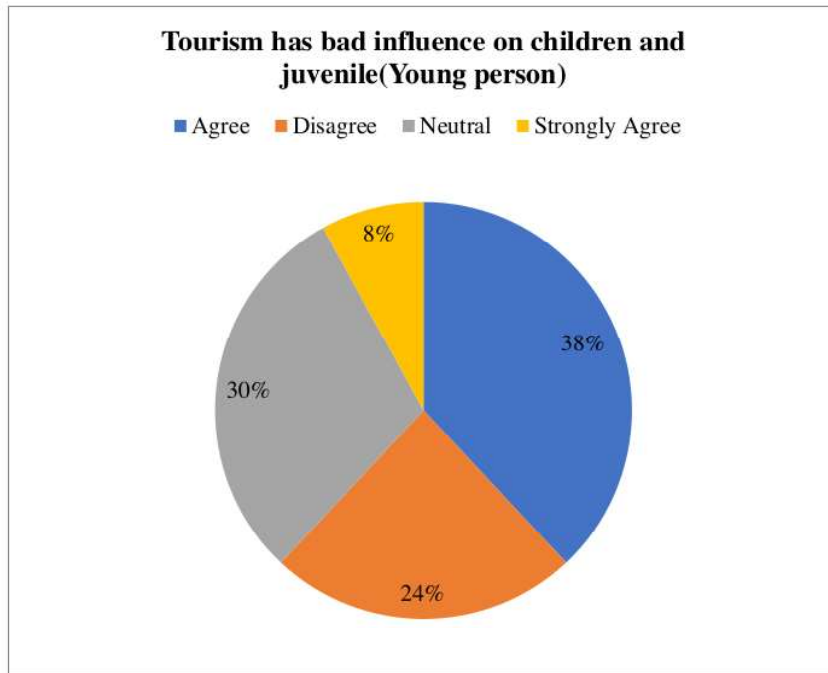


chart 53:percentage of bad effect on children and young people

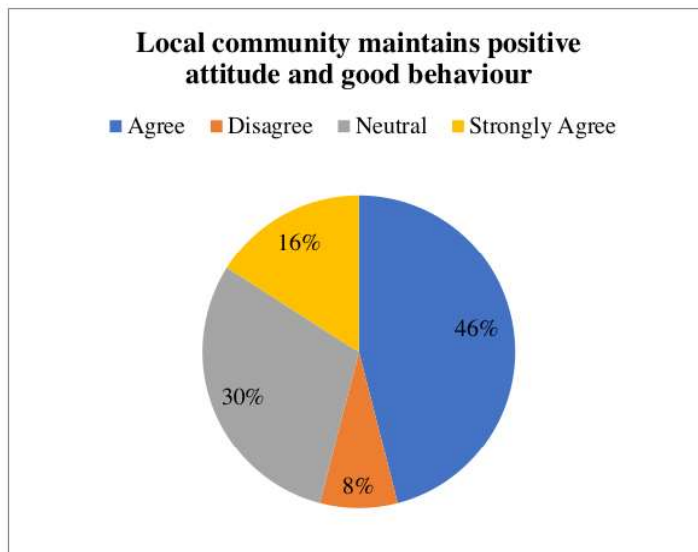


chart 54:percentage of locals maintains positive fact and good behavior

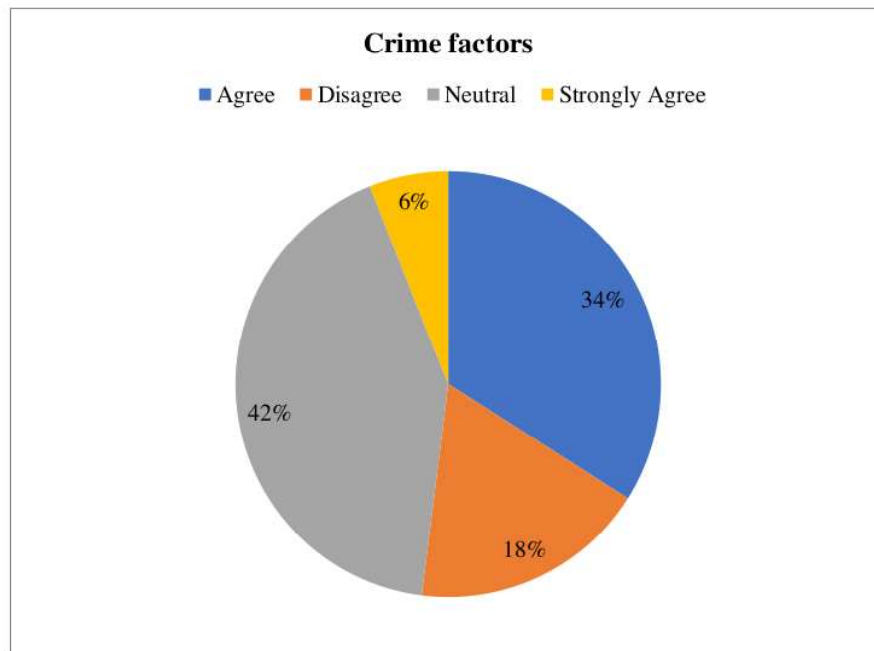


chart 55:percentage of crime factor in Bodhgaya

CHAPTER 8: PROPOSED SOLUTION

Solid waste management:

Door to door collection on daily basis.

Nagar parishad is working very well but few peoples are generating waste materials near to residential areas. Municipal has action (penalty) but no one dare.

Recommendation:

- We can install cctv cameras near to residential zone which that notify that people and can take action.
- We should arrange several types of awareness campaign
- Advertisement
- solid waste management should be based on reduce, reuse and recycle
- We can try Indore solid waste management method for better environment.



Figure 24:Ward no. 4 (village – Amwa)



Figure 25:Ward no. 17 (village – Mastipur)

Environmental sustainable tourism:

According to survey we can see there are many issues in environmental sustainability than economic and socio-cultural. Negative impacts taken places in Bodhgaya tourism due to pollution, dust particles, solid waste management and drainage problem. So I want to work in environmental sustainable tourism which that helps to strength and boost our tourism.

- 3 pain(pond) cleaned time to time.
- Jal jeevan hariyali programs is running through the site(There are 1950 trees planted in the block)
- Sprinkler machine is used on road area time to time by which dust effects low of environment.

Recommendation:

- In future it should be drainage water recycle and then use in different purpose
- We can purposed waste treatment plant(WTP).
- We can provide water fountain where soil erosion occurs.
- It should be make cover naala or naali where entry and exit point cover with jaali which that helps to store the solid waste. Only liquids can go in drainage. After that solid waste remove from entry and exit points.
- Sustainability should also focus on saving the non-renewable Resources through producing alternative energy sources for example solar and wind. Proper Waste management is necessary to control the pollution and avoid the degradation of the Environment.

To Address the problems facing tourism in Bodhgaya, several solutions can be implemented:

- **Infrastructure Development:** Invest in the improvement of roads, transportation systems, and other essential infrastructure to accommodate the growing number of tourists. This includes expanding and upgrading

transportation networks, constructing new roads, and ensuring efficient connectivity to and from Bodhgaya.

- **Waste Management:** Establish an effective waste management system that focuses on waste segregation, recycling, and proper disposal. Implement awareness campaigns to educate tourists and local residents about the importance of responsible waste management practices. Collaborate with local authorities and waste management agencies to develop sustainable waste management solutions.
- **Environmental Conservation:** Implement measures to mitigate pollution and protect the environment. This includes promoting cleaner transportation options, enforcing emission control measures, and encouraging the use of renewable energy sources. Create designated green zones to preserve the natural beauty of Bodhgaya and ensure sustainable development practices.
- **Heritage Site Preservation:** Allocate adequate funds and resources for the preservation and maintenance of heritage sites. Establish strict regulations to prevent encroachments and unauthorized construction near these sites. Collaborate with UNESCO and other relevant organizations to seek assistance and expertise in heritage preservation techniques.
- **Community Involvement:** Involve the local community in tourism development and empower them to participate in the tourism industry. Promote community-based tourism initiatives that enable local residents to benefit economically from tourism activities. Provide training and capacity-building programs to enhance the skills of the local workforce and encourage entrepreneurship in the tourism sector.
- **Diversification of Tourism Offerings:** Develop a diversified range of tourism offerings to attract visitors throughout the year. Promote cultural events, festivals, and spiritual retreats in Bodhgaya during off-peak seasons. Encourage the development of niche tourism segments such as wellness tourism, eco-tourism, and educational tours to broaden the appeal of Bodhgaya beyond its religious significance.
- **Collaboration and Partnerships:** Foster collaboration between the government, tourism authorities, local communities, and private sector

stakeholders. Establish public-private partnerships to leverage resources, expertise, and funding for tourism development projects. Engage with tour operators, travel agencies, and hospitality providers to ensure sustainable and responsible tourism practices.

- **Visitor Management:** Implement effective visitor management strategies to avoid overcrowding and maintain a peaceful atmosphere in Bodhgaya. This can include regulating the number of visitors allowed at heritage sites simultaneously, implementing ticketing and reservation systems, and encouraging responsible tourism behavior through information campaigns.

By implementing these solutions, Bodhgaya can address the identified problems and achieve sustainable tourism development. It is crucial to balance tourism growth with environmental preservation, socio-cultural integrity, and the well-being of the local community to ensure a positive and enduring tourism experience for visitors and locals alike.

Planning for sustainable resort in Bodhgaya. I will take a reference to one of the resort located on the Fiji country.

- Six Senses Fiji is a five-star resort with sustainable luxury and cultural knowledge at its core. It is situated on the beautiful Malolo Island.
- To reduce the usage of single-use plastic bottles, the resort uses only solar energy and has its own on-site water filtering system and rainwater collection system. The resort strives to produce as little trash as possible by promoting the reuse of items, recycling, composting, and using a "worm-based septic system" while cultivating as much of its own herbs and vegetables as it can.
- The hotel supports the Rise Beyond the Reef Charity, which aims to "bridge the divide between remote communities, government, and the private sector in the South Pacific, sustainably creating a better world for women and children," and all the handiwork and artwork in the establishment was created by neighbourhood villagers.



Figure 26:Six Senses Fiji is a five-star resort

source 43:internet

Solution for dusting:

- Water mist or fine spray from nozzles to prevent dust at the site from re-suspension.
- Depending on the amount of dust produced, C&D wastes or building materials should preferably be covered when being stored or carried (on tractors or in trucks).
- Dust is produced during the usage of machinery and equipment, such as conveyor belt transport, crushing, hammering, and other operations; these regions must be enclosed and surrounded by water sprinklers to reduce dust emissions. [9]
- Gensets (DG sets) should be kept in good condition to ensure low emissions.
- The employed transport vehicles must be in good working order (PUC compliance).
- While water is a valuable resource and its use needs to be rationalised, it is frequently advised to use sprinklers to reduce dust. To prevent dust from being formed at ground level, it is crucial to build higher roadblocks, relocate loading

and unloading areas, and cover construction materials and waste with materials like jute, plastic, and tarpaulin.

- It is forbidden to dump (unload) or dispose of C&D wastes on any non-designated sites, including the sides of roads, vacant lots, water bodies, and drains.
- Information on the environment needs to be spread and the environmental issues need to be highlighted.
- Existing dust suppression devices (fugitive emissions): Road dust and routine water sprinkling on haul roads will both reduce dust.[10]

CHAPTER 9: CONCLUSION AND FUTURE WORK

CONCLUSION

making sustainable plans India's tourism industry is expanding at the quickest rate. The tourism sector is regarded as a crucial business sector for the development of the nation and helps many countries' economies expand. New locations have been discovered thanks to tourism, and the number of visitors to the destinations is rising. Massive tourist influxes have made issues like environmental deterioration, security threats, and deterioration of the host community's cultural, economic, and social aspects public knowledge. For the tourism business to flourish and grow over the long term, sustainably based tourism is very crucial. The main source of tourism to draw tourists and increase the number of visitors is cultural heritage. Uncontrolled tourism has a negative impact on the natural resources and causes cultural heritage sites to lose their identity, deteriorate their historic structures, and lose their cultural biodiversity. To maintain and preserve those sites, which are vulnerable when exposed to tourism, sustainable development is required.

For the steady growth of cultural heritage sites, the sustainable development of tourism should assure the environmental sustainability, sociocultural sustainability, and economic sustainability. Through financial support and promotion of the locations, tourism activities should help the local population's economic development and assure the protection and preservation of the cultural identity and assets. Organizations on a national, international, and private scale are working to promote sustainable tourism. The sustainable growth of tourism in cultural heritage sites can only be accomplished with the involvement of all parties involved in the tourism industry, not just a small number of organizations or individuals. The government should fully support the promotion of sustainable tourism as well as the preservation and protection of cultural heritages.

The players in the development of cultural heritage sites must carry out a sizable number of activities in order for tourism to grow sustainably. The local population needs to be made aware of the effects of tourism through awareness campaigns. Empowering locals to protect the natural and cultural resources should be taken into

account. The development of tools and procedures for the management of tourism as well as efforts to reduce poverty through tourism are crucial and must be carried out if tourism is to be regulated in a sustainable way. In order to establish sustainable tourism, the effects of tourism on a location should be evaluated on a regular basis for proper management, implementation, and monitoring.

FUTURE WORK:

Bihar 3P paradigm for sustainable tourism in Bihar

The state's primary tool for generating tourism-related revenue has been Buddhist tourism. The state anticipates more success with the planned diversification and development of other initiatives. From 85,673 foreign visitors in 2001 to 10.9 lakh in 2019, a 12-fold rise, Bihar's tourism industry has made significant strides. The number of visitors has increased by 62 lakh over the past four years, representing an excellent year over year rise of 21%.

To increase the number of tourists visiting the state, the state has used a 3P model policy, which stands for Promote, Preserve, and Protect. The state is home to the Mahabodhi Temple at Bodh Gaya and the Nalanda Ruins, both of which are UNESCO World Heritage Sites. In 2019, more than 5 lakh foreigners travelled to Gaya and Bodhgaya. The epicentre of all Buddhist pilgrimage is in Bodhgaya.

To make Bodhgaya into a Mecca for Buddhists, the state government has undertaken a number of projects. The state has been able to strengthen its position in the international world with the introduction of direct flights to Gaya from places like Rangoon, Paro in Bhutan, and Hanoi in Vietnam. The administration has also created the International Buddhist Conclave in addition to enhancing connectivity. Buddhists from all over the globe gather in Bodh Gaya every two years for a Buddhist Conclave that is organised by Bihar Tourism. In addition, Bodhgaya hosts the Baudh Mahotsav each year to highlight the region's tourist attractions. As part of its effort to promote tourism, the government is constructing a Mahabodhi Culture Centre with an auditorium that can hold up to 2000 people.

INTERVENTIONS NEEDED

Given that the town's piped water supply system has just been installed, its operations and maintenance system need to be planned with the roles and duties of the implementing agency, operating agency, and nagar panchayat being clearly specified.

In Bodh Gaya, it is not customary to monitor the water quality at household or public water sources. Since contamination has been found in both public and private water sources, it is advised that state-level protocols for monitoring urban water quality be created and followed by the ULBs.

The town needs to enforce legislative provisions like the Water (Prevention & Control of Pollution) Act, 1974. A comprehensive programme for the prevention, control, or abatement of stream and pond pollution should be developed by the State Pollution Control Board.

Because the PWS and private water sources are also reliant on groundwater, the community relies heavily on it. Thus, in accordance with the 2014 Bihar Building By-laws, groundwater recharge should be given top priority, and strategies like rainwater collecting should be encouraged in public spaces and at the home level.

The future work of Bodhgaya tourism should focus on further enhancing and developing the destination to attract more visitors and ensure sustainable growth. Some key areas of future work include:

- **Infrastructure Development:** Continued investment in improving infrastructure is essential to support the growing number of tourists. This includes upgrading transportation networks, expanding airport facilities, improving road connectivity, and enhancing accommodation options to meet the diverse needs of visitors.
- **Digital Connectivity:** Embrace technology to enhance the visitor experience and improve connectivity. Develop high-speed internet access in Bodhgaya to provide tourists with easy access to information, online booking services, and digital platforms for tourism promotion. This can include the development of mobile applications, virtual tours, and online ticketing systems.

- **Sustainable Tourism Practices:** Focus on promoting sustainable tourism practices to minimize the impact on the environment and preserve the cultural heritage of Bodhgaya. Encourage responsible tourism behavior, implement waste management initiatives, promote eco-friendly transportation options, and support local businesses that adhere to sustainable practices.
- **Heritage Conservation:** Continue efforts to preserve and restore the historical and cultural heritage sites in Bodhgaya. Collaborate with heritage conservation organizations, local communities, and experts to ensure the proper maintenance, restoration, and protection of these sites for future generations.
- **Pilgrim Facilities:** Enhance the facilities and services available to pilgrims visiting Bodhgaya. Improve the infrastructure around pilgrimage sites, including better amenities, resting areas, and accessible facilities for elderly and differently-abled visitors. Provide information centers and multilingual guides to assist pilgrims in understanding the significance of the sites they are visiting.
- **Tourism Promotion:** Invest in targeted marketing and promotion campaigns to raise awareness about Bodhgaya as a premier Buddhist pilgrimage destination. Collaborate with travel agencies, tour operators, and digital platforms to promote Bodhgaya globally, targeting specific segments such as spiritual seekers, history enthusiasts, and wellness tourists.
- **Skill Development and Training:** Provide training and capacity-building programs for the local community to enhance their skills and employability in the tourism sector. This can include language training, hospitality management, tour guiding, and entrepreneurship development. Empowering the local community will ensure their active participation and economic benefits from tourism.
- **Research and Innovation:** Encourage research and innovation in tourism development, including conducting studies on visitor preferences, market trends, and sustainability practices. Foster partnerships with academic institutions and research organizations to explore new opportunities and develop innovative tourism products and experiences.

- **Cultural Exchanges and Events:** Organize cultural exchanges, festivals, and events that showcase the rich Buddhist heritage of Bodhgaya. This can include international Buddhist conferences, meditation retreats, art exhibitions, and music festivals. Such events will attract diverse audiences and promote cross-cultural understanding.
- **Collaboration and Partnerships:** Foster collaboration between various stakeholders, including the government, local communities, private sector, NGOs, and international organizations. Establish public-private partnerships to leverage resources, expertise, and funding for tourism development projects and ensure the sustainable growth of Bodhgaya as a tourism destination.

By focusing on these areas of future work, Bodhgaya can position itself as a world-class pilgrimage and cultural destination while preserving its heritage and promoting sustainable tourism practices. The ultimate goal is to provide visitors with an enriching and transformative experience while benefiting the local community and ensuring the long-term sustainability of the destination.

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