

**SUSTAINABILITY AND MANAGEMENT OF MANAS
NATIONAL PARK, ASSAM: A STUDY ON LIVELIHOOD OF
FRINGE LOCAL COMMUNITIES**

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REQUIREMENTS FOR THE DEGREE OF DOCTOR OF
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GAURAV DAS

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COMMUNITIES**

**BY
GAURAV DAS
DEPARTMENT OF MANAGEMENT**

**SUPERVISOR
Prof. L. S. SHARMA**

**Submitted
In partial fulfilment of the requirement of the Degree of Doctor of Philosophy in
Management of Mizoram University, Aizawl.**



Prof. L. S. Sharma
Head

MIZORAM UNIVERSITY

Department of Management
School of EMIS
Aizawl-796004, India
Tel: 2330710/2330261/9862569024
Email : lsksharma@yahoo.co.in

Dated 28/08/2024

CERTIFICATE

This is to certify that

1. Gaurav Das having registration no. MZU/Ph.D/1837 of 22.08.2021 is a research scholar of Department of Management working under the supervision of Prof. L. S. Sharma, Department of Management, Mizoram University.
2. He was admitted for the PhD Programme through open advertisement, written test and viva-voce.
3. He has fulfilled all the prescribed/mandatory regulations under UGC (Minimum Standards and Procedure for Award of Ph.D Degrees) Regulations, 2018 for pursuing PhD Programme in Management.
4. He has also published research papers in the refereed journals which is mandatory prior to submission of PhD thesis under the said UGC Regulations 2018.

(PROF. L. S. SHARMA)
Supervisor

DECLARATION
MIZORAM UNIVERSITY
AUGUST, 2024

I **GAURAV DAS**, hereby declare that the thesis is the record of work done by me that the contents of this thesis did not form any basis of the award of any previous degree to me or to the best of my knowledge to anybody else, and that the thesis has not been submitted by me for any research degree in any other institution/University.

This is being submitted to the Mizoram University for the Degree of **Doctor of Philosophy in Management**.

(PROF. L. S. SHARMA)
(Supervisor)

(GAURAV DAS)
(Candidate)

PROF. L. S. SHARMA
(Head)

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This thesis is dedicated to my late father, Mr. Gobinda Chandra Das, whose enduring love, wisdom, and sacrifices have been a constant source of inspiration. His memory and the values he instilled in me have provided the strength and motivation needed to overcome the challenges encountered during this research.

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Date :

(GAURAV DAS)

Place :

(Research Scholar)

Preface

This thesis explores the intricate relationship between conservation efforts and the livelihoods of fringe communities surrounding Manas National Park in Assam. With sustainability as its central theme, the study delves into the challenges and opportunities associated with managing a protected area that is rich in biodiversity yet surrounded by communities that rely heavily on natural resources for their survival.

The journey to this research topic began with an interest in sustainable development a global objective that seeks to balance economic growth with environmental preservation. This objective is especially critical in regions like Assam, where the pressures of economic development often clash with the need to conserve the natural environment. My exploration of this tension led me to Manas National Park, a UNESCO World Heritage Site known not only for its endangered species but also for its role in supporting local livelihoods through eco-tourism and sustainable resource management.

Throughout this study, I have sought to understand how the park's management can be aligned with the needs of the local communities, who are often the most affected by conservation policies. By examining the history of national parks in India, the specific context of Assam, and the management practices within Manas National Park, this thesis provides insights into the complexities of balancing conservation with sustainable development.

The concept of sustainable livelihoods, which is central to this study, offers a framework for addressing these challenges. It emphasizes the importance of enabling communities to secure their means of subsistence while preserving the natural environment. This approach, which has been institutionalized by various international organizations, forms the basis of the management strategies proposed in this thesis.

The research presented here has been shaped by extensive fieldwork, literature review, and interactions with local stakeholders, including park management authorities, conservationists, and community members. I hope that the findings and recommendations of this study will contribute to the ongoing efforts to protect the rich biodiversity of Manas National Park while ensuring that the surrounding communities can thrive sustainably.

In presenting this work, I am deeply aware of the complex and sometimes conflicting demands of conservation and development. It is my hope that this thesis will serve as a useful resource for those engaged in the management of protected areas and the promotion of sustainable livelihoods in similar contexts around the world.

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Acronyms

AAGSP	-	All Assam Gana Sangram Parishad
AASU	-	All Assam Students Union
ABSU	-	All Bodo Students Union
AEA	-	Agriculture Extension Assistant
AIR	-	All India Radio
ANOVA	-	Analysis of Variance
AP	-	Arunachal Pradesh
BBC	-	British Broadcasting Corporation
BLT	-	Bodo Liberation Tigers
BPL	-	Below Poverty Line
BTC	-	Bodoland Territorial Council
BTR	-	Bodoland Territorial Region
CBET	-	Community-Based Ecotourism
CBH		circumference at breast height
CBNRM	-	Community-Based Natural Resource Management
COVID	-	COronaVirus Disease
CWS	—	Centre for Wildlife Studies
DC	-	District Collector
DFO	-	Divisional Forest Officer
DRM	-	Disaster Risk Management
EE	-	Environmental Education
FGD	-	Focus Group Discussion
HWC	-	Human-Wildlife Conflict
ICDP	-	Integrated Conservation and Development Project

JFM	-	Joint Forest Management
KNP	-	Kaziranga National Park
MNP	-	Manas National Park
NCS	-	National Conservation Strategies
NPAs	-	National Park Authorities
NPBI	-	National Park Behaviour Intention
NPSAT	-	National Park Sustainability
NPSUS	-	National Park Sustainability
NTCA	-	National Tiger Conservation Authority
NTP	-	National Tourism Policy
PA	-	Protected Areas
PBR	-	Participatory Biodiversity Register
PPP	-	Public-Private Partners
SEM	-	Structural Equation Modeling
SL	-	Sustainable Livelihood
SPSS	-	Statistical Package for the Social Sciences
UNESCO	-	United Nations Educational, Scientific and Cultural Organization
WCS	-	Wildlife Conservation Society

CHAPTER 1

INTRODUCTION

1.1 Prologue

Sustainable development is defined as the pursuit of growth that fulfils the needs of the present without compromising the capacity of future generations to satisfy their own needs (Griggs et al., 2013). This concept serves as a foundational framework for achieving human development goals while ensuring that natural systems remain capable of supplying the essential resources and ecosystem services that economies and societies rely upon. The objective of sustainable development is to harmonize economic progress with environmental stewardship, ensuring that advancements today do not undermine the well-being of future generations.

In recent decades, there has been a significant global focus on sustainability, evidenced by the formation of various partnerships, organizations, and initiatives dedicated to promoting sustainable practices. Despite these efforts, sustainable development faces persistent challenges, particularly in reconciling the often-conflicting demands of economic growth and environmental preservation (Scoones, 2007). The path toward sustainability requires substantial financial investments, which can place a considerable strain on a nation's economy, highlighting the complexity of implementing sustainable practices in a way that is both economically viable and environmentally sound.

The concept of sustainability emerged in the late 1980s and has since evolved into a broad discourse that includes related ideas such as sustainable development and sustainable ecosystems. These concepts emphasize the importance of maintaining the earth's biophysical environment, particularly regarding the utilization and conservation of natural resources. Unlike traditional environmental protection or conservation efforts, sustainability aims to establish a balanced state in which the planet can support human populations and economic activities without endangering the health of ecosystems, including humans, animals, and plants (Biodiversity) (Farley and Smith, 2020).

When we talk about biodiversity, national parks play a pivotal role in safeguarding earth's biodiversity and enhancing human well-being. The sustainability of national parks hinges on the maintenance of ecological integrity, financial stability, and social relevance. The experience of visiting a national park can be profoundly impactful, fostering the preservation of the natural environment and enriching human intellect and well-being. However, it is increasingly clear that human activities and technologies exert significant influence, both beneficial and detrimental, on the natural environment and multicultural societies. Human-induced physical, chemical, and ecological processes are powerful drivers of change, even within protected areas like national parks. Economic development in regions adjacent to protected natural environments should not be perceived as over-exploitation. Instead, achieving self-sufficiency and sustainability in these bordering areas aligns with legal objectives, as these regions often face economic disadvantages due to factors such as the decline of agriculture and restrictions on natural resource use following the designation of protected spaces. Promoting sustainable development in these areas can support both conservation goals and community well-being.

In the context of Assam, the sustainability of its rich flora and fauna is crucial for maintaining ecological balance and promoting human well-being. Assam's diverse ecosystems, including its national parks and wildlife sanctuaries, are home to a variety of species that contribute significantly to the region's biodiversity. The conservation of these ecosystems is integral to sustaining the natural resources and ecosystem services that local communities depend on. For instance, the preservation of the Kaziranga National Park and Manas National Park not only protects endangered species like the one-horned rhinoceros and the Bengal tiger but also supports the livelihoods of local populations through eco-tourism and sustainable resource management. However, the challenge lies in balancing the conservation efforts with the needs of the surrounding communities, who often face economic hardships exacerbated by conservation restrictions. Ensuring the sustainability of Assam's flora and fauna requires a holistic approach that integrates environmental protection with socio-economic development. By fostering sustainable practices and supporting community-based conservation initiatives, Assam can enhance its

ecological resilience while promoting the well-being of its inhabitants. This approach aligns with the broader goals of sustainable development, emphasizing the need to harmonize economic progress with environmental stewardship and social equity.

1.2 Brief History of Assam

The evolution of Assam's historical path has navigated through multiple phases to accomplish in its existing state. Categorically, the historical narrative of Assam can be delineated into four distinct eras namely Ancient Era (350-1206), Medieval Era (1206-1826), Colonial Era (1826-1947) and Post Colonial Era (1947- present).

1.2.1 Ancient Era (350-1206)

The Ancient Era commenced around the 4th century, with the earliest references to Kamarupa in the inscriptions of Samudragupta on the Allahabad pillar. This period marked the establishment of the Kamarupa kingdom, which laid the foundation for Assam's historical and cultural identity.

1.2.2 Medieval Era (1206-1826)

The transition to the Medieval Era was characterized by the incursions of the Bengal Sultanate, notably initiated in 1206 by Bakhtiyar Khilji, as recorded in the Kanai-boroxiboa rock inscription. This era saw the fragmentation of the ancient Kamarupa kingdom and the rise of new principalities and chieftaincies across the region.

1.2.3 Colonial Era (1826-1947)

The Colonial Era began with the imposition of British rule following the Treaty of Yandaboo in 1826, which marked the end of the Ahom rule and the beginning of a new administrative framework. The British era brought significant changes to Assam's political and economic structure. Sir Muhammad Saleh Akbar Hydari was the first Governor of autonomous Assam, with Gopinath Bordoloi serving as Chief Minister. During Bordoloi's tenure, Assam saw the establishment of crucial institutions such as Gauhati University (1948), Gauhati High Court (1948), and the Guwahati station of All India Radio (AIR). After Bordoloi's death in 1950, Bishnu Ram Medhi took over as Chief Minister, initiating the First Five-Year Plan and the Panchayat system, which focused on agricultural development. His successor, Bimla

Prasad Chaliha (1957-1970), oversaw major infrastructure projects, including the Saraighat Bridge (1965) and an oil refinery in Noonmati (1962). This period also witnessed the 1959-60 language agitation, resulting in Assamese being declared the official language of the state, alongside Bengali in the Cachar District.

1.2.4 Post Colonial Era(1947-Present)

The Post-Colonial Era began in 1947 with India's independence, marking a new chapter in Assam's political and developmental history. Mohendra Mohan Choudhury became Chief Minister in 1970, laying the groundwork for industrial projects like Bongaigaon Petro-Chemicals and a paper mill at Jogighopa. Sarat Chandra Sinha, who succeeded Choudhury in 1972, was instrumental in relocating the capital to Dispur, Guwahati, in 1974.

A notable event during this era was the Assam Movement (1979-1985), led by the All Assam Students Union (AASU) and the All Assam Gana Sangram Parishad (AAGSP). This movement aimed to address the issue of unauthorized migrants, particularly from Bangladesh, and sought constitutional, legislative, and administrative safeguards for the Assamese people. The movement culminated in the signing of the Assam Accord on August 15, 1985, which resolved the long-standing agitation. Today, Assam covers 78,438 sq. km., is divided into thirty-three districts, and is recognized as the most densely populated state in Northeast India.

Assam's cultural heritage, deeply intertwined with the Brahmaputra River, reflects influences from both ancient and colonial periods. The river has been central to Assam's development, inspiring renowned figures like Lt. Bhupen Hazarika and Lt. Pramathesh Barua. Other notable cultural contributors include Lt. Jyoti Prasad Agarwala, Lt. Mamoni Raisom Goswami, Lt. Bishnu Prasad Rabha, and Sh. Jahnu Barua, who have enriched Assam's cultural landscape through their artistic and literary contributions.

1.3 History of National Parks in India

The inception of the National Park movement in India has roots that extend deep into the country's ancient history, closely knotted with its cultural and spiritual heritage.

Early forms of conservation can be seen in the Rishi Ashrams, or *Abannyas*, which served as sanctuaries where all forms of life were protected. This concept of a protected natural space is vividly captured in Kalidasa's *Shakuntala*, where the protagonist's departure from her father's ashram is marked by a touching farewell from the flora and fauna, symbolizing a profound connection between humans and nature that mirrors the ideals of modern National Parks (Rangarajan and Shivramakrishnan, 2014).

As Indian civilization progressed, this ethos of protection continued, most notably during the reign of King Ashoka the Great (300 B.C.), who implemented laws to safeguard animals and plants (Bagchi, 1996). However, the centuries that followed saw a decline in these conservation efforts, particularly during the colonial era. The exploitation of India's natural resources became rampant as the country turned into a vast hunting ground for British officials and local rulers. This period of aggressive hunting and deforestation led to significant destruction of India's wildlife and natural habitats (Bowen, 2005).

In response to the growing threat of species extinction in the early 1900s, a group of committed naturalists began advocating for the preservation of India's wildlife. Their efforts led to the establishment of India's first Wildlife Preserve in the Banjar Valley (now Kanha National Park) and the creation of sanctuaries like Kaziranga and Orang in the early 1900s (Adams, 2013). These initiatives marked the beginning of a formalized approach to conservation in India, though the concept of wildlife reserves was not widely supported by the ruling classes, who prioritized hunting.

The momentum for conservation continued to build after World War I, with the establishment of additional sanctuaries and the creation of India's first National Park in 1935, originally named Hailey National Park (now Corbett National Park). This period also saw the spread of the National Park concept to other regions of India, with parks being established in Orissa, Bihar, and Maharashtra (Stastny, 1987). However, the outbreak of World War II and the subsequent political upheavals posed new challenges to these early conservation efforts.

In the chaotic years following World War II and India's independence, wildlife and habitats faced severe threats from poaching and deforestation. The government's push to increase food production led to the clearing of large forest areas, while wildlife was targeted under the pretext of crop protection. This widespread destruction prompted Prime Minister Jawaharlal Nehru to intervene, resulting in the formation of the Indian Board for Wild Life Preservation in 1952. This marked a new chapter in India's conservation history, with a significant expansion in the number of sanctuaries and national parks (Van, 2016).

By the early 1960s, India had established over a hundred sanctuaries and five national parks, yet these areas were still not widely recognized as tourist destinations. The advent of air travel and increased global interest in wildlife conservation led to a renewed focus on these protected areas, with the number of sanctuaries increasing further. Today, India boasts 125 sanctuaries and several national parks, with ongoing efforts to expand this network. These protected areas are accessible to the public and offer accommodations that allow visitors to experience India's rich natural heritage (Negi, 2013). This evolving legacy emphasizes the importance of balancing conservation with sustainable development, ensuring that future generations can continue to enjoy and benefit from India's diverse ecosystems.

1.3.1 National Park of Assam

Assam, with its seven national parks, two of which have been recognized as World Natural Heritage Sites by UNESCO, as well as numerous wildlife and bird sanctuaries, emerges as a region of great significance for those interested in wildlife. Assam's inherent richness in biodiversity is attributed to its diverse topography, which features verdant hills and valleys intersected by the grand Brahmaputra River and its numerous tributaries. The state of Assam harbours a diverse array of mammalian species, exceeding 180 in number, among which are esteemed and vulnerable species such as the majestic great Indian one-horned rhinoceros, the regal royal Bengal tiger, the captivating golden langur, and the agile hoolock gibbon, alongside a remarkable assortment of bird species. Among Assam's most renowned parks are Kaziranga and Manas, both of which received the esteemed recognition of World Heritage Status

back in the year 1985. The Protected Area Network (PAN) of Assam consists of 18 animal sanctuaries and 7 national parks, encompassing an area of around 4044 sq. km., or about 5% of the state's total land area. Currently, Assam is home to four tiger reserves. The wildlife sanctuaries of Assam contain a diverse collection of different types of habitats, plants, birds, and animals. Assam is a favourable home for birds, animals, and natural vegetation due to its hospitable climate, strategic location, and substantial forest reserves. The state's national parks and animal sanctuaries serve as breeding places for some of the rarest species on earth. Many of Assam's wildlife sanctuaries are home to numerous priceless wildlife species, including the one-horned rhinoceros and the golden langur. The different national parks of Assam are:

1.3.1.1 Kaziranga National Park

Kaziranga National Park covers an area of 858 sq. km. and is situated in the floodplains on both banks of the Brahmaputra River. Interspersed within the park are patches of mixed deciduous forests along with extensive expanses of savannah grasslands, wetlands, and chars of river islands that have been formed due to the changing course of the Brahmaputra. The park is segmented into five ranges, namely Central (accessible from Kohora), Western (entrance located at Bagori), Eastern (at Agratoli), Western-most Burha Pahar (at Ghorakati), and Northern. The first four ranges are positioned on the southern side of the river, whereas the last range is situated on the northern bank. A remarkable method of navigating Kaziranga is by riding on the back of an elephant, allowing visitors to observe the surroundings as these gentle creatures move through the tall grass. The park's most prized inhabitants, the rhinoceroses, can often be sighted in significant numbers feeding alongside deer and buffaloes. An alternative approach to exploring the park is by opting for a jeep safari, a highly recommended activity for visitors.



Image 1. Kaziranga National Park Signboard at the Entrance (Source: <https://www.kaziranganationalpark-india.com/blog/indian-wildlife-award-for-kaziranga-national-park/>)

1.3.1.2 Raimona National Park

Raimona National Park is located in the far western region of Assam, within the Kokrajhar district of the Bodoland Territorial Region, specifically in the Gossaigaon and Kokrajhar subdivisions. On June 5, 2021, during World Environment Day celebrations at Gandhi Mandap in Guwahati, Assam's Chief Minister Himanta Biswa Sarma announced that the area would become a National Park. This was made official through Assam Gazette Notification no. FRW.02/2021/27 on June 8, 2021, and the area was officially designated as a national park on June 9, 2021. Raimona National Park includes part of the Ripu Reserve Forest, covering 508.62 sq.km (196.38 sq mi). It serves as the westernmost buffer of the Manas Tiger Reserve in the foothills of the Eastern Himalayas, encompassing a continuous forest area of 422 sq.km (163 sq mi). This designation plays a crucial role in the region's conservation efforts.



Image 2. Raimona National Park Signboard at the Entrance
(Source: <https://liamtra.com/blog/know-about-raimona-national-park/>)

1.3.1.3 Dibru - Saikhowa National Park

The Dibru-Saikhowa area, spanning 340 sq. km. in the Tinsukia district, is designated as both a National Park and a Biosphere Reserve. This region is known for its unique habitat, which underwent significant changes following the seismic event of 1950. One of the main attractions of Dibru-Saikhowa is the presence of migratory birds. Additionally, the area is home to 36 species of mammals, including tigers, elephants, leopards, jungle cats, bears, small Indian civets, squirrels, Gangetic dolphins, slow lorises, Assamese macaques, rhesus macaques, capped langurs, hoolock gibbons, wild pigs, sambar deer, barking deer, water buffalo, and feral horses.



Image 3. Dibru - Saikhowa National Park Signboard at the Entrance
 (Source: <https://timesofindia.indiatimes.com/travel/things-to-do/dibru-saikhowa-national-park/articleshow/29669900.cms>)

1.3.1.4 Nameri National Park

Nameri National Park, situated in the Sonitpur district of Assam, northeast India, spans an area of 200 sq. km in the foothills of the eastern Himalayas. Adjacent to the Pakhui Wildlife Sanctuary in Arunachal Pradesh to the north, these combined areas cover approximately 1,000 sq. km with elevations ranging from 79 m to over 1,500 m. The Jia Bhareli river borders the park's western and southern edges, while the Bor Dikrai river defines its eastern boundary. The park's topography features rolling hills, with elevations from 80 to 100 meters along the Jia Bhareli river and its tributaries, rising to 200 to 225 meters in the central and northern regions. The soil is predominantly sandy or sandy loam due to alluvial deposits. Numerous minor rivers and perennial streams, originating in Arunachal Pradesh, traverse the park and flow into the Jia Bhareli river. During the wet season, several rivers alter their paths, leading to dry riverbeds in the winter. Nameri National Park is home to a diverse array of wildlife. Notable animals include tigers, elephants, leopards, clouded leopards, Indian bison (gaur), wild boars, and various species of deer such as sambar and barking deer. The park is also a haven for birdwatchers, featuring species like the white-winged

woodduck, great pied hornbill, and the rare black stork. Additionally, the park supports populations of smaller mammals and reptiles, contributing to its rich biodiversity.



Image 4. Nameri National Park Signboard at the Entrance

(Source : <https://newstrack.com/tourism/nameri-national-park-in-assam- best-time-to-visit-in-these-months-411096>)

1.3.1.5 Orang National Park

The Orang National Park, situated in India, can be found on the northern side of the Brahmaputra River within the Darrang and Sonitpur districts of Assam. Encompassing a land area of 79.28 sq.km (30.61 sq mi), this park was initially designated as a sanctuary in the year 1985 before being officially declared a national park on the 13th of April in 1999. Renowned for its diverse range of flora and fauna, the park is home to notable species such as the great Indian rhinoceros, pygmy hog, Asian elephant, wild water buffalo, and the Bengal tiger. Notably, it serves as the sole bastion for the rhinoceros' population along the northern banks of the Brahmaputra River.



Image 5. Orang National Park Signboard at the Entrance (Source: <https://northeastlivetv.com/around-ne/assam/orang-national-park-to-reopen-on-october-1/>)

1.3.1.6 Dihing Patkai

The Dihing Patkai National Park, sometimes known as the "Amazon of the East," is a region of abundant and varied biodiversity situated between the Tinsukia and Dibrugarh districts of Assam. Among all the national parks in Assam, this one is the most recently designated and the only one classified as a tropical rainforest. Due to its abundant biodiversity, this location holds great importance for the forest conservators and activists in Assam. The expansive terrain of this region provides a sanctuary for unique plant and animal species, including the slow loris, hoolock gibbon, big-tailed and stump-tailed macaques, Asian elephant, and numerous more species. The rainforest has an area of 231.65 sq. km. (89.44 sq. mi). On June 13, 2004, it was officially designated as a wildlife sanctuary. The Government of Assam elevated the status of Nameri National Park to a National Park on December 13, 2020. Subsequently, on June 9, 2021, the Forest Department of Assam officially designated it as a National Park.



Image 6. Dihing Patkai National Park Signboard at the Entrance

(Source: <https://economictimes.indiatimes.com/news/politics-and-nation/assam-to-upgrade-dehing-patkai-wildlife-sanctuary-into-national-park/articleshow/76820603.cms?from=mdr>)

1.3.1.7 Manas National Park

The Manas National Park is situated in the western region of Assam within the bhabar area at the foothills of the Himalayas, Manas was initially established as a game reserve in 1928, later attaining the status of a Tiger Reserve in 1974, a World Heritage Site in 1985, and finally a Biosphere Reserve in 1989. Its official designation as a National Park occurred in 1990, encompassing an expanse of 500 sq. km., serving as the heart of the 2600 sq. km. Chirang Ripu Elephant Reserve. Within its boundaries, Manas provides sanctuary to over 22 endangered species, categorized as Schedule species under the Wildlife Protection Act, affording them the utmost level of safeguarding. Renowned for its picturesque landscapes, Manas has been praised in the UNESCO World Heritage Tag declaration for encapsulating unparalleled natural phenomena and areas of remarkable natural beauty and aesthetic significance. Additionally, it holds the title of an Important Bird Area, boasting a rich

avian population comprising more than 500 distinct species. Manas National Park has four ranges Panbari, Bansbari, Kuklung and Bhuyapara.



Image 7. Manas National Park Signboard at the Entrance

Source: (<https://currylines.com/manas-national-park-assam-safari/>)

a) History of Manas National Park

In the early 1900s, the area that today encompasses Manas National Park was extensively used as a hunting ground by the King of Gauripur and the royal family of Cooch Behar. This region, situated amidst the foothills of the Himalayas in Assam, was noted for its diverse and abundant wildlife, drawing the attention of the British colonial authorities. In 1905, recognizing the area's rich flora and fauna and the need for conservation, the British government proposed the establishment of a reserved forest to protect its natural resources. This proposal marked a significant early effort toward recognizing and preserving the ecological importance of what would later become one of India's renowned national parks. This proposal came to fruition in 1907, establishing the area as a reserve forest with strict prohibitions on hunting and regulated activities within its boundaries. In 1928, the status of the park evolved into a game sanctuary, allowing for regulated hunting of wild animals.

Following India's independence, the Union Government identified the threats posed by indiscriminate hunting and environmental degradation in the Manas region.

Consequently, the area was designated as a wildlife sanctuary, halting all hunting activities and promoting sustainable development. The ecological significance of the Manas Wildlife Sanctuary garnered international attention, leading to its recognition as a biosphere reserve under UNESCO's Man and Biosphere (MAB) program. Enhanced protection measures were implemented, dividing the area into core, buffer, and transition zones, each with varying levels of protection.

In 1990, the Union Government elevated the protection status of the Manas area by designating it as a national park. Further conservation efforts were undertaken in 2003 when Manas National Park was selected for elephant conservation under Project Elephant. These successive designations and protective measures emphasize the commitment to preserving the ecological integrity and biodiversity of Manas National Park.

b) Biodiversity of Manas National Park

The entirety of all living things that may be found in Earth's many ecosystems is known as biodiversity. It gives people access to social, economic, and ecological services. On Earth, there are several hotspots for biodiversity where certain plant and animal species are endemic. Travelers from other nations come to these areas rich in biodiversity to view these unusual flora and fauna for leisure and educational reasons. This generates significant income for the region through ecotourism, which further contributes to the improvement of society. Due to several human activities that have increased strain on biodiversity in recent years and are causing its extinction, biodiversity conservation has gained international attention. Manas National Park, showcases exceptional biodiversity across various categories. The park spans the Indo-Gangetic and Indo-Malayan biogeographical realms, featuring three primary vegetation types: sub-Himalayan alluvial semi-evergreen forest, East Himalayan mixed moist and dry deciduous forests, and extensive grasslands. Dominant tree species include *Aphanamixis polystachya*, *Bombax ceiba*, and *Terminalia species*, complemented by diverse grass species such as *Imperata cylindrica* and *Phragmites karka*. The park's rich floral diversity encompasses 374 species of dicotyledons, 139 species of monocotyledons including 43 grass species, and 15 species of orchids. Faunally, Manas National Park hosts a remarkable array of wildlife, including flagship mammal species such as the Bengal tiger (*Panthera tigris tigris*), Indian elephant

(*Elephas maximus indicus*), and Indian rhinoceros (*Rhinoceros unicornis*). It supports 22 mammal species listed under India's Wildlife (Protection) Act, 1972, including the endangered hispid hare (*Caprolagus hispidus*), golden langur (*Trachypithecus geei*), and clouded leopard (*Neofelis nebulosa*). The park is renowned for its avian diversity, with over 450 recorded species, including the critically endangered Bengal florican (*Houbaropsis bengalensis*) and various hornbill species. Additionally, Manas National Park is home to diverse reptiles, including the endangered gharial (*Gavialis gangeticus*) and king cobra (*Ophiophagus hannah*), along with notable amphibians and freshwater turtles such as the Assam roofed turtle (*Pangshura sylhetensis*). The park's biodiversity highlights its significance as a key conservation area within South Asia, characterized by its varied habitats and critical role in preserving endemic and endangered species.

Table 1: Forest Area

Sl. No.	Reserve Forest	Area (in sq. km)
1	Manas R. F. (part)	120.00
2	North Kamrup R.F	271.02
3	Panbari R.F.	16.30
4	Kahimata R.F.	34.86
5	Kokilabari R. F.	77.59
Total Area		519.77

Source: Field Officer Manas National Park

Table 2: Wetlands

Sl. No	Name of Ranges	No. of fresh water lake	No. of Ponds
1	Bansbari Range	62	09
2	Bhuyapara Range	42	10
3	Panbari Range	24	08
4	Kuklung Range	16	10

Source: Field Officer Manas National Park

Table 3: Elephant population in MNP

Sl. No.	Year	No. of Elephant
1	2008	780
2	2011	945
3	2017	1034

Source: Field Officer Manas National Park.

Table 4: Rhino population in MNP (2006-20)

Sl. No.	Year	Total no. of Rhino
1	2006	3
2	2007	3
3	2008	5
4	2009	5
5	2010	7
6	2011	10
7	2012	22
8	2013	28
9	2014	30
10	2015	32
11	2016	28
12	2017	29
13	2018	34
14	2019	38
15	2020	30

Source: Field Officer Manas National Park

Table 5: Tiger Population

Sl. No.	Year	Tiger population
1	1972	10
2	1975	41
3	1976	51
4	1988-89	53
5	1994-95	80
6	1996-97	89
7	2000-01	65
8	2008	80
9	2011	09
10	2012	18
11	2013	12
12	2014	11
13	2015	16
14	2016	11
15	2017	31
16	2018	30
17	2019-20	30
18	2021	46
19	2022	60
20	2023	60

Source: Field Officer Manas National Park

As stated earlier Manas National Park, recognized for its exceptional biodiversity, supports a diverse array of flora and fauna, establishing it as a significant biodiversity hotspot. Concurrently, the park plays a vital role in the livelihoods of the surrounding communities. It generates employment opportunities through eco-tourism, stimulates local economic activities, and provides resources to fringe populations, contributing to their sustainable livelihood. By harmonizing conservation initiatives with economic development, Manas National Park

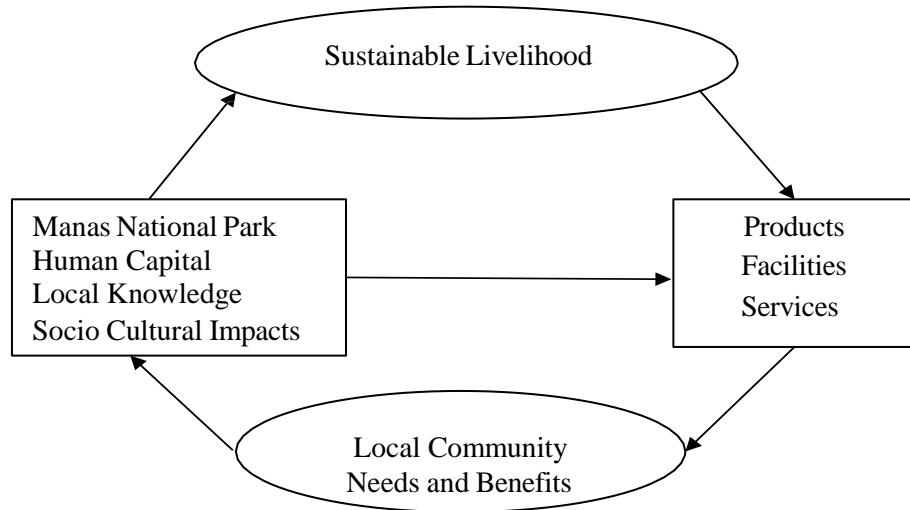
exemplifies how the preservation of natural ecosystems can simultaneously advance environmental objectives and support the well-being of local communities

1.4 Sustainable livelihood approach

The Sustainable Livelihood Approach (SLA) is a framework designed to improve the understanding and support of livelihoods in a sustainable manner, particularly for vulnerable populations. Throughout this study, the livelihoods approach was used to frame the types of assets available to people in Manas National Park, the mechanisms by which these five assets were transformed into livelihood strategies, and the outcomes of these activities for villagers' livelihoods and the meanings they ascribed to them. While scholars and practitioners have identified broad trends in rural agrarian change over the last century—notably a shift away from a sole reliance on agriculture—the precise nature of the livelihood strategies that farmers employ in response to declining agricultural opportunities, as well as the resulting outcomes of these strategies, are context-specific and dependent on the processes unfolding in a given context (Ellis, 2000), property rights (Sjaastad et al., 2002) and gender relations (Hart, 1995). They are further shaped by interactions with the physical environment and by changes in the larger political economy (Ellis, 1998).

The sustainable livelihood approach in Manas National Park focuses on integrating local knowledge and human capital to align conservation efforts with the needs and well-being of the surrounding communities. By utilizing the indigenous knowledge of local populations, the park's management can implement culturally relevant strategies that enhance both environmental protection and socio-economic development. By prioritizing the needs and benefits of the local community, this approach ensures that conservation efforts contribute to sustainable livelihoods, fostering a harmonious relationship between the park and its neighboring populations.

Figure 1: Sustainable Livelihood Approach



(Source: Author's compilation)

The approach to sustainable livelihoods (Figure 1) makes it easier to identify realistic priorities for activities based on the perspectives and interests of individuals affected, but it is not a panacea. Other techniques, such as participatory development, sector-wide approaches, and integrated rural development, are not replaced by it. It is, however, the link between people and the entire enabling environment that has an impact on the outcomes of livelihood initiatives. It emphasizes people's intrinsic potential in terms of talents, social networks, physical and financial resources, and the ability to influence essential institutions.

1.5 Statement of the problem

Manas National Park's management system is vital in achieving insight into the park's effects on the local population. National Parks are typically established to achieve conservation or preservation objectives for natural resources (Svarstad et al., 2007). While establishing such protected zones, however, governments do not appear to take into account the requirements or customary rights of local residents. The issues surrounding people's relationships with protected places are particularly acute in developing countries (Svarstad et al., 2007). BTC (Bodoland Territorial Council) and Assam's government's approach to the organization and management of MNP

makes it difficult to manage the livelihood of people who live near the park, as many lands have been encroached by locals and natural calamities such as floods take away many lands that are meant for agriculture every year, as a result, many lands have been infringed by locals and the area of the park is shrinking every year. The process of institution building is costly as well as participating locally (Vedeld, 2002). Existing customary customs or rights of local populations living near the NPs are not taken into consideration when developing new policy decisions, making local administration more problematic and conflict-prone. Poor infrastructure, a lack of government assistance, a lack of awareness, and outside party influence have all taken away from the community. This study focused on the difficulties that the fringe community (groups of people who live on the outskirts or edges of MNP) as a whole is facing, as well as methods to provide them with all of the resources needed to improve their quality of life through planning and park management strategies.

1.6 Significance of the study

Protected Areas (PA) were established in the past in response to local residents concerns about overexploitation of natural resources. This includes, in some circumstances, the eviction of residents and the prohibition of certain activities such as resource usage (Hutton et al., 2005). Conservation approaches have evolved over time as a result of the challenges that natural resources encounter (Tumusiime, 2006). Nowadays, it is widely recognised that PAs should play an important role in the preservation of the communities in which they work. The impact of the PA on local livelihoods is the most important factor shaping local sentiments toward these locations (Tumusiime, 2006). According to Hjerpe and Kim (2007), the relationship between a national park and the towns that surround it can be beneficial at best, but harmful at worst if local expenses grow too high. When it comes to communities living near or inside National Parks, there are two main reasons of dispute. The first reason (Vedeld et al., 2004) is that forest products are a major source of income for these communities, and the second is that park revenue can help relieve economic inequity on a micro level. Natural forest resource reliance has been fairly explored, as has the cost of living adjacent to such sites, according to a recent World Bank (WB) meta

research (Vedeld et al., 2004). The purpose of this study is to examine the management of Manas National Park (MNP) in a way that promotes sustainable development that combines conservation and development, as well as incorporating fringe communities in conservation and development activities. The study also examined the existing economic activities of the communities living around MNP. The study also investigated the local residents' perceptions and attitudes toward conservation measures and government policies, as well as their obstacles to improved livelihoods.

Several literature reviews collectively highlight the multifaceted nature of national park management and the need for inclusive, participatory approaches that integrate ecological, socio-economic, and cultural dimensions. The research gap finds comparatively lesser studies conducted in India on these topics. The gap is specifically seen in Assam, and finds a need to address the management and sustainability of national parks. The research gap of the study is detailed in chapter 2 after rigorous literature review.

1.7 Research Questions of the Study

RQ1: How do planning initiatives affect the sustainable development of communities adjacent to Manas National Park?

RQ2: How does park management impact the livelihoods of people living adjacent to Manas National Park?

RQ3: How do the perceptions and attitudes of people living adjacent to Manas National Park influence conservation measures and government policies?

RQ4: How do sustainability practices in Manas National Park influence visitor satisfaction and behavioral intentions, and what specific improvements in sustainability attributes can enhance visitor experiences and promote positive behaviors?

1.8 Objectives of the study

- To examine the sustainability and management of Manas National Park, Assam
- To study the current state of livelihood of people in villages living adjacent to Manas National Park.
- To analyze the perception and attitude of fringe community adjacent to Manas National Park towards conservation and development.
- To explore how sustainability and satisfaction affect visitor's intentions to recommend and revisit Manas National Park

1.9 Research Methodology

To take up this study, fieldwork in Manas National Park in Assam is necessary to provide insights into the impacts on local people and to include findings for accomplishing the project's objectives which is empirical in nature. As a result, this study uses mixed techniques to collect both qualitative and quantitative data on processes and institutions relevant to rural livelihoods and natural resource management. Quantitative data supported identifying patterns of association between variables by acquiring data primarily related to household activities, assets, and incomes, whereas qualitative data enabled obtaining data regarding opinions, beliefs, constraints, attitudes, and perceptions.

1.9.1 Type of Study

The study is descriptive and explanatory with the objective of describing the situation of sustainability and management of the National Park, and also about the livelihood of the fringe people. Such studies are known as descripto-explanatory studies. Survey strategy is used for present descripto-explanatory study. Surveys are popular method of data collection for large amount of data in a highly economical way (Chen and Zhang, 2014). Usually, data is obtained by using questionnaire administered to a sample.

1.9.2 Sampling Design

Due to the impracticality of collecting and analysing data from every single member of the census, a representative subset of the population, known as a sample, was selected for study. Empirical evidence has demonstrated that conducting a census may not yield more dependable outcomes when compared to analysing a sample from the population alone (Geronimus and Bound, 1998). In addition, gathering data from a smaller number of cases allows for the collection of more specific information and enables more effective control of non-sampling mistakes.

1.9.2.1 Population of the Study and Study Area

Target population can be defined in terms of sample element or respondents, sample units or the organizations to be targeted and further the time and extent of the study (Ritchie et al., 2003). The universe or population under this study defines domestic tourist who have visited MNP, officials working in MNP and fringe people residing in four villages in MNP. The fringe people are undertaken from four villages namely Gyti, Narayanguri, Raghob Bill and Bhuyapara which are adjacent to MNP. Two ranges are chosen namely Bhuyapara and Bansbari after proper pilot study done in the area.



Figure 2. Geographical Map of Manas National Park.

Source: https://www.researchgate.net/figure/Map-of-Manas-National-Park-Source-http-wwwkolkatabirdscom-manas-manas_fig1_322308017

1.9.2.2 Sampling Method/Technique and Sample Size

As indicated in the subsections of the study area, MNP encompassed land from four villages. These villages—Gyti, Naranguri, Raghobill, and Bhuyapara—were selected for the investigation, with one settlement chosen from each village. This approach aligned with common practices in case studies, where researchers utilized their judgment to serve the study's objectives (Gerring, 2006). The primary stakeholders of the park, namely the local communities, officials and tourists directly impacted by its activities, were identified as the target group for this study.

The observation unit for data collection during the household survey was the individual household. A stratified random sampling method was employed to select the sample group of households. The Manas National Park region was first divided into four strata—South, North, East, and West—and four villages were chosen based on their proximity to the park, with a distance of less than 2 km from the park range (Bansbari and Bhuyapara) to ensure that each subgroup is adequately represented in the overall sample. Data collection from officials and tourists was conducted using convenience sampling. In two of the selected villages, focus group discussions were conducted, with group sizes ranging from four to eight participants. Additionally, key informant interviews (KIIs) were carried out with a variety of stakeholders, including government officials and non-governmental organizations (NGOs).

The research sample comprised 60 households, selected to analyze the livelihoods of fringe communities surrounding the park. To ensure a representative understanding, 15 households were surveyed from each of the four villages involved in the study. Additionally, interviews were conducted with 20 officials from various hierarchical levels within the park's management structure, including the Director, Forest Rangers, Foresters (I and II), Beat Officers, and Guards. Furthermore, data was collected from 233 tourists to assess their behavioral intentions, providing a comprehensive overview of visitor attitudes and experiences.

1.9.3 Data Collection

The data requirements were satisfied through the utilization of both primary and secondary data collection methods. The primary data collection methods encompassed

focus group discussions, key informant interviews, and household surveys, online questionnaire. In contrast, the secondary data collection methods involved the use of official documents, reviews, reports from NGO's, articles in national newspapers, and academic publications. The integration of different data collection approaches is crucial, as it can potentially mitigate biases and enhance the opportunity for triangulation.

In order to maximize the benefits of different sources of evidence attempts have been made to follow three important principles. First principle was to use multiple sources of evidence in order to address a broad range of historical, observational and attitudinal issues (Bhattacharjee, 2012). Second principle was to create a case study database in the form of notes that could take different forms such as handwritten, typed or audiotapes (Tessier, 2012). Finally, the third principle to be followed was to keep a chain of evidence that could enable an external observer to follow the derivation of evidence (Tellis,1997). The tools for data collection are elaborated in the following sub-sections.

1.9.3.1 Tools for Data collection

Various tools were being used for collection of data from the different segments of the population. The tools are being discussed as under

a) Document Review

The initial phase of the research procedure involved acquiring documents pertaining to the management of natural resources, conservation, longitudinal plans, management plans, development plans, and their implementation. Throughout the process of conducting fieldwork, a multitude of documents were gathered, summarized, and subsequently examined. These documents proved to be of significant value as they offered essential background information about MNP. They contained guidance and suggestions from park management, policies addressing the management of natural resources, scholarly and scientific papers, articles published in national newspaper.

b) Household Survey

The household survey preceded the rest of primary data collection techniques and it was carried out using a structured questionnaire. As mentioned above, stratified random sampling technique was used to select households from 4 villages for interview. The target respondents were the heads of households, and the questionnaire had both closed-ended and open-ended questions. However, because the majority of the time the households were headed by men who were at home during the interviews but in case of their absence the second head of the family that is wife (Women) are taken into considerations. Interviews were conducted with the available adult in the household when the head of the household was not available. The respondents homes served as the location of the interviews. Depending on the interviewee's willingness in participating to the research and their ability to reply, the length of each interview ranged from 40 mins to 1 hour on average.

c) Focus Group Discussions (FGDs)

Household surveys were supplemented with focus groups, which provided a flexible and open venue for discussion of the areas of interest and allowed for additional group development of these themes. This made it possible to see why specific behaviors or emotions of various performers, information that the household survey did not disclose. One FGD was conducted in total, in two sample villages. FGD went for one and half hours. The topics of discussion included local involvement, state vs local authority over natural resources, the allocation of tourism advantages, and the exploitation of resources in protected areas, including compensation concerns and perception regarding conservation of biodiversity.

d) Key Informant interviews (KIIs)

The final step in gathering primary data for the fieldwork was to conduct KIIs. In addition, a large number of unofficial interviews were carried like Gaon Burha of the villages and the NGO's who are linked with the village's development and

livelihood. KIIs were in-depth, semi-structured interviews with a range of stakeholders that allowed for the collection of unique data and opinions on many topics. Generally, the duration of the interview with a single key informant ranged from thirty minutes to an hour, contingent upon the informant's availability and willingness to participate in the study. Shortly following informal interviews, KIIs were conducted, giving participants advance notice of the kinds of questions that will be asked. An interview guide consisting mostly of open-ended questions was used to frame the topics and keep the interviewees on track.

1.9.4 Data Analysis

The analysis of livelihood capital was conducted using a variety of indicators across different dimensions: natural, physical, human, financial, and social capital. Each indicator was defined and measured to provide a comprehensive understanding of the community's living conditions. Descriptive statistics, including mean values, were used to capture central tendencies and variations. Following that diverse analytical approaches are employed to scrutinize the viewpoint and attitude of marginalized people towards conservation and development. Kendall's tau is a fundamental analytical technique used for non-parametric correlation analysis, specifically suitable for situations with limited sample sizes and ordinal data. This tool offers a comprehensive analysis of the correlations among variables, including Resource_Park, Wildlife_Protection, Community_Relation with Park, and Economic_Impact. In addition, this includes indicators to evaluate many aspects of livelihood capital, such as the size of farmland and the quality of land for natural capital, as well as the area of the homestead and the assets owned by the family for physical capital. These variables assist in quantifying the economic and physical resources accessible to the communities, so adding to a full examination of their living situations. The SPSS software is widely utilized for data analysis, allowing for the utilization of these technologies and permitting a comprehensive of the intricate relationships between local populations and the park. In addition, this includes indicators for evaluating livelihood capital. Indicators such as agricultural land and land quality are utilized to assess natural capital. When analyzing physical capital, we consider the homestead area and assets possessed by the family. These variables

assist in quantifying the economic and physical resources accessible to the communities, so adding to a full examination of their living situations. Various indicators are employed to evaluate community views and attitudes. Resource_Park permits activities such as the extraction of forest products, the grazing of animals, and hunting, among other things. Indicators for Wildlife_Protection encompasses assessments of opinions toward the safeguarding of animals and natural vegetation. The indicators for Community_Relation with Park encompass the community's interaction with park personnel, the availability of social facilities, and the potential for employment. The Economic_Impact component evaluates the economic consequences of wildlife reliance, meat trade, and the influence of tourism. The use of SPSS software is widespread in order to facilitate these analyses, guaranteeing a strong statistical assessment and a sophisticated comprehension of the intricate interactions between local populations and park management. In order to conduct an empirical examination of the hypotheses in the present study, a questionnaire was created. This questionnaire included three constructs that aimed to measure tourists National Park Behavioral Intentions (NPBI) towards Manas National Park (MNP). The constructs referred to in the text are National Park Sustainability (NPSus), National Park Satisfaction (NPSat), and NPBI (National Park Behavioral Intentions). The operationalization of NPSus was derived from prior research and tailored to fit the specific circumstances of the current investigation. NPSat was quantified using items derived from previous studies, while NPBI was evaluated using well-established measures. The evaluation of each concept was conducted using a 7-point Likert scale, which ranged from a score of 1 indicating severe disagreement to a score of 7 indicating strong agreement. The survey was administered to domestic tourists, with a sample size of 300, although only 233 replies were obtained. The sources of the data include databases of resort and home stay owners, as well as the Manas National Park office. The data analysis was conducted with the SPSS software.

1.9.4.1 Livelihood Analysis

The data analysis for the livelihood measurements was conducted using a combination of descriptive statistics to summarize and understand the collected data. The indicators across different dimensions such as natural, physical, human, financial, and social capital were assessed using mean values and standard deviations to capture central tendencies and variations. For instance, land area, land quality, homestead area, asset ownership, livestock breeding, family size, skill training, education level, health condition, medical treatment frequency, off-farm management, annual income, agricultural cooperative membership, relationships with relatives and park officials, road condition, and transportation convenience were all analyzed. This statistical approach provided a clear overview of the current state and distribution of livelihood.

1.9.4.2 FGD Analysis

In order to achieve the research goals, a reflexive thematic analysis methodology was utilized to examine the qualitative data. Reflexive thematic analysis, as described by Braun & Clarke (2020), is an accessible and adaptable interpretative method for analyzing qualitative data, enabling the identification and study of patterns or themes within a data set. The researcher used Nvivo 14, a widely recognized qualitative data analysis tool, to perform the analysis. The reflexive thematic analysis technique involved six steps: familiarization with the data, generating initial codes, generating initial themes, reviewing potential themes, naming themes, and producing the report. This structured approach ensured a comprehensive and systematic analysis of the qualitative data.

1.9.4.3 Pilot Study

A pilot survey was carried out in advance of the study to determine what data would be needed for the main investigation. Through a Pilot Survey and many local visits, the number of villages and homes to be questioned was determined. The study has included the sample homes whose member(s) involve in farming, business, daily wage labours etc. including those related to tourism in and around the MNP. Fifteen houses were chosen from these four communities in total to gather information on a range of

topics. The convenience sampling technique has been the primary approach used for selecting sample houses. Together with the locals, surveys were carried out to improve communication and get access to the family head. Verifying the sample households of the chosen villages under investigation required the pilot research. The previously created Sample Village Household Questionnaire was examined for inconsistencies or issues that the respondents could have encountered when responding to the questions. Three groups of people—park rangers, non-governmental organizations, and fringe participants—were the focus of the study, and three separate questionnaires were created. The poll conducted by the NGO and officials used reference sampling.

1.10 Outline of Thesis

The work presented here is on smoldering issue of park management in Manas National Park; focused on sustainability, management, and livelihood of the Fringe People. The study has been organized in seven chapters. A brief outline of the chapters is discussed here:

Chapter 1. Introduction: The chapter begins by tracing the historical evolution of National Parks in India and offers a concise overview of the management challenges faced by Manas National Park (MNP). It highlights the rich biodiversity of Assam, particularly highlighting national parks like Kaziranga and Manas renowned for their conservation efforts. Emphasizing sustainability, it explores the impact on the livelihoods of communities living on the park fringes. The study is geographically focused on Baksa, Assam, detailing its significance and scope. The chapter introduces the research problem, objectives, followed by a discussion on the research methodology. This includes the sampling design, construction and reliability of the questionnaire, conceptualization and operationalization of variables, methods of data collection, and the tools and techniques employed for data processing and analysis.

Chapter 2. Review of Literature: This section deals with the literature on different aspect of sustainability and management of National parks. It also focussed on the different literature with respect to the livelihood of fringe people.

Chapter 3. Sustainability and Management of the MNP: This section explores the sustainability and management of Manas National Park (MNP), beginning with the conceptual relationship between sustainability and sustainable development. It presents a sustainable framework for MNP, emphasizing the park's need for sustainability through visitor management, collaboration with indigenous peoples and local communities, resource management, and measuring impact for sustainable tourism. The chapter then discusses the management of national parks, focusing on strategic, operational, and tactical planning within MNP. It delves into the organizing functions of the park, including visitor services, cooperative actions with neighbors and communities, policing tasks, incident and emergency responses, specialized departments, collaborative committees, training and capacity building, and resource allocation. It also highlights the various stakeholders involved with MNP, including the Forest Department, the Tourism Department of BTC Administration, NGOs, and administrative controls. Finally, the chapter addresses the management constraints faced by MNP.

Chapter 4. Sustainable Livelihood of Fringe Community of MNP: This section explores into the concept of sustainable livelihoods, starting with an exploration of the sustainable livelihood approach and its components, including livelihoods, people- centered approaches, responsive and participatory frameworks, multilevel governance, public-private partnerships, dynamic management, and sustainability. It applies this framework to the context of Manas National Park, emphasizing local potential and resources, integration with other development tools, appreciative inquiry, community engagement, and the various forms of capital assets—human, social, natural, physical, and financial—specific to the park. The chapter also includes a detailed data analysis of livelihood measurements, focusing on the fringe communities of the park. It addresses the vulnerability context, highlighting shocks, seasonality, critical trends, coping mechanisms, policies, institutions, structures, and processes relevant to Manas National Park. Furthermore, it discusses livelihood strategies and outcomes, such as natural-resource-based activities, off-farm activities, migration, and the balance between intensification and diversification. The chapter concludes by examining the implications of the sustainable livelihoods approach,

emphasizing contextual development, process-oriented strategies, institutional framework mapping, policy appraisal, and alternative local perspectives, with a final look at tourism, particularly ecotourism, as an alternate means of livelihood.

Chapter 5. Data Analysis: In this chapter, the analysis of the collected data is conducted to evaluate the perceptions and attitudes of fringe communities toward the conservation and development of Manas National Park (MNP). The chapter begins by detailing the statistical methods used, such as correlation analysis with Kendall's tau, to examine relationships between variables like Resource_Park, Wildlife_Protection, Community_Relation with Park, and Economic_Impact. The analysis aims to identify patterns and differences in community responses based on factors such as village location and community type. The chapter also includes the results of the household surveys, focus group discussions, and key informant interviews, providing a comprehensive understanding of how local communities perceive conservation efforts and their impact on livelihoods. The findings are then interpreted in the context of the study's objectives, offering insights into the effectiveness of current management strategies and potential areas for improvement.

Chapter 6: Sustainability and satisfaction affect on visitor's intentions: In this chapter, the focus is on exploring the relationship between sustainability practices and visitor satisfaction in influencing their intentions to revisit or recommend Manas National Park (MNP). The chapter examines how sustainable tourism initiatives contribute to positive visitor experiences and how satisfaction with these practices can enhance visitors' likelihood to engage in supportive behaviors, such as advocacy and repeat visits. The chapter also discusses the importance of aligning sustainability efforts with visitor expectations to achieve long-term benefits for both conservation and local communities.

Chapter 7: Findings, Conclusion and Suggestions: It emphasizes on the overall findings of the study, concludes the study and offer appropriate suggestions based on the findings. Lastly, scope for future research is discussed.

1.11 Summary

The study centered on the sustainable administration of Manas National Park (MNP) in Assam, India, and its influence on the livelihoods of neighboring populations. The objective was to achieve a harmonious equilibrium between the preservation of the park's natural riches and the promotion of local economic development. The local villagers heavily relied on Manas National Park for their livelihoods, as it provided essential resources. However, there were persistent disputes around land and resource utilization. The study investigated the park's management, assessed the present living situations of the residents in the nearby villages, and gauged the attitudes of these populations towards conservation initiatives and governmental policies. The peripheral regions of the park suffered from a dearth of fundamental infrastructure, including educational institutions, healthcare facilities, and sanitation services, which posed significant hardships for the local inhabitants. In addition, the local populace frequently lacked awareness of the latest regulations established by the Forest Department, resulting in legal complications and being stigmatized as encroachers. The study gathered quantitative data, such as information on household activities and income, as well as qualitative data, including personal opinions, beliefs, and attitudes, from the villagers. The research endeavored to uncover the primary obstacles faced by the residents of villages near the park through direct interaction and conversation. Additionally, it sought to provide strategies for enhancing their quality of life while simultaneously safeguarding the park's natural resources.

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CHAPTER 2

REVIEW OF LITERATURE

2.1 Introduction

A comprehensive literature review was conducted on the topic of research, encompassing an extensive range of sources, including books, articles, research papers, computerized documents, web pages, journals, and other relevant studies. The review is systematically structured into two main sections to ensure a thorough exploration of the topic. The first section addresses the core concepts essential to the study, namely Sustainability, Sustainability of national parks, Management of national parks, and the relationship between Livelihoods and national parks. This section critically examines previous studies, highlighting their objectives, methodologies, and findings to identify and articulate the research gap. By synthesizing key insights from these studies, the review aims to provide a nuanced understanding of the existing knowledge and pinpoint areas requiring further investigation.

The second section delves into the theoretical underpinnings of concepts pertinent to livelihood studies. It explores key concepts such as household dynamics, livelihood strategies, household attitudes towards the park, and household strategies. This exploration helps to establish a conceptual framework for the study, offering a comprehensive understanding of the sustainable livelihoods of fringe villagers (those residing around Manas National Park) under investigation. This framework is crucial for contextualizing the study and ensuring that the analysis is grounded in a solid theoretical base. In addition to academic sources, government records were examined to ensure a robust and credible foundation for the study. These records provide valuable data and insights that complement the academic literature, offering a well-rounded perspective on the topic. To mitigate potential bias and enhance the reliability of the review, only relevant and high-quality literature was included.

By combining insights from both sections, the review not only provides a detailed understanding of the current state of knowledge but also identifies gaps that the current study aims to address. This structured and rigorous approach ensures that the study is well-informed and positioned to make a significant contribution to the field.

2.2 Sustainability and Management of National Parks

The EPA (Environmental Protection Agency) defines sustainability as "the ability to maintain or improve standards of living without damaging or depleting natural resources for present and future generations."

2.2.1 Sustainability

Basiago (1995) discusses sustainability with several key objectives: establishing a new paradigm for society, economics, and development; preserving the environment through the precautionary principle; promoting sustainable development as a central policy; accounting for and restructuring the biological foundations of the economy; framing an ethos of sustainable society that considers both human and environmental wellbeing; designing sustainable urban development through transit-oriented, pedestrian-friendly communities; and adopting a "restorative design" approach that imitates nature. The study defines sustainability as a methodology designed to maximize the vitality of social and environmental systems and addresses the challenges facing human civilization and its impact on the natural environment. The methodology described, "sustainability analysis," involves applying four key criteria—futurity, equity, global environmentalism, and biodiversity—to the development process to maximize the vitality of these systems. As a theoretical discussion, the study is a conceptual framework and criteria necessary for achieving sustainable development goals.

Costanza and Patten (1995) attempt to separate the definition of sustainability from related issues of what to sustain, for how long, and when to assess sustainability, arguing that sustainability is more of a prediction problem than a definition problem. They found that sustainability concerns the persistence or longevity of a system and must be assessed within a nested hierarchy of systems and subsystems across different temporal and spatial scales, termed the "metasystem" and they also found that achieving sustainability requires a balance of longevity across these scales, ensuring that parts have shorter lifespans than the larger systems they are part of, which allows for evolutionary adaptation. The key idea is that sustainability requires a balance of longevity across scales, where component parts have shorter lifespans than the larger

systems they belong to, facilitating evolutionary adaptation. It is a conceptual paper which aimed at sustainability.

Mitchell and Buggey (2000) define protected natural and scenic areas as designated spaces crucial for safeguarding landscapes of national and international significance. These areas fulfill multiple purposes, including spiritual, scientific, educational, recreational, and tourist interests. They play a vital role in preserving diverse physiographic regions, biotic communities, genetic resources, and species to maintain ecological stability and promote biodiversity. The findings of the study state that management strategies for protected areas prioritize balancing visitor activities to offer inspirational, educational, and cultural experiences while maintaining the area's natural or near-natural condition. These strategies aim to prohibit and prevent activities that could undermine conservation goals, ensuring the preservation of ecological, geomorphologic, sacred, and aesthetic values. Methodology of the study involves a review of existing literature and policy documents on protected areas management, supplemented by case studies or field observations to illustrate effective management practices.

Placet et al. (2005) study focuses on sustainability in Arizona, emphasizing the need for customized strategies and action plans by organizations to address local sustainability challenges. The finding of the paper stresses the importance of stakeholder engagement, innovative approaches, and worker safety in achieving sustainability goals. Methodologically, the paper includes case studies and surveys to analyze current sustainability practices and challenges specific to Arizona, providing practical insights for organizational sustainability strategies.

Scoones (2007) discusses the evolution of the term "sustainability" from its technical origins in German forest management to its current broader application across cities, economies, and development policies. His paper highlights sustainability as a transformative concept driving innovation and policy changes worldwide, influencing various sectors to adopt sustainable practices. The methodology primarily involves a historical analysis of the term's evolution and its impact on policy frameworks globally.

Scoones (2007) provides an overview of different conceptualizations of "transformation" in the context of sustainability and outlines practical principles for effective research and action towards sustainability transformations. The paper outlines three complementary conceptual approaches to understanding and advancing transformations to sustainability: structural, systemic, and enabling approaches. These approaches are not mutually exclusive but offer complementary perspectives necessary for achieving the ambitious Sustainable Development Goals (SDGs). The main findings are that a combination of these three approaches is required to advance sustainability transformations effectively. The study methodology involved in reviewing different kinds of literature and emphasizes the importance of clearly defining what is meant by transformation and recognizing practical principles for effective action toward achieving sustainability goals.

Heinberg and Lerch (2010) outline five axioms that define a sustainable society, focusing on the sustainable use of resources, control of population and consumption growth, and minimization of environmental harm. They assert that any society using critical resources unsustainably will inevitably collapse, emphasizing that population growth and increasing rates of resource consumption are unsustainable. The study found that the use of renewable resources must not exceed their natural replenishment rates, while the use of nonrenewable resources must decline at a rate greater than or equal to their rate of depletion. They further posit that no continuous rate of use of nonrenewable resources can be sustainable. The methodology involves a conceptual and analytical approach, using historical and contemporary examples to support his claims. They emphasize the need for systemic changes and a paradigm shift in societal operations to prioritize long-term ecological health and social well-being over short-term economic gains, highlighting the importance of ensuring the environment's capacity to provide for future generations.

Kuhlman and Farrington (2010) argue for a return to the original meaning of sustainability, emphasizing the well-being of future generations and the preservation of irreplaceable natural resources rather than focusing solely on current needs. The original concept from the Brundtland Report, which addressed the tension between human aspirations and environmental limits, has been overshadowed by the shift

towards a three-pillar model of sustainability—social, economic, and environmental dimensions. They also proposed sustaining or increasing the aggregate of natural and human-made resources to ensure future well-being. They aimed to argue that the three-dimensional interpretation of sustainability has obscured its original meaning and suggests reverting to prioritizing resource preservation for future generations. Additionally, it provides a framework for assessing the sustainability of policies, programs, and projects by distinguishing between present well-being and future sustainability concerns.

White (2013) utilizes the Wordle data visualization tool to analyze over 100 previously published definitions of sustainability, aiming to create a composite visualization of its essence rather than proposing a new definition. This approach explores whether a cohesive understanding of sustainability can be discerned despite its elusive and multifaceted nature. By generating tag clouds that highlight the most frequently cited elements across these definitions, White provides a high-level overview of common themes in sustainability discourse. The finding of the study reveals that sustainability encompasses diverse yet interconnected concepts such as environmental stewardship, social equity, economic resilience, and intergenerational well-being. This visual representation serves as a starting point for interdisciplinary dialogue and collaboration, acknowledging the diverse interpretations and complexities inherent in defining sustainability.

Hicks et al. (2016) emphasize the need to integrate key social concepts into sustainability efforts, identifying seven critical areas including well-being, values, agency, inequality, power, and culture. They discuss existing and emerging indicators for these concepts, highlighting their importance in measuring progress towards sustainability goals. They also argue that while indicators can effectively assess local conditions and factors impacting sustainability, they may also inadvertently prioritize easily quantifiable metrics over essential social determinants. They finally propose priority areas for further conceptual and methodological development of these indicators, aiming to enhance their ability to capture the complex social dimensions crucial for sustainable development.

Scoones et al. (2020) explore various conceptualizations of "transformation" within the context of sustainability, aiming to outline practical principles for effective research and action. The study introduces three conceptual approaches—structural, systemic, and enabling—to understanding and promoting transformations towards sustainability. The findings of the study sees these approaches are seen as complementary rather than mutually exclusive, offering different perspectives crucial for achieving the Sustainable Development Goals (SDGs). The study emphasizes the importance of clarity in defining transformation and stresses the practical principles necessary for advancing sustainable development efforts.

Dilek (2022) addresses sustainability as a concept integral to maintaining ecological, social, and economic continuity. It calls for societal responsibility in preserving habitats and resources for future generations. Methodologically, the paper reviews case studies and policy analyses to accentuate the interdependence of ecological, social, and economic factors in sustainability initiatives.

2.2.2 Sustainability of National Park/Protected Area/ wildlife Sanctuaries.

According to the International Union for Conservation of Nature (IUCN), Protected Areas are defined "as spaces designated for the conservation of nature and the provision of ecosystem services"

According to the Environment Protection and Biodiversity Conservation Act 1999: a national park is defined as "an area of land or sea that is dedicated to the conservation of its natural environment and its natural and associated cultural resources, and is managed for that purpose."

The IUCN defines wildlife sanctuaries as "areas set aside for the conservation of wild plants and animals and for the regulation of their hunting, with the objective of protecting the environment and achieving the recovery of populations of species of wild fauna and flora."

Nelson (1987) explores the role of national parks and protected areas within the National Conservation Strategies (NCS) of nine countries, highlighting their varied and often suboptimal integration. The study reveals that these areas are not fully

utilized in the strategies despite their potential contributions to conservation efforts. Importantly, Nelson identifies a lack of clear alignment between the designated roles of national parks and protected areas and the socioeconomic contexts of the countries studied. Methodologically, the research draws on a review and extraction of data from both preliminary and final NCS reports across the countries. Supplementing this review, Nelson uses data sourced from the IUCN's List of National Parks and Related Reserves to contextualize the state of these protected areas within the broader conservation strategies. The analysis aims to assess how well these strategies reflect contemporary thinking on the multiple roles that protected areas can play, identifying discrepancies among countries and exploring potential reasons for these variations. The study concludes with recommendations for improving the integration of national parks and protected areas into NCS, advocating for enhanced information systems and further research to better align conservation strategies with the diverse roles these areas can fulfill.

Child and Heath (1990) employ a conceptual and policy analysis approach to examine Zimbabwe's national parks and protected areas. The study finds that the management and operations of the Parks and Wild Life Estate, emphasizing the decentralization of management rights to landholders. It reviews visitor trends post-independence, contrasting national park visitation with overall tourism figures. The paper critiques low-pricing policies within parks, suggesting they undervalue wildlife resources and hinder rural development potential.

Sharma (1990) qualitatively analyzes the conflicts between local communities and Royal Chitwan National Park in Nepal, focusing on the park's challenges such as deforestation, wildlife depredation on crops and livestock, and the local community's dependence on park resources for subsistence. The findings emphasize the need for a paradigm shift in park management, advocating for strategies that integrate resource conservation with the social and economic needs of local residents. Proposed solutions include establishing an "impact zone" to meet local firewood and fodder needs, promoting community forestry initiatives, implementing energy-efficient practices, and managing wildlife populations to mitigate human-wildlife conflicts.

Eyre (1990) explores sustainability perceptions among residents neighboring Spanish National Parks, focusing on economic and social development, quality of life, and their relationship with public use and tourism over the past decade. The study aims to analyze the perception of sustainability by residents near Spanish National Parks, focusing on economic and social development, quality of life, and the relationship between these factors and the sustainability of their environment. The study employs a structured questionnaire sent to the authorities (mayors) of villages located within the socio-economic influence zone of Spanish National Parks. The sample consists of 169 villages, with 75 responses obtained, representing 44.38% of the initial sample. The results indicate significant relationships between the perception of economic development and quality of life, but not with social development. A positive relationship is found between quality of life and social development.

Steinitz (1990) aimed to establish the sensitivity of the landscape to management and design changes for both ecological and visual aspects, assess the ecological integrity of the landscape following the Congressional mandate for wildlife conservation, and develop a geographic information system (GIS) for the study area. The researchers used GIS to analyze the landscape of Mt. Desert Island, including land cover, terrain, transportation, and hydrographic data. They developed a visual preference model based on a survey of several hundred people, comparing responses to existing models and creating a new predictive model. An ecological integrity model was also developed to identify the roles of landscape elements in maintaining wildlife habitat diversity. The researchers conducted 12 experiments simulating different landscape management policies and design actions along the Loop Road, including 7 pessimistic scenarios and 5 attempts to improve visual preference and ecological integrity. The study developed models to assess the visual preference and ecological integrity of the landscape in Acadia National Park and used these models to simulate the impacts of various landscape management policies and actions along the Loop Road. It found that a combination of policies and actions can be designed to improve both the visual and ecological conditions of the landscape, moving towards a more sustainable landscape management plan. The study also assessed the sensitivity of the Loop Road to changes, providing an analysis of the visual and ecological costs of inaction versus the benefits

of implementing a sustainable landscape management plan. The paper concludes that research developed models to assess the visual and ecological impacts of landscape management policies and actions in Acadia National Park, identifying policies and actions that could lead to a more sustainable landscape.

McCarthy et al. (2002) argued that the debates around the introduction of national parks in Scotland, considering the experience of national parks in other European countries, and to provide context for the contemporary arrangements for national parks in Scotland as set out in the National Parks (Scotland) Act 2000. The paper does not describe a specific methodology but provides a review and analysis of the experience of National Parks in Europe to contextualize the introduction of National Parks in Scotland. The finding of the study reveals that national parks in Scotland are intended to balance environmental protection with sustainable economic and social development, contrasting with the dominant European approach, which prioritizes environmental conservation. The Scottish approach aims to integrate the needs of local communities with the conservation of natural and cultural heritage, based on principles of sustainable development. This represents a divergence from the traditional model of National Parks in Europe, including England and Wales, which has focused more on environmental protection. The study also examines the introduction of national parks in Scotland, highlighting their aim to balance environmental protection with sustainable socioeconomic development, in contrast to the dominant European approach that prioritizes environmental protection over social and economic development.

Getzner (2003) aimed to explore the potential for economic development in national park communities from a qualitative perspective, focusing on the perceptions of local and regional stakeholders, particularly mayors. It sought to complement existing quantitative studies on the economic impact of national parks by providing the perspective of key regional decision-makers and to determine whether the results of quantitative assessment studies align with the perceptions of economic success or failure held by regional stakeholders. The study used a survey of mayors in all 65 Austrian national park communities, achieving a 71% response rate (46 out of 65 communities). A written questionnaire was mailed to the mayors in November 1999,

with a follow-up in January 2000 for non-respondents. This qualitative, survey-based approach was chosen due to the unavailability of quantitative data and the need to capture perceptions and tacit knowledge. Mayors were chosen as key respondents as they represent the communities and are central decision-makers involved in the national park planning process. The study found that national parks are perceived to contribute to economic development in surrounding communities. The sources of economic success are mostly in the tourism and primary sectors, as well as new investments and new enterprises. Crucial elements for economic success include the involvement of local and regional stakeholders and the cooperation between the national park administration and the communities. The paper concludes that the economic development potential of national parks is significant and is perceived positively by local stakeholders, particularly mayors, who view the parks as contributing to economic development.

Cernea and Schmidst (2006) in their study aims to examine the forced displacement of rural populations for biodiversity conservation, analyze the impacts of these displacements using the Impoverishment Risks and Reconstruction (IRR) model, and conduct the study across 12 protected areas and national parks in 6 Central African countries. The research involved a detailed literature review of various data sources (census, maps, market data, forest inventories, government correspondence) and detailed interviews with displaced populations using snowball sampling to gather information on population, land use, social costs, and livelihood changes. It also included a comparison with similar livelihoods in non-displaced areas. The findings can be seen as forced and violent displacements have been widely used to expel people from areas converted into national parks. The major impact of these displacements is the aggravated impoverishment of the affected people, similar to development-caused displacements. These displacements and their impoverishment effects occur largely due to a policy vacuum in the relevant countries and conservation-promoting NGOs, with an absence of provisions to prevent economic destitution and human rights abuses. The study also examines the conflict between biodiversity conservation and poverty reduction through 12 case studies in the Congo basin. It finds that parks have already displaced and impoverished around 120-150,000 people, and that this

approach of compulsory population displacement has compromised biodiversity conservation by impoverishing large numbers of people.

West and Brockington (2006) in their study observes the social, economic, and political effects of protected areas, focusing on their impact on people's lives and surroundings through a literature review and conceptual analysis. The study employs a literature review and conceptual analysis to explore how protected areas influence social, economic, and political dynamics. The findings showed that the protected areas have significant social impacts, affecting residents living within, adjacent to, and displaced by them, as well as employees of the managing organizations. They often impose a Western dichotomy between nature and culture, simplifying local relationships with the environment. The creation of protected areas can lead to increased elite control over resources, the alienation of local communities from their traditional lands and seas, and the criminalization of customary land-use practices. The study also provides a comprehensive review of the social, economic, and political implications of environmental conservation initiatives, particularly focusing on protected areas. The study analyzes their effects on local populations and displaced communities, critiques the global expansion of protected areas, and suggests future research avenues for anthropology in understanding and addressing these impacts.

Sharpley and Pearce (2007) in their study identify the extent to which National Park Authorities (NPAs) have embraced the sustainable tourism development agenda, explore the roles and processes adopted by NPAs in delivering sustainable tourism, and evaluate the role of marketing in achieving sustainable tourism development. The study used a qualitative methodology based on semi-structured interviews with key personnel from each of the English NPAs, including those responsible for marketing, tourism, and sustainable development. At least two interviews per NPA were conducted to obtain in-depth information and allow for cross-referencing of responses. The finding claim that many NPAs do not have a dedicated marketing role, with marketing activities spread across the organization. NPAs often measure the outcomes of their sustainable development strategies only in economic terms, rather than considering environmental or social impacts. There is a need for NPAs to adopt a more holistic, integrated approach to managing national parks and developing sustainable

tourism, rather than the current piecemeal approach. This study also examines the role of English NPAs in developing sustainable tourism and provides recommendations for how they and other protected area management organizations can improve their approach. It highlights the need for a more integrated and holistic management strategy that considers environmental and social impacts alongside economic outcomes.

Abukari and Mwalyosi (2020) in their study compared the perceptions of park-adjacent communities in Ghana and Tanzania regarding the impact of protected areas on their livelihoods and community development through household surveys conducted near Tarangire National Park in Tanzania (181 households) and Mole National Park in Ghana (184 households). Villages were randomly selected from neighboring communities, and Cochran's formula was used to determine sample sizes. Questionnaires were translated to Kiswahili for the Tanzanian survey, with face-to-face interviews conducted with household members over 18 years old. The findings reveal that perceptions of the impact of protected areas differed significantly between Ghana and Tanzania, with Ghanaian communities generally holding more positive views. Governance issues emerged as the most influential factor shaping community perceptions, influencing views on the social impacts, ecological outcomes, legitimacy of conservation governance, and acceptability of conservation management practices. The study suggests that conservation authorities should prioritize developing inclusive governance structures that better incorporate the roles and entitlements of local communities. This approach could help bridge differences in community perceptions and enhance the overall effectiveness of conservation efforts in both countries.

Miller et al. (2021) examined the impacts of the COVID-19 pandemic on conservation research, management, and public engagement in US national parks. The authors gathered information from approximately 30 national parks and NPS programs through informal requests and available data sources, focusing on large parks. They solicited insights from park staff on the significant challenges and opportunities presented by the pandemic, seeking both qualitative descriptions and quantitative evidence. Findings of the study reveals that the COVID-19 pandemic has profoundly disrupted operations within US national parks, affecting conservation research, management activities, and public engagement. Challenges include operational

disruptions, reduced staffing and funding, and the shift to virtual modes of public engagement. Despite these challenges, the pandemic has also created opportunities for more flexible approaches in park management and inclusive public engagement strategies. The study highlights the uncertain long-term impacts of the pandemic on national parks, highlighting the need for adaptive strategies to navigate ongoing and future disruptions effectively. Lessons learned from these experiences may provide valuable insights applicable to other protected areas worldwide facing similar challenges in the wake of global health crises.

Das and Roy (2022) argue that the livelihood issues faced by local communities living near national parks in Assam, include conflicts with wildlife, restrictions on resource access, and the long-term impacts on park development. Findings reveal that restrictions on traditional livelihood activities like fishing, hunting, and grazing within national parks significantly impact the livelihoods of local communities. The displacement of communities due to the establishment or expansion of national parks disrupts their existing patterns of subsistence and leads to economic hardships. Furthermore, restrictions on resource extraction and agricultural practices within national parks, such as the use of forest resources and shifting cultivation, further affect the livelihoods of local communities. The methodology included a primary survey with 200 stakeholders, utilizing a questionnaire and collecting secondary data from various sources. The study aimed to present an overview of National Parks in Assam, study the livelihood issues in National Parks in Assam, and put forward measures to solve the livelihood issues.

Mandic (2023) in his study employs a risk assessment framework to evaluate the impact of the COVID-19 pandemic on management outputs at Plitvice Lakes National Park, Croatia. Using an exploratory research design, the study includes a literature review and content analysis. The researchers sent a list of park management objectives to the Plitvice Lakes National Park team, who rated the influence of COVID-19 and the relative importance of each objective on a 7-point Likert scale. Risk scores were calculated by multiplying perception of impact and importance rates. Finding of the study reveals that COVID-19 pandemic has significantly impacted nature-based tourism and local community development outputs at Plitvice Lakes National Park.

While core conservation functions have been relatively resilient in the short term, outputs supporting visitor management and community sustainable development have been severely affected. This exploratory case study highlights the vulnerability of protected areas to external shocks such as pandemics. It highlights the need for adaptive management strategies that prioritize core conservation functions while enhancing resilience in nature-based tourism and community development initiatives. The findings provide insights applicable to other protected areas worldwide facing similar challenges in maintaining management effectiveness during global crises.

Hameed et al. (2024) conducted a systematic review of recent research on the population trends and conservation status of Indian primates from studies published between 2003 and 2023. Using the SALSA approach, it synthesizes data on population trends, threats, study locations, protection status, and survey methods from major databases. The findings reveal declining population trends across most Indian primate species, primarily driven by habitat loss and fragmentation due to anthropogenic activities. Despite some exceptions where populations are stable or increasing, these trends highlight the urgent need for more robust conservation measures. The paper emphasizes the importance of comprehensive population surveys and recommends developing targeted conservation strategies tailored to different primate species and their habitats to mitigate threats effectively.

Denny et al. (2024) in their study investigates the impacts of private sector management of protected areas (PAs) in Africa by African Parks (AP), compared to government management scenarios using a dynamic difference-in-differences estimator. It focuses on wildlife, socioeconomic, and security-related outcomes over a timeframe spanning 5 years before to 10 years after transference to AP management. Control areas, termed "anchor areas," provide a counterfactual for comparison. Excluding areas in AP's incubator program, findings suggest that AP's private management enhances wildlife outcomes by reducing elephant poaching and increasing bird abundances. However, impacts on rural wealth remain inconclusive. Notably, improved monitoring and enforcement under AP's management may inadvertently increase the risk of armed groups targeting nearby communities, highlighting a complex interplay between conservation efforts and local security

dynamics in the region.

Pradhan and Choudhury (2024) in their studies explores human-wildlife conflict (HWC) in Manas National Park, Assam, which poses challenges to achieving Sustainable Development Goals (SDGs) related to poverty alleviation, food security, and biodiversity conservation. The park's management has evolved from traditional conservation approaches to include community-based strategies, allowing sustainable resource use by local communities. Proposing the Radical Ecological Democracy (RED) framework, the paper advocates for a holistic approach to HWC that integrates ecological, economic, social, and political dimensions, aiming to enhance security and coexistence between humans and wildlife in Manas National Park.

2.2.3 Management of National Park

Management, in the context of sustainability and conservation, refers to the deliberate planning, coordination, and implementation of strategies aimed at preserving natural resources, protecting biodiversity, and promoting sustainable development. It involves the application of principles and practices to ensure that human activities do not degrade ecosystems but instead contribute to their long-term health and resilience (Murphree,2009).

Hough (1988) examine the key obstacles hindering effective conflict management between national parks and surrounding human communities, and to propose strategies for overcoming these obstacles. The study adopts a qualitative approach, focusing on identifying barriers to conflict resolution rather than a specific methodological framework. It draws insights from existing literature and expert analyses to explore the dynamics of distrust and communication breakdown between park authorities and local populations. The findings shows primary obstacle identified is the pervasive lack of trust and inadequate communication channels between powerful park authorities and rural communities, exacerbated by historical grievances. The study emphasizes the need for park staff to cultivate new skills in social and political domains, in addition to their traditional biological training. It proposes a paradigm shift for national parks, advocating for management approaches that integrate conservation goals with the socio-economic development needs of local communities. This summary encapsulates

the study's focus on understanding and addressing conflicts between national parks and local communities, aiming to foster sustainable management practices that benefit both biodiversity conservation and human livelihoods.

Carruthers (1989) highlights the creation of the Kruger National Park in 1926, highlighting findings that its establishment was influenced by a complex mix of political, social, and economic factors rather than purely moral or conservation-driven motivations. The findings emphasize that the park's creation coincided with the rise of Afrikaner nationalism and efforts to build a unified white South African identity. The state played a crucial role in this process, viewing the game as a public resource under Roman-Dutch law. Carruthers employs historical analysis, examining archival records, government documents, and contemporary accounts to trace the sociopolitical factors influencing the park's establishment.

McNeely (1990) discusses the increasing pressures on national parks and the need for greater investment to maintain societal benefits. He highlights the necessity of more diverse protected areas, beyond just strict national parks, to conserve biodiversity while accommodating human activities. The study emphasizes that greater support for protected areas at all levels is essential, as unprotected lands face degradation. McNeely advocates for a balanced, multi-pronged approach to protected area management, combining strictly protected zones with areas that allow human use to effectively address these challenges. His findings highlight the importance of diversified protected area management strategies. McNeely's work is based on policy analysis and synthesis of existing literature and conservation reports.

Nepal and Weber (1995) discuss the major management challenges in protected areas of developing nations, specifically focusing on land use disputes with local and native communities. It also seeks to highlight sources of conflict in national parks within developing countries and to summarize theoretical approaches and strategies for conflict resolution in this context. The study explores various theoretical frameworks and strategies for resolving conflicts between national parks and local communities. These include interactive planning processes that involve stakeholders from the outset, conducting thorough social impact assessments to understand community concerns, employing mediation and negotiation techniques to find mutually agreeable solutions,

and emphasizing the importance of participatory management approaches where local communities have a voice in decision-making. The finding state that management problem identified is the conflict arising from restrictions placed on traditional resource use by local and native communities following the establishment of national parks. These conflicts have stemmed from perceived or actual limitations on livelihood activities such as hunting, fishing, and gathering within park boundaries. Key mechanisms for addressing these conflicts emphasize the importance of inclusive governance structures that integrate local knowledge and preferences, thus improving community engagement and support for conservation efforts. Ultimately, the paper argues that the long-term success of protected areas hinges on enhancing local livelihoods and fostering collaborative management approaches that respect and involve local communities. This summary encapsulates the paper's exploration of the complex dynamics between national parks and local communities in developing nations, advocating for inclusive and participatory approaches to mitigate conflicts and enhance conservation outcomes.

Khan et al. (1996) evaluates the impact of conservation measures in Gujarat's Gir Lion Sanctuary and National Park, following research conducted in the 1970s. He highlights significant conservation issues and proposes management recommendations, presenting a habitat classification system for managing vegetation and ungulate populations. Notably, the sanctuary has experienced increased plant density and decreased species richness due to the lack of livestock grazing and fire over the past 20 years. Khan introduces the road-strip count method, which provides more accurate population estimates for ungulates compared to the water-hole count method used by the forest department. His findings include the effectiveness of specific conservation measures and changes in the sanctuary's ecosystem. The research involved line transects and road-strip counts for vegetation sampling, as well as four census operations for ungulate populations.

National Park Service Report (1997) highlighted the importance and need for proper framework development to manage parks and protected areas by establishing a balance between the protection of resources and the satisfaction of stakeholders. The report described that these frameworks depend on three main elements: management

objectives, associated indicators, and standards formulated depending on the resources. Indicators are monitored to ensure standards are maintained, and management decisions are implemented to maintain indicators within the defined standards. The policy report suggested that these management decisions differ depending on the settings, values held by the park stakeholders, and the access and levels of resource use. Therefore, stakeholders, including tourists, should be involved in framing an appropriate management action plan. Findings emphasize the need for adaptable management frameworks and stakeholder involvement. The report is based on policy analysis and recommendations derived from stakeholder consultations and existing management practices.

Mitchell and Buggey (2000) explored the concepts of protected and cultural landscapes in global conservation efforts in protected areas. They explained how these landscapes are different yet increasingly interconnected in conservation strategies. The study emphasizes the importance of including local communities in conservation decisions, as they hold historical knowledge and care for these landscapes. They advocated for integrated conservation approaches that respect both natural and cultural values to better preserve these important areas for future generations. Their findings highlight the need for integrating cultural and natural conservation efforts. The study utilizes case studies and literature reviews to illustrate the interconnectedness of protected and cultural landscapes.

Naughton et al. (2005) in their study aimed to comprehensively examine the expansion of protected areas over the past 25 years, along with the evolution of their missions to include broader goals beyond biodiversity conservation. Methodologically, the research compiles and analyzes data from 20 published studies focusing on deforestation rates in 49 tropical protected areas, utilizing Landsat satellite imagery and other remote sensing data verified through fieldwork. Findings indicate significant physical expansion of protected areas globally, accompanied by a shift towards multifaceted missions that now encompass climate change mitigation, cultural heritage preservation, and sustainable development alongside biodiversity conservation. Despite challenges such as insufficient funding and weak institutional support, the majority of studied protected areas have effectively slowed deforestation within their

boundaries. Additionally, the study highlights the complexities in measuring the effectiveness of protected areas in supporting local livelihoods, highlighting ongoing debates about their socio-economic impacts. It concludes by emphasizing the critical role of these areas in balancing conservation goals with broader socio-economic benefits, marking them as pivotal in global conservation efforts and sustainable development agendas.

Mathur et al. (2005) discuss the prospects and challenges facing Kaziranga National Park, emphasizing the critical role of external pressures in determining its long-term survival and ecological integrity. They outlined various strategies to mitigate identified threats, including erosion control, measures to reduce road casualties, the establishment of animal refuges on higher ground, integrated catchment management, potential park area expansion, and pollution reduction. These measures are proposed to safeguard Kaziranga National Park's biodiversity and ecological balance amidst ongoing developmental pressures beyond its boundaries. The findings highlight the necessity of comprehensive strategies to address external threats. The study combines field observations, threat assessments, and the development of mitigation strategies.

Leverington et al. (2010) in their studies provides a comprehensive global analysis aimed at assessing the effectiveness of protected area management across over 8,000 assessments worldwide. The primary objectives were to compile and analyze a large dataset of management effectiveness assessments, develop a method for synthesizing results from diverse methodologies and indicators, and investigate key factors associated with effective management. Methodologically, the study involved compiling detailed information from over 8,000 assessments conducted across various protected areas globally. A rigorous analysis method was developed to harmonize results from different assessment methodologies and indicators. Original data from 4,092 evaluations conducted in 3,038 protected areas were analyzed, spanning 14 different assessment methodologies. The researchers developed "headline indicators" by categorizing and coding over 1,800 specific indicators used in these assessments, allowing for comparative analysis across diverse contexts. Findings from the study revealed significant insights into the state of protected area management globally. Approximately 40% of the assessed protected areas were

found to have major deficiencies in their management practices, with 14% lacking basic requirements necessary for effective operation. Strong management aspects typically centered on the establishment and legal frameworks of protected areas, as well as governance structures. However, critical weaknesses were identified in areas such as community benefit programs, resource allocation, and the effectiveness of management evaluations.

Karanth et al. (2011) in their study examines trends and patterns in nature-based tourism across 10 protected areas in India, focusing on tourist infrastructure, the attitudes and practices of tourist facilities, and tourism management. The study highlights the rapid growth of nature-based tourism in India, with domestic tourists constituting over 80% of visitors, presenting significant opportunities for public engagement in conservation. However, while tourism generates considerable revenue in some areas, these funds are rarely allocated towards conservation efforts or local community support, resulting in only marginal economic benefits for local communities from tourism-related employment. The findings emphasize the potential and challenges of nature-based tourism in contributing to conservation and local economies. The qualitative research involved semi-structured interviews with managers and owners of 336 tourist facilities within 25 km of the protected areas, interviews with forest department officials, and the collection of official records on visitor numbers, origins, seasonality, gate fees, and revenues.

Wilkins et al. (2021) reviews the academic literature on Indigenous Protected and Conserved Areas (IPCAs) globally, synthesizing findings from 86 initiatives involving 68 Indigenous Peoples across 25 countries. The objectives were to identify and characterize IPCA initiatives, describe their motivations and external support, summarize their successes and challenges, and provide recommendations for improving support and recognition. Methodologically, the study conducted a comprehensive literature search across three interdisciplinary databases: Web of Science, Scopus, and Google Scholar. Keywords related to IPCAs were used to identify relevant studies, resulting in a review of over 900 references. The researchers imported these references into Endnote and systematically reviewed and filtered them based on criteria that included involvement of Indigenous Peoples, focus on protecting

or conserving defined areas, and analysis or evaluation of IPCA initiatives. Findings from the review highlight that IPCAs have been established independently by Indigenous Peoples or through partnerships at local and broader scales. They have generated significant socio-cultural, political, and ecological benefits for Indigenous communities. However, IPCAs also face challenges such as restrictive legislation, burdensome partnerships, and inadequate funding.

Schell et al. (2021) in their study aimed to provide a comprehensive review of the ecological drivers of urban conflict globally, explain how sociocultural factors underpin conflict and vary across scales, emphasize how management decisions in response to conflict work to select and reinforce specific wildlife traits, and discuss how urban evolutionary biology can provide a toolkit to help optimize adaptive wildlife management strategies. As a review paper, it synthesizes existing literature and integrates insights from various studies to create a transdisciplinary framework. It does not present new empirical data or methods but rather compiles and analyzes findings from diverse sources to illustrate key concepts and trends. The findings highlight that urbanization leads to habitat encroachment, increasing human-wildlife interactions and competition for resources. Urban areas provide abundant resources, such as food and shelter, attracting wildlife and increasing population densities. Species composition in urban areas, influenced by factors such as biodiversity and behavioral traits, can heighten conflict potential, and climate change alters wildlife behavior and distribution, bringing new species into urban environments. Sociocultural factors, including perceptions, attitudes, and cultural practices, significantly influence the nature and management of conflicts. These factors vary across local, regional, and global scales, shaping community responses and management strategies. Management techniques like removal, relocation, or lethal control act as selective pressures on urban wildlife, shaping their behavioral and physiological traits. These interventions can lead to the evolution of traits such as boldness, adaptability, and conflict-related behaviors in wildlife. Investigating human-wildlife conflict through an evolutionary lens provides insights into the origins and dynamics of conflicts. Understanding how human-driven ecological conditions and management strategies influence evolutionary outcomes is crucial. Urban evolutionary

biology offers strategies for adaptive wildlife management, optimizing interventions to balance human and wildlife needs. The paper highlights the importance of integrating human-wildlife conflict and urban evolutionary ecology to address the complex dynamics of urban ecosystems. It highlights the variability in urban metrics across developed and developing cities, which affects the implementation and success of management strategies.

Dean (2021) provides an integrative literature review comparing national park (NP) interpretation and place-based education (PBE), highlighting key similarities in ideologies, epistemologies, goals, learning approaches, and content matter. However, significant differences exist, particularly in perceptions of learning, the incorporation of the local setting, and the role of the community. The study suggests that collaboration between the National Park Service and place-based educators could enhance learning about and caring for local environments, history, and culture. His findings reveal key areas of convergence and divergence between NP interpretation and PBE. An integrative literature review of existing research on NP interpretation and PBE was done.

Roy (2021) explores the biodiversity richness and ecotourism potential of Manas National Park, emphasizing its role in fostering sustainable livelihoods for local communities. She highlighted collaborative efforts among government, NGOs, and local stakeholders to promote ecotourism, resulting in increased tourist influx and economic benefits. Initiatives such as homestays, local cuisine ventures, and handicraft businesses have empowered the community. His findings demonstrate the positive impact of ecotourism on local livelihoods and biodiversity conservation. The mixed research method aims to assess biodiversity, analyze tourism promotion strategies, and propose conservation measures. It involves field surveys, stakeholder interviews, and analysis of tourism data.

Bruce and Mulrennan (2024) tries to develop a comprehensive typology of co-management agreements within national parks, national park reserves, and National Marine Conservation Areas (NMCAs). It addresses a gap in knowledge by focusing on specific details of these agreements documented in the literature and identified

through a detailed database preparation process. Methodologically, the study identified relevant co-management agreements and compiled a database, which included scanning and coding the content of these agreements based on various parameters. This process involved narrowing down parameters to establish a common set of dimensions and sub-parameters related to context and governance. The resulting typology categorizes co-management agreements according to contextual factors and governance arrangements. This classification provides valuable insights into the feasibility of shared governance approaches and assesses the strengths and weaknesses of these agreements in fulfilling reconciliation commitments between Parks Canada and Indigenous groups. Findings indicate that co-management agreements exhibit considerable variability in their governance parameters. Consensus-based management agreements (CMAs) are highlighted as supportive of joint governance and management arrangements, albeit within the constraints of Canadian law. The study contributes to understanding how co-management can potentially facilitate reconciliation within protected areas. It highlights the importance of context-specific governance frameworks and collaborative approaches in achieving effective management and conservation outcomes in national parks, reserves, and NMCA's.

Joshi et al. (2024) in their study tried to quantify the tree biomass and carbon stocks in the Binsar Wildlife Sanctuary, assess the structural attributes of the forest stands, and understand the sanctuary's potential contribution to climate change mitigation through its biomass and carbon stocks. A non-destructive method was employed to estimate tree biomass by measuring the circumference at breast height (CBH) of each tree and using an allometric equation to calculate biomass. Carbon stock was then determined by multiplying the biomass values by a conversion factor of 0.475. The findings revealed that the Binsar Wildlife Sanctuary plays a significant role in climate change mitigation due to its substantial biomass and carbon stock. Significant variations in tree structural attributes, such as species richness and tree density, were observed along altitudinal gradients, with the highest values at the highest elevation (2200-2400 m). Positive correlations were found between elevation and various structural variables, including biomass and carbon stock. This highlights the importance of considering elevation and tree diversity in climate change mitigation policies and practices.

Kichloo et al. (2024) in their study examined the human-leopard conflict in Kishtwar National Park, India, focusing on livestock depredation and local community attitudes. The objectives of this study were to understand the spatial patterns of livestock depredation by leopards, the practices employed to mitigate such depredation, and the factors governing people's attitudes towards leopards. The study utilized a structured questionnaire survey to collect data from local communities and Bakerwals in and around Kishtwar National Park in India. The questionnaire was divided into three parts: socio-demographic information and respondent knowledge of wildlife, details on livestock depredation and mitigation practices, and people's perceptions towards carnivores on a Likert scale. Informed verbal consent was obtained from respondents, and interviews were conducted in local languages with assistance from local people and wildlife department staff, with no financial incentives provided to respondents. The findings revealed that leopards were responsible for high livestock depredation, with over 200 incidents reported in the past five years. Households with larger livestock holdings experienced higher predation rates. Respondents' attitudes towards leopards were influenced by their age and the duration of their activity in the park, with older respondents and those engaged in park activities for longer periods having more negative attitudes. Larger livestock losses also correlated with more negative attitudes towards leopards. Financial compensation for livestock losses emerged as a critical factor in improving human-leopard coexistence. The study concludes that a comprehensive, collaborative approach is essential to resolving conflicts and promoting favorable attitudes towards leopards.

Denny et al. (2024) in their study argue to estimate the impacts of African Parks (AP) management on wildlife, socioeconomic, and security-related outcomes compared to a counterfactual scenario of government management, and to provide insights into the real-world impacts of private sector involvement in conservation in Africa, given AP's ambitious vision and extensive protected area management. The methodology involved using a dynamic difference-in-differences estimator to compare outcomes in protected areas transferred to AP management versus those that remained under government management. This estimator analyzed the impact of AP management over multiple years relative to the date of transference, from five years before to ten years

after. The control group consisted of "anchor areas" that AP has identified as potential future management candidates to create a more valid counterfactual. The study excluded protected areas in AP's incubator program as they are not fully under AP management. The findings indicate that private management of protected areas by African Parks improves wildlife outcomes, reducing elephant poaching and increasing bird abundances. AP's management also appears to increase tourism, although the effect on rural wealth is inconclusive. However, AP's management increases the risk of armed groups targeting civilians near the protected areas, which could be an unintended consequence of AP's improved monitoring and enforcement. In summary, private management of protected areas in Africa by the NGO African Parks improves wildlife outcomes but has inconclusive impacts on rural wealth and may undermine the physical security of nearby communities.

2.2.3.1 Community-Based Natural Resource Management

Wearings and Gartrell (1999) tries to explore how ecotourism principles can facilitate community ownership and control of tourism in Australian national parks. The objectives include investigating the impacts of natural resource-based tourism on national parks management agencies and Aboriginal communities, developing evaluative research frameworks to enhance cross-cultural understanding, and maximizing opportunities for Aboriginal involvement in tourism management. Findings indicate that increasing tourism pressures have significant effects on local Aboriginal communities, highlighting the need for sustainable and culturally sensitive management practices. The application of ecotourism principles shows promise in developing research approaches that foster community participation and equitable management of tourism in national parks. This research framework serves as a foundational step towards managing tourism in Australian national parks more effectively and inclusively. Methodologically, the study proposes to review existing literature on ecotourism principles and their application in national parks management. It also suggests conducting case studies and interviews with stakeholders from national parks management agencies and Aboriginal communities involved in tourism.

Gruber (2008) in his aims to examine recent research on community-based environmental and natural resource management (CBNRM) approaches. The study seeks to identify effective characteristics of CBNRM by collecting perspectives from research teams and comparing them with practitioner case studies vetted through the World Bank International Workshop on CBNRM. Practitioner case studies were compared and contrasted with research team findings to refine and validate the matrix. The study found that community involvement in natural resource management can lead to improved livelihoods and conservation outcomes. A range of studies have explored the potential and challenges of community-based natural resource management in national parks.

2.3 Livelihood and National Park

According to International Labour Organization (ILO) Livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks, and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base.

Morris and Romeril (1986) examine the amalgamation of tourism and agriculture in the Peak National Park, UK, emphasizing its economic advantages for agricultural communities and its contribution to the preservation of rural ecosystems and landscapes. The study outlines different strategies and programs designed to promote farm tourism, including advertising and exhibitions, creating a marketing cooperative, and offering financial support for transforming farm structures into lodging facilities. The findings suggest that rural development and conservation initiatives have been positively influenced. The methodology entails conducting case studies and performing qualitative assessments of participant comments to analyze the effectiveness and difficulties of these projects in combining tourism with agriculture, assuring economic sustainability while maintaining environmental purity.

Rao and Geisler (1990) investigate the social consequences of protected area development strategies in Third World countries, emphasizing how co-management with resident populations can reduce negative impacts such as involuntary relocation,

residency without access to resources, and assimilation. The study identifies significant social consequences of large-scale conservation projects for local populations, including involuntary relocation, residency without access to resources, and disruption of local economies and traditional ways of life. It highlights that co-management approaches, where local communities are involved in decision-making and management, can help mitigate these adverse social impacts. The authors employ terms and concepts from the social impact assessment (SIA) literature to investigate the social consequences of protected areas development and ways to mitigate these consequences through co-management.

Nepal (1997) discusses the issue of protected area tourism and its impact on local livelihoods in developing countries, highlighting the need for sustainable tourism approaches that balance conservation and local community needs through his qualitative paper. The study finds that protected area-based tourism in developing countries is expanding rapidly and constitutes a significant proportion of international tourism. Despite governmental and institutional recognition of the issue, the livelihood needs of local communities living in and around protected areas are often marginalized. At the local level, the economic benefits of protected area-based tourism often accrue to a handful of rich and politically influential people, while the majority of local people suffer from the negative impacts of tourism-related developments.

Goodwin and Roe (2001) examine the potential for fair-trade tourism to benefit local communities around protected areas, despite the challenges faced. The study finds that local communities around protected areas have high expectations of tourism as a livelihood strategy but often benefit little from tourism revenues. Significant opportunities exist for local communities to participate in and benefit from tourism around protected areas through initiatives like marketing support, regulation, and price management. However, barriers to local participation include a lack of access to capital, skills, and markets, as well as the dominance of local elites in capturing tourism benefits. The study used a combination of closed-ended and open-ended survey questions to understand local communities' perspectives on and interest in participating in tourism around a national park in Zimbabwe. The surveys were conducted by a local researcher as part of a larger DFID-funded project on the

relationships between tourism, conservation, and sustainable development.

Uddin and Mukul (2007) provide a summary of the key conclusions from case studies on the linkages between rural communities and conservation in protected areas in Bangladesh, highlighting that no single strategy is a universal solution and that constructive involvement of local stakeholders through co-management systems is important for successful protected area management. Findings indicate that non-timber forest products (NTFPs) and NTFP-based products provide an important source of cash income for villagers living in and around Satchari National Park. Additionally, home gardens can play an important role in forest conservation by reducing dependency on the forest for fuelwood and other products. Enriching home gardens and buffer zones with commercially important NTFPs may help reduce pressures on the national park. The study used a combination of literature review and primary data collection methods, randomly selecting four villages representing different levels of forest dependency, including the village inside the park, and conducting intensive household surveys in these villages. Households were classified into three forest dependency categories based on their reliance on forest products for cash income and household consumption.

Jupoli (2010) investigates the management practices of Sharr Mountains National Park (SMNP) in Kosovo to ascertain their contribution to sustainable development and community engagement in conservation and development activities. Employing a mixed methods approach involving qualitative methods such as focus group discussions and key informant interviews, alongside quantitative household surveys, the study utilizes a case study and cross-sectional design. Data from primary and secondary sources are triangulated to reduce biases. Findings suggest that SMNP's management primarily emphasizes conservation over supporting local livelihoods, resulting in economic insecurity among adjacent communities. Local perceptions reveal negative attitudes towards conservation policies due to restricted access to vital forest resources. Furthermore, community involvement in park management decisions remains limited, predominantly at lower levels of consultation.

Schelhas and Pfeffer (2010) explored the dynamics between global conservation efforts, particularly the establishment of national parks, and local resource-dependent communities in Costa Rica and Honduras. Using a mixed-methods approach that includes qualitative semi-structured interviews and quantitative household surveys, the research aims to examine how social and cultural processes unfold under different circumstances. Qualitative interviews focus on community leaders and residents near national parks, exploring their attitudes and behaviors towards forests and conservation. Quantitative surveys provide insights into local environmental values, land use patterns, and sociodemographic characteristics. Findings reveal that while local communities widely adopt external conservation discourses, these often do not fully integrate into their daily practices and decision-making. Utilitarian views prevail, with forests primarily perceived as renewable resources essential for livelihoods. However, some individuals have successfully merged environmental and livelihood values, developing unique local discourses that blend conservation with sustainable development goals. Overall, the study highlights the complexity of integrating global conservation goals with local livelihood priorities, highlighting both challenges and opportunities for achieving sustainable coexistence between conservation efforts and local communities.

Mamo (2015) argues that the attitudes and awareness of local communities towards the Bale Mountains National Park and the mountain nyala, finding an overall positive attitude with 80% of respondents willing to support the park's conservation activities. The study aimed to determine and compare the types of benefits and conflicts that the local people experience from the park's flora and fauna, determine perceptions and attitudes of various groups of residents towards land use/cover change, environmental/ecological services, conservation values of the park, and willingness to support the park, assess the attitudes and perceptions of residents towards the mountain nyala, and assess how factors like village type, proximity to park headquarters, duration of settlements, and livelihood sources impact the perceptions and attitudes of local communities towards the park and mountain nyala conservation. Findings reveal that the local people have a positive overall attitude towards the park and mountain nyala conservation, but their positive attitudes do not necessarily translate to positive

behaviors. Proximity to the park and type of village influenced local perceptions more than duration of settlement and livelihood source. Awareness education is needed to bring about positive behavioral changes in the local communities, as even unrestricted access to the park may not guarantee sustainable livelihoods in the long run. The study employed a cross-sectional survey of residents from 7 villages near the northern part of the park, combining interviews with key informants and questionnaires to household heads. Five percent of the 2,720 total households were randomly selected as respondents (N=136). The questionnaire covered settlement history, benefits/conflicts, land cover change, conservation values, and perceptions about mountain nyala. Pre-testing of the questionnaire was conducted before administration.

Kumar et al. (2019) examined the impact of the Jim Corbett National Park on the livelihood security and sustainability of the local community, assessing the present status of the park and the level of awareness about the impact of forest ecosystem services on local livelihoods. Findings indicate that tourism activities are the most successful livelihood source for the local community, with 45% of respondents engaged in tourism-related work. Additionally, the handloom industry plays a significant role in the economic development of the rural people in the region. The government has also established a center for ecotourism and sustainable livelihood to support the local communities near the Jim Corbett National Park. The study used a combination of methods, including a semi-structured questionnaire survey of 150 respondents selected through stratified random sampling from 15 villages, gathering information from village leaders, government officials, local community members, and park staff, cartographic techniques to visualize the data, calculation of average annual household income from various sources, and adoption of the range equalization method to measure the indicators of the five capitals (human, physical, social, financial, and natural) and calculate a household livelihood sustainability index.

Agyeman et al. (2019) explored how ecotourism impacts the livelihoods of households in the Mesomakor community near Kakum National Park in Ghana, in order to understand how ecotourism contributes to poverty reduction. The study aimed to understand the change in household livelihoods due to ecotourism, assess the impacts of ecotourism on the assets of the households, and examine the impacts of ecotourism

on the farming activities of the households. Findings indicate that ecotourism contributes to reducing poverty, but this can be enhanced by focusing on the non-economic aspects and minimizing the negative impacts on household livelihoods. The economic focus on employment and income generation is too narrow, and there are other non-economic aspects relevant to poverty reduction that should be considered. Additionally, ecotourism has both positive and negative impacts on household livelihoods, and these need to be carefully managed to maximize the benefits for poverty reduction. The study used a qualitative case study approach, with the Mesomagor community chosen as the case study site. In-depth interviews were conducted with 22 purposively sampled participants who were members of the ecotourism groups, and observations were made of the cultural displays in the community.

Abukari and Mwalyosi (2020) discuss the impact of national parks on livelihoods and community development in Ghana and Tanzania, focusing on perceptions of park-adjacent communities. Household surveys near the Tarangire National Park in Tanzania and the Mole National Park in Ghana revealed differences in community perceptions, with governance issues being a significant influence. The study emphasizes the importance of inclusive park governance structures that prioritize the roles of local communities to strengthen support for conservation. The findings highlight that successful conservation initiatives are not solely based on financial prowess but rather on governance structures that engage and recognize local stakeholders, ultimately fostering positive perceptions and attitudes toward conservation goals. The study is empirical. A combination of different survey techniques was utilized, including the use of pictures to illustrate concepts and ideas to reduce response bias.

Buragohain and Saikia (2023) examined the factors that influence the local households' decision to participate in tourism-related occupations in two national parks in Assam, India, and explores ways to make tourism more economically supportive for the local population. Findings indicate that tourism has the potential to diversify the local economic base and provide economic opportunities for local people near wildlife destinations. Despite potential adverse impacts from tourism promotion, the success

stories in other countries with a solid institutional framework highlight tourism's potential to address local livelihoods. Tourism can create sustainable livelihoods for local communities by offering alternative income sources like shopkeeping, cooking, housekeeping, and tour guiding, replacing environmentally destructive activities. The study used a combination of primary data collection methods, including a pilot survey, interviews, focus group discussions, and stratified random sampling to collect data from 320 households (160 participants and 160 non-participants) in 9 villages near Kaziranga and Manas National Parks in Assam. The study aimed to find the factors that determine the local households' selection of tourism occupation and to explore the possible ways to make tourism economically more supportive to the local population living nearby a particular destination.

Gogoi and Gogoi (2022) examine the infringement of livelihood rights of communities living in the periphery of Kaziranga National Park, particularly in its additional areas, and offers possible solutions to safeguard both livelihood rights and natural resource management. The study had an observational, cross-sectional design, employing a multi-stage cluster sampling approach to select study participants. Findings indicate that conservation efforts at Kaziranga National Park have led to a loss of grazing lands and fodder for local communities' livestock, significantly impacting their livelihoods. Additionally, communities in areas like the 6th Addition have lost traditional fishing rights due to the park's expansion. Poor implementation of the Forest Rights Act 2006 by the state government exacerbates these issues, further limiting local communities' livelihood rights.

Hussain and Kalita (2021) studied the livelihood status and human pressure on forest resources by the inhabitants of forest villages in Kamrup West Forest Division of Assam, India. It aims to understand the socio-economic conditions and dependency of these communities on the forest ecosystem for their livelihood and sustenance. The study utilized a mixed-methods approach, involving primary data collection through random sampling of 85 households from 17 forest villages, using focus group discussions, personal interviews, and questionnaires. Secondary data was gathered from government records, statistical handbooks, and research reports. Findings indicate that the forest-dwelling communities heavily rely on the forest ecosystem,

which provides essential services and products. Factors contributing to human pressure on the forest include low literacy rates, large family sizes, unsustainable use of forest resources, frequent visits to the forests, and economic dependence on forest products such as firewood and bamboo. This reliance, coupled with poverty and unsustainable practices, is contributing to significant forest degradation in the region.

Widiono et al. (2024) aims to uncover the livelihood systems of village communities surrounding Kerinci Seblat National Park (KSNP), focusing on those lacking legal access to forest resources. It seeks to examine livelihood assets, strategy types, and the impact of assets on livelihood diversity. Methodologically, structured face-to-face interviews and in-depth interviews with key informants were conducted to collect quantitative data on household income and qualitative insights on conflicts and norms. Quantitative analyses included Mann-Whitney U tests, ANOVA, Tukey's tests, and regression analysis, while qualitative data were analyzed using Giddens' structuration theory framework. Findings reveal that households diversified into eight livelihood strategy types, with significant differences in livelihood asset indicators influencing livelihood diversity indices. Households adapted their structures to secure livelihoods amidst challenges such as limited land access and variable income sources.

Madaki et al. (2024) explore impact of local community participation in biodiversity conservation within the Gashaka Gumti National Park, focusing on factors influencing their engagement. Utilizing a household survey methodology conducted from June to August 2019, the study employed pre-tested questionnaires to gather data from 118 fully completed responses (out of 200 distributed, with 8 rejected due to missing data). The survey covered demographic factors and factors influencing community participation in conservation initiatives. Findings highlight that local community participation in biodiversity conservation is significant. The community's perception of the effectiveness of conservation programs, which directly impacts their engagement. Furthermore, higher levels of community awareness and education on biodiversity conservation positively correlate with increased participation rates. Additionally, strong social capital, characterized by community cohesion and supportive leadership, plays a pivotal role in fostering successful conservation initiatives. Access to effective information and communication channels about

conservation activities also significantly influences the level of community involvement in conservation efforts. The study identifies that increased employment in the tourism sector enhances community involvement in conservation efforts, while insufficient financial benefits can deter participation. Additionally, the provision of infrastructure development was examined for its effect on household engagement in biodiversity conservation initiatives.

Mardiyanto et al. (2024) This study employs a qualitative methodology to investigate the mapping of forest-local community and inter-community boundaries in the Biha Resort buffer area adjacent to Bukit Barisan Selatan National Park in Indonesia. The research aims to map the location of local communities neighboring Biha Resort, determine the forest ecosystem services utilized by these communities, and explore when and where these services are utilized. Through a preliminary study and data collection involving case study selection, key informant interviews, spatial mapping, questionnaires, and focus group discussions (FGDs), the study reveals ongoing issues and potential conflicts related to community perceptions of resource boundaries. It emphasizes the importance of community-participation mapping to collectively identify and clarify critical resource boundaries. The findings highlight the crucial role of forest ecosystem services in sustaining rural livelihoods, highlighting context-specific conservation strategies essential for fostering sustainable relationships between local communities and forest ecosystems.

Pereira et al. (2024) aims to assess the synergies and trade-offs between dimensions of livelihood vulnerability and explore if these vary between the PAs. Additionally, it investigates whether the drivers of livelihood vulnerability in the PAs are similar study utilizes structured questionnaires and household surveys across Quirimbas National Park, Niassa Special Reserve, and Limpopo National Park in Mozambique to determine how livelihood vulnerability and its dimensions vary both within and across these three protected areas (PAs). Using data collected at three time points (2013, 2019, 2021) and geographic information to measure village characteristics, including proximity to roads, rivers, and strict protection areas, the study calculates the livelihood vulnerability index (LVI). Findings indicate that households in these PAs face vulnerabilities primarily due to climate variability, human-wildlife interactions

(HWI), and limitations in livelihood strategies and social networks. The average LVI across the PAs is assessed as low-to-medium, with social networks, HWI, livelihood strategies, and climate variability identified as significant contributors. Furthermore, vulnerability increases with distance from strict protection zones and rivers within the PAs, while proximity to infrastructure and household assets mitigates vulnerability. The study highlights the interconnectedness of these impacts and advocates for holistic approaches to address livelihood vulnerabilities in protected areas.

Roslinda et al. (2024) utilized a mixed-method approach to explore the livelihood system of the Nanga Lauk Village community, focusing on their management of the village forest to meet their family's living needs. The study selected Nanga Lauk Forest Village as the site, conducted a survey with a sample of 100 respondents selected randomly from 233 family heads, and employed primary data collection methods including questionnaires, in-depth interviews, and participant observation. Secondary data were gathered from existing documents. Findings reveal that the Nanga Lauk community primarily relies on natural and physical assets to sustain their livelihoods, supplemented by social, human, and financial assets. Their livelihood strategy emphasizes consolidation based on socio-economic status, leveraging abundant natural resources for agricultural activities. However, the community faces challenges related to human asset development, highlighting the need for skill training to enhance their capabilities and diversify their livelihoods.

Patience (2024) in his study addresses the global challenge of increasing human activities encroaching on protected areas, focusing on Cameroon's Mount Cameroon National Park, which faces threats from human intrusion and deforestation exacerbated by urban growth in cities like Buea. The objectives are to examine community perceptions of forest conservation policies, assess their impact on land use/land cover change, and inform policy development for effective forest management. Employing a mixed research design, the study utilized multi-stage random sampling involving purposive, stratified, and systematic methods. Primary data collection methods included household surveys, questionnaires, key informant interviews, and focus group discussions, complemented by secondary data from published and unpublished sources, along with satellite imagery analyzed using GIS and remote sensing

techniques. Qualitative data were analyzed using descriptive statistics in SPSS. Findings indicate a mixed perception among local communities towards current forest conservation policies in Mount Cameroon National Park. Education levels significantly influence community compliance with forest laws, perception of risks associated with reserve entry, and opinions on protected area regulations. Despite these varied perceptions, the study observed a decline in forest cover and an increase in grassland over the study period, highlighting the ineffectiveness of current conservation policies.

2.4 Concept of Community and Fringe People

Communities are complex entities, defined by shared interests and values. A "community" is group of people sharing a common interest and set of values. The members of a community often view the world through a distinct perspective that dictates how members of the community deal with the objects in their world ("community practices") (Rein, 1997). They can be based on cultural identity, interest, or place, and are crucial for social integration (Spicker, 2019). Wellman (2005) emphasizes the role of interpersonal ties in communities, which can extend beyond physical neighborhoods. Membership in a community is a key aspect of personal and social identity, often based on commonalities and shared values . Fringe people refer to individuals or communities living in the rural-urban fringe (RUF) or forest-fringe areas. In the RUF, older people's mobility experiences and practices are shaped by the range of mobilities and mobility infrastructures available to them, as well as the concept of proximity (Gyanaranjan et al., 2021). In forest-fringe areas, people's livelihoods are primarily based on subsistence agriculture, and the focus is on the perceptions of the forest as a self-contained resource and the forest edge people as reliant on resources (Adam et al., 2019). The concept of the folk-urban continuum has also been discussed, which characterizes folk societies as small, isolated, non-literate, and homogeneous, with a strong sense of group solidarity, while urban societies are constructed in contrast with folk people (Rao,1959). The term "fringe people" can also be used in the context of homelessness, where it refers to individuals who are part of the crisis of the homeless in America.

Hulme and Murphree (2001) define four characteristics needed for a community in order to successfully carry out collaboration. Cohesion determines the membership in the community with shared interests and identity which makes the community members willing and able to collaborate for common goals. Demarcation reflects the boundaries of the community's jurisdiction, usually defined spatially on a designated area. Demarcation is crucial for efficient management of such an area. Legitimacy is regarded as the power and authority internally based on socio-cultural and socioeconomic criteria. Resilience is defined as the capacity to adapt to changes in cohesion, demarcation and legitimacy evolving over time in a society.

2.5 Concept of Participation

Participation is a vehicle to achieve development that community members can involve directly in development process (Woost, 2020). Participation is a political process where actors involved in decision-making processes are positioned towards each other through power relationships that are (to an extent) egalitarian which also has impact over participation in democratic theory, which allows introducing the distinction between minimalist and maximalist forms of participation. The concept of participation in research design by adopting a relational, temporal, and process-oriented perspective. In the paper, we draw on recent theory where human interaction is understood as complex responsive processes of relating. Thus, participation is seen as people taking part in creating social objects that emerge in the complex social processes of everyday organisational life (Mosleh, 2020).

2.6 Rural Household

A family household consists of individuals related by birth, marriage, or adoption, while a nonfamily household can be a single person or a householder with unrelated individuals (Dupree, 1995). A group of persons normally living together and taking food from a common kitchen constitutes a household. A household may contain one or more members. Members of a household may or may not be related by blood, marriage or adoption to one another. The following points are to be noted: (i) Each individual inmate (including residential staff) of a mess, hotel (excluding temporary inmates), boarding and lodging house, hostel, etc. constitutes a 'single- member

household'. If, however, among these inmates, there is a group of persons who normally pool their total income and spend from this common pool, such a group is treated as a separate single household by itself, e.g., a family living in a hotel will be treated as a separate single household by itself (ii) Inmates of jails, hospitals, nursing homes, etc., are to be excluded from the household surveys, but residential staff therein, e.g., Superintendent of a hospital staying in the hospital will be listed as a household. The former persons will be considered as normal members of their parent households and will be counted there. (Indian Economic Survey, 2023)

2.7 Livelihood

Livelihood refers to the means of making a living or supporting oneself. It encompasses various aspects such as income generation, poverty alleviation, and sustainable development (Moina et al,2023). The sustainable livelihood approach emerged in the 1990s and emphasizes the agency and capabilities of the poor, as well as environmental sustainability (Sandeep, 2022). Robert Chambers and Gordon Conway proposed the following composite definition of a sustainable rural livelihood: A livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living; a livelihood is sustainable which can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in the short and long term (Krantz,2000).

2.7.1 Livelihood Strategies

Livelihood strategies are the activities and actions that individuals or households undertake to achieve their desired goals. These strategies can vary based on several factors such as livelihood goals, social capital, environmental perception, and available assets or capital. Chen and Chen (2023) found that households with survival goals are more likely to choose agricultural and diversification strategies, while households with security and self-respect goals are more likely to choose non-agricultural strategies.

2.7.2 Vulnerability

Vulnerability, the susceptibility to harm, results from an interaction between the resources available to individuals and communities and the life challenges they face (Mechanic and Tanner, 2007). Vulnerability results from developmental problems, personal incapacities, disadvantaged social status, inadequacy of interpersonal networks and supports, degraded neighbourhoods and environments, and the complex interactions of these factors over the life course.

2.7.3 Human Animal Conflict

Parker et al., (2007) explains that Wildlife can be a valuable natural resource for rural communities. To yield the maximum benefits it needs to be managed, part of which includes reducing human wildlife conflict. Clear policies on dealing with human-wildlife conflict help set the options that can be implemented by farmers and communities Hannah et al., (1998) states that any form of participatory wildlife monitoring has one important rider that can ensure its success or failure.

2.7.4 Endowment Bundle

Nash (2008) explains endowment bundle as a combination of all resources legally owned by a person or a household which includes both tangible and intangible assets (e.g., land, labour. Entitlement Bundle comprises of a combination of all possible goods and services that a person or a household can legally obtain by using the resources of his endowment bundle (e.g. crop production, employment).

Sen (1981) defines endowments as a person's original bundle of legally owned resources. Entitlements constitute a set of commodities a person can legally generate through various transformation processes of the endowments. Endowment refers to the property or assets that are dedicated to a specific purpose, often for the benefit of society or a particular cause. It can play a significant role in various aspects such as peace, human rights, social justice, and socio-economic development. Forest resource endowment, or the entire quantity of forest products that may be used under the current regime, is one of the key factors in this study. Therefore, it is important to analyze the implications of changes in MNP management and how they affect people's health due to changes in their possibilities for a living using the entitlement method.

2.8 Household Strategies and Diversification

Ayele and Senapathy (2023) argues that rural households are typically heterogeneous, possess different sets of resources and have a diversified portfolio of livelihood activities. Livelihood diversification is defined as the process by which rural families construct a diverse portfolio of activities and social support capabilities to survive and improve their standards of living. The determinants and effects of diversification are examined in the areas of poverty, income distribution, farm output, and gender. They also highlighted the importance of diversifying livelihoods beyond agriculture to include off-farm and non-farm activities. These strategies are adopted due to factors such as land scarcity, population pressure, and recurrent drought.

2.9 Costs/Benefits Related to Living Close to the Park, Household Attitudes Towards the Park and Perception of Conservation

Living close to a national park can provide various benefits to the local communities. These benefits include the opportunity for ecotourism, which can contribute to the economic development and wellbeing of the people living nearby (Mouratidis,2021). National parks also play a role in maintaining ecosystem health and biodiversity conservation, which in turn can have positive impacts on the local population (Buxton, et., al 2015) Household attitudes towards the national park and perception of conservation are influenced by various factors such as socio-demographic characteristics, frequency of visits, and benefits derived from ecosystem services (Daniel,2023). Local communities living adjacent to protected areas (PA) are willing to contribute to biodiversity conservation despite property loss and management costs (Baur,2014). It is often acknowledged that the most crucial elements for maintaining the long-term integrity of national parks are local people' participation and support. Owing to the limited access to national park resources, neighboring populations typically have unfavorable opinions of the protected regions since they bear the majority of the expenditures associated with conservation while receiving little to no benefits. These communities frequently advocate degazating protected areas and live in extreme poverty. Typically, they believe that protected places limit their capacity to make a living. More attention must be paid to local communities' needs, goals, and

concerns if one hopes to win their support.

2.10 Wealth categories, location and gender

Dependence on forest income can be greatly impacted by even small wealth disparities between households. Because they are less able to invest in other endeavors, impoverished households typically rely more on forest income, whereas wealthy households typically pursue more secure livelihood options. Various factors impact the livelihood activities chosen by households in various areas, as well as the money they get from such activities. The pursuits of various homes may also be influenced by gender.

2.11 Research Gap

Several studies worldwide have explored various aspects of national park management, biodiversity conservation, and community engagement. Research has emphasized the importance of building trust and communication between park authorities and local communities, highlighting the socio-political skills required by park staff. Studies on land use disputes have advocated for participatory management to align conservation efforts with local livelihoods. The broader roles of protected areas in climate change mitigation and sustainable development have been recognized, pointing out the challenges of balancing biodiversity conservation with socio-economic impacts. Global perspectives on protected area management effectiveness have identified significant deficiencies and highlighted the need for community benefit programs and resource allocation. Indigenous Protected and Conserved Areas (IPCAs) have been highlighted for their socio-cultural, political, and ecological benefits, although challenges such as restrictive legislation and inadequate funding persist. Insights into urban human-wildlife conflicts and the potential of urban evolutionary biology for adaptive wildlife management have been offered. Co-management agreements in national parks have been explored, emphasizing the variability in governance parameters and the importance of context-specific frameworks for effective reconciliation. The quantification of biomass and carbon stocks in wildlife sanctuaries has demonstrated their significant role in climate change mitigation. Human-wildlife conflicts have been examined, revealing the influence of

livestock depredation on local attitudes and the critical role of financial compensation in improving coexistence. Evaluations of private management of parks have found improvements in wildlife outcomes and tourism but also raised concerns about security risks for nearby communities. While these studies collectively highlight the multifaceted nature of national park management and the need for inclusive, participatory approaches that integrate ecological, socio-economic, and cultural dimensions, there has been comparatively less research conducted in India on these topics. Specifically, in Assam, there is a notable gap in studies addressing the management and sustainability of national parks, highlighting the need for focused research in this region to address these critical issues. This study aims to fill this gap by examining the importance of community development through organization and training for long-term growth. Although efforts by the government and other organizations have been made to promote and stimulate the Manas National Park's residents, the park continues to suffer from poachers, militants, and poverty. Fringe community residents have been fighting for survival, and despite resolving many issues, their economic circumstances remain largely unchanged.

Furthermore, the literature indicates a lack of comprehensive strategies to address socio-economic issues, such as unemployment and lack of access to education and healthcare, which are prevalent among the fringe communities. There is also a significant gap in understanding how community-based tourism initiatives and other sustainable livelihood strategies can be integrated into park management plans. The role of local governance and participatory approaches in decision-making processes related to park management has not been thoroughly investigated. Additionally, the impact of external funding and international conservation policies on local livelihoods and park sustainability remains underexplored.

An in-depth analysis and study are required to explore the management and sustainable development of fringe communities near national parks, with a particular focus on Manas National Park in Assam. This research will address the critical need for integrating effective park management with community livelihood improvements, conflict resolution, and sustainable development strategies. By doing so, the study

aims to provide a framework for enhancing the socio-economic well-being of fringe communities while ensuring the ecological integrity of the park. This holistic approach is essential for achieving long-term conservation goals and fostering a harmonious relationship between the park and its surrounding communities. Given the limited research conducted in these specific areas, particularly in Assam, this study addresses the under-researched areas of sustainability and management of Manas National Park, assessing the livelihoods of people in adjacent villages, and exploring the perception and attitudes of the fringe community towards conservation and development. This comprehensive analysis aims to fill significant gaps in the existing literature by providing insights into these critical issues.

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CHAPTER 3

SUSTAINABILITY AND MANAGEMENT OF THE MNP

3.1 Sustainability and Sustainability Development

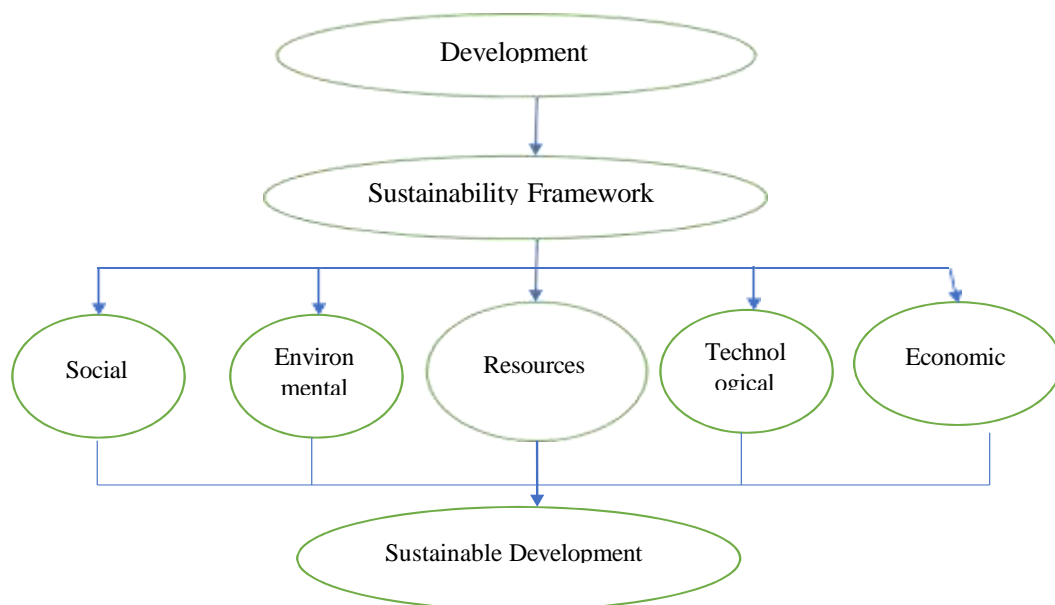
The concept of sustainable development was first defined in the 1987 United Nations report titled "Our Common Future," commonly known as the Brundtland Report of the World Commission on Environment and Development (Holden, 2014). It described sustainable development as development that fulfills the needs of the present without jeopardizing the ability of future generations to meet their own needs. Additionally, the National Sustainable Development Strategy characterizes sustainable development as a targeted, long-term, comprehensive, and synergistic process that affects all aspects of life at every level. It aims to meet the biological, material, spiritual, and social needs and interests of people, significantly reduces or eliminates harmful interferences with life, avoids burdening the country, preserves resources, and protects cultural and natural heritage. In academic literature, sustainable development is defined as the process of enhancing the quality of human life while living within the carrying capacity of supporting ecosystems (Marten, 2010).

Sustainable development encompasses a wide range of interpretations depending on the specific dimensions under consideration. This concept has garnered significant attention from policymakers and scholars for several key reasons. Primarily, sustainable development is viewed as the ultimate objective of the United Nations' global agenda, with numerous countries committed to attaining these goals. Additionally, it plays a crucial role in fostering a sustainable planet for future generations. Furthermore, sustainable development is seen as a comprehensive development goal, as the achievement of all other development objectives ultimately aims for sustainability (Worts, 2006). Lastly, sustainable development is anticipated to yield enduring socio-economic benefits for all individuals and the environment.

3.1.1 Conceptual relationship between sustainability and sustainable development

The concepts of sustainability and sustainable development, while related, are not identical. Sustainability serves as the guiding force or agenda that directs the development process towards achieving a sustainable level of development (Bünemann, 2022). It establishes the approach, principles, and coordination necessary to ensure that all aspects of development aim for sustainability. In contrast, sustainable development is the objective or target attained by adhering to sustainability principles and guidelines. A conceptual illustration demonstrates how development guided by a relevant sustainability framework can result in sustainable development. This illustration suggests a positive, potentially linear or non-linear, relationship between sustainability and sustainable development. The framework implies that sustainable development is achieved when sustainability is prioritized throughout the development process. Consequently, any level of development realized with a sustainability framework is deemed a sustainable outcome, whereas development achieved without such guidance is considered unsustainable.

Figure 3: Conceptual Relation between Sustainability and Sustainable Development



(Source : Ozili, 2022)

Past studies have explored various themes within the sustainability and sustainable development literature, including the factors influencing sustainability and strategies for promoting sustainable development through infrastructure development and innovation. Additionally, various approaches to sustainable development have been analyzed, alongside country-specific practices. Research has also focused on the role of financial inclusion in sustainable development and the interplay between environmental responsibility and economic growth in achieving sustainability. While these themes address crucial issues, there is a noticeable lack of studies providing an overview of the progress and challenges affecting sustainable development and sustainability across several national parks. The various components plays a crucial role in sustainable development of national parks.

A) Social Component: Social components of park management prioritize the welfare and engagement of local residents and visitors (Eagles,2014). This entails actively interacting with local communities to comprehend their requirements, integrating their viewpoints into decision-making procedures, and cultivating a sense of responsibility and guardianship among citizens. For visitors, it entails offering pleasurable and enlightening experiences through meticulously maintained amenities, informative programs, and activities that foster an understanding and admiration for the natural and cultural heritage. Parks also place a high importance on assuring safety and accessibility, guaranteeing that individuals of all backgrounds and abilities may fully enjoy and get benefits from park resources.

B) Environmental Component: Environmental issues are paramount in park management, with a focus on safeguarding and conserving natural habitats and species (Crofts, 2015). Parks employ conservation measures to protect biodiversity, rehabilitate damaged ecosystems, and preserve ecological equilibrium. This includes the tasks of controlling invasive species, reducing pollution, and implementing sustainable measures such as water and energy. Parks strive to minimize human impact and safeguard ecosystems' long-term health and resilience by conserving natural resources and supporting sustainable practices.

C) Resource Component: Efficiently managing natural resources, such as water, plants, and animals, is crucial for ensuring the sustainability of park operations (Fancy et al., 2009). Parks oversee the utilization of resources, implement methods for conservation, and undertake habitat restoration to improve their ability to withstand and function well. This entails the management of water resources through the implementation of effective utilization and preservation techniques, the supervision and control of plant and animal populations to uphold biodiversity, and the regular evaluation of data to guide management choices. Parks can achieve sustainable support for ecosystem health and visitor experiences by effectively managing resources.

D) Technological Component: Technological progress is essential for enhancing park management and tourist experiences (Neuhofer, 2014). Parks employ technology to implement visitor information systems, which offer digital resources for navigation, access to information, and organizing trips. Remote monitoring technologies, such as camera and sensors, enhance the efficiency of monitoring species, ecosystems, and park conditions. In addition, management technologies such as software and databases facilitate the efficient execution of administrative tasks, resource allocation, and scheduling of maintenance activities. Parks improve operating efficiency, resource conservation, and visitor enjoyment by utilizing technology.

E) Economic Component: Economic sustainability includes the generation of income to sustain park operations and contribute to local economies, all while upholding environmental and social integrity (Basiago, 1995). Parks generate various sources of income, including entrance fees, concessions, guided tours, and merchandise sales. The promotion of tourism emphasizes parks as appealing locations, which in turn boosts local economies by encouraging visitor expenditure and generating employment opportunities. Effective funding strategies guarantee that the generation of revenue is in line with conservation objectives, striking a balance between economic advantages and environmental care. Parks can achieve sustainable funding for conservation initiatives, improve tourist experiences, and provide long-term assistance to local people by producing income in a responsible manner. By

integrating these components, national parks can achieve sustainable development, balancing ecological health, community needs, and economic viability.

3.1.2 Manas National Park and its Sustainability

Sustainable development is a framework for achieving human development goals while preserving the natural systems that provide essential resources and ecosystem services. It emphasizes economic growth that does not compromise the environment for future generations (Donaires, 2019). Manas National Park, a UNESCO World Heritage Site located in the northeastern state of Assam, India, is a unique and diverse ecosystem that is facing various challenges in maintaining its sustainability. The park is home to a wide range of flora and fauna, including several endangered species such as the one-horned rhinoceros, Asiatic elephant, and Royal Bengal tiger (Nath, 2013). One of the key factors contributing to the sustainability of Manas National Park is its biodiversity (Nath, 2013). The park is part of the Eastern Himalayan biodiversity hotspot and provides crucial habitats for many species (Nath, 2013). Additionally, the park serves as a buffer to mitigate the impacts of environmental disturbances and climate change, which is a significant aspect of its sustainability (Kumar et al., 2020). Manas National Park, play a critical role in this framework by conserving biodiversity and supporting local livelihoods. The park witnessed the visitation of more than 30,725 tourists, including 410 foreign visitors, from April 2023 to December 2024 (Economic Survey of Assam). However, economic progress often leads to land degradation, soil erosion, pollution, and deforestation, which can outweigh the benefits of development. Manas National Park, established for conservation (Nelson, 1987), faces challenges due to conflicts over land and resources. Surrounding the park are over 50 villages spread across its four ranges: Panbari, Bansbari, Bhuiyapara, and Kuklung. These villages suffer from a lack of basic infrastructure such as schools, electricity, health centers, water, roads, and sanitation, which limits residents' access to non-timber forest products (Dou et al., 2023). Health issues like malaria and dysentery are prevalent among the local population (Boro et al., 2023). The dual objectives of protecting nature and providing recreation have led to governance challenges, exacerbated by a fortress mentality that separates wilderness from culture. The growing tourism industry further complicates the sustainable management of protected areas. As a focal point for

sustainable nature tourism, Manas National Park must balance conservation with tourism development, ensuring that both can coexist without harming the park's ecological integrity. This involves adopting sustainable practices that integrate conservation goals with community needs and tourism opportunities, fostering a harmonious relationship between people and nature.

Over the past two decades, various partnerships, organizations, and projects have focused on sustainability efforts within Manas National Park, reflecting a broader global trend. However, the park's sustainability initiatives often grapple with the economic feasibility of such measures in a modern context. Sustainability efforts in Manas National Park require significant investment, which can strain the economic resources of the region. Nonetheless, neglecting sustainable development can lead to the depletion of natural resources, ultimately resulting in both environmental degradation and economic challenges. Understanding the sustainability concept as applied to Manas National Park involves recognizing its origins in the late 1980s and its evolution. Initially focused on the Earth's biophysical environment and the sustainable use of natural resources, the concept has expanded to include sustainable development and ecosystems. In Manas, sustainability emphasizes maintaining a balance that allows the park to support both human populations and wildlife without compromising health and ecological integrity. This approach ensures that Manas National Park can continue to thrive, supporting diverse species and providing ecological, economic, and social benefits for present and future generations. The sustainability deals with some important aspects:

3.1.2.1 Visitor Management

National parks attract a significant number of visitors every day. The constant foot traffic and the threat of human interference put them at an especially high risk of ecological degradation. Sustainable management plans for national parks address this problem by managing the impacts of tourism on the environment. These efforts are highly visitor-centric, including implementing measures such as visitor education programs, infrastructure in environmentally sensitive locations, and technology for managing the number of visitors entering the park daily.

A visitor management system (VM) is an important instrument for limiting the negative consequences of visitor activities and optimizing their positive ones. Gaining insight into the factors that contribute to overtourism and underutilization of tourist destinations, particularly natural areas, requires a deeper knowledge of visitor perceptions and satisfaction. Visitor satisfaction is crucial for a development to be sustainable since it affects their desire to return to a place in the future, which benefits the national park's (NP) many stakeholders (Velmurugan, 2021).

3.1.2.2 Collaboration with Indigenous Peoples and Local Communities

Indigenous peoples and local communities play a unique role in the sustainable management of national parks (Nelson, 1987). Their deep understanding of the local ecosystems, wildlife, and natural heritage, as they have inhabited these lands for generations, is fundamental for understanding and managing biodiversity and developing relevant conservation strategies. Their traditional sustainable knowledge, love, and respect for their lands make them invaluable partners in the sustainable management of national parks (Laird, 2010). Approximately 476 million indigenous peoples live across 90 countries around the planet. According to the United Nations, indigenous people are 'inheritors and practitioners of unique cultures and ways of relating to people and the environment.' Indeed, nowadays, these communities manage 17% of forest carbon around the world, significantly contributing to climate change mitigation.

The Manas National Park (MNP) is home to some of the most abundant plant and animal diversity in the nation (Lahkar et al., 2018). But because of unlawful expansion, poaching, and sociopolitical turmoil, the Park has had many ups and downs. A 20.47 km² portion of the Park has been documented to have been encroached upon between 1991 and 2004 as a result of sociopolitical upheaval in the area. Manas lost its status as a World Heritage Site in 2003 as a result. But the Bodo Liberation Tigers (BLT), the Central Government of India, and the Government of Assam signed a memorandum of settlement on the Bodoland Territorial Council (BTC) in New Delhi on February 10, 2003, which brought peace and security to the area.

The Department of Environment and Forest, BTC (now BTR—Bodoland Territorial Region), NGOs, local organizations, and fringe villagers were among the conservation fraternity members who promptly took the initiative to protect and conserve the bioresources of MNP by employing the community conservation and livelihood generation approach. By generating livelihoods and engaging the community, the peripheral villagers actively contributed to Manas' revitalization, ensuring the long-term sustainability of the biodiversity-rich region. Manas eventually regained its World Heritage title in 2011. This research shows how the residents of MNP's periphery villages have contributed to the preservation of biodiversity and biological resources, resulting in a success story for both (Sarma,2023)Hence, involving these communities in the planning and decision-making process is vital for building trust, inclusion, and meaningful conservation efforts. The Conservation Activity is an example of an inclusive and multi-sectoral project that highlights the importance of engaging local communities in the management and preservation of protected areas and enhancing their economic growth in the long term.

3.1.2.3 Resource Management

Resource management is key to sustainable tourism for natural parks. A thriving yet unregulated tourism industry creates a large demand for resources such as water and wood. Consequently, destinations that face this demand may find themselves especially vulnerable to ecological depletion. This threat can be mitigated by sustainable tourism infrastructure that consumes minimal resources while contributing to the visitor experience (Islary,2021)

National Parks in India function as significant hubs, drawing a diverse array of travelers seeking various experiences such as exploring flora and fauna, observing wildlife, engaging in leisurely visits, and even conducting research. Annually, these parks attract individuals from different states within India and from across the globe. As of January 2023, Madhya Pradesh held the highest count of national parks in India, while Assam ranked second during that period (Desai, 2023). Collectively, India boasts 106 national parks, covering over 44 thousand sq. km., constituting approximately 1.35 percent of the nation's total geographic expanse. The attractiveness of these parks is rooted in the unique opportunity they present for observing diverse wildlife in their

natural habitats, providing tourists with an engaging and enriching experience. However, the escalating influx of visitors presents a challenge for park management authorities in ensuring the sustainability of these natural habitats. (Aktymbayeva et al.,2023) Sustainability, as elucidated by Dilek (2022), encompasses the assurance of a sustainable world by addressing ecological, social, and economic concerns. Within the context of national parks, sustainability necessitates a balance between the promotion of tourist activities and the preservation of the parks' biological value, as highlighted by Boyd (2000).

Effectively managing the surge in tourist numbers requires authorities to advocate for responsible tourism practices that uphold the delicate balance of the ecosystems within the national parks. This entails implementing measures to mitigate the environmental impact of tourism activities, fostering conservation awareness among visitors, and supporting local communities in socially and economically sustainable ways. The sustainability primarily depends on the management of national parks.

3.2 Management of Protected Areas /National Parks

According to the Indian Wildlife (Protection) Act, 1972, a "Protected Area" refers to areas declared as national parks, wildlife sanctuaries, conservation reserves, and community reserves by the central government or state government for the purpose of protecting and conserving wildlife and their habitats. These areas are legally designated to ensure the protection of various species of flora and fauna, while also maintaining ecological balance and conserving biodiversity. The Act provides specific regulations and restrictions on human activities within these areas to minimize disturbances and promote conservation efforts. Protected areas are areas with specific boundaries that are managed in order to maintain biodiversity, ecosystems, and cultural heritage (González et al., 2022). Protected areas (PAs) are a crucial element in the conservation of biodiversity and improvement of human welfare. The sustainability of PAs is based on the maintenance of ecological integrity, economic viability, and social importance. The administration of protected areas is a crucial component that requires the attention of policymakers and practitioners in the field (Rodríguez, 2022).

Proactive management is crucial for achieving conservation objectives in national parks, and its importance is recognized across all levels of government. This chapter defines management and its four primary functions as they relate to the management of national parks, emphasizing the need for effective planning frameworks, strategic management considerations, and supportive tools to enhance management effectiveness and foster innovation. These strategies are vital for addressing the challenges that protected areas, including national parks, face. Among these challenges are the impacts of climate change, the introduction of extraterrestrial species, tourist pressures, acts of vandalism, poaching, pollution, developmental activities, extractive industries, civil unrest, and natural disasters such as severe storms or wildfires. Effective management strategies are essential to mitigate these impacts and ensure the long-term sustainability of national parks in Assam and beyond (Mathur et al., 2005).

Addressing these threats requires a well-thought-out and efficient response. Practitioners responsible for protected areas manage a wide range of duties, including species management, visitor services, emergency management, anti-poaching patrols, research and monitoring, and restoration projects. Government policy must address the threats posed by development activities to protected areas. The social, economic, and environmental benefits of proactive and adaptable protected area management extend to tourists, surrounding communities, researchers, local communities, businesses, private groups, governments, and future generations. Despite being a protected region and a national park, Manas National Park faces numerous challenges that hinder progress in various areas. One significant issue the park must address, in addition to the needs of the local population, is human-wildlife conflict. This type of conflict is defined as any interaction between humans and wildlife that results in negative impacts on human social, economic, or cultural life, on the conservation of wildlife populations, or on the environment. While conflicts between humans and animals are inevitable, increasing awareness and knowledge can help reduce these conflicts, benefiting both parties involved (Dawkins, 2016). The field of wildlife management is starting to understand that, although momentarily solving conflicts between humans and animals can occasionally be achieved by focusing management efforts on wildlife, long-term solutions can often be found by

changing human behavior. Human aspects studies on animal conflicts generally focus on the characteristics of stakeholders, issue identification, and management acceptability; human behavior and the assessment of management actions aimed at modifying that behavior are less frequently investigated (Baruch et al., 2009). The lives of the peripheral people who live close to Manas National Park now revolve around the park (Sarma et al., 2023).

The National Park is essential to the residents' ability to survive and obtain supplies. However, the ongoing confrontation between humans and animals is having a negative impact on the park and its visitors. There are around fifty additional communities on the fringes of the park. The four ranges of the park, Panbari, Bansbari, Kuklung and Bhuyapara, are home to these communities. Every remote community faces unique challenges and is equally susceptible. The most susceptible problem is animal conflict, which causes a significant drop in animal populations and an increase in the loss of human lives and property. The Bhuyapara range was the scene of warfare between animals and militants in the 1980s, when flooding damaged most of the infrastructure. There is an inconsistent tourist footfall throughout the three functioning ranges in Manas National Park. This is caused by unequal development. The Basbari Range, the primary range from which all visitors enter the national park, has undergone substantial development. However, Bhuyapara Range is underdeveloped in terms of economic activity, infrastructure, and other aspects. Over time, the Bhuyapara range has not seen significant infrastructural development. This lack of interest in two ranges raises the problem of animal-human conflict since one range is less developed and is producing a lot of disturbance between humans and animals (Dickman, 2010). These regions need to be controlled as effectively as feasible using the available management tools and planning is one of the integral part of any organization to manage.

3.2.1 Management of Manas National Parks

The management of Wild Life Sanctuaries and national park were traditionally done by forest department by employing a "top-down" approach that tends to enforce central administrative policies rather than fostering collaborative partnerships. This hierarchical approach results in limited communication between various management

levels, leading to planning that is often theoretical and poorly adapted to on-the-ground realities. Consequently, this disconnects between theoretical planning and practical implementation leaves administrators and managers disillusioned and hinders their ability to meet expectations. Without proper coordination and communication, managers of national parks struggle to effectively oversee and safeguard these crucial regions.

To address these challenges, it is essential to adopt comprehensive management strategies, such as those originally identified by Gulick and Urwick (1937), which include planning, organizing, staffing, directing, coordinating, reporting, and budgeting. This approach has proven effective in various management contexts, including educational administration (Nwadike and Nwogu, 2019). Applying these principles to national parks can improve service quality and sustainability efforts. Proper implementation in the management of national parks, like those in Assam, can ensure a balanced approach to administrative processes, enhancing both operational efficiency and service quality. Thus, these administrative processes are as crucial in managing Manas National Park (MNP) as they are in any other organizational context.

3.2.1.1 Planning

Planning in the context of national parks is about making future-oriented decisions to achieve specific goals. It involves addressing key questions such as how, when, where, who, and what, with solutions that can be either long-term or short-term. According to Gupta (2006), planning ensures the optimal use of resources. It acts as the driving force behind all other strategic management approaches, enabling them to fulfill their functions. In national parks, planning entails proactive and forward-thinking decisions to solve problems related to conservation, visitor management, and resource allocation. It includes preparing and implementing activities and programs for both long-term and short-term use to achieve the goals of preserving natural habitats, ensuring visitor satisfaction, and maintaining the ecological balance. Effective planning in national parks ensures that resources are used efficiently and that the park's objectives are met sustainably.

In the case of Manas National Park, three levels of planning are recognized for the

management of this large protected area. Most importantly the planning is done by Manas Tiger Reserve office and the final decisions are taken by consulting the Assam Government along with BTC government taking in consideration of 5 years planning.

- **Strategic Planning:** At an elevated level, strategic planning comprises the process of envisioning and establishing long-term objectives for the park. This entails the consideration of wider conservation goals, stakeholder participation, as well as the amalgamation of diverse perspectives (Bryson, 2018). With regards to Manas National Park, strategic planning would encompass the evaluation of habitat preservation, biodiversity conservation, community engagement, reducing human-animal conflicts, and sustainable development in the adjacent regions.
- **Operational Planning:** Operational planning pertains to the level of planning that is principally concerned with the tangible implementation of strategic goals and objectives (Chakraborty, 2019). Its primary objective is to translate the strategic vision into concrete, actionable plans, and programs. In the case of Manas National Park, operational planning would entail the identification and specification of precise activities, including habitat restoration efforts, anti-poaching measures, visitor management strategies, research initiatives, and community engagement projects.
- **Tactical Planning:** At the tactical planning level, the focus is on the operational intricacies and everyday management of the park. This level involves the coordination of resources, budget allocation, task scheduling, and the facilitation of effective communication and coordination among the diverse park departments and personnel (Rojek, 2005). The tactical plan for Manas National Park would entail a comprehensive strategy that addresses ranger patrols, wildlife monitoring, infrastructure maintenance, visitor services, and emergency response procedures.

3.2.1.2 Organizing

The organizing function within Manas National Park's management framework is essential for integrating and coordinating all aspects of park operations to achieve effective conservation and protection of its natural resources and wildlife. This function encompasses the management of laws, funding, resource allocation,

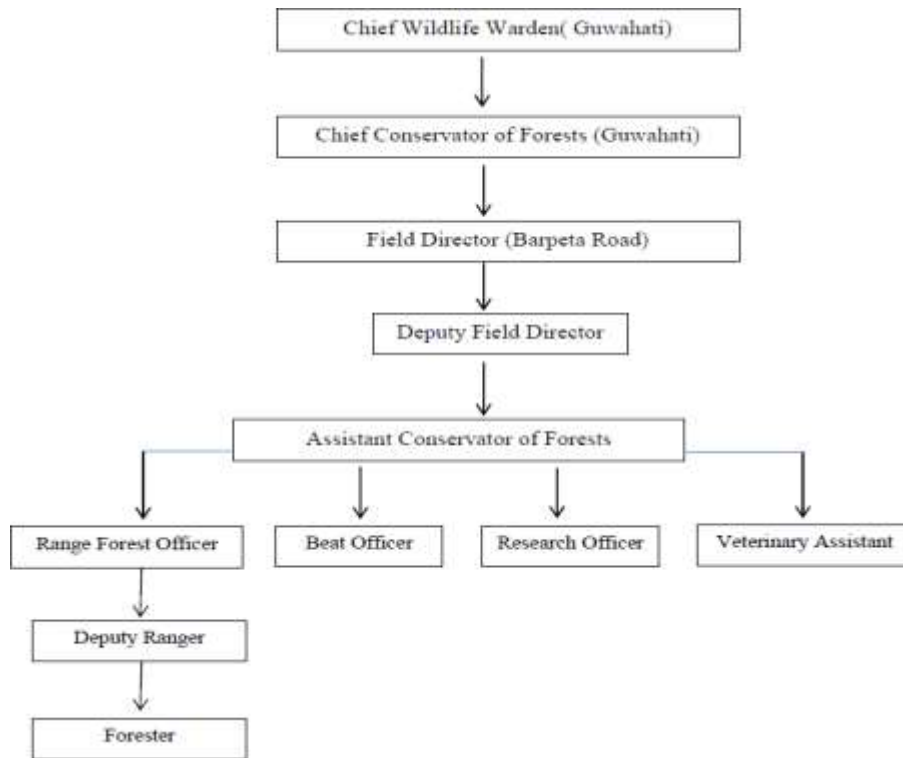
logistics, visitor management, and human resources. Centralization and decentralization are two major approaches to organizing management in national parks. In a centralized system, a central authority controls resource distribution and decision-making without the input of individual park units. In contrast, decentralization allows power to be distributed among various stakeholders, enabling individual parks to make decisions, plan budgets, and design programs tailored to their unique needs.

In the context of Manas National Park, effective management requires thorough planning, but it is the organizing function that ensures the successful implementation of these plans by coordinating the necessary expertise, material resources, and support services. The park's management faces various operational tasks that demand constant attention and responsiveness. These tasks include managing tourist services, which is crucial as the number of visitors increases each year. This growth necessitates careful management to ensure that tourism does not compromise the park's conservation objectives.

Additionally, Manas National Park must work closely with neighboring communities to promote sustainable practices and mitigate human-wildlife conflicts, recognizing that the park does not operate in isolation. Policing tasks are also critical to prevent illegal activities such as poaching or encroachment that could harm the park's ecosystem. Furthermore, the park management must be prepared to handle incidents and emergencies, such as forest fires or natural disasters, which require swift and efficient responses to minimize their impact on biodiversity.

To enhance efficiency, the park has established specialized departments focused on tasks like visitor services, wildlife protection, and community engagement. Collaborative committees involving park staff, local communities, and relevant authorities facilitate cooperation towards mutual conservation goals. Continuous training and capacity-building programs are provided to improve staff skills and knowledge, ensuring they are well-equipped to handle challenges. Clear communication channels between departments and stakeholders are vital for prompt decision-making, especially during emergencies.

Figure 4 (b): Organizational Structure of Manas National Park



(Source: Director Office Manas National Park)

3.2.1.3 Staffing

Staffing: Staffing is a crucial management function involving the selection, development, training, and maintenance of park staff to achieve the goals of biodiversity protection. Dick (2021) notes that staffing is a continuous activity, particularly in the forest sector, where staff placement and development are ongoing processes.

Key Areas of Concentration in Staffing: According to Ogu (2018), there are several important areas to focus on when staffing a national park:

- **Qualification:** Ensuring that staff have the necessary qualifications for their roles.
- **Psychological Stability:** Assessing the mental and emotional stability of potential staff.

- **Training and Retraining:** Providing initial training and continuous professional development opportunities.
- **Staff Welfare:** Ensuring the well-being and satisfaction of staff through various support measures.
- **Recruitment Process:** Implementing a fair and efficient process for hiring new staff.

Additionally, organizing the forest department involves setting up committees and arranging programs, workshops, and seminars for staff at all levels to ensure quality and efficiency within the organization.

- **Staffing of Employees in MNP**

The processes of recruitment, interview, selection, and placement strictly adhere to the regulations and guidelines prescribed by the Government of India and the Government of Assam for a diverse range of positions, encompassing both executive and non-executive roles, within the Forest Department. These positions include, but are not limited to, the following:

Table No 6: Details of Post

Sl. No.	Category of Post	Strength	Occupied	Vacant
1	Field Director	1	1	0
2	Deputy Director	1	1	0
3	Assistant Conservator of Forest	1	1	0
4	Research Officer	1	0	1
5	Superintendent	1	1	0
6	Veterinary	1	1	0
7	Sr. Assistant	2	2	0
8	Jr. Assistant	5	0	5
9	Record Keeper	1	0	1
10	Range Assistant	3	0	3
11	Veterinary Field Asstt.	1	0	1
12	Stenographer	1	1	0

13	Forest Ranger	6	6	0
14	Deputy Ranger	5	5	0
15	Forester-1	39	33	6
16	Forester-2	20	5	15
17	Forest Guard	235	76	159
18	Mahut	27	16	11
19	Game Watcher	44	29	15
20	Driver	9	4	5
21	Office Peon	4	4	0
22	Chowkidar	11	11	0
23	Handyman	3	3	0
24	Grass Cutter	23	23	0
25	Boat Man	12	12	0
26	Sweeper	1	0	1
27	Attendant	2	0	2
28	Laboratory Attendant	1	1	0
29	Dak Runner	1	1	0
30	Mali	1	1	0
32	Bearer	1	1	0
33	Jamadar	1	0	1
Total		466	240	226

*(Source: Director Office, Manas National Park.) Permanent Employees- 240
Casual Employees- 256
As on 06.05.2024*

The recruitment and selection procedures are conducted in accordance with the established governmental rules and procedures to ensure transparency, equity, and effectiveness in the process of filling these positions. Gender, irrespective of whether one is male or female, does not possess any significance within this particular context, especially when examined from the perspective of societal and cultural duties rather than biological contrasts. With the passage of time, women working in the forestry sector have surpassed conventional domestic boundaries and actively participated in democratic procedures, assuming positions and obligations across various establishments and organizations. Nevertheless, it is worth mentioning that there might be discernible attitudes and behaviors prevalent among male and female personnel within the department.

3.2.1.4 Directing

Directing involves issuing instructions to ensure that the organization's decisions and policies are effectively and efficiently implemented (Okoroma, 2019). Leaders in various institutions, including educational settings, utilize this approach to make decisions by providing orders, instructions, and commands to their subordinates. This approach often reflects an autocratic leadership style, where directives flow from the top down. Effective directing and positioning of institutional programs to achieve sustainability goals depend on the quality of decisions made prior to giving directions. Decision-making can be either individualistic or collective, and it is a crucial management strategy for selecting the most appropriate solutions to achieve optimal results (Brian, 2007). In the context of forest departments, directives are typically issued by top officials to safeguard wildlife, manage proper fencing, ensure effective patrolling, and oversee tourist activities, thereby contributing to the overall management and protection of national parks.

The direction function of Manas National Park encompasses the strategic planning, oversight, and implementation of policies aimed at conserving the park's unique biodiversity while fostering sustainable development. This function is primarily managed by the Field Director of the Manas Tiger Project, who is responsible for coordinating all conservation activities, habitat management, and anti-poaching measures. The direction function involves collaboration with various stakeholders, including the Forest Department, Tourism Department of the Bodoland Territorial Council, and multiple NGOs, to ensure cohesive and effective management. This collaborative approach is essential for addressing challenges such as land degradation, human-wildlife conflict, and resource management. By integrating scientific research, community involvement, and sustainable tourism practices, the direction function aims to preserve the ecological integrity of Manas National Park while supporting the livelihoods of local communities and enhancing visitor experiences. This ensures that the park continues to serve as a vital sanctuary for endangered species and a source of natural heritage for future generations.

3.2.1.5 Coordinating

Coordination is a critical function for policymakers and managers within Manas National Park, involving the organization and alignment of various groups, individuals, and stakeholders. Effective coordination, as highlighted by Dick (2021), requires uniting people towards a common objective, a fundamental skill in successful management. The primary aim of coordination is to achieve unified organizational goals and to project these goals to the broader society. It is the responsibility of park officials to maintain harmony and make decisions that benefit fringe communities, tourists, and employees alike, ensuring that all parties work collaboratively towards the park's sustainability and overall success.

According to Ola (2018), coordination in national parks can be categorized into two main types: internal and external. Internal coordination focuses on managing in-house activities within the park, flowing from top managerial levels, such as forest officers, down to the lowest staff levels, including forest guards. This includes organizing staff meetings, providing welfare, enforcing discipline, and supervising staff. External coordination, on the other hand, involves interfacing with external bodies to integrate their input with internal mechanisms, particularly in policymaking. This includes activities like recruitment, promotion, and dismissal of staff, as well as conducting major supervision and inspections for quality assurance and providing infrastructural facilities. By effectively managing both internal and external coordination, national parks can ensure a cohesive and comprehensive approach to management and policy implementation.

Coordination with various departments is also crucial for the effective management of Manas National Park (MNP). The park collaborates closely with departments such as Forest, Wildlife, Tourism, and local administrative bodies to ensure seamless implementation of conservation policies and operational strategies. This collaboration facilitates integrated resource management, enhances wildlife protection efforts, supports tourism initiatives, and fosters community engagement programs. By coordinating with multiple departments, MNP can address complex challenges holistically and sustainably, ensuring the preservation of its biodiversity

and natural ecosystems for future generations.

In terms of research, training, and development, the Research Education and Working Plan (REWP) wing of the Forest Department in Assam plays a significant role. It encompasses a broad spectrum of activities related to forest research, education, training, and the formulation of working plans. The REWP is divided into several specialized divisions. The Silviculture Division focuses on standardizing nursery techniques, studying vegetation changes, investigating species growth in diverse forest types, and developing propagation techniques for bamboo, orchids, and medicinal plants. The Genetic Cell Division is responsible for selecting superior trees, managing seed stands, developing seedlings, and researching advanced nursery practices. The Education and Empowerment division operates two Forest Schools in Assam—Assam Forest School in Jalukbari and Assam Forest Guards' School in Makum—where frontline staff receive essential training. These schools offer induction training for new staff and in-service training for experienced staff, with capacities of 100 and 80 trainees, respectively. They also conduct short-term refresher courses.

Additionally, Assam has three Working Plan Divisions responsible for formulating working plans for all Reserved Forests in the region based on field data. These divisions play a vital role in data collection and management, with working plans for 21 Forest Divisions currently in preparation and awaiting final approval. Through these coordinated efforts, Manas National Park ensures the systematic conservation of its rich biodiversity while supporting the ongoing professional development of its staff.

3.2.1.6 Reporting/ Communicating

Reporting is a crucial communication strategy in every sector. Nwadike and Godwins (2017) assert that effective communication is key to organizational success. Similarly, Akande (2020) notes that communication involves coding, decoding, and feedback.

Coding: This is the process of sending messages, conveying information to subordinates, and providing directives on what and how tasks should be

accomplished in line with institutional operations.

Decoding: This refers to the ability of subordinates to understand the transmitted messages and respond appropriately.

Feedback: This involves responding or reporting back to the sender, completing the communication loop.

In the context of national parks, reporting encompasses documenting all events and activities within and around the park. Effective communication is vital at all levels, particularly for ensuring animal safety. Timely reporting of incidents, such as the presence of poachers or any deviations from standard procedures, can prevent significant mishaps or asset losses within the park. This highlights the importance of robust communication systems for the efficient management and protection of national park resources.

- **Communication with various stakeholders**

Manas National Park (MNP) is managed and supported by a diverse group of stakeholders, each playing a crucial role in its conservation and sustainable development. The Forest Department is the primary manager of the park, deploying a dedicated workforce responsible for wildlife conservation, habitat protection, anti-poaching activities, and overall park operations. The Tourism Department of the Bodoland Territorial Council (BTC) administration also plays a significant role by overseeing tourism-related activities, including eco-tourism initiatives and visitor management, thus contributing to the park's economic and conservation goals. Several national and international non-governmental organizations (NGOs) such as WWF, ARANYAK, MMES, and ATREE actively support MNP's conservation efforts by providing technical expertise, funding, and community engagement initiatives. These NGOs collaborate closely with park authorities to promote biodiversity conservation and nature-based tourism. The synergy between the Forest Department, Tourism Department, and various NGOs has notably increased over recent decades, enhancing the park's conservation status and sustainable development. Additionally, the park is under the administrative control of the Field Director of the Manas Tiger Project, based at Barpeta Road, Assam, who oversees and coordinates all management activities. The

Deputy Field Director assists in these administrative and conservation efforts, ensuring the effective management of Manas National Park.

3.1.1 Forest Department: The park is primarily managed by the Forest Department, which plays a pivotal role in wildlife conservation and habitat protection. The department deploys a workforce of dedicated staff members who are responsible for day-to-day park operations, including wildlife monitoring, anti-poaching activities, and habitat management.

3.1.2 Tourism Department of BTC Administration: The Tourism Department of the Bodoland Territorial Council (BTC) administration plays a crucial role in the management and sustainable development of Manas National Park by overseeing a range of tourism-related activities. This department is responsible for facilitating eco-tourism initiatives, which are designed to attract visitors while minimizing environmental impact and promoting conservation awareness. Key aspects of their responsibilities include developing and maintaining visitor infrastructure, such as eco-friendly accommodations, trails, and interpretive centers, which enhance the overall visitor experience while ensuring minimal disturbance to the natural habitat. Visitor management is another critical function of the BTC Tourism Department. This involves regulating the number of visitors allowed in sensitive areas, providing educational programs to inform tourists about the park's ecological significance and conservation efforts, and implementing measures to reduce the ecological footprint of tourism activities. The department collaborates closely with local communities to integrate them into the eco-tourism framework, thereby providing alternative livelihoods and fostering a sense of ownership and responsibility towards the park's conservation.

3.1.3 Non-Governmental Organizations (NGOs): Several national and international NGOs are actively involved in supporting Manas National Park's conservation efforts. Organizations such as WWF, ARANYAK, MMES, and ATREE collaborate with the park authorities to promote biodiversity conservation and nature-based tourism in the surrounding regions. These NGOs often provide technical expertise, funding, and community engagement initiatives. Over the recent decades,

there has been a notable increase in the synergy and vibrancy of collaboration among the Forest Department, Tourism Department, and various NGOs. This cooperative approach has been instrumental in elevating the status of Manas National Park in terms of conservation and sustainable development. Over the recent decades, there has been a notable increase in the synergy and vibrancy of collaboration among the Forest Department, Tourism Department, and various NGOs. This cooperative approach has been instrumental in elevating the status of Manas National Park in terms of conservation and sustainable development.

3.1.4 Communication with Administrative Department: Manas National Park falls under the administrative control of the Field Director, Manas Tiger Project, whose headquarters is located at Barpeta Road, Assam. At the top, the Chief Wildlife Warden in Guwahati provides strategic direction and oversees compliance with conservation standards. Reporting to them, the Field Director at Barpeta Road manages park operations, supported by the Deputy Field Director who executes management plans and coordinates projects. This hierarchy cascades down to Range Forest Officers, Beat Officers, Research Officers, and Veterinary Assistants, each playing crucial roles in conservation, wildlife health, and operational coordination. This structured communication flow enables efficient dissemination of policies, feedback mechanisms, and decision-making, ultimately supporting the park in achieving its conservation objectives while meeting community and tourist needs.

3.2.1.7 Budgeting

Effective budgeting is essential for achieving sustainable objectives in national parks, requiring careful consideration of the amount, timing, and method of expenditure. The primary source of funding for national parks typically comes from government allocations at various levels, supplemented by income generated from park activities. Proper budgeting is crucial as it provides clear guidance, facilitates the efficient execution of tasks, and ensures that resources are used effectively. The significance of budgeting includes facilitating the strategic organization of development initiatives, regulating and monitoring expenditures, identifying

financial challenges, enabling cost savings, and ensuring the appropriate allocation of funds.

At Manas National Park, the budgeting function plays a pivotal role in ensuring effective conservation efforts amid diverse challenges and fluctuating financial support. Since its inception, the park has received varying levels of financial allocations from both national and international sources, primarily aimed at biodiversity conservation and rhino protection. In the late 1980s and early 1990s, the Governments of India and Assam allocated significant financial support totaling INR 2,545,000 (approximately US\$195,770 adjusted for inflation). Despite this substantial investment, reports emerged of funds being diverted for non-conservation purposes, highlighting early challenges in budget management and financial transparency.

By the mid-1990s, funding challenges persisted as less than two-thirds of the budgeted amount, approximately INR 1,817,800 (US\$272,850), was disbursed, leading to inadequate financial resources for operational needs. The World Heritage Fund provided crucial support in 1997 and 1998, totaling INR 7,425,000 (US\$165,000), intended for essential infrastructure such as vehicles, boats, ranger posts, and staff housing. However, due to security concerns, some funds were redirected to veterinary and health camps and infrastructure repairs to foster better community relations. The Indian government's commitment to conservation at Manas National Park was further demonstrated through substantial grants, including INR 25,000,000 (US\$500,000) allocated in 1997-1998. Despite these allocations, challenges in fund release from state-level projects like Project Tiger and Project Elephant persisted, impacting the park's financial stability and operational continuity. In response to these funding gaps, external organizations such as the Bodoland Territorial Council and international foundations like the UN Foundation, Ford Foundation, and Suri Sehgal Foundation stepped in with critical support. For instance, the Bodoland Territorial Council contributed INR 27,025,000 (US\$164,000) for infrastructure refurbishment and community support, while additional funds from international donors were earmarked for enhancing park management capabilities, staff training, and sustainable development initiatives. The Assam Government's estimated a budget of INR 108,000,000 (US\$1,350,000) for the

development of Manas National Park and its associated wildlife sanctuary (Economic survey of Assam 2023). Despite historical challenges in fund utilization and management, the budgeting function at Manas National Park remains crucial for aligning financial resources with conservation priorities. Ongoing efforts to improve transparency, accountability, and financial sustainability are vital to ensuring that future allocations are effectively utilized for biodiversity conservation, rhino protection, and community engagement. By learning from past financial challenges and embracing collaborative partnerships, Manas National Park continues to strive towards its conservation goals, ensuring the protection of its rich biodiversity for future generations.

3.3 Management Constraints

The Indian National Forest Policy Act of 1952 stated that national forests should be used to produce timber for industry and commerce rather than for local people's subsistence because land that is owned rather than held in common is typically treated with care (Lurie, 1991). The act held the poor accountable for deforestation. Thus, the region was declared a Sanctuary without offering the locals any substitute resources, and they kept encroaching on it as if it was still accessible to them. The buffer zone has had several infringements, particularly between Sankosh in the extreme west and the Manas River, which has caused the forest to become haphazardly fragmented, although overall the Tiger Reserve is still intact. Since 1973, there have been unauthorized settlements on around 1,500 hectares in the Panbari Reserve Forests, which is the westernmost part of the Park. The village communities on the periphery gather grasses, fuel, wood, fodder, and lumber, and their animals graze in the Park. There is no buffer to the south. The villagers feel that since the Tiger Reserve was declared in 1973, these uses have been denied to them and that they are entitled to them (WWF, 1993). The buffer zone is invaded, illicit logging and firewood exploitation, organized poaching, unsustainable hunting levels, uncontrolled dry season burning, and tiger persecution occur. The regular destruction of the villagers' homes, crops, and animals by tigers, elephants, wild boar, and deer from the park must be balanced against this. For instance, no compensation was given for the 11 man-eating tiger deaths that occurred between 1979 and 1983. Elephant and hog-deer

crop-raids are becoming more frequent, which causes the locals to remain resentful (Deb Roy, 1991). Plains tribes like the Borokacharis, who work at Kokla Bari Seed Farm, fiercely rejected government attempts to dismantle the farm in 1984 (Choudhury, 1986). Kokla Bari Seed Farm was established in the core Park grasslands in 1971. The integrity of the Manas ecosystem may be seriously impacted by the two dams that were proposed in the 1990s in the upper sections of the Manas and Sankosh rivers. Work on the Manas River dam upstream in Bhutan was the cause of the severe floods in 2003 that destroyed a portion of the park's riverfront property and equipment (WildLife Trust of India, 2004). The Bodo tribe, who make up over one-third of Assam's population, invaded the park on occasion between 1988 and 2003. Separatist members of the local All Bodo Students Union (ABSU) forcefully invaded Reserve and Park in February 1988 in an effort to restore the people's right to use forest areas and gain their own sovereignty (Dikshit, 2014). Later on, the National Democratic Front of Bodoland (NDFB), the United Liberation Front of Asom (ULFA), and the Bodo Liberation Tigers (BLT) joined them. In the absence of the police, there was arson, looting, the destruction of buildings and bridges, and the terrorists' murder of eight wildlife guards.

The park was off-limits to the general public from 1989 to 1996. Due to this, Sanctuary employees were compelled to leave, opening the Park to professional poachers, timber smugglers, and outlying locals. Of the 44 ranger posts, 30 were abandoned and 21 were destroyed. Hundreds of animals were killed as a result, mostly rhinos but also elephants, tigers, and important deer species (Hussain, 1989; Rahmani et al., 1989). As a result, the location was listed as World Heritage in Danger in 1992. Between 1989 and 1996, the Park was inaccessible to the public, and from 1988 to 2003, there were periodic disturbances that returned in 2001 and 2002 when militants from the ULFA and NDFB evacuated their refuges in Bhutan.

Although poaching has always been an issue, it reached a peak in the 1990s. The extremely impoverished inhabitants in the area rely on natural resources for their livelihood, which they believe the Park and Reserve is depriving them of. As a result, they were antagonistic. However, the most severe poaching was committed by big, well-armed, well-funded professional gangs that were partially supported by dealers

in endangered animals (Narayan, 1990). Hundreds of animals were therefore slaughtered, including rhinoceroses, elephants, tigers, and priceless deer species (Hussain, 1989; Rahmani et al., 1989). Poachers almost wiped off the local rhino population because there is a lucrative market for rhino horns.

3.4 Summary

In the context of Manas National Park, sustainability is fundamental to balancing conservation with socio-economic development. The park, known for its rich biodiversity and cultural significance, faces challenges such as land degradation and resource depletion exacerbated by local conflicts and economic pressures. Sustainable practices in visitor management, collaboration with indigenous communities, efficient resource utilization, and impact assessment for tourism are crucial. These efforts aim to ensure that the park continues to thrive ecologically while supporting local livelihoods and offering meaningful visitor experiences, thereby safeguarding its natural and cultural heritage for future generations. Effective management of national parks is essential for conserving biodiversity and preserving cultural heritage. It involves a comprehensive approach encompassing strategic planning, resource allocation, personnel management, and stakeholder coordination. Challenges such as human-wildlife conflict, climate change impacts, and tourism pressures necessitate proactive measures like habitat restoration, anti-poaching efforts, and sustainable tourism practices. Collaboration among government agencies, NGOs, local communities, and researchers is crucial to achieving conservation goals. Continuous research, education, and capacity-building initiatives further enhance management effectiveness by promoting knowledge-sharing and fostering public engagement in conservation efforts. Overall, integrated management strategies are key to ensuring the long-term sustainability and ecological integrity of national parks worldwide.

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CHAPTER 4

SUSTAINABLE LIVELIHOOD OF FRINGE COMMUNITY OF MNP

4.1 Sustainable Livelihood

In the 1990s and 2000s overseas development assistance has increasingly been directed towards an agenda for poverty reduction, as expressed in the Millennium development goals to halve extreme poverty and increase well-being globally by 2015. Towards these ends, development agencies and national governments have generated or adopted a range of tools and strategies for designing development, including sustainable livelihood approaches, direct budgetary support, governance, and rights-based approaches.

The concept of sustainable livelihoods has developed from shifting perspectives on poverty, participation, and sustainable development (Sen, 1981). In 1987, the World Commission on Environment and Development introduced the concept of 'sustainable livelihoods' during their deliberations on resource ownership, meeting basic needs, and ensuring security for rural livelihoods (Litvinoff, 1988). The 1992 UN Conference on Environment and Development identified sustainable livelihoods as a method of connecting socioeconomic and environmental issues. Both forums played a crucial role in shifting global attention from environmental challenges to the impact on people and their livelihoods, and integrating these concerns into a policy framework for sustainable development.

In the late 1990s, the concept of sustainable livelihoods became established as an approach. This approach was developed and implemented by various intergovernmental organizations such as the United Nations Development Programme, the Food and Agriculture Organization, the International Fund for Agricultural Development, and the World Food Programme. It was also supported by bilateral donors like the British Department for International Development, non-governmental organizations such as Development Alternatives in India, CARE International, and Oxfam, as well as research institutes like the International Institute for Sustainable Development in Winnipeg, the Institute of Development Studies in Sussex, and the Overseas Development Institute in London. From the

viewpoint of a donor, a sustainable livelihood approach serves as a practical method to support efforts to reduce poverty (Alterelli and Carloni, 2000). These ideas are based on an 'asset-vulnerability approach' to comprehending poverty. Their objective is to combine the knowledge gained from the most effective development methods with a set of guiding principles that are supported by an analytical framework. This framework serves as a tool to analyze problems and focus on specific actions. The guiding principles are universally applicable to various organizations that adopt a sustainable livelihoods strategy, despite variations in frameworks and methodologies (Carney et al., 1999). While several organizations have developed their interpretations, most rely on the notion of livelihood as "the methods of acquiring a means of subsistence, encompassing capabilities, tangible assets, and intangible assets" (Chambers, 1992). In addition, there is a sustainability aspect to consider. A livelihood is considered sustainable when it has the potential to withstand and bounce back from pressures and unexpected events, while also maintaining or improving its abilities and resources, without depleting the natural resources it relies on (Scoones, 1998).

4.2 Sustainable Livelihood Approach

The sustainable livelihoods approach is a conceptual framework that guides the goals, extent, and priorities of development initiatives. It is grounded in the progressive understanding of the circumstances in which impoverished and susceptible individuals lead their lives, as well as the significance of policies and institutions. Sustainable Livelihoods Approach comprises four main components. Firstly, it views individuals as living within a vulnerable context, exposing them to risks through sudden shocks, long-term trends, and seasonal changes. Secondly, individuals possess various capital assets which they utilize to sustain their livelihoods. These assets include social capital (networks and trust relationships), natural capital (resource stocks), financial capital (savings, income, credit), physical capital (transport, shelter, water, energy, communications), and human capital (skills, knowledge, labor). These five assets form an 'asset pentagon,' used to evaluate the overall asset base of individuals. Thirdly, these assets are used within people's livelihood strategies, encompassing the choices and activities aimed at generating a

living or achieving positive livelihood outcomes. Fourthly, policies, institutions, and processes influence access to assets and livelihood activities, as well as the vulnerability context in which individuals exist. This component highlights the connections between micro-level livelihood activities and the meso- or macro-level institutional and policy contexts. The sustainable livelihoods approach represents a shift in development practice from needs-based, resource-focused solutions to an emphasis on people and their capacity to initiate and maintain positive change (Carney, 1998). The concept of sustainable livelihoods offers a more comprehensive understanding of the complexities of living and surviving in impoverished communities compared to approaches based solely on income, consumption, and employment measures. In rural contexts, it also redirects attention from solely agrarian changes to the diversity of livelihoods, a topic of growing importance in scholarly research (Davies, 1996) and rural development policy (Ashley, 2001).

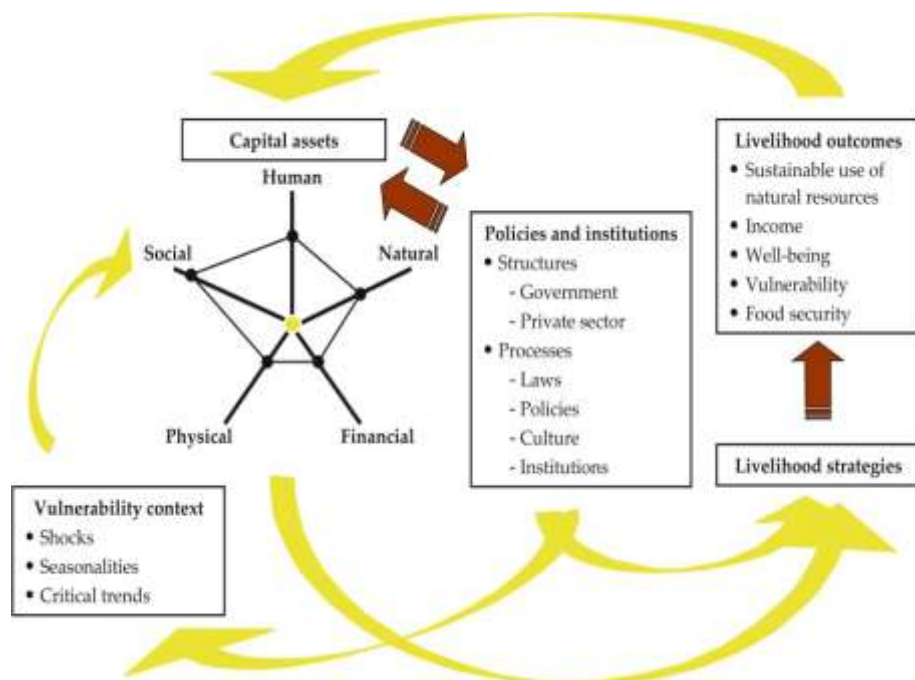


Figure 5: Sustainable Livelihood Approach
Source: Serrat & Serrat (2017)

4.3 Sustainable Livelihoods Approach in the Context of Manas National Park

The sustainable livelihoods approach (SLA) at Manas National Park facilitates the identification of practical priorities for conservation and development actions by considering the views and interests of local communities. While SLA is not a comprehensive solution, it complements other methodologies such as participatory development, sector-wide approaches, and integrated rural development. SLA establishes a crucial link between the people living near Manas National Park and the broader enabling environment that influences the success of their livelihood strategies. This approach highlights the inherent potential of the local population, focusing on their skills, social networks, access to physical and financial resources, and their capacity to influence core institutions.

a) Vulnerability Context

Vulnerability, in the context of Manas National Park, encompasses the insecurity faced by individuals, households, and communities due to changes in their external environment. This concept of vulnerability provides a more dynamic and nuanced understanding of the processes affecting community well-being than static poverty line measurements. Vulnerability in this context has both external and internal facets: the external dimension includes shocks, seasonalities, and critical trends, while the internal dimension involves the community's capacity to cope with these external factors.

- **Shocks:** Sudden events like natural disasters (floods, droughts) or socio-political conflicts that can disrupt lives. The Manas River is a key aspect of the Manas National Park, and both are under threat from many environmental factors. The area has been flooded several times. Manas saw many significant flash floods between 2001 and 2009. The Manas River's upper catchment area had cloudbursts and rainstorms, resulting in these conditions. The Manas National Park was severely impacted by the terrible catastrophe that occurred in 2004 as a result of the Kurichu dam's excessive water flow (Dorji, 2020).
- **Seasonality:** Seasonal variations in employment, income, prices, and availability of resources, which can lead to uncertainty. Seasonal variations

significantly impact the livelihood opportunities of those living near Manas National Park. Agricultural cycles, which are heavily influenced by seasonal rains, dictate periods of planting and harvest, affecting food availability and income. Seasonal fluctuations in prices of agricultural products can lead to economic instability, making it difficult for households to plan and save. Employment opportunities in the region also tend to be seasonal, with tourism-related jobs peaking during certain times of the year. This seasonality in employment can result in periods of income uncertainty and heightened vulnerability for families dependent on seasonal work.

- **Critical Trends:** Long-term trends such as population growth, environmental degradation, or changes in policy that affect livelihood sustainability. Several critical trends influence the vulnerability context of communities around Manas National Park. Demographically, population growth can increase pressure on natural resources, leading to over-exploitation and environmental degradation. Environmental trends, including climate change, can exacerbate the frequency and intensity of natural disasters, altering ecosystems and affecting biodiversity within the park. Economically, fluctuations in the broader market can impact local livelihoods, particularly if there is a heavy reliance on a single industry such as agriculture or tourism. Governance trends, including policy changes and the effectiveness of local institutions, play a crucial role in determining the resilience of communities. Effective governance can enhance the capacity to manage natural resources sustainably and respond to shocks, while poor governance can increase vulnerability. Technological trends, including access to and use of new technologies, can either mitigate or exacerbate vulnerabilities. For instance, improved agricultural technologies and practices can increase productivity and resilience, while lack of access to such innovations can leave communities more vulnerable to environmental and economic shocks.

b) Policies and Institutions: The livelihood strategies and outcomes for communities surrounding Manas National Park are influenced not only by their access to capital assets and the vulnerabilities they face but also by the structures and processes that govern their environment. These structures and processes—comprising public and private sector organizations, laws, regulations, and societal

norms—play a crucial role in shaping the livelihoods of local communities. The effectiveness of policy-determining structures hinges on the presence of appropriate institutions and processes that facilitate the implementation of these policies. In the context of Manas National Park, understanding the interplay between these elements is essential for promoting sustainable development and conservation efforts.

- **Structures:** The structures that impact livelihoods around Manas National Park include a range of public and private sector organizations. Public sector organizations, such as government agencies and local authorities, are responsible for setting and implementing policies and legislation related to conservation, land use, and community development. These organizations deliver essential services, such as healthcare, education, and infrastructure development, which directly affect local livelihoods. Private sector entities, including tourism operators, businesses, and non- governmental organizations (NGOs), also play significant roles. They contribute to the local economy through employment opportunities, trade, and investment in community projects. The collaborative efforts of these public and private sector structures are vital for creating an enabling environment that supports sustainable livelihoods.

- **Process:** Processes encompass the laws, regulations, policies, and societal norms that influence how structures operate and how individuals and communities interact with these structures. In Manas National Park, processes such as land use regulations, conservation policies, and community engagement practices determine the allocation and management of natural resources. These processes can either facilitate or hinder access to assets, influence market dynamics, and shape interpersonal relations within the community. Effective processes provide incentives that encourage sustainable practices and better livelihood choices. For instance, policies promoting eco-tourism can incentivize local communities to engage in conservation efforts while benefiting economically from tourism. Conversely, processes that are not inclusive or pro-poor can systematically restrict the opportunities available to vulnerable populations. For example, stringent conservation regulations without adequate community consultation or compensation can limit access to natural resources, exacerbating poverty and

vulnerability.

c) Livelihood Strategies and outcomes

Livelihood strategies in Baksa District hold significant potential for enhancing the well-being of local communities. While agriculture remains a key livelihood option, diversifying strategies can greatly benefit the people. The district's abundant natural resources offer opportunities for creating local organic products that can be marketed to nearby resorts at subsidized rates. For example, lemons are commonly grown in almost every household in Baksa. These can be processed into lemonade or lemon soda, which can then be sold to the resorts. Additionally, artisans can craft products such as animal carvings from bamboo, tapping into the district's rich tradition of craftsmanship. Implementing effective processes is crucial for incentivizing sustainable practices and enhancing livelihood choices. Policies that promote eco-tourism, for example, can encourage local communities to participate in conservation efforts while also gaining economic benefits from the influx of tourists. However, it's essential that these processes are inclusive and supportive of the most vulnerable populations. When policies are not inclusive or fail to consider the needs of the poor, they can limit the opportunities available to those who are most in need. For instance, strict conservation regulations without adequate community consultation or compensation can restrict access to natural resources, thereby exacerbating poverty and vulnerability in the region.

The potential livelihood outcomes for communities around Manas National Park include increased income, enhanced well-being, reduced vulnerability, improved food security, sustainable use of natural resources, and recovered human dignity. These outcomes are interlinked and sometimes conflicting. For example, efforts to increase income through agricultural intensification might undermine sustainable resource use if it leads to deforestation or soil degradation. Similarly, enhancing food security through extensive farming might conflict with conservation goals aimed at preserving wildlife habitats.

d) Capital Assets

The sustainable livelihoods framework offers a structured approach to understanding the factors that either constrain or enhance livelihood opportunities, and it elucidates the interrelationships among these factors. Within the context of

Manas National Park, the framework is particularly useful for identifying and expanding the access of local households to various livelihood assets. These assets are critical for the community's well-being and resilience, especially given the trade-offs and choices that poor households often must make. The key livelihood assets within this framework include human capital, social capital, natural capital, physical capital, and financial capital.

(i) Human Capital

Human capital in the vicinity of Manas National Park encompasses the health, nutrition, education, knowledge, and skills of the local population. Efforts to improve human capital involve initiatives such as healthcare programs, nutritional support, and educational opportunities. Additionally, capacity-building programs focused on enhancing skills relevant to conservation, tourism, and sustainable agriculture are crucial. For example, training local guides in wildlife conservation and eco-tourism can enhance their employability and ability to contribute to sustainable tourism initiatives, thereby improving their capacity to work and adapt to changing economic conditions.

(ii) Social Capital

Social capital is a significant asset for communities around Manas National Park, comprising networks and connections, relationships of trust, and mutual support systems. The local community benefits from strong kinship ties, neighborhood networks, and collective representation through formal and informal groups. These social structures are essential for fostering community solidarity and cooperation in conservation efforts. Mechanisms for community participation in decision-making, such as local conservation committees, enhance collective action and leadership. Trust and mutual understanding within the community facilitate effective communication and cooperation, which are vital for the sustainable management of the park's resources.

(iii) Natural Capital

Natural capital is a cornerstone of livelihoods in the areas surrounding Manas National Park, including land, water, forest products, wildlife, and biodiversity. The park itself is a rich repository of natural capital, providing resources such as wild

foods, fibers, and environmental services. Sustainable management of these natural resources is crucial for maintaining biodiversity and ecosystem services that local communities depend on. Initiatives such as sustainable harvesting practices, community forestry programs, and biodiversity conservation projects help to preserve and enhance natural capital. The protection and sustainable use of these resources ensure that they continue to provide livelihood opportunities for future generations.

(iv) Physical Capital

Physical capital in the region includes infrastructure such as transportation networks, secure shelter, water supply, sanitation, energy, and communication systems. Access to appropriate tools and technology, including agricultural equipment, seeds, and traditional technologies, also falls under this category. Investments in improving physical capital are essential for enhancing the livelihoods of local communities. For instance, better road infrastructure can facilitate access to markets, while improved water and sanitation facilities can enhance health outcomes. Energy solutions, such as renewable energy projects, can provide sustainable power sources for local households and businesses, contributing to overall economic development.

(v) Financial Capital

Financial capital comprises savings, credit, debt, remittances, pensions, and wages. Access to financial capital is often limited in rural areas surrounding Manas National Park, yet it is crucial for enabling households to invest in education, health, and business opportunities. Microfinance initiatives, savings groups, and remittance services can provide much-needed financial support to local residents. Developing financial literacy programs and creating opportunities for income generation through tourism and conservation-related activities can help improve financial stability and resilience.

4.4 Livelihood Measurement Data Analysis

The Sustainable Livelihoods Approach emphasizes the importance of understanding various "capital assets" possessed by individuals or communities. These capitals, which encompass natural resources, financial resources, human

capabilities, social networks, and physical assets, are not independent entities but rather a constellation of resources that people draw upon in a multifaceted way to secure their livelihoods.

A critical aspect of the SLA analysis involves identifying the specific combination of livelihood resources (or "capitals") required for different livelihood strategies. Livelihood strategies themselves are not monolithic; they often represent a portfolio of diverse activities, ranging from highly specialized single-activity pursuits to more diversified approaches. Separating the factors that influence the selection and combination of activities within a livelihood strategy is crucial for understanding how people navigate their economic realities. Therefore, to effectively structure the analysis of livelihoods using the SLA, a thorough examination of each capital type and its interaction with others is essential. This examination allows us to identify how combinations of these capitals shape the livelihood strategies pursued by individuals and communities. Different types of capital have a crucial impact on supporting people's lives, especially in places focused on managing natural resources, such as Manas National Park (MNP). Natural capital refers to the stock of resources such as land, water, air, and genetic resources, as well as environmental services like the hydrological cycle and pollutant sinks. These resources and services are essential for supplying valued resources and services. Economic or financial capital encompasses the fundamental economic resources required for any livelihood strategy, such as money, credit/debt, savings, basic infrastructure, and production equipment and technologies. Physical capital include tangible resources such as livestock, privately owned goods, and residential places that are essential for sustaining livelihoods. Human capital encompasses a person's abilities, expertise, ability to work, and overall well-being and physical qualities needed to successfully pursue various career opportunities. Social capital refers to the interconnected networks, social connections, interactions, affiliations, and associations that individuals depend on to carry out coordinated actions in different ways of making a living. Together, these many types of capital offer a thorough comprehension of the resources accessible to local communities and their impact on the long-term viability of their livelihoods.

Table 7: Livelihood Measurement

Dimension Layer	Criteria	Indicators	Indicator Definition	Mean	Standard Deviation
Livelihood Capital	Natural capital	Land Area (C1)	Area of farmland (unit: Bigha)	2.87	1.27
		Land Quality (C2)	1 = very poor, 2 = poor, 3 = average, 4 = fertile, and 5 = very fertile	3.583	0.493
	Physical Capital	Homestead area (C3)	1 = 100 and below, 2= 100–160, 3 = 160– 200, and 4 = above200 (unit: m ²)	3.55	0.441
		Family owning assets (C4)	The number of assets such as Television, Computer, Cycle, Scooter, Refrigerator etc.	2.6	0.51
		Livestock and poultry breeding (C5)	Breeding livestock and poultry: 0 = No and 1 = Yes	0.9	0.5
	Human Capital	Family Size (C6)	Total number of family members	4.25	0.946
		Skill training (C7)	Participation in Professional skill training programmes: 0 = No and 1 = Yes	0.2	0.40
		Education level (C8)	1 = Primary school and below, 2 = Junior high school, 3= High school,4= College & Intermediate, and 5= Postgraduate	1.42	0.714
		Physical health condition (C9)	0=Experienced major disease and 1= Healthy	0.75	0.433

		Annual frequency of seeking medical treatment (C10)	Annual frequency of going to the hospital (unit:times)	1	1.064
		Off-farm management (C11)	Running a business or a store/Homestay etc: 0 = No and 1 = Yes	0.467	0.512
	Financial capital	Annual family income (C12)	1=30,000 and below, 2 = 30,000–90,000, 3 = 90,000–150,000, 4=150,000–300,000, and 5 =above 300,000 (unit: INR)	1.92	0.84
	Social Capital	Agricultural cooperative organization (C13)	Joining the Specialized farmers' cooperatives: 0 = No and 1 = Yes	0.32	0.47
		Relationship with Relatives (C14)	1 = very poor, 2 = poor, 3 = Good 4= Excellent	1.77	0.90
		Road Condition (C15)	0 = Unpaved road and 1 = Cement/Asphalt road	0.6	0.49
		Transportation convenience (C16)	1 = Lower, 2 = Average, 3 = High, and 4 = Higher	2.2	0.73.
		Relationship with the Park Officials (C17)	1 = very poor, 2 = poor, and 3 = Good 4= Excellent	1.75	0.82

(Source: Authors own creation)

4.4.1 Livelihood Status of Fringe People in Manas National Park

To determine the livelihood status of the people residing in the four villages near Manas National Park, after taking consideration of the sustainable livelihood approach and doing the analysis based on the different assets some of the information gathered from the survey are being stated.

4.4.1.1. Natural Capital

a) Land Area

Agriculture is the district's primary source of income, and more than seventy percent of the population in Baksa district relies on agriculture as their primary source of supporting themselves. The vast majority of the district is comprised of plains that are situated near the foothills of the Himalayas. There are a variety of crops that can be grown successfully in the Baksa district because the land is rich in nutrients and easy to work. The majority of the paddy that is grown in the district is grown by the farmers. It is primarily summer paddy and winter paddy that they cultivate. In addition to paddy, the farmers of the district cultivate several other important crops, including mustard, jute, wheat, potato, lentil, black gram, and a variety of vegetables, including cabbage, knol-khol, cauliflower, brinjal, radish, tomato, cucumber, carrot, onion, garlic, chili, ginger, turmeric, lady's finger, and so on. These crops are grown in various parts of the district. A significant proportion of individuals, as indicated by the results of the survey, are landowners. The people who live on the edges are tremendously dependent on the property that they control, and these folks engage in a range of agricultural activities on the land that they own. There were periods when the price of the land was much lower than usual. As a result of the terrorist attacks that had taken place in some regions, people were reluctant to purchase land in those locations. Because the land is situated within the tribal belt, the only people who are allowed to purchase it are the neighbors. Because of this, a significant number of parcels of land are still owned by the people. An investigation into land area, which is a component of natural capital, revealed that there is a moderate level of heterogeneity among four communities that are situated in close vicinity to Manas National Park. This was the conclusion

reached by the researchers who conducted the investigation. The results of the poll indicate that residents who live on the periphery of the park have land that has been handed down from one generation to the next. This exemplifies the strong connection that these individuals have to the lands that have been passed down from generation to generation. The measurement of these lands has traditionally been done in Bighas, with each Bigha being equivalent to five Kathas in the Baksa district. The majority of these lands are utilized for agricultural and plantation purposes or for other purposes. By indicating that there is a large degree of variance across villages, a standard deviation of 1.27 Bighas demonstrates that some villages have much greater or less land holdings than others. This implies that there is a significant amount of variation among villages. Although there is a large amount of variation among villages, the average amount of land that each village possesses is 2.87 Bighas. A significant number of people are abandoning their farms due to the low profits and the intense labor involved. In this day and age of technology and accuracy, it is imperative that efficient labor be utilized in order to boost output in the agricultural sector as well as in the allied sectors of the home of tribal people. A study from the farmers indicates that they have not received any training or demonstration from the government regarding the utilization of contemporary tools and implements. Furthermore, more than fifty percent of the farmers have reported that their Agriculture Extension Assistant (AEA) has never visited the field. Due to the fact that the majority of farmers are in a poor economic situation, they are unable to acquire mechanized agricultural machinery, high-yield seeds, chemical fertilizers, or land development in order to boost their production and productivity. In this regard, the farmers have expressed that the assistance provided by the government to alleviate their suffering and provide financial assistance is not adequate.



Image: 8. Land Area 1 Bhuyapara Village
(Source: Author's own collection)



Image: 9. Land Area 2 Bhuyapara Village
(Source: Author's own collection)

b) Land Quality

The majority of the agricultural lands in Assam are rich in fertility and suitable for agricultural uses. In a similar vein, the results of my study have shown that the majority of the land owned by the respondents is of a fertile type, and the majority of the people own land that is suitable for farming. Farming rice is a significant crop that has been cultivated by individuals living on the margins of society. The people also plant a variety of products for their day-to-day needs. Because the land they have is abundant, they plant a variety of trees. Beetel nuts, chillis, jackfruit, mangoes, and lemons, in particular, are grown in abundance in the lands that they use for their own personal needs. Additionally, they sell these products in the nearby market (Gadhuli Bazar for three villages: Naranguri, Gyti, and Raghob Bill) and in (Rupohi Bazar) for the village of Bhuyapara. Vegetables are grown on the land of every household, albeit in small amounts, for the sake of domestic consumption. This demonstrates that the area is considered to be on the fertile side.

Once the land quality and land area of the communities that are located close to Manas National Park are analyzed, it becomes clear that the situation is favorable. According to the average rating of approximately four on a scale that ranges from one to five, the quality of the land is generally good, which indicates that it is quite fruitful for agricultural purposes. Although there is a level of fluctuation, the standard deviation for both the land area (1.27 Bigha) and the quality (0.493) indicates that there is some variation. The landholdings of specific villages may be larger than those of other villages, although these holdings feature a mix of fertile and less fruitful areas. On the other hand, villages that are significantly smaller in terms of their geographical area could have a higher quality on average, which could help compensate for the disadvantage of their size.



Image 10. Lemon Tree



Image 11. Jack Fruit Tree Raghob bill Village

(Source: Authors own collection)

4.4.1.2 Physical Capital

a. Homestead Area

Based on the results of the survey, the majority of the homes are Kacha, which means "not concrete," and are constructed out of bamboo and mud. A small number

of residences are pakka, which are housed in government-owned homes. Approximately one-third of the total land area is where the majority of people make their homes. The restroom and the latrine are detached from the main living section of the house. In close proximity to the restroom is also where the tube well and well of the drinking water facilities are located. Upon analyzing the homestead area, which is another type of physical capital in these villages, it becomes apparent that there is a certain degree of diversity. On the given scale, the average size of a homestead is 3.55 square meters, which corresponds to an area that is between 160 and 200 square meters. This is based on the fact that 1 represents less than 100 square meters, 2 represents between 100 and 160 square meters, 3 represents between 160 and 200 square meters, and 4 represents more than that. The standard deviation of 0.441, on the other hand, indicates that a number of towns have homestead areas that are much higher or lower than the average.



Images 12. (a & b): Gyti Village and Naranguri Village Home Stead Area
(Source: Author's own collection)

b. Assets

According to the data, there is a moderate level of ownership of family-owned fixed assets in each of the four villages. These fixed assets include things like televisions,

refrigerator, bicycles, and scooters. Two of these assets are owned by the average household. The presence of a standard deviation of 0.51, on the other hand, leads one to believe that there is a fair degree of fluctuation in the levels of ownership. Although the average serves as a point of reference, certain households have a significantly higher or lower number of fixed assets in comparison to the average. This is because some children have achieved a first division in their Higher Secondary Exam, which enables them to receive a scooter from the government as part of the Pragyan Bharati Scooty Scheme.

c. Livestock

During the course of the study, it was discovered that the majority of the individuals own animals. Cattle, hens, ducks, and pork are at their disposal. A portion of the milk that has been produced from the cows is consumed for personal consumption, while the remaining milk is sold to the market in the immediate vicinity. The majority of the time, households will use the eggs that they have obtained from chickens and ducks for their own personal necessities. The vast majority of Bodo people engaged in pig farming. Additionally, the locals raise the meat of the livestock (pigs, hens, and ducks) for their own consumption to satisfy their own needs. A considerable number of villages are growing livestock and poultry, as indicated by the mean score of 0.9 for C5, which indicates that this is the case. In the context of this particular scenario, where the value 0 represents "No" and the value 1 represents "Yes," a value that is close to 1 implies that a sizeable proportion of families (about 90 percent) are engaged in the activity of raising livestock or poultry. A standard deviation of 0.5 shows that there is a certain degree of variation in the methods that are utilized in the communities for the rearing of livestock and poultry and that this variation is there. These are the consequences of illnesses that occurred in pigs and hens, which resulted in considerable losses for the population that was disadvantaged.



Image 13 (a, b & C) Livestock Bhuyarapa Village
(Source: Authors own collection)

4.4.1.3 Human Capital

a) Family Size

The study revealed that the majority of individuals have a family size ranging from four to six members. The majority of the inhabitants in the four villages are predominantly Hindu. In the household, there is a male figure who holds the position of authority and makes all the decisions. There are one or two youngsters who attend both school and college. The elderly dependents in the home, typically one or two individuals, actively participate in agricultural activities. Both males and females participate in agricultural activities. The majority of household members engage in agriculture production. Planting trees and plants have been observed to be customary practices in family households. Even the children are actively participating in tree planting activities. The average family size in the four communities is 4.25 individuals. These findings indicate that the typical number of people living in households in these areas is around four to five. The standard deviation of 0.946 suggests that there is a moderate level of variation in family size among the localities. While the average serves as a general approximation, some families may drastically differ from the average in terms of their size. The standard deviation suggests that a significant share of families are expected to have a number of members ranging from 3.3 (4.25 minus 0.946) to 5.2 (4.25 plus 0.946). However,

it is feasible for there to be families with much higher or lower amounts that are outside of this specified range.

b) Skill Training

The survey revealed a lack of awareness among the majority of individuals on the skill training procedure, with just a small number of people actually participating in the training. The organization of the training and workshops is mostly coordinated by non- governmental organizations (NGOs) and park authorities. Despite providing them with complimentary training, there is a decrease in engagement. An NGO called AARANYAK primarily focuses on engaging with households and motivating them to partake in training programs aimed at acquiring new skills for the purpose of producing marketable goods. An project was implemented to provide the villagers with the necessary skills to produce pickles. Only a small number of women participated in the training and subsequently initiated the business. However, their efforts were not successful as they believed that crop growing is a simple task that does not require strict adherence to a schedule. Mitali Dutta's NGO, Food Sutra, has implemented an additional project where a select group of women from the villages have been taught and an ethnic restaurant called GUNZEMA kitchen has been established. This restaurant specifically caters to tourists visiting Manas National Park by serving traditional Bodo cuisine. The data about Skill Training (C7) indicates a minimal level of participation in professional skill training programs within the four communities neighboring Manas National Park. The mean value of 0.2 (with 0 being "No" and 1 denoting "Yes") suggests that, on average, only 20% of the population participates in these activities. A standard deviation of 0.40 suggests a substantial level of variation in the level of involvement among the communities. While the general average is moderate, some towns may display much higher or lower participation rates compared to the norm. Lack of knowledge about available skill training programs and their associated advantages may hinder participation and contribute to low attendance. Achieving a harmonious equilibrium between engagement and existing work and familial responsibilities.

c) Education Level

As a result of the survey, it was discovered that the majority of the heads of families do not have a high level of education. They did not place any importance

on the awareness and passion to educate themselves at any point in time. Their belief was based on the fact that they possessed vast territories that would necessitate the employment of laborers, and that the people had begun engaging in agricultural activities at a very young age. The education level of the women who are in charge is likewise lower than average. Additionally, the educational facilities are in a poor state at the moment. At the moment, parents are well aware of the significance of education and are making every effort to educate their children. However, the lack of appropriate access and educational facilities is creating a barrier that prevents children from receiving an education. As a result of the women's marriage to their families at a relatively young age, they are unable to further their education or attend school. The average level of education attained by residents of all of the villages is 1.42 dollars. The average education level is approximately halfway between elementary school and junior high school, according to the scale that was provided. The scale states that 1 represents elementary school and below, 2 represents junior high school, 3 represents high school, 4 represents college and intermediate, and 5 represents postgraduate study. It can be deduced from this that a sizeable portion of the population may have a limited amount of formal education. It appears that there is a moderate degree of variation in the educational levels of the communities, as indicated by the standard deviation value of 0.714. There are Lower Primary Schools (LP) and Middle Education Schools (ME) in the villages, which means that children who wish to pursue Higher Secondary education are need to travel to Salbari College, which is located a considerable distance away. Additionally, the severity of the quality of lower education in these communities is substantially impacted by the presence of poverty as well as the few educational possibilities that are available.



Image 14. Bhuyapara LP School (Source: Author's own collection)

d) Physical Health conditions

During the course of the survey, it was discovered that the health of the family members, on average, is in a satisfactory state. They are able to feel this way mostly because they put in a lot of effort and consume organic meals. The vast majority of people have access to clean drinking water because they filter it through sand and iron and store it in clay pots. The majority of the food that they prepare is consumed within a single day. Those that are left over are not given to the animals' diet. They cook every day because they believe that stale foods are poisonous, and they cook every day. Additionally, the rice comes from their very own farms, and the vegetables come from their very own garden. In addition, the alcohol is made in their own home using rice, specifically in the form of rice brews. The seasonal ailments such as cough, cold, and fever are still present in the locations, despite the fact that these healthy practices are employed. Originally the Bodos were very fond of animal meat and fish. The Bodo households under study were non-vegetarian and rice was their staple food and was often accompanied by a nonvegetarian dish such as fish or pork or chicken. Pork (Oma bedor) is an important item of dietary

menus. But they do not eat beef and meat of buffalo. They prepared pork meat with different flavours and style. It could be fried, roasted (smoked) and stewed or drying of the meat in the sun for several days or cooked by mixing pork blood and meat called Oma khaji. Another dish of fish Napham made by grinding smoked fish and mixed with certain leafy vegetables and the mixture was allowed to age in a sealed bamboo cylinder and eaten by adding in curries or making chutneys. Onla a gravy made from rice powder and slices of bamboo shoots cooked lightly with oil and spices. Chicken or pork could be added to Onla. Apart from these they ate lots of vegetables by stewing as well. Traditional favourite drink of the Bodos was Zu Mai (Zu: wine, Mai: rice). A special kind of rice beer customarily brewed in every household is of great use in Bodo society and they serve this to guests. This beer has essential place in social and religious function. Besides they take a cup of rice beer to get relief from mental and physical fatigue. It was encouraging to see that many people were prohibited from making the drink at home or selling by Bathou religious followers, but, it is yet to be followed strictly. Food processing, preservation, daily cooking and serving activities were the sole responsibility of the women of the household. A positive outcome is indicated by the data, which reveals an average value of 0.75. These values, where 0 represents "Experienced major disease" and 1 represents "Healthy," imply that. The percentage of persons in these towns who say they are healthy constitutes 75% of the total population on average. This indicates that there is a relatively high percentage of people who report being in good health. With a standard deviation of 0.433, it can be deduced that there is a fair degree of variation in the health issues that have been reported by the populations. There is a fluctuation of approximately 0.5 points on the scale, which indicates that specific villages have a higher or lower percentage of individuals reporting health difficulties in comparison to the average. This is despite the fact that the majority of people claim to be in good health.

e) Annual frequency of seeking medical help

Since it was stated before that the majority of individuals are healthy, it follows that they have a tendency to visit the hospital in a less frequent manner. In order to treat the seasonal illnesses that they experience, the Bodo people have developed a wide range of home remedies that contain a variety of herbs. As a result of the

widespread belief that allopathic therapy is detrimental to one's health and that the administration of drugs shortens one's lifespan, many individuals shy away from visiting hospitals. In spite of the fact that they are healthy, a significant number of people have not yet received the COVID vaccine. Even during the course of the Corona Virus, they reported that it did not have a significant impact on them significantly. Although this was discovered, it was also discovered that the local hospital, which is called Salbari Hospital, is located 15 kilometers away from the hamlet, which makes it extremely difficult for the inhabitants to travel there in the event of an emergency. Within each of the communities, the average number of people who visit the hospital on an annual basis is 1. Based on this information, it can be deduced that the individuals who reside in these communities make an annual visit to the hospital on average. There is a considerable degree of fluctuation in the frequency with which individuals visit the hospital, as indicated by the standard deviation value of 1.064, which shows that there is some degree of variation. Despite the fact that the average serves as a point of reference, there are some people who may have hospital visiting rates that are significantly different from the usual. According to the standard deviation, there is a departure from the mean that is slightly greater than one visit per year in both directions than the mean. It is mostly superstition that is responsible for the decline in the number of visits to hospitals. The Bodo community is well-informed about the benefits of numerous herbal plants, which enables them to seek treatment locally. Many people rely on local Baidis or Ojhas (Natural healer) for healing as they get access to them easily with less cost involved. As the people are under the poverty line so they have a notion that government hospitals treatment is free but the medicine cost is on the higher side. Local Baidis and all give the medicine in very less money which is affordable for the fringe people. Even the medical camp organised by the government also sees less attendance.



Image 15: Salbari Model Hospital (Source: Authors own collection)

4.4.1.4 Financial Capital

a) Off-farm management

Due to the fact that Manas National Park is located in close vicinity, there is the possibility of engaging in a variety of economic activities. People who are on the periphery of society participate in a variety of activities throughout the appropriate time of year. One of the most common activities that can be found in that region is homestay, which has been discovered there. The folks in the area construct bamboo houses that are beneficial to the environment and then give them to the people so that they can dwell there and generate money from them. Even the meal is being served by them, and the necessary amount is being charged for it. On occasion, individuals who are proficient in driving are the ones that drive the Jeep or Gypsy for the safari, and they receive a daily income because the owners of the vehicles are completely different. It may be deduced from the mean result of 0.467 (where 0 represents "No" and 1 represents "Yes") that around 47% of the population in these

towns participates in activities that are not related to farming responsibilities. This comprises a wide range of entrepreneurial endeavors, including the management of a business, the operation of a store, the management of a guesthouse, and the participation in various activities that do not involve agriculture that generate money. This indicates that a sizeable portion of the population may be dependent on a combination of agricultural and non- agricultural activities for their means of subsistence. There is a moderate degree of variation in the amount of off-farm management participation among the villages, as indicated by the standard deviation value of 0.512 of the data. In spite of the fact that nearly half of the population normally participates, there are some communities that may have a significantly larger or lower percentage of people engaged in activities that are not related to agriculture in comparison to the average case. MNP, which is located in close proximity to the villages, makes it easier for people to participate in economic activities on particular occasions.



Image 16. Homestay at Gyti Village (Source: Authors own collection)

b) Annual family income

Because the marginalized population generates a lower income and the majority of people fall below the poverty line, the majority of people have a lower income. Only a small percentage of those who are salaried and have work have a good income. According to the scale that was provided, the mean value of 1.92

corresponds to an average annual household income that falls somewhere between 30,000 and 90,000 Indian Rupees. This would be the case if the scale was set as follows: 1 = 30,000 and less, 2 = 30,000-90,000, 3 = 90,000-150,000, 4 = 150,000-300,000, and 5 = over 300,000 INR. The families that make up these communities are often those that fall into the lower income classification. Within the communities, there appears to be a moderate degree of variation in terms of income levels, as indicated by the standard deviation value of 0.84. Despite the fact that the average income provides a broad indication, it is possible for some households to have substantial incomes that are either higher or lower than the average. This means that there is a dispersion of approximately one unit of income range on both sides of the mean, as indicated by the standard deviation. It may be deduced from this that certain households have wages that are fewer than 30,000 Indian Rupees, which allows them to fall into category 1. Other households, on the other hand, have incomes that are equal to or more than the upper limit of the range of 30,000 to 90,000 Indian Rupees, which places them in category 2. It has been discovered from the data that the bulk of the persons who participated in the survey are farmers. However, during the course of the survey, a few educators and businesspeople were also selected as responders.

4.4.1.5 Social Capital

a) Agricultural cooperative organization

A significant portion of the agricultural cooperatives that are doing business in Baksa District at the present time. The qualities of these organizations are similar to those of the classic cooperative model, which includes open membership societies, communal ownership, equal voting power, ideals of equality and solidarity, ideological motivation, and other similar traits. Despite the fact that there are a great number of societies, the number of members is still quite low. According to the average value of 0.32 (where 0 represents "No" and 1 represents "Yes"), it appears that approximately 32 percent of the population in these villages is involved in specialized farmer's cooperatives such as Assam Coop: Jute Mills Ltd, Assam Vegetable Grower's Coop: Society Ltd, and Assam Apex Fish Marketing & Processing Federation Ltd., amongst others. According to this, a sizeable section of

the population is able to reap the benefits of the potential advantages that can be gained through cooperation. These advantages include access to markets, shared resources, and strong bargaining power. The fact that the standard deviation is 0.47 indicates that there is a large amount of variation in the amount of people who participate in agricultural cooperatives depending on the hamlet. When compared to the average, several villages have a much higher or lower proportion of farmers who are participating in cooperatives. This is despite the fact that the average indicates that cooperative involvement is modest.

b) Relationship with Relatives

The nature of the family system in Baksa is influenced by the majority of the socio-religious beliefs and practices, as well as the demographic features, and these factors also reflect the changes that are occurring within the family system. The patrilineal family structure is followed by the majority of Hindu castes. Since ancient times, the Bodo people who live in that region have maintained their social relationships through the use of their own individual kinship system. A social tie can be expressed through the concept of kinship. Relationships or connections between individuals that are founded on marriage or blood might be considered to be examples of kinship. In each land every community across the globe, the social relationship is regarded as being of more significance than the biological connection. Due to the fact that the relationship is not acknowledged by society, it does not fit within the category of kinship. Due to the fact that kinship is regarded to be universal, it plays an essential part in the process of socialization of individuals as well as the preservation of social cohesion within the body of people. Bilateral kinship is a characteristic of the Bodo. Due to the fact that in Bodo culture, they place a high level of significance on their relatives, the relationship that they have with their relatives is generally healthy. According to the findings of the study, even individuals who do not belong to the Bodo ethnic group maintain harmonious relationships with their relatives. With a mean score of 1.77 on a scale that ranges from 1 (Very Poor) to 4 (Excellent), it may be deduced that the perceived ties with family are generally advantageous in these areas. Within the context of extended

kinship networks and familial units, this denotes a sense of closeness and help toward one another. This implies that there is a moderate degree of diversity in the quality of links with relatives, both between villages and possibly even within villages, as indicated by a standard deviation of 0.90 percentage points. Even if the average is satisfactory, there are some communities that have a higher proportion of residents who report having exceptional connections, and these communities have scores that are closer to four on the scale. On the other hand, it's possible that people of other villages report having a greater number of relationships that are weaker. It is possible that a strong cultural emphasis on family connection will result in an increase in the quality of relationships on average.

c) Road Condition

Manas National Park presents a unique set of challenges for drivers due to the condition of the roads. These villages, such as Naranguri, Gyti, and Raghob Bill, are located in close proximity to Bansbari, which is the central range of Manas National Park. The roads in these villages are in good shape. While the center range is receiving the majority of the attention, all of the development work is being carried out in one particular location. As far as road conditions are concerned, the Bhuyapara range is the most neglected. The range itself, in addition to the roads in the villages, is in a pitiful state. Due to the absence of concrete roads, it is extremely challenging for those living on the edge to get to their places of employment during the rainy season. The fact that the mean value is 0.6 (where 0 denotes "Unpaved road" and 1 indicates "Cement/Asphalt road") suggests that the majority of the roads in these areas are not paved. Because of this, there is a possibility that mobility and the ability to access services within the Village will be negatively impacted. An average standard deviation of 0.49 suggests that there is a substantial amount of variation in the quality of the roads between the communities. Bhuyapara village has a higher percentage of paved roads in contrast to other villages in the vicinity, despite the fact that the majority of the roads in the region are not paved.

d) Transportation convenience

The term "transport" refers to a link or connection that connects two or more locations. The road transport system is the most extensive means of transportation in Assam, surpassing all other modes of transportation. Transport and communication systems that are well established make a significant contribution to the overall socioeconomic development of a given region by meeting the requirements of the community and providing the fundamental infrastructure that is necessary for that development. The transportation system is the arteries and nerves that contribute to the circulation of both people and materials. If agriculture is considered to be the body and the economy, then transportation is it. A moderate level of transportation convenience is indicated by the mean score of 2.2 on a scale that ranges from 1 (Low) to 4 (High), which shows that these towns have a moderate degree of convenience. The fact that this is the case shows that peasants have some degree of access to road transportation. There are handy options available to fulfill their primary requirements, such as the Bus Stand at Rupohi and Barpeta, as well as the neighboring Sarupeta Railway Station. This shows that there is a modest degree of diversity in the level of transportation convenience among the towns, as indicated by the standard deviation value of 0.73. As a result of the availability of transportation options that are more regular and reliable, Naranguri, Gyti, and Raghob Bill demonstrate a higher level of convenience (closer to a four on the scale), despite the fact that the average degree of convenience is rather low. Bhuyapara, on the other hand, has a lower level of convenience, which is reflected by a rating that is closer to 1, because it has a restricted number of transit options that are either unreliable or limited.



Image 17. Rupohi Bus Stand

Image 18. Sarupeta Railway Station

(Source: Authors own collection)

e) **Relationship with the park officials**

In terms of nature, the impact that Manas National Park has on people's means of subsistence is enormous. A significant number of individuals on the periphery are of the belief that Manas National Park provides a substantial amount of options for locals to earn a living, and that the community's connection with park officials is of great importance. On a scale that ranges from 1 (extremely Poor) to 4 (Excellent), the mean score of 1.75 (which shows a relatively good opinion of the connection between villagers and park authorities) indicates that the connection is somewhat favorable. The fact that this is the case indicates that there is some level of interaction and probably even collaboration between the two groups under consideration. Although there is a considerable degree of variety in perceptions of the relationship between villagers and park officials, the standard deviation of 0.82 indicates that there is significant variation. This is because local inhabitants are ignored during the decision- making process, which is the cause of this situation. Certain villages may demonstrate a higher level of positivity (closer to 4), which indicates a stronger degree of cooperation or trust, despite the fact that the overall average is favorable. Some people, on the other hand, have a more pessimistic outlook (one that is closer to 1), which indicates the existence of potential disagreements or communication breakdowns.

4.5 Summary

The livelihood measurements for the Manas National Park area reveal a mixed but largely promising landscape. Natural capital, characterized by land area and quality, shows moderate potential for agriculture and resource utilization, albeit with variability. Physical capital, including homestead size and fixed assets, indicates adequate infrastructure, though disparities exist. Human capital exhibits opportunities for improvement in education levels and skill training participation, despite generally good health and moderate medical service utilization. Financially, there is room for economic growth, with income levels predominantly in lower brackets. Socially, strong community relations and cooperative memberships contribute positively to social capital, complemented by satisfactory relations with park officials. Overall, while challenges such as income disparity and educational enhancement persist, leveraging existing social cohesion and natural resource potential can foster sustainable development and conservation efforts in the Manas National Park region. Efforts should focus on enhancing human capital through education and skills training, promoting economic diversification, and strengthening community participation in conservation initiatives to achieve balanced livelihood development and environmental sustainability.

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CHAPTER 5

DATA ANALYSIS ON PERCEPTION AND ATTITUDE OF FRINGE COMMUNITY ADJACENT TO MANAS NATIONAL PARK TOWARDS CONSERVATION AND DEVELOPMENT

5.1 Introduction

The active participation of local population is essential for the successful preservation of biodiversity in protected areas, such as Manas National Park (MNP). Conservation experts have noted that having a good attitude towards protected areas (PAs) is likely to encourage people to engage in behaviors that support conservation efforts (Holmes, 2003). According to Albarracín et al. (2005), attitude refers to an individual's psychological inclination to assess a person, location, behaviour, or thing with a certain level of preference or aversion. Attitudes are crucial in forecasting human behavior towards the natural environment (Clayton, 2012). It is crucial for PA managers and conservation policymakers to comprehend the attitudes of individuals residing in areas around PAs, specifically MNP, as stated by Allendorf (2006). By obtaining precise data regarding the perspectives of local people, managers of protected areas (PAs) and other conservation authorities can develop suitable management programs and interventions that can gain the endorsement of local communities, so ensuring the successful preservation of biodiversity (St. John et al., 2012). Conservation attitudes are usually influenced by different elements, which are determined by the community's requirements in relation to the goals of protected areas (PAs) and the tactics used to attain those goals (Bragagnolo et al., 2016). The relationship between Manas National Park (MNP) and the surrounding community is influenced by various factors such as age, gender, household size, education, livelihood activities, and landholding. These factors have a significant impact on people's attitudes towards conservation in the park (Gifford & Sussman, 2012). The distinct impact of age and gender on conservation attitudes is frequently dependent on the individual setting and closely connected to other factors (Bragagnolo et al., 2016). The division of gender roles in a community, such as that around MNP, is determined by factors such as ethnicity, culture, local economy, and religion. For

example, in numerous communities next to MNP, women and children are often tasked with gathering firewood, tending to animals, or retrieving water. The activities mentioned are strongly connected to the natural environment. This implies that the conservation attitudes of women and children in these areas are probably affected by the abundance or scarcity of these resources (Bragagnolo et al., 2016).

5.2 Analysis on Perception and attitude of fringe people towards conservation

The study on the perception and attitude of the fringe community adjacent to Manas National Park (MNP) towards conservation and development aimed to gain insights into the local residents' views on the park and its impact on their lives. Using a 7-point Likert scale, respondents indicated their level of agreement or disagreement with various statements related to conservation and development. The survey, informed by elicitation studies conducted in similar settings near Manas National Park, encompassed twenty statements to gauge the attitudes of the local communities. The findings revealed that the overall mean attitude scores were greater than 2, suggesting a generally positive outlook towards MNP. Likert scale (1strongly disagree, 2 quite disagree, and 3 slightly disagree) represented negative attitude with the middle score (4 neither agree nor disagree) representing neutral attitude and the “agree” side (5 slightly agree, 6 quite agree, and 7 strongly agree) represented positive attitude This positive perception indicates that despite the challenges, there is a significant level of support for conservation efforts among the fringe communities. The study's results highlight the importance of involving local residents in conservation initiatives and ensuring that development projects address their needs and concerns, ultimately fostering a more harmonious and sustainable relationship between the park and its neighboring communities.To achieve reliable results, twenty statements (Mkonyi, 2021) were utilized to assess the attitudes of residents in communities near MNP. The internal consistency of the items was deemed acceptable 0.75, indicating that over 70% of the variance in the scores is reliable variance. This suggests that participants who expressed a positive attitude toward the park on one question tended to do so on other questions as well. Table 8 provides details on responses to the items and the reliability contribution of each item. In examining the perception and attitude of fringe communities on the

conservation and development of Manas National Park (MNP), it is crucial to understand the relationships among various factors that influence these perceptions and attitudes. To achieve this, a correlation analysis was performed using Kendall's tau. This statistical method is particularly useful for small sample sizes and non-parametric data, providing a robust measure of association between variables that may not meet the assumptions required for parametric tests like Pearson's correlation. Kendall's tau is well-suited for this study due to its ability to handle tied ranks effectively, which often occur in smaller datasets. The analysis was conducted using SPSS (Statistical Package for the Social Sciences), a comprehensive software for statistical analysis. SPSS is widely used in social sciences for its user-friendly interface and powerful statistical capabilities, allowing researchers to perform complex analyses with ease. This study involved a sample size of 60 participants, ensuring a detailed exploration of the relationships between the variables. The key variables analyzed in this study include Resource_Park, Wildlife_Protection, Community_Relation with Park, and Economic_Impact which are obtained combining the different statements on themes. Understanding these relationships can provide valuable insights into how fringe communities perceive and interact with the conservation and development efforts in MNP, ultimately informing better management and policy decisions. The analysis for the required study is given below:

Table 8: Statements of perception and attitude towards conservation and development.

<i>Statements pertaining to perception and attitude toward Resource Park</i>					
Statement	Positive	Negative	Neutral	Mean	SD
Harvesting of forest products (fuelwood, poles, rafters, fruits, and grasses) should be allowed in the park. (P1)	32	26	02	2.1	0.9781
Grazing of animals in the park should be allowed. (P2)	44	14	02	2.5	0.8465
Grazing livestock in the park will destroy its natural vegetation. (P5)	52	07	01	2.75	0.6487
Picking fruits or nuts and collecting grasses in the park will	48	10	02	2.6	0.7522

destroy wildlife habitat (P4)					
People should be allowed to hunt in the park for their household protein needs (P9)	01	59	00	1.0	0.256
<i>Statements pertaining to perception and attitude on Wildlife and Habitat Protection (Wildlife_Protection)</i>					
Wildlife should be protected for posterity (P3)	52	08	00	2.7	0.6800
It is good the natural vegetation and wildlife near my village is protected (P6)	41	18	01	2.3	0.9148
If subsistence hunting is allowed in the park wildlife will be ruined (P7)	39	21	00	2.3	0.9539
Protecting this land is waste of productive land (P8)	19	41	00	1.36	0.768
Wild animals that destroy crops and livestock should be killed(P10)	40	16	04	2.4	0.879
<i>Statements pertaining to perception and attitude on Community Development and relation with park (Community_Relation With Park)</i>					
Government is doing little to help my community with income from the park(P11)	58	02	00	2.9	0.359
The park provides social amenities in my community (P12)	30	28	02	2.0	0.9911
The staff of the park are friendly to people in my community (P13)	29	27	04	2.0	0.9688
The park creates employment for people in my community (P15)	45	15	00	2.5	0.866
Tourism in the park creates income-generating opportunities for people in my community (P16)	40	18	02	2.3	0.921
<i>Statements pertaining to perception and attitude on Economic implication and Livelihood (Economic_Impact)</i>					
Depending on wildlife for income is not a good thing to do (P14)	60	00	00	3.0	0
Meat trade is part of our income-generating opportunities (P17)	38	21	01	2.2	0.949
The park adversely affect our livelihoods through wildlife depredation and limited access to resources.(P18)	38	22	00	2.2	0.963

Only rich people from outside my community make money from tourism.(P19)	58	02	00	2.9	0.179
The staff of the park harass people in my community(P20)	02	56	01	2.0	0.225

(Source: Authors creation)

Based on the survey conducted among residents neighboring Manas National Park (MNP), several key findings emerged regarding their perceptions and attitudes towards park conservation and its role in socio-economic development. Overall, there was a mixed but generally positive attitude towards wildlife protection and concerns about activities like grazing and harvesting impacting natural habitats. Respondents strongly supported the idea that wildlife should be protected for future generations, yet expressed reservations about activities like subsistence hunting and grazing potentially damaging the park's biodiversity. There was also a noticeable divide regarding the economic benefits derived from the park, with perceptions split on whether local communities adequately benefit or if benefits primarily accrue to external entities. Additionally, concerns were raised about perceived inadequacies in government support for community income from the park, although respondents generally felt that park staff were friendly and not perceived as harassing. In conclusion, while there is significant local support for wildlife conservation efforts in MNP, effective management strategies should address community concerns about livelihood impacts and ensure equitable distribution of economic benefits to enhance overall conservation outcomes and community well-being.

Table 9: Correlation Analysis Results (Kendall's tau)

Variables	Correlation	Resource_ Park	Wildlife_ Protection	Community_ Relation With Park	Economic_ Impact
Resource_ Park	Correlation Coefficient	1	0.164	.178*	0.039
	Sig. (2-tailed)	.	0.069	0.05	0.673
	N	60	60	60	60
Wildlife_ Protection	Correlation Coefficient	0.164	1	.199*	0.137

	Sig. (2-tailed)	0.069	.	0.028	0.134
	N	60	60	60	60
Community_Relation with Park	Correlation Coefficient	.178*	.199*	1	.272**
	Sig. (2-tailed)	0.05	0.028	.	0.003
	N	60	60	60	60
Economic_Impact	Correlation Coefficient	0.039	0.137	.272**	1
	Sig. (2-tailed)	0.673	0.134	0.003	.
	N	60	60	60	60

(Source: Authors own creation)

In examining the perception and attitude of fringe communities on the conservation and development of Manas National Park (MNP), a correlation analysis using Kendall's tau was performed. Kendall's tau is particularly useful for small sample sizes and non-parametric data, providing a robust measure of the association between variables that may not meet the assumptions of parametric tests like Pearson's correlation. This method is well-suited to understanding the relationships among the variables in our study, which include Resource_Park, Wildlife_Protection, Community_Relation with Park, and Economic_Impact.

5.2.1 Resource_Park and Wildlife_Protection

The correlation coefficient between the variables is 0.164, with a significance level (2-tailed) of 0.069. Park resources and wildlife protection are intrinsically linked in the context of conservation efforts. Effective wildlife protection often relies on the availability and proper management of park resources, which include funding, infrastructure, personnel, and equipment. Adequate resources enable the implementation of various conservation measures, such as anti-poaching patrols, habitat restoration, and community education programs. Understanding the relationship between park resources and wildlife protection is crucial for developing strategies that enhance the conservation impact of protected areas. There is a weak positive correlation between Resource_Park and Wildlife_Protection, which is not statistically significant ($p > 0.05$). This suggests

that while there may be a slight tendency for increases in park resources to be associated with better wildlife protection efforts, this relationship is not strong or consistent enough to be considered significant in this sample. The observed weak positive correlation between park resources and wildlife protection, though not statistically significant, provides some insights into the dynamics at play in the management of Manas National Park (MNP). The lack of a strong and significant relationship could be attributed to several factors.

Firstly, the allocation and utilization of park resources is not directly aligned with wildlife protection efforts (KC and Serenari, 2022). Resources might be distributed across various initiatives, such as infrastructure development, tourism, or community outreach, which, while important, do not directly contribute to immediate wildlife protection outcomes. Secondly, the effectiveness of wildlife protection is not solely dependent on the availability of resources (Thondhlana et al., 2020) but also on how efficiently these resources are managed and deployed. Factors such as governance, strategic planning, and stakeholder involvement play critical roles in translating resources into effective conservation actions. Furthermore, the perception and cooperation of local communities are crucial in wildlife protection. If the community does not perceive a direct benefit from the conservation efforts or feels excluded from decision-making processes (Guibrunet et al., 2021), the impact of park resources on wildlife protection might be diminished. This highlights the importance of integrating community engagement and support into conservation strategies.

In conclusion, while there appears to be a slight tendency for better resource availability to correlate with improved wildlife protection, this relationship is not robust in the context of MNP. Future conservation efforts should focus not only on increasing resources but also on improving resource management, enhancing community involvement, and ensuring that conservation actions are strategically targeted to yield significant protection outcomes.

5.2.2 Resource_Park and Community_Relation with Park

Park resources and community relations are critical elements in the successful management of protected areas. The resources available to a park, including funding, infrastructure, and personnel, can significantly impact how the park interacts with and supports its surrounding communities. Positive relationships between parks and local communities are essential for garnering support for conservation efforts and ensuring the sustainable development of the area. Understanding the correlation between park resources and community relations can help inform better management practices and policy decisions.

The correlation coefficient between the variables is 0.178*, with a significance level (2-tailed) of 0.050. There is a weak positive correlation between Resource_Park and Community_Relation with Park, which is statistically significant at the 0.05 level. This indicates that better park resources are associated with improved relations between the park and the community, highlighting the importance of resource allocation for fostering positive attitudes among fringe communities.

The statistically significant positive correlation between park resources and community relations suggests that adequate resource allocation to Manas National Park (MNP) positively influences the relationship between the park and its neighboring communities. Although the correlation is weak, its significance indicates a meaningful association that can have practical implications for park management and policy. The availability of resources allows for better infrastructure and services within the park, directly benefiting local communities (Basu and Nagendra, 2021). Improved facilities, such as roads and healthcare services funded by park resources, can enhance the quality of life for residents. Additionally, employment opportunities within the park, supported by these resources, can lead to economic benefits for the community, further strengthening relations (Musavengane and Kloppers, 2020). Resources dedicated to community engagement and education initiatives can foster a deeper understanding and appreciation of conservation efforts among local residents. Programs involving the community in decision-making processes and providing education about the

importance of conservation can create a sense of ownership and partnership, leading to more supportive attitudes and cooperative behaviors toward the park's goals. While resources are important, they are not the sole factor influencing community relations (Wongsansukcharoen, 2020). Effective management practices, transparent communication, and addressing the specific needs and concerns of the community are equally crucial. Ensuring that resource allocation is strategically targeted to areas that directly impact community well-being and engagement can enhance the positive effects observed.

In conclusion, the significant positive correlation between park resources and community relations in MNP highlights the importance of investing in resources to foster positive interactions with fringe communities. By prioritizing resource allocation that benefits local residents and involves them in conservation efforts, MNP can build stronger, more supportive relationships that are essential for the park's long-term sustainability and success.

5.2.3 Resource_Park and Economic_Impact

The relationship between park resources and the economic impact on surrounding communities is crucial in understanding how conservation efforts influence local livelihoods. Effective resource allocation in protected areas like Manas National Park (MNP) is often expected to contribute to the economic well-being of fringe communities, potentially through job creation, tourism, and enhanced infrastructure. Evaluating this relationship helps determine whether the resources provided by the park are effectively translating into tangible economic benefits for the local population.

The correlation coefficient between the variables is 0.039, with a significance level (2-tailed) of 0.673. There is no significant correlation between Resource_Park and Economic_Impact, suggesting that park resources do not have a strong influence on the economic perceptions of fringe communities. This near-zero correlation coefficient indicates no linear relationship between these two variables. The analysis reveals that park resources do not significantly impact the economic perceptions of the fringe communities around Manas National Park (MNP). The

correlation coefficient of 0.039 is very close to zero, and the high p-value (0.673) further supports the absence of a meaningful relationship between these variables. This finding indicates that, despite the allocation of resources within the park, these efforts do not directly translate into perceived economic benefits for the surrounding communities. Several factors could explain this lack of correlation. The distribution of resources has not been effectively reaching the community members or addressing their specific economic needs. Resources are focused on park infrastructure and wildlife protection, with limited direct economic benefits for the local population.

Additionally, the economic impact perceived by the communities may be influenced by other external factors such as local employment opportunities, market access, and broader economic conditions, which are not directly tied to the resources provided by the park. This suggests that improving the economic perceptions of the fringe communities may require targeted interventions beyond mere resource allocation, such as developing community-focused economic programs, enhancing local employment opportunities related to the park, and ensuring that the benefits of conservation efforts are equitably shared with the local population.

In conclusion, the absence of a significant correlation between park resources and economic impact highlights the need for a more nuanced approach to community engagement and economic development. Ensuring that resource allocation is inclusive and addresses the economic aspirations of the fringe communities can foster a more supportive and sustainable relationship between the park and its neighboring populations (Govindjee, 2021).

5.2.4 Wildlife_Protection and Community_Relation with Park

The significant positive correlation between Wildlife_Protection and Community_Relation with Park suggests that effective wildlife protection measures contribute to better relations with the local community. This indicates that communities value conservation efforts and are likely to support them when they perceive tangible benefits to wildlife protection.

The correlation coefficient between the variables is 0.199* with a significance level (2-tailed) of 0.028. There is a weak positive correlation between Wildlife_Protection and Community_Relation with Park, which is statistically significant at the 0.05 level. This suggests that better wildlife protection is associated with improved community relations, indicating a positive perception among fringe communities towards conservation efforts. The significant correlation between wildlife protection and community relations highlights the intricate connection between effective conservation measures and community engagement (Zhang et al., 2020). Improved wildlife protection efforts appear to foster positive relations between the park authorities and local communities. This can be attributed to the community's recognition of the benefits of wildlife conservation, such as enhanced biodiversity, which can contribute to eco-tourism and other sustainable livelihood opportunities. The positive association suggests that when park management prioritizes wildlife protection, it can lead to increased community support and cooperation, which are essential for the long-term success of conservation initiatives (Musakwa et al., 2020). It highlights the importance of integrating community relations into wildlife protection strategies to achieve mutual benefits for both conservation and local development.

5.2.5 Wildlife_Protection and Economic_Impact

Wildlife protection efforts aim to preserve biodiversity and ensure the sustainability of ecosystems within protected areas. The potential economic impact of these efforts on fringe communities is crucial, as effective conservation can enhance local livelihoods and promote sustainable development.

The correlation coefficient between the variables is 0.137 with a significance level (2-tailed) of 0.134. There is a weak positive correlation between Wildlife_Protection and Economic_Impact, which is not statistically significant. This indicates that perceptions of wildlife protection have limited influence on the economic outlook of fringe communities. The lack of significant correlation between wildlife protection and economic impact suggests that efforts to enhance wildlife protection do not strongly affect the perceived economic benefits among

fringe communities. While better wildlife protection may contribute to the overall health of the ecosystem (Castillo-Huitrón et al.,2020), this relationship does not translate into a noticeable economic impact for local residents in the short term. This finding highlights the need to consider other factors, such as direct economic benefits from conservation activities or alternative development strategies, to improve the economic conditions of communities adjacent to protected areas. Ensuring that conservation efforts are complemented by tangible economic opportunities might help align community interests with wildlife protection goals, thereby fostering more holistic and sustainable development.

5.2.6 Community_Relation with Park and Economic_Impact

The relationship between community engagement and economic impact is essential in the context of protected areas. Positive community relations with the park can lead to enhanced economic opportunities and benefits for local residents, fostering support for conservation initiatives. The correlation coefficient between the variables is 0.272** with a significance level (2-tailed) of 0.003. There is a moderate positive correlation between Community_Relation with Park and Economic_Impact, which is statistically significant at the 0.01 level. This indicates that better relations between the community and the park are strongly associated with more favorable economic perceptions among the fringe communities. The significant correlation between community relations with the park and economic impact highlights the importance of fostering strong, positive relationships between local communities and protected areas. Effective community engagement and positive interactions with park management appear to be crucial for enhancing economic perceptions and benefits (Croy et al.,2020). This finding highlight that when communities feel more connected and involved with the park, their economic outlook improves. It suggests that park management strategies should focus on building and maintaining good relationships with local residents, as this can lead to mutual benefits, including enhanced community support for conservation efforts and improved local economic conditions.

To further explore these positive correlations and deepen our understanding of community perspectives, the next phase of the study has been targeted to Focus

Group Discussions (FGDs). These discussions have provided a platform for community members to express their views on conservation and economic impact more thoroughly. The FGDs has helped to uncover detailed insights into how community connections influence perceptions and attitudes towards MNP, allowing for a richer analysis of the qualitative data. By aligning the FGDs with the study's findings, it focuses to ensure that community voices are heard and integrated into the planning and implementation of sustainable development initiatives. This approach has helped to foster a cooperative environment where both the park and its surrounding communities can thrive.

5.3 Focus Group Discussion

Focus Group Discussion (FGD) is a qualitative research technique that aims to collect insights from a limited and varied group of persons regarding a certain subject. FGDs are utilized in this study to explore the perspectives and attitudes of local residents regarding the sustainability and administration of Manas National Park (MNP). This approach enables a comprehensive comprehension of participants' perspectives, encounters, and recommendations through engaging and fluid dialogues. FGDs are utilized as a supplementary tool for the primary investigation on perception and livelihood in this study. The FGDs offer a holistic understanding of the park's impact on different community members by involving participants from diverse vocational backgrounds. This qualitative methodology enhances the quantitative data, enhancing the overall analysis and aiding in the identification of subtle concerns and potential solutions for the sustainable management of MNP. The knowledge acquired from these discussions is vital for enlightening park authorities, policymakers, and stakeholders about community requirements and viewpoints, so facilitating the creation of equitable and efficient conservation plans in MNP. MNP is an important ecological asset, abundant with species and natural splendour. The area functions as a refuge for a diverse range of animal and plant species, while also drawing in tourists who are keen to witness its marvels. Nevertheless, guaranteeing the park's sustained well-being poses an intricate dilemma. Achieving a harmonious balance between conservation initiatives, economic development, and community needs necessitates a

comprehensive and multidimensional strategy.

Developing a comprehensive understanding of the intricate dynamics related to sustainability and management in MNP is essential for its future. This seeks to offer helpful perspectives for park officials, policymakers, and stakeholders who are committed to preserving the park and promoting its sustainable growth. This research aims to identify the issues and potential solutions for the sustainable management of MNP. By doing so, it will help ensure the continuing survival of the park as a national treasure for future generations.

5.3.1 Setting

This study aims to acquire a thorough understanding of the human aspect of the park's environment by focusing on the viewpoints of populations living near Manas National Park. The research participants are from four specific villages located next to the boundary of the park: Bhuyapara, Raghob Bill, Naranguri, and Gyti. The communities have a crucial impact on the general welfare of the park, and the well-being of its residents is closely connected to the park's health and management strategies. Participants were carefully selected from the four villages adjacent to Manas National Park (Bhuyapara, Raghob Bill, Naranguri, and Gyti) using convenience sampling. This method was chosen to ensure a representative sample of the local population with diverse perspectives on the park's management and its impact on their lives.

The following is an analysis of the criteria employed for convenience sampling in the study:

Occupations: For the study the selected individuals holding occupations that represent different ways people in the community interact with the park. These occupations include:

- a) **Teacher (T1):** Represents the perspective of those involved in education and potentially shaping future generations' understanding of the park's value.
- b) **Service Holder (Govt.) T2:** This is based on someone working in tourism, park management, or another service sector directly linked to the park's operations.

- c) **Driver (D1):** Represents those involved in transportation, potentially offering insights into park access, tourism patterns, and potential environmental impacts.
- d) **Caretaker of Resort (C1):** Represents individuals working within the tourism sector and can provide insights into tourism practices, visitor behaviour, and potential impacts on the park.
- e) **Businessman (B1) :** Represents the perspective of the local economy and how businesses might be affected by or contribute to park management practices.

5.3.2 Methods

In order to achieve the research goals, a reflexive thematic analysis methodology was utilized to examine the qualitative data gathered from a Focus Group Discussion comprising five individuals from diverse backgrounds. Reflexive thematic analysis, as described by Braun & Clarke (2020), is a readily accessible and theoretically adaptable interpretative method for analyzing qualitative data. This methodology enables the identification and study of patterns or specific themes within a given data set. The researcher utilized Nvivo 14, a widely recognized qualitative data analysis tool, to perform the reflexive thematic analysis in this study. The reflexive thematic analysis technique involved six steps for processing qualitative data:

1. Familiarization with the data
2. Generating initial codes
3. Generating initial themes
4. Reviewing potential themes
5. Naming themes
6. Producing the report

5.3.3 Initial Codes Output

The initial stage of the reflexive thematic analysis involved familiarizing the researcher with the data collected through interviews. These interviews were conducted in Bengali with audio video recorder, the local language of the participants. To ensure accurate capture of all details, the initial transcripts were

handwritten in Bengali. During the typing process, the Bengali content was meticulously translated into English. Upon completing the transcription process, the researcher embarked on a deep dive into the data. This involved carefully reading and rereading the transcripts to gain a comprehensive understanding of the information provided by the interviewees. This initial immersion facilitated the identification of potential themes emerging from the participants' perspectives. After familiarizing with the data, the researcher proceeded to the second step of reflexive thematic analysis, which is generating initial codes. The initial codes generated in Nvivo 14 are shown in the table below.

Table 10: Initial Codes

Theme	Description	Codes
Community Relations	This theme relates to the relationship between the local communities and the Manas National Park (MNP) authorities.	* Biasedness in Discussing Issues * Family Running * Ignoring Locals * Ignoring Participation * Lack of information's about Funds * Lack of involvement in decision making * Lack of Opportunity * Less Information given to fringe people * Little opportunity for decision making * No Compensation * No Conflict with Management * No opportunity for decision making * Protection from Unlawful Activities * Public Suffers * Relation Hamper with the Locals * Relation Ruins with locals
Economic Leakage	This theme focuses on the loss of revenue for local communities due to outsiders or outside	* Loosing Revenue * Loss Of Revenue * Misappropriation of Funds by officials * NGO role to stop Revenue Leakage * Outside people still opening lodges *

Theme	Description	Codes
	products.	Outsider lodges cannot be reduced * People from other states opened resorts * Revenue Loss * Selling lands to outsiders * Unaware of running lodges
Human-Wildlife Interaction	This theme explores conflicts and interactions between wildlife and humans in MNP.	* Animal Attack * Animal Human Conflict * Conflict with animal * Elephant Attack * No Animal Human Conflict * Wild Animals Concentration
Livelihood	This theme examines the livelihood issues faced by people living near MNP.	* Dependency on Park * Development of people and economic activity * Employment Generation * Fringe people should be considered for meeting * Fringe people support important * Fringe Villages adjacent to MNP * Funds came for Cattle, Farming etc * Informing Authority about Illegal Activities * Less flood in MNP * Livelihood better * Local Contribution * Lodges run well * Remunerating the people * Revenue earnings while opening lodges
Park Management	This theme covers issues related to the MNP authorities and park management practices.	* Aranyak has given Training * Authority such as Govt and Ministers * Balanced development needed * Bansbari primary range of MNP * Beki River * Better Service to Tourist * Bhutan Route Visit *

Theme	Description	Codes
		<p>Call for Bridge making * Call for development of Bhuyapara * Closure of Roads * Closure of Route * Closure of Safari Routes * Closure routes * Comparison with KNP * Conflict of Authority to open routes * Contingency meeting * Development need in all ranges * Development of All ranges * Development of Roads * Difficult to develop Panbari * Enhancing Height of Roads * Failure of Govt. regarding encroachments * Flood Affected Routes * Forest Grows in time of Monsoon * Funds for development * Govt. Important Role in park Management * Guides the tourist * Importance of Training * Informal Communication * Infrastructure problem in Panbari * Introduction of Schemes * Kuklung Falls under MNP * Lack of Rules and Regulations * Lack of visitors * Land Settled * Lean period cannot be reduced * Less attention to park development * Management Ignorance * Need a bridge * Need for new Scientific Methods * Need for road to panabari * Need for training * Panbari falls under MNP * Panbari is near but no route * Personal Relationship * Photographer visit * Public role in Park Management * Rainfall Play a role for closure * Reduced Lean Period * Responsibility allocation to Locals * Risky to drive vehicle * Risky to reduce lean period * Species of Animals should be</p>

Theme	Description	Codes
		maintained
Sustainability (Page 2)	This theme focuses on environmental sustainability within MNP.	<ul style="list-style-type: none"> * Air pollution Caused * Cutting down of forest * Cutting down Trees * Decreased Environmental Pollution * Encroachment in Panbari * Encroachments in Panbari and Kuklung * Less Citing of Animals * Less Environmental Impact * Less Environmental Pollution * Less impact on Environment * Less Water in the routes * Less Water Lodging * Low Water Lodging * Maintaining Grassland * No cutting of trees * No Encroachment in Bansbari * No Environmental Impact * No Environmental Pollution * No Environmental Problems * Petrol Vehicle Enters * Poaching exists * Poaching Stopped * Protecting Wild Animals * Public encourages Sustainability * Spreading Awareness for Sustainability * Sustainability Leads to Safeguarding Animals * Sustainability Maintained * Unnecessary Trees Cut Down * Villages set up inside Panbari * Zero Encroachment in Bansbari
Tourism Management (Page 2)	This theme explores tourism management practices and their impact on MNP.	<ul style="list-style-type: none"> * Cannot reduce the lean period * Closed Park * Decreased Interest of Tourist * Conflict between Management and Fringe People * Decreased Tourism * Difficult for

Theme	Description	Codes
		Eco Tourism * Easy Access to book * Eco tourism is bane * Eco tourism not possible * Eco Tourism Promote healthy Environment * Economic Benefit * Ethnic Food Restaurants * Hazle Free booking * Lack of Interest to Visit Bhutan Route * Lack of Safari Routes discourages Tourism * Lack of Tourism Development * Less number of lodges * One day Allotted to Bhuyapara * One day safari in Bansbari * Quick Completion of Safaris * Safari problem * Tourism * Tourism can be improved * Tourism Decreased * Tourism Discouragement

(Source: Authors own creation)

5.3.4 Theme Generation

Once the initial codes were generated, the researcher dedicated time to thoroughly examine the codes and investigate any developing patterns and relationships within them. Following that, the codes that were related were organized together to produce initial themes, which constituted the third stage of the reflective thematic analysis procedure. In the fourth stage of reflexive thematic analysis, the initial themes were reviewed and revised in order to ensure that they directly addressed the research questions pertaining to the study. The fifth stage of the reflective thematic analysis approach involved generating the definitive labels for each theme that were directly connected to the study questions and objectives. The investigation has identified the final themes, which are presented as follows:

Training and Development

Tourism Management

Sustainability

Park Management

Livelihood

Human Wild Life Interactions

Economic Leakage

Community Relations

5.3.5 Combination of Theme and Codes

The sixth and final stage of the reflexive thematic analysis process involved producing the report. The report represented the different codes and how they came together to form themes that related the research objectives posed in the study. The report also included excerpts representing the statements of different interviewed participants as evidence of different codes and themes. The table below shows the final codes and themes.

Table 11: Themes and Codes

Name	Files
Training and Development	12
<i>Provided</i>	10
Role of resort owner	1
Promotion of skills	1
NGO Support	1
NGO gives training	1
NGO and Govt Provide Training	1
NGO act as middlemen	1
Many resorts gives training to locals	1
Government Initiative to train	1
Enhancing Skills	1
Aranyak has given Training	1
<i>Not Provided</i>	02
Need for training	1

Importance of Training	1
Tourism Management	25
<i>Liberate</i>	08
Tourism Entrepreneurship Increasing	1
Tourism can be improved	1
Tourism	1
Hazle Free booking	1
Ethnic Food Restaurants	1
Economic Benefit	1
Eco Tourism Promote healthy Environment	1
Easy Access to book	1
Constraints	17
Tourism Discouragement	1
Tourism Decreased	1
Safari problem	1
Quick Completion of Safaris	1
One day Allotted to Bhuyapara	1
Less number of lodges	1
Lack of Tourism Development	1
Lack of Safari Routes discourages Tourism	1
Lack of Interest to Visit Bhutan Route	1
Heavy impact on Bansbari	1
Eco tourism not possible	1
Eco tourism is bane	1
Difficult for Eco Tourism	1
Decreased Tourism	1
Decreased Interest of Tourist	1
Closed Park	1
Cannot reduce the lean period	1
Sustainability	30
<i>Liberate</i>	20
Zero Encroachment in Bansbari	1
Sustainability Maintained	1

Sustainability Leads to Safeguarding Animals	1
Spreading Awareness for Sustainability	1
Public encourages Sustainability	1
Protecting Wild Animals	1
Poaching Stopped	1
No Environmental Problems	1
No Environmental Pollution	1
No Environmental Impact	1
No Encroachment in Bansbari	1
No cutting of trees	1
Maintaining Grassland	1
Low Water Lodging	1
Less Water Lodging	1
Less Water in the routes	1
Less impact on Environment	1
Less Environmental Pollution	1
Less Environmental Impact	1
Decreased Environmental Pollution	1
<i>Constraints</i>	10
Villages set up inside Panbari	1
Unnecessary Trees Cut Down	1
Poaching exists	1
Petrol Vehicle Enters	1
Less Citing of Animals	1
Encroachments in Panbari and Kuklung	1
Encroachments in Panbari	1
Cutting down Trees	1
Cutting down of forest	1
Air pollution Caused	1
Park Management	51
<i>Positive Perception</i>	22
Species of Animals should be maintained	1
Responsibility's allocation to Locals	1

Reduced Lean Period	1
Panbari falls under MNP	1
Need for road to Panabri	1
Kuklung Falls under MNP	1
Introduction of Schemes	1
Informal Communication	1
Guides the tourist	1
Govt. Important Role in park Management	1
Funds for development	1
Enhancing Height of Roads	1
Difficult to develop Panbari	1
Development of Roads	1
Call for development of Bhuyapara	1
Call for Bridge making	1
Bhutan Route Visit	1
Better Service to Tourist	1
Beki River	1
Bansbari primary range of MNP	1
Balanced development needed	1
Authority such as Govt and Ministers	1
<i>Negative Perception</i>	29
Risky to reduce lean period	1
Risky to drive vehicle	1
Rainfall Play a role for closure	1
Public role in Park Management	1
Photographer visit	1
Personal Relationship	1
Panbari is near but no route	1
Need for new Scientific Methods	1
Need a bridge	1
Management Ignorance	1
Less attention to park development	1
Lean period cannot be reduced	1

Land Settled	1
Lack of visitors	1
Lack of Rules and Regulations	1
Infrastructure problem in Panbari	1
Forest Grows in time of Monsoon	1
Flood Affected Routes	1
Failure of Govt. regarding encroachments	1
Development of All ranges	1
Development need in all ranges	1
contingency meeting	1
Conflict of Authority to open routes	1
Comparison with KNP	1
Closure routes	1
Closure of Safari Routes	1
Closure of Route	1
Closure of Roads	1
Livelihood	14
<i>Positive Status</i>	12
Revenue earnings while opening lodges	1
Remunerating the people	1
Lodges run well	1
Local Contribution	1
Livelihood better	1
Less flood in MNP	1
Informing Authority about Illegal Activities	1
Funds came for Cattle, Farming etc.	1
Fringe Villages adjacent to MNP	1
Fringe people support important	1
Employment Generation	1
Development of people and economic activity	1
<i>Negative</i>	02
Lack of Discussion with authority	1
Dependency on Park	1

Human Wild Life Interactions	03
<i>Positive</i>	03
Wild Animals Concentration	1
No Animal Human Conflict	1
Elephant Attack	1
<i>Negative</i>	0
Conflict with animal	1
Animal Human Conflict	1
Animal Attack	1
Economic Leakage	10
<i>Prevail</i>	10
Unaware of running lodges	1
Selling lands to outsiders	1
Revenue Loss	1
People from other states opened resorts	1
outsider lodges cannot be reduced	1
Outside people still opening lodges	1
NGO role to stop Revenue Leakage	1
Misappropriation of Funds by officials	1
Loss Of Revenue	1
Loosing Revenue	1
<i>Do not Prevail</i>	0
Community Relations	17
<i>Unfavorable</i>	13
Relation Ruins with locals	1
Relation Hamper with the Locals	1
Public Suffers	1
No opportunity for decision making	1
Little opportunity for decision making	1
Less Information given to fringe people	1
Lack of Participation	1
Lack of Opportunity	1
Lack of involvement in decision making	1

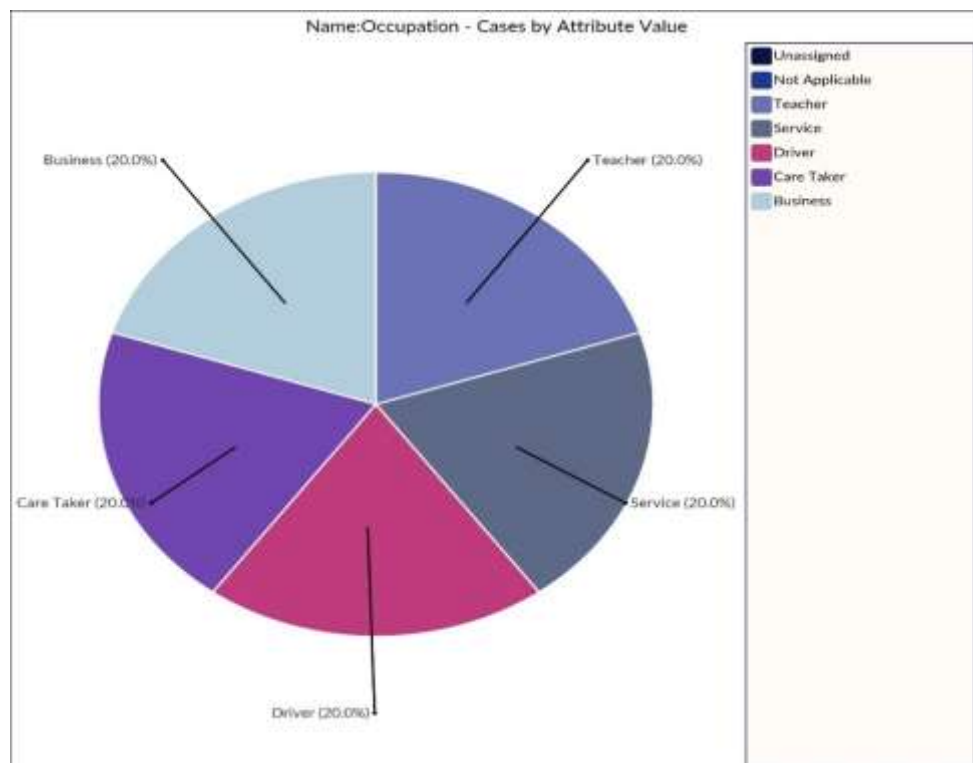
Lack of information about Funds	1
Ignoring Participation	1
Ignoring Locals	1
Bias in Discussing Issues	1
<i>Favorable</i>	<i>04</i>
Protection from Unlawful Activities	1
No Conflict with Management	1
No Compensation	1
Family Running	1

(Source: Authors creation)

5.3.7 Analysis and Interpretation

Description of the Participants

Figure 6: Occupation



(Source: Authors creation)

The main themes that emerged after conducting the reflexive thematic analysis process included Training and Development, Tourism Management, Sustainability, Park Management, Livelihood, Human Wild Life Interactions, Economic Leakage, Community Relations.

1. Training and Development

Training is a crucial aspect for the growth of every rural community. Manas National Park is situated in a secluded region of Assam, resulting in underdeveloped communities and posing a challenge for stakeholders. The individuals on the periphery are undoubtedly the main point of interaction. Tourists from many regions and nations often seek to engage with marginalized individuals, who in turn strive to offer the necessary services to these tourists. Rural towns located on the outskirts of national parks have unique opportunities and challenges. While the park's abundant resources and potential for tourism can benefit residents, they may also face difficulties regarding their means of living and conflicts with wildlife. Training and development programs possess the capacity to exert significant influence in strengthening local communities and fostering a durable and sustainable collaboration with the national park. The training program encompassed village heads, tourist managers, and fringe people.

Training is important in many ways most significantly it helps to reduce the burden of the stakeholders in managing the park. It is not possible to manage the park all by the authority alone, they need the support of the fringe people to maintain the park in the best manner. Therefore, for managing the different facet of the park, training is utmost important.

Focus Group Discussion in Manas national Park has brought many important aspects of training that has been prevailing in the fringe villages adjacent to the Park. The people have the view that training is essential need and it has been given to the people of the fringe villages. Person T1 is in the opinion that Training has been given in the area

Yes, training is necessary and its being given from different NGO's and government time to time to the people residing here (T1)

Role of different organization in respect of training in Manas National Park:

Educating local populations about the importance of conservation helps in garnering their support for national park initiatives. Understanding the ecological value of the parks and the role they play in maintaining environmental balance can inspire community participation in conservation efforts. Fringe communities often encounter wildlife entering their villages, leading to crop damage, livestock predation, and even human injuries. Training can provide them with skills and knowledge to implement non-lethal pre-emption methods, use of safe animal passageways, and other conflict mitigation strategies. In this view the fringe people has a positive response regarding the training given by different parties. Resort Owners namely Sikhri Cottage, Musa Jungle Resort, Wild Tiger resorts etc has a wide tourist base and that leads to interaction with many locals in respect of services provided by them. Many locals are working in the resorts in different positions and that paves the way for giving training to the locals. As the locals are less educated and doesn't know how to talk or behave with the tourist coming to the resorts. Service Industry heavily depends on the behaviour and empathy which is key for the success in tourism Industry. The Resort Owners with the help of Park Management authorities recruit people from the fringe village and they impart training to the locals to know the basic requirements to speak and greet the Tourist amicably. In the light of the above statements the participants of the FGD have in the view of

Many people have made lodge, resort in MNP which needs many people as driver, caretaker, cook etc. (T2)

Yes, it is very essential and it has been done in many resorts. Many resort owners are training the local people to promote their skills and perform some cultural functions and earn money. (D1)

In the light of the response, it has been also revealed by the participant that the resort owners and the NGO's also practicing a healthy exercise in giving training for showcasing their skill and talents with the virtue of performing cultural programs for the enjoyment of the guest and earning revenue. Performing cultural programs by the fringe people in the resorts helps the tourist from to connect with the local culture and educating themselves about the practices the tribe have in their

community (Bodo Dance) (Sebastian,2009). The fringe people are in total support with the resort owners for giving training in those aspects. Even the NGO's also help in conducting the training program for the locals in the field of food and restaurants. Training them and presenting the local culinary for the tourist gives a two-way advantage in terms of revenue and services.

Many resort owners are training the local people to promote their skills and perform some cultural functions and earn money (D1)

Many NGOs are giving training to the local people to promote their culture and tradition through the medium of food, like Mitali Dutta runs a NGO name FSM food trails have given training to local women to showcase their skills and run GUNGZEMA kitchen where all local traditional (Bodo) food are served to the people coming to the restaurants. (C1)

Training to resolve Human Animal Conflict: Fringe communities often encounter wildlife entering their villages, leading to crop damage, livestock predation, and even human injuries. Training can provide them with skills and knowledge to implement non-lethal deterrence methods, use of safe animal passageways, and other conflict mitigation strategies. Human-wildlife conflict is defined as "any interaction between humans and wildlife that results in negative impacts on human social, economic or cultural life, on the conservation of wildlife populations, or on the environment. "Human-Animal conflict is inevitable, but through training impairment can reduce these conflicts for the benefit of both sides (Dawkins, 2016). Wildlife management is beginning to realize that while concentrating management efforts on wildlife might sometimes resolve problems between people and wildlife temporarily, altering human behavior can offer more lasting answers. The characteristics of stakeholders, problem identification, and management acceptability are frequently the focus of human aspects study on animal conflicts, while human behavior and the evaluation of management activities to change that behavior are less often studied. (Baruch-Mordo, et. al. 2009).

Elephants attack are still prevailing in many areas and eco-tourism may lead to losses of many huts and all. (T1)

Bhuyapara village has human elephant conflict and no steps are being taken by the management and it creates a conflict between the management and fringe people. (T1)

In response to these issues, the government and many NGOS has initiated training

programs for local people who have been vulnerable to animal attacks. The Bhuyapara range is particularly impacted by human-animal conflict, with a pilot study revealing that most villagers complain about wild hogs destroying their crops significantly, leading to heavy losses. Despite villagers submitting applications for compensation, park management has been unable to compensate them due to financial constraints, as compensating many villagers requires substantial funds, and revenue is low in MNP (McNeely, 1990). To solve this problem the government and many NGO's specially Aranyak has given training to the local people to dela with the animal attacks like using of torch lights, beating drums, and even barricading the fields with wires etc. The fringe people have positive opinion of training allotted to them.

Government has also initiated facilities to train different persons to open up homestay and train them how to interact with guests and give best services. (T2)

The participation of many stakeholders, including as the government, NGOs, and resort owners, has played a crucial role in providing efficient training in Manas National Park. These programs have not only emphasized conflict resolution approaches and safety measures, but also emphasized hospitality skills, cultural promotion, and eco-tourism. As a result, local communities have been integrated into the wider conservation and tourism framework. The favourable reception from marginalized groups towards these training efforts highlights their capacity to promote a peaceful cohabitation between humans and wildlife. In conclusion, these endeavours actively contribute to the long-term and responsible administration of the park, guaranteeing the achievement of conservation objectives while simultaneously promoting the progress and welfare of the nearby communities.



Figure 7. Codes for Training

2. Tourism Management

National Parks are frequently prominent tourism destinations situated in isolated and marginalized rural regions. The significant contribution of tourism towards financing conservation efforts and creating economic prospects for people residing near natural heritage sites has been acknowledged for a considerable period of time (Butler et al., 2000). National parks draw a significant number of affluent local and international tourists to relatively isolated rural regions. Numerous National Parks draw a substantial number of customers to experience their offerings (Prakash et al., 2019). These customers travel to the location of the park to enjoy their vacation within and around the park. These affluent consumers, who are drawn to nature-based tourism, represent a potential market for tourism products that are centred around natural resources and local culture. Manas National Park being one of the important destinations regarding wild life still lacks great deal. Tourism is in a developing state but it calls for more development in the area.

Many people have made lodge, resort in MNP (T2)
There is govt. department, there are ministers. There are lot of things to be done, like the tourism (T2)

The locals are in opinion that tourism has been in a bad shape and need to be

restored in MNP. The authority on the other hand is in the opinion that Government is not promoting the park properly which has been impacting the tourism in many ways. Significant amount of funds is being used for the development of the park but still the locals are in the opinion that the management policies are impacting tourism in many ways. The routes for Safari are the life line of every National Park (Fetene, et al.,2012) as the routes gives the tourist a thrilling experience inside the national park and citing of animals are dependent on the routes. But due to sudden policies the many routes are being closed by the park authority which indeed cutting down the time of safari and causing dissatisfaction to the tourist.

Tourism would have increased in the area if the roads of the ranges would have opened. Many roads are closed for safari which decreasing the interest of the tourist as the siting are less compared to travelling in those routes. There is stagnant conflict with the authority to open up the roads which will increase tourist and livelihood will be better. 50% tourism decreased due to closure of the routes. The photographers who visit the park comes for 4 to 5 days but as the route are closed two ranges namely Bansbari and Bhuyapara are covered within two days and we lose revenue for the other two days. We urge the people to visit Bhutan range (Half of Manas national Park falls on Bhutan) but they are not so much interested. (D1)

Upon enquiring about the closure of the routes the authority on the hand has different version on that, they have closed the roads due to maintenance and it will be opened in due course of time. This dissatisfaction is leading to an abrupt situation in MNP and the tourism is getting hampered in a significant manner.

Tourism decreased a lot due to the problems of route and it's hampering the relation between the locals and the authority of park. (C1)

In order to effectively manage tourism in and around National Parks, it is important to differentiate between nature tourism and ecotourism. Nature tourism focuses on the pleasure derived from nature, whereas ecotourism goes a step further by emphasizing the need to actively contribute to conservation efforts (Räikkönen et al.,2023). Ecotourism is a goal or objective of management. In the context of Eco Tourism, the fringe people have different viewpoints. The locals do feel that eco-tourism is essential for the sustainability of the national parks which gathers enough

tourist for the wellbeing of the environment.

If Eco Tourism is promoted then automatically the environment will upgrade and future generations can get all the resources intact and can be preserved properly (C1)

At the same time few people are in the opinion that Eco Tourism is not possible in MNP. After lot of discussion the researcher found that the people in those area are still unaware of the concept of Eco Tourism, they feel that Eco Tourism will lead to more expenses and its prone to Animal Attacks which will destroy the infrastructure made by the locals. They are more focussed on making a concrete lodge (Pakka Rooms) and give that in rent for the tourist and do not further go deep into the eco-tourism concept.

Eco- Tourism may lead to human animal conflict. Elephants attack are still prevailing in many areas and eco-tourism may lead to losses of many huts and all. (T1)

Eco Tourism may hamper the business as the infra structure used in eco-tourism will not be favourable for the area. (T2)

Plans have been made for doing so, but it is difficult to promote eco-tourism. (D1)

a) **Location factor**

Location is a crucial factor; being close to park entrances and tourist traffic opens up possibilities (Rossi et al.,2015). Within Manas National Park, nearly all of the revenue generated contributes to the local economy of nearby villages.

Unfortunately, this economic benefit does not reach the communities residing within the park itself, who face the greatest disadvantages due to restrictions on resource utilization. These communities lack the necessary capital and opportunities to develop tourism facilities, primarily because of the limitations imposed by the park.

It can be very well said that we do not get any facilities neither we can use the resources of the park nor we are equipped to develop economically as we do not get anything, no subsidised rate no schemes, less Job opportunities for the locals. (D1)

The location of MNP is not developed like Kaziranga and we have less tourist attraction due to which our development are less and it discourages the tourism. There are four ranges in MNP but more concentration is being given to Bansbari Range. Bhuyapara Range is not developed and its infrastructure is very poor which discourages the tourist to do safari in Bhuyapara Range. The Panbari Range and

Kuklung Range are not operational which location is also very far from here. (T2)
If the development was done fringe people public would have got benefited (T2)

b) Economic leakages

Lindberg and Enriquez (1994) highlighted four key elements that will influence the impact of tourism on local economies: the attractiveness and marketability of the tourist destination, the characteristics of the tourists themselves, the quality of the infrastructure and facilities available, and the level of local participation and connections. The loss of money from the local economy is linked to the extent of importing items from outside the region and the degree of non-local ownership of tourism-related businesses.

Within the local economy around MNP, a minimum of 50% of revenue is lost due to resorts made by the non-locals, imports and the participation of non-local entities in the local tourism business. A significant majority of public transport services are either owned by the government or operated by external entities. Additionally, several of the more expensive charter operations are managed by external entities and are based in other states like Tour Operators, Resort Owners, etc. The significant amount of leakage from retail establishments can be attributed to the tourist demand for manufactured goods such as bottled drinks, snacks, cigarettes, etc., which are not locally produced. Given that a large amount of the products restaurants sell are fresh vegetables, the percentage of leakage from these establishments is smaller.

Whatever has been done cannot be reduced. (D1)

This is a big question because the people residing here didn't realise that if any resort or any lodge is opened here will run, this thing has not been aware by the locals that's why from far areas people came and brought land here and opened resort. People saw that the lodge of them are running very well, then local one two people started making lodges and did pretty well and earned well so now many locals are coming up with homestay and lodges. But still there are less number of lodges like 4 to 5 lodges but there are homestays. But still there are lot of people from outside who have made lodges and resorts here. (T2)

c) Discussion

While the tourism earning potential in Manas National Park is rather restricted, it is

worth mentioning that there is very little loss of money from income-generating activities in the nearby communities. This is because these businesses rely on labor and the production of basic goods. Although external investors may hold certain tourism-related properties, such as guesthouses and homestays, a significant portion of the cash generated from these assets is still kept within the local villages. This helps to support the wider local economy and benefits the rural population living around the park.

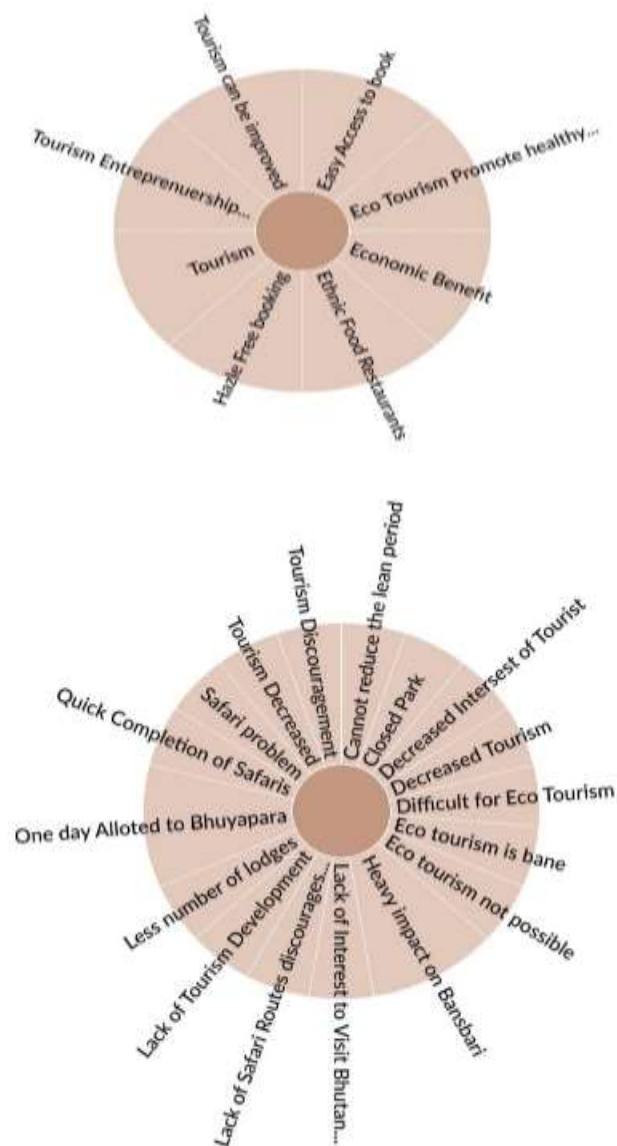


Figure 8 (a & b): Codes of Tourism

3. Sustainability

Sustainable destination management refers to the process of devising, organizing, and executing plans aimed at ensuring the long-term sustainability of a tourism destination (Kree et al.,2016). These tactics aid both tourists and residents in maximizing their experience in a particular location while minimizing harm to its ecological resources.

Public has utmost responsibility for the park management like in case any poacher or any encroaching is done public is the medium to inform the park authority at earliest. This has been done in many occasions. Even for the sustainability public plays an important role for park management. (B1)

Roads can be developed and the wild animals, mainly the wild animals is important, if the wild animals any species has reduced should be brought into proper number from outside. The focus should be mainly on the wild animals. (B1)

Over the past five decades, the tourism industry has experienced substantial growth, with the number of international visitors rising from 200 million to about 1.6 billion (Hawkins,2001). With this expansion comes numerous economic and societal advantages; yet, safeguarding destinations and their resources from exhaustion becomes even more crucial (Job et al.,2020). In order to accomplish this, it is necessary to create strategic planning solutions for tourism sites that are in danger of ecological depletion. If executed effectively, these strategies have the potential to foster the growth of the tourism sector while simultaneously promoting the well-being of local populations and safeguarding natural resources.

a) Management of visitors

Every day, national parks draw a substantial influx of visitors. Due to the continuous flow of people and the potential for human meddling, these animals are particularly vulnerable to ecological degradation. National parks' sustainable management strategies aim to mitigate the environmental repercussions of tourism. These initiatives prioritize the needs and experiences of visitors, and involve implementing strategies such as educational programs for visitors, infrastructure

development in environmentally fragile areas, and the use of technology to regulate the daily influx of visitors to the park.

Tourist management can further enhance the traveller's experience by offering information via tourist centres. Solimar has constructed numerous visitor centres in various global destinations (Fayos,2019). These visitor centres offer comprehensive travel and lodging information while simultaneously promoting and bolstering local enterprises and communities. In the same manner in Manas National Park many resorts have started the same procedure and for guiding the tourists and also the resort owners have set up important hoardings and destination boards to educate the tourist about the park and also about the ranges and history of the park.

Resort or lodge owners also plays important role, as now many resort owners have put up guidelines, maps, and informative information about the park which educate the tourist about the do's and don'ts entering the park. (C1)

However, the advancement of sustainable tourism poses obstacles on two fronts. Firstly, there is a disagreement among scholars over how to understand and define sustainability (Sharpley, 2000; Hopwood et al., 2005). Furthermore, the execution of this idea is complex and poses significant difficulties for humans (Gladwin et al., 1995). Tourism planning, carried out at the local and regional level, serves as a powerful tool for executing public policies and directing tourism destinations according to the community's long-term vision. This process encompasses the stages of analysis, development, implementation, and assessment. This fact is clearly emphasized in several publications by international organizations, which affirm that the strategic planning of tourism destinations is a method to promote and implement sustainable tourism development. MNP lacks the planning on these important aspects as a result the sustainability concept is still to get importance. Although the pollution is in lesser side in MNP still many areas like encroachments, Public awareness, poaching has to be eradicated from the park. The people have different opinion in those aspects

There is no such environmental pollution in MNP. Cutting of trees was done to manage the grass land as the woodland was getting higher so they cut the trees for maintain the grassland. Shimul trees which are unnecessary were being cut down. (T1)

There is no such environmental pollution in MNP only the vehicles which go inside causes a bit pollution. (T2)

There is no such environmental pollution in MNP. Vehicles doesn't cause pollution as all the vehicles used for the safari are petrol vehicles. (D1)

There is no such environmental pollution in MNP (C1)

There is no such environmental pollution in MNP. In earlier times there was issue regarding cutting down of Trees but now it has completely stopped and by this the environmental pollution has decreased. Even Poaching has also stopped in this area. (B1)

The purpose of this FGD is to understand whether the public planning of tourism activity promotes sustainable development, according to the best practices suggested by international entities and scientific literature. More precisely, it is aimed to ascertain, at the local/regional level, (i) whether tourism planning incorporates clear interpretations and visions specific to sustainable development, (ii) whether stakeholders are invited to participate in the planning process, contributing to establishing a long-term vision for tourism destination development. People in the FGD have different view point on the park sustainability and planning concerns. To improve the park sustainability the locals believe the management can do lot of things to improve the infrastructure which will even lessen the slack period to ply vehicles inside the park. While asking instantly about the pollution caused by the vehicles, they shifted in defense about the vehicle's nature. Flood is not a major issue in MNP as the water do not lodge much in the roads even the animals do not suffer much during the time of Monsoon.

Yes it can be reduced if the forest near the route is cut down and the roods inside the park are made in height which will not allow water to lodge in the roads. As floods in Manas is comparatively less then KNP and only one river is there in Manas that is Beki River and water doesn't stay long in roads, maximum it stays for one or two days. (T1)

Vehicles doesn't cause pollution as all the vehicles used for the safari are petrol vehicles. (D1)

b) Human Encroachments

Biodiversity is currently confronted with significant challenges of habitat destruction and overexploitation as a result of the substantial growth in the global human population and the subsequent increase in development and demand for shelter in place like Baksa near Manas National Park. The insurgency alarming the place still haunts the people over there. There was a notion in that area that the place is their land and building houses inside the area of MNP was common. Militants (NDFB) National Democratic Front of Boroland made the place for hide outs and enormous animals were hunted (Narzary, 2006). A total of 20.47 km² has also been infringed during this period (Sarma et al., 2008). This possessed a particular hardship for impoverished park management. To address the issues of biodiversity overexploitation and species extinction, strict nature reserves, national parks, wildlife sanctuaries, and forest reserves have been set up. These areas serve the purpose of preserving ecosystems, conducting scientific research for species conservation, and providing recreational opportunities through ecotourism. Although the encroaching has come down after the peace accord formed with the government, still encroaching are prevailing in some places. FGD has brought out some important aspect of infringements which is a major concern in the segment of Sustainability.

Encroachment was there before but not in our area. Go to east and west you will find encroachments. Still there are encroachments in that area. (T2)

Yes Panbari area falls under Manas National Park. Kunklung also falls under MNP. (D1)

No encroachment on our side. The Panbari area falls under manas isn't it? Many villages are set up inside Manas National Park in that area. Kuklung area also has encroachments. Government has taken step but couldn't do anything to stop the encroachments. Later the land has been settled. (B1)

The Bansbari range as it is developed and been monitored continuously is being spared of encroachment but Panbari Range and Kuklung Ranges are not operational so it is easy for the people to infringe the lands now, the question arises what step the official take after the encroachment. It has been seen that in Kaziranga the authority is very

strict and demolished the houses of the encroachers and even they have to pay fine in due course.

After encroachments the authority cannot do anything and they have to settle the lands, which means they the authority have to give away the lands to the encroachers. (B1)

Encroachment is a crime and if the people are being settled with the land due to fear of fight and chaos it is indeed a threat to sustainability. Manas National Park requires the integration of local people, park administration, and other stakeholders to ensure that tourism expansion aligns with conservation efforts and improves local livelihoods. Through the implementation of a strategic framework for tourism planning, Manas National Park can effectively tackle sustainability issues, encourage responsible tourism behaviours, and ensure fair distribution of the economic advantages of tourism among the local community and strict measures should be taken for encroachments.

c) Discussion

Manas National Park (MNP) faces numerous challenges and opportunities in its pursuit of sustainable destination management. Resolving the issue of human-wildlife conflict, namely the damage caused by elephants to crops, is of utmost importance as it undermines the local backing for conservation efforts and puts a strain on the relationship between park authorities and people. An all-encompassing approach, incorporating remuneration schemes, enhanced barriers, and community education campaigns, is crucial. Sustainable tourism management has the capacity to greatly improve the local community's quality of life. This requires careful planning that incorporates the involvement of local stakeholders, creates markets for items produced locally, and fosters connections across different sectors. Integrating items such as 'tea leaves grown in the local area', 'bamboo shoots', and 'spicy pickled peppers' into the tourism value chain might contribute to keeping economic advantages within the community. Effective visitor management is crucial for regulating visitor numbers and minimizing ecological effect. Key measures include implementing educational programs, developing eco-friendly infrastructure, and enforcing visitor number regulations. Resort operators have a

vital role in disseminating information and encouraging appropriate conduct. The encroachment of illegal settlements, especially in less monitored regions such as Panbari and Kuklung, continues to pose a significant threat. To address this issue, it is imperative to implement more stringent enforcement measures, initiate relocation programs, and actively include the community in prevention efforts. Community engagement is crucial, as indigenous groups may serve as diligent monitors of illicit activity, bolstering conservation endeavors. The importance of sustainability in MNP lies in its ability to ensure the long-term well-being of ecosystems, promote biodiversity, and offer a reliable source of revenue for local populations through sustainable tourism. Through the incorporation of sustainable practices, MNP can achieve a harmonious equilibrium between ecological integrity and socio-economic growth, hence yielding advantages for both present and future generations.

The sustainability concerns of Manas National Park necessitate a comprehensive and integrated approach. MNP can increase its conservation efforts and promote local economic development by implementing strategic tourist planning that prioritizes local involvement, sustainable practices, and robust visitor management. Resolving conflicts between humans and wildlife can be achieved by implementing community-driven strategies and reducing the intrusion of human activities through rigorous enforcement and active involvement of the community. These measures are essential in addressing the issue effectively.

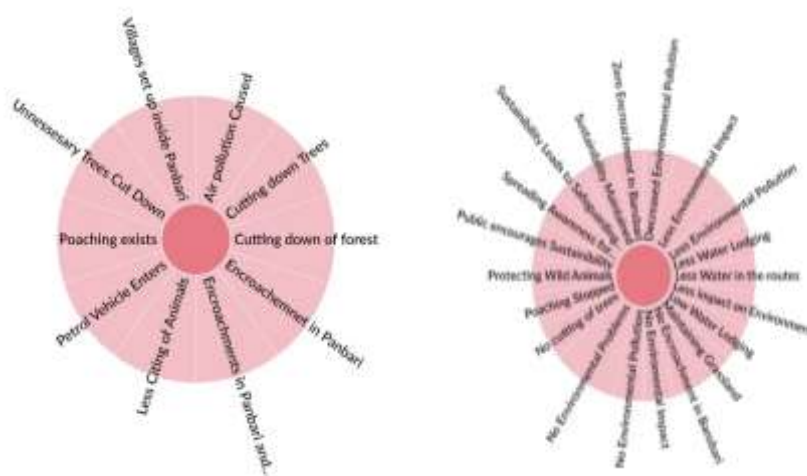


Figure 9 (a & b): Codes of Sustainability

4. Park Management

The establishment and maintenance of national parks is frequently a contentious process due to the inherent clash of values and objectives related to the preservation of natural resources. In general, the establishment of a national park necessitates park authorities to achieve a harmonious equilibrium between two conflicting objectives - conserving the natural resource foundation and facilitating tourist access for the purpose of enjoying the same natural environment and scenery. Addressing these two objectives is really difficult, particularly when it pertains to the advancement of tourism in regions that are protected. In Norway, environmental objectives take precedence over visitor access and the development of tourism (McCool, 2009)

Various issues develop due to not only inherent disparities in the objectives of protected area planning and administration authorities and the local tourism industry, but also because of divergent cultures and social and economic interdependencies between the two parties (McCool, 2009). Tourism stakeholders currently have limited involvement in the conservation and planning processes, as these responsibilities fall under the jurisdiction of the national parks management agency (Jamal & Stronza, 2009).

In light of the economic downturn in rural areas of Assam and the resulting dearth of employment opportunities (Sharma et al., 2021) the central government has recently made a decision to allow certain commercial activities, such as expanded tourism, in national parks and other protected areas, including Manas National Park. These changes indicate that the conflicts and societal aspects of managing protected areas are becoming more prominent in protection strategies. This shift emphasizes the importance of maintaining a balance between conservation efforts and socio-economic development in order to benefit local populations and ensure the long-term viability of the park's natural resources.

a) Support to preserve the national park

The authority predominantly support the preservation of the national park designation for Manas National Park. The individuals stress the importance of safeguarding significant natural reserves for future generations and express

apprehensions over the potential dangers posed by the use of natural resources by society. This viewpoint is in agreement with the fundamental goal of individuals involved in tourism, who prioritize the harmonization of conservation initiatives and the sustainable growth of tourism. Their objective is to safeguard the ecological integrity of the park while simultaneously fostering economic advantages for the neighbouring community.

Public has utmost responsibility for the park management like in case any poacher or any encroaching is done public is the medium to inform the park authority at earliest. This has been done in many occasions. Even for the sustainability public plays an important role for park management. (B1)

Despite the overall support for maintaining Manas National Park's status, informants expressed dissatisfaction with the planning processes that led to the current management plans. Interviews highlighted a skeptical attitude towards these processes, stemming from a perceived lack of input from the tourism industry. Respondents felt that their perspectives were overlooked and that their local knowledge was not adequately taken into account.

There is no public meeting in our area which deviates the chance of seeking participation from the locals.(C1)

Sometimes they discuss with the people who are close to the management of mnp, if the person knows the officials personally, they sometimes ask informally about anything that need to be done.(B1)

The Management does not give ample opportunity for the locals to participate. The development works they do have not been taken any support from the locality. (T2)

As one respondent in Manas National Park explained, a balanced power relationship should be founded on the principle of mutual give and take—something they believe has not occurred so far in Manas. They felt that early-phase dialogue about the needs of the local tourism industry would have made the process more constructive.

Whenever they do any work, they do not go for any informal or formal meeting with the locals. After they do the work, if any mistakes happen and after the locals complain then they go for meeting with the locals. (D1)

The absence of representativeness was also regarded as a democratic concern at Manas National Park. Only a minority of individuals participate in local supervisory committees and park management boards, and their connections with the local tourism business are limited.

From every village at least two to three people should be taken into consideration before taking any decision. From government or NGO's they should be given responsibilities. People will not work free for that, they should give minimum some amount for the work done by the few peoples who will work for them. They have their family to run so something can be done. They should take support from the fringe people and schemes should be given to the educated young people or unemployed youths for livelihood. (B1)

A lack of convincing scientific evidence for the measures which have been implemented to protect the wild life was a major concern expressed by respondents. There was a general feeling that the wild life are not threatened by tourism activities, and that the universal protection measures are unnecessary. This was seen as the management plan's weakest point. Respondents argued that the wild life should be conserved and scientific methods should be implemented to protect the park.

In Manas National Park as no rules and regulations have been made so far. The only thing the authority is concerned about protecting the animals but still poaching is prevailing in MNP. (D1)
wild animals is important, if the wild animals any species has reduced should be brought into proper number from outside. The focus should be mainly on the wild animals. (B1)

b) Park fees and access to the locals

Respondents also expressed worry about the accessibility to Manas National Park and the fees that has been taken to enter the park. Robust increase in the fees discourages tourist to enter the park (Rs. 2800 per jeep). They advocate for the provision of equitable access to various populations, including facilities for the elderly and disabled. The prohibition on organized groups outlined in the park's management plan was a subject of extensive debate, with a significant number of participants arguing that local residents should receive the advantage of discounted or waived entry fees. Furthermore, there is a prevailing conviction that the local

populace should have access to new initiatives and amenities, such as vehicle acquisition loans and employment prospects.

Like the entry fees. The department enhanced the entry fees as a result public and tourism got reduced. There was heavy loss for the tourism. No, No there is no rule in that for the drivers, if any driver knows any person or officer, with good relation he can enter the park. (D1)

There should be reservation for the fringe village, some schemes should be introduced like the educated youth can do something from their own. there are Gypsies but many family youth cannot by Gypsies for safari as a result the drive other people Gypsies who have 4 to 5 Gypsies with rs.400 per trip basis wage. Rather doing that if he could loan in a subsidized rate he could buy gypsy by his own and run his family. (T2)

c) Balanced development (Infrastructure)

The respondent believed that the authority is not giving ample of thinking for developing the different ranges in MNP. Out of four ranges only two ranges are operational and also the infrastructure like roads, electricity, transportation facility is in horrible condition. Panbari range needs one bridge to connect to Bansbari range which will reduce the distance from 200 km to 20 km but still there was no plan to make the bridge which indeed acting as an hindrance to the development and also decreasing the tourism.

Bansbari Range is the capital of MNP. There should be development in other range also. We need a bridge to connect to Panbari.(T2)

Yes, it is important to develop all the ranges. Bhuyapara range can be developed like in 7 days safari we have been allotted one day safari in Bhuyapara closing Bansbari range. But panbari range development is difficult as the jeep safari from here is very difficult. (D1)

Development can be done. (C1)

From Manas via Beki if a road is made the panbari will be easily accessible. Panbari is very near only we need a bridge. Panbari is very near but to go we need to go all around. (B1)

c) Misappropriation of funds

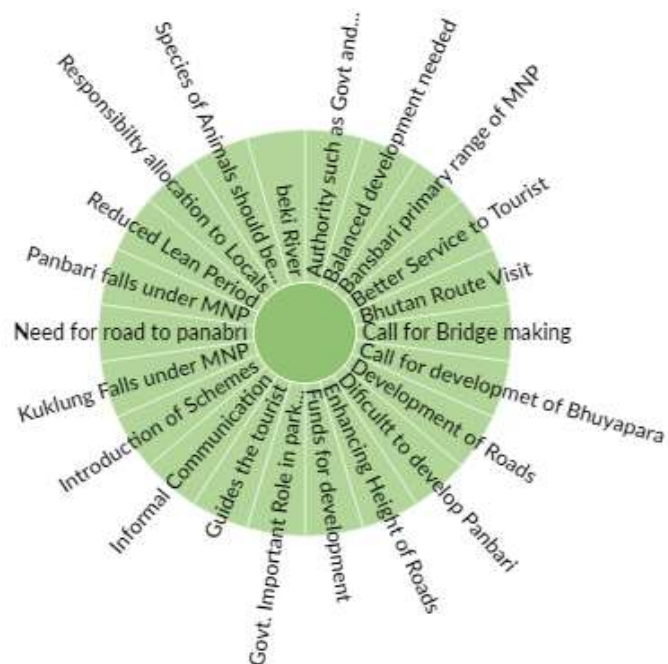
The respondents are in the opinion that there are huge number of funds comes for the development of fringe villages and the park but these are not transparent in

nature and the authorities never reveals them and they also do not take the local people in confidence which as a result creates a distrust over the authority and also puts question mark on the development of the park.

Public doesn't know anything about the fund. Public knows only 20 pigs given. Before there was no opportunity for local communities in decision making but now little happened. (T1)
Before there used to come funds for the benefit of the people. Like 1 cr fund now if the officer is working and cutting 10 lakh rupees in his pocket that is not good atleast the public should get the chance to participate in that and support is needed. There came a fund for Pig, cattle, Chicken, Duck Farming from government but it was successful. How many crores came public didn't knew. (T2)

d) Discussion

In general, the local people that participated in this FGD expressed their support for preserving the national park designation of Manas National Park. Nevertheless, numerous criticisms regarding the park's management planning processes and outcomes were uncovered. Initially, the tourist representatives who were interviewed stated that they had very little participation in the park planning processes and had only a small influence on the final planning arrangements. Furthermore, survey participants voiced apprehensions regarding the limited prospects available for tourism-oriented enterprises within the park as a result of managerial constraints. The precise impact of these restrictions on the welfare of tourist operators and their families is still somewhat uncertain. Furthermore, the participants expressed that park managers lacked proficiency in business management and tourism development matters, which they believed was hindering their capacity to grow their enterprises within the park. Furthermore, concerns were raised regarding the need for certain measures implemented to safeguard the park's animals, and the scientific basis backing these actions was called into question. Furthermore, stakeholders have requested the creation of a visitation plan and have expressed a significant interest in participating in the co-management of the park.



Negative Perception						
contingency meeting	Personal Re...	Panbari is n...	Need for ne...	Need a brid...	Manageme...	Less attent...
Risky to reduce lean ...						
Risky to drive vehicle	Lean period cannot be red...		Forest Gro...	Flood Affec...	Failure of G...	Developme...
Rainfall Play a role for...	Land Settled					
Public role in Park Ma...	Lack of visitors		Development need in all ...	Closure routes	Closure of Saf...	
Photographer visit	Lack of Rules and Regulat...		Conflict of Authority to...	Closure of Route		
	Infrastructure problem in...		Comparison with KNP	Closure of Roads		

Figure 10 (a & b). Code representation of Park Management

5. Community Relations

National parks maintain intricate interconnections with local communities, which have significant effects on the achievement of conservation goals as well as the

welfare of the community. Integrated conservation and development programs have been a primary method for managing these interactions, although their success has come under scrutiny. Simultaneously, tourism activities pose ongoing challenges concerning: (1) the equitable allocation of tourism benefits between local residents and non-residents, as well as within the local community, (2) preserving the local economic advantages of tourism while safeguarding park resources, and (3) fostering park or conservation-related economic prospects to supplement tourism. Establishing expansive protected spaces is a crucial approach in preserving biodiversity and safeguarding watersheds (Kramer et al., 1997). However, the effectiveness of these areas typically relies on the efficient management of the interactions between parks and the surrounding community. Since the early 1980s, the prevailing approach in international conservation has been to address this connection by implementing integrated conservation and development programs (McNeely et al., 1984). This method is founded on the concept that offering acknowledged and substantial advantages to nearby residents of parks can amplify local regard for and approval of national parks and other conserved regions. Developing local people's understanding and approval of such regions can be achieved through several methods. One approach is to offer economic prospects to nearby communities that are directly linked to the park, such as employment opportunities within the park, employment within the tourism sector, selling food and handicrafts to tourists, providing services to local communities, and permitting traditional land uses (Zube et al., 1990). Another approach is the creation of economic prospects beyond the park boundaries, aimed at diminishing reliance on park resources. These prospects may include ventures related to agriculture, agroforestry, forestry, or fisheries. The compatibility of conservation with development has been scrutinized from several viewpoints. According to (Redford et al., 1992), conservation and sustainable development are essentially incompatible, and attempts to pursue both objectives simultaneously have had limited success. According to (Brandon, 1998) and (Langholz, 1999), economic development projects in neighborhoods around parks may merely alter the kind of threats to the park, rather than completely eradicating them. However, practical methods have demonstrated that the connections between conservation and development are

intricate and occasionally go against common sense. It has been proven that even extensive agricultural growth can coexist harmoniously with park protection, as supported by studies conducted by (Schelhas,1992). The preservation of biodiversity has been the central objective in numerous countries, particularly nations with high levels of biodiversity like India. The establishment of protected areas (PAs) such as national parks, wildlife reserves, and sanctuaries plays a crucial role in advancing conservation initiatives. Protected areas in India have a lengthy history, commencing with the formation of Hailey National Park (now known as Jim Corbett National Park) in 1936. Over the years, some states in India have officially recognized certain natural regions as protected zones, and one prominent illustration of this is the Manas National Park. Manas National Park is home to local populations, including the Assamese and indigenous Bodo communities, who live within or in close proximity to the protected region. These communities have historically depended on natural resources for sustenance, healing, commerce, and construction materials.

a) People of MNP and community participation

A community is a collective of individuals who share a physical location, a social structure, a common sense of self, similar hobbies or pursuits, a shared geographical area, and a certain level of self-governance (Flora, 1992). Individuals within a community engage in social contact and organization that extends beyond the government. Through active engagement, they are able to fulfill all their daily needs within the local area. The community also engages with the broader society, both in effecting change and in responding to it. Ultimately, the community collectively engages with the surrounding environment, shaping the physical features of the area in which it exists, while also being influenced by it (Maser, 1996).

Manas National Park has many villages linked to its boundry but notably there are four villages which are adjacent to the Park namely, Gyti, Naranguri, Raghub Bill, Bhuyapara. The ethnicity of the people are mixed mostly there are more Bodo people followed by Bengali people and then Assamese people. There is one river (Beki)which is the primary river and a source of water and fishes, logs etc. Human activities have a substantial impact on Manas National Park in Assam,

posing a threat to its ecological viability. The destruction of habitats, conflicts among wildlife, and ecological imbalances have been caused by development and human activities, including illegal logging, land clearing for agriculture, intensive farming, and aquaculture operations in the vicinity of the park. These pressures have a detrimental impact on the various species residing in the park and also lead to water contamination and a general decrease in the environment.

The increase of villagers using the park resources even some people goes inside the park to use the river for catching fish disrupts the environment and causes immense problems. After lot of warning the people do not listen and they enter to collect snails and other creatures from the river. They think its free for them and most of them argues with the officials. (T1)

In his book Sand County Almanac, published in 1949, Aldo Leopold discussed the concept that individuals are integral components of a community consisting of interconnected pieces. His innate inclinations drive him to strive for his position within the community, while his moral principles also urge him to collaborate. This concept is of utmost importance when contemplating the involvement of the community in the administration of Manas National Park (MNP). Participation refers to the active involvement of stakeholders in influencing and exerting control over development projects, decisions, and resources that have an impact on them. Community engagement fosters a collaborative endeavor to attain objectives that extend beyond the capabilities of individuals working independently. It entails the participation of individuals who share similar needs and objectives in making decisions that have a direct influence on their lives. This process fosters democracy by allowing communities to identify problems, provide solutions, and carry out the resulting actions (Agrawal,2005). Resolving issues between local communities and the management agency of MNP is crucial.

b) Respondents attitudes towards the economic benefits derived from community participation in national park management

Although the fringe people are function autonomously without financial support from the government, individuals from the towns surrounding Manas National Park expressed favourable sentiments towards the economic advantages of community involvement. A consensus was reached that such involvement has the potential to

generate employment prospects, stimulate economic endeavours, and enhance the quality of life in their rural communities. Despite the neighbourhood's self-sufficiency, there remains optimism that additional economic advantages and opportunities will arise from community engagement programs. Nevertheless, a significant proportion of respondents expressed uncertainty over the economic advantages of community involvement. However, nearly all participants concurred that income does not pose a hindrance to engaging in community activities.

There should be reservation for the fringe village, some schemes should be introduced like the educated youth can do something from their own. there are Gypsies but many family youth cannot by gypsies for safari as a result the drive other people Gypsies who have 4 to 5 Gypsies with rs.400 per trip basis wage. Rather doing that if he could loan in a subsidised rate he could buy gypsy by his own and run his family. (T2)

Despite being mostly marginalized in the village, the groups remained steadfast in their adherence to their cultural heritage and customs. The findings suggest that their cultural practices do not hinder community engagement efforts. It is a frequent occurrence for several communities in isolated regions to have strong connections with one another. They mutually uphold and honor each other's traditions and customs, actively engaging in each other's rituals, including marriage ceremonies. Collaboration and cooperation have been their established customs and cultural values. Respondents also perceived that community participation may strengthen their socio-cultural bonds inside the village. All participants expressed favorable sentiments towards community involvement as a means of preserving their cultural identity. The majority of individuals also hold the belief that community involvement will allow individuals to value and sustain their way of life and cultural practices.

We all stay in harmony in this place, there are different people from different community but we respect each other and never have any adverse situation. We offer help to each other in times of needs. Many people from different community has opened Lodge together namely the "Pigeons Guest House" which is opened by Muslim and Hindu people together. (T1)

c) Responses to institutional benefits of community-managed national parks

Similar to other villages in Assam, the neighboring villages are also governed by the Gaon Panchayat. The local institution is often elected by the community and is entrusted with the task of devising and executing development programs and projects within the village. Additionally, an individual is chosen to oversee the affairs of the villages. It has been discovered that a Gaon Bura has been assigned three villages, resulting in an increase in his duties and obligations. However, the compensation he receives is very low. In Assam, the government has implemented an initiative to provide free education to individuals who fall below the poverty line (BPL). To be eligible for this program, local residents must obtain a certificate from the Gaon Bura. Managing three villages (Gyti, Naranguri, Raghob Bill) is undeniably a burdensome task for a single individual. The Gaon Bura has been observed to diligently and consistently execute the community's tasks on a daily basis. This institution also has a crucial function in promoting community engagement to foster a more dynamic and fruitful community. The majority of respondents expressed the belief that their local institution has effectively facilitated community participation.

The Gaon Bura is managing all works but do not get any benefit from the government but for the benefit of the people he is doing works at the age of 72. Everyday he sits in three different villages and completes the work. We want him to get adequate money from the Government. (D1)

d) Park–community interactions

During the Focus Group Discussion (FGD), individuals in the MNP (Manas National Park) were queried about their sentiments towards the park, encompassing their perceptions of the advantages or disadvantages they experienced as a result of it. The overwhelming majority of responders provided positive responses. A significant number of participants promptly highlighted the fact that the community has consistently demonstrated reverence and concern for the park. They are dissatisfied with the management of the park and the decision-making process. The individuals asserted that the authorities fail to provide sufficient opportunities in the decision-making process, which adversely affects both them and the tourism

industry. However, they were also in a favorable condition where the park still holds some significance by allowing the initiation of commercial operations. The park's economic advantages were generally acknowledged by the community. The majority of participants indicated that the park offers a significant means of generating revenue through various employment opportunities such as serving as guides, gypsy drivers, and selling food or services to tourists. This can be determined since one of the participants in the Focus Group Discussion (FGD) was a driver, while another was a businessman who owns a shop in close proximity to the park.

There is option for the drivers, mainly driver like after seeing the vehicle driver family can enter without paying the revenue to the park. (D1)

e) Discussion

The villages in the vicinity of MNP have always placed a high importance on cooperation, and the prosperity of these communities is closely linked to the well-being of their natural surroundings. The idea of community is intricately intertwined with the enduring bond between individuals and their environment. Hence, it is imperative to preserve the landscape of MNP in order to uphold community values, rather than allowing it to be the initial victim of excessive use (Hasan, Salleh, & Komo, 1997; Maser, 1996). Involving local communities in conservation initiatives guarantees their active participation in safeguarding the park, while also allowing them to reap the benefits of sustainable utilization of its resources.

Community participation is crucial because it allows for the utilization of local knowledge, enabling the discovery of essential information that may otherwise remain unknown and the prompt identification of significant issues. In addition, it is financially advantageous as it helps to prevent errors in costing and obstacles. Individuals who actively participate and allocate their resources and aspirations towards a particular endeavor are more inclined to sustain their motivation. Effective participation enables the potential for attaining long-term goals. Sustainability. Additionally, it aids in fostering the community's dedication and ongoing participation in the program, thereby promoting the idea of collective accountability.

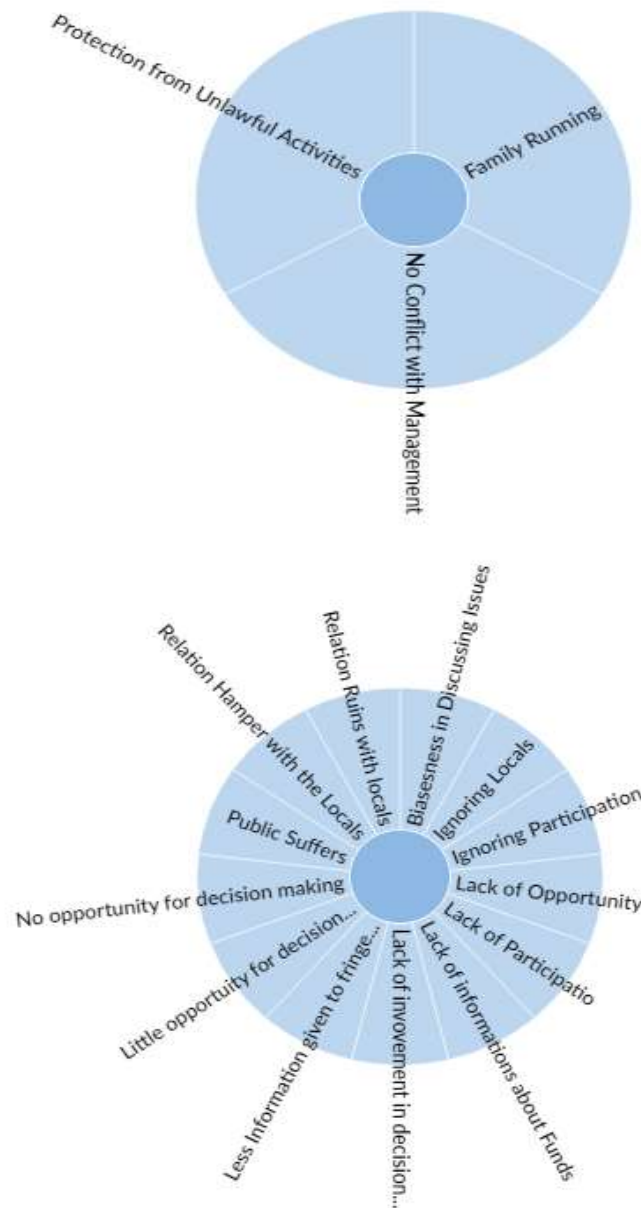


Figure 11 (a & b). Codes Representation of Community Relation

6. Livelihood

In developing nations, the majority of rural inhabitants rely on forest resources for their sustenance. However, the establishment of protected areas and national parks restricts their access to these resources. Conservation areas, such as Manas National Park (MNP), play a crucial role in national and regional endeavors to combat the decrease in biodiversity. MNP serves as a reservoir of genetic diversity and a

preserved representation of pristine habitats, while also establishing connections with the spiritual, cultural, artistic, and interpersonal dimensions of human existence (Chape et al., 2003). Human activities are invariably the primary factors contributing to the degradation of parks and the suboptimal results observed in numerous protected areas, including MNP. Since its inception, the Manas National Park in Baksa has been a site of confrontations between local communities and wildlife authorities. The conflicts encompass a variety of incidents, including the apprehension of local individuals by Wildlife Officials for entering the park to gather non-timber forest products, as well as intense confrontations with poachers. These conflicts often lead to arrests, evictions, and instances of violence by militants, which occasionally result in fatalities. There is a limited amount of documented information available regarding these battles.

Tourism decreased a lot due to the problems of route and its hampering the relation between the locals and the authority of park.(C1)

People saw that the lodge of them are running very well, then local one two people started making lodges and did pretty well and earned well so now many locals are coming up with homestay and lodges. (T1)

Historically, conservation initiatives often regarded local communities as agents of deforestation, resulting in a perspective that they should be excluded from biodiversity protection efforts. This viewpoint led to the acceptance of the preservationist strategy, which is often referred to as the 'fences and penalties', 'fences and guns', or 'colonial method'. This approach facilitated the creation of protected areas without considering the local communities, as evidenced by (King,2009).

An appropriate instance of this methodology can be observed in the historical context of Manas National Park in India. At first, the park's administration prioritized stringent conservation measures that excluded nearby populations, resulting in frequent clashes and opposition from people who historically depended on the forest for their sustenance. The implementation of enforcement-focused policies, which sought to protect biodiversity without incorporating the knowledge and needs of local communities, led to conflicts and occasional animosity between park administrators and indigenous inhabitants. Over time, it became clear that

sustainable conservation could only be accomplished by engaging local populations, resulting in a gradual transition towards more inclusive conservation techniques. This alteration emphasized the significance of taking into account the roles and rights of local individuals in conservation endeavors in order to accomplish long-term biodiversity objectives.

These two different methods have had a significant impact on the fundamental principles of managing protected areas and have been the main focus of discussion in the field of environmental conservation in recent decades. The preservationists advocate for the inherent aesthetic and worth of all elements within 'the one big unit of creation' and maintain the perspective that nature should be conserved for its own intrinsic value, enabling humans to coexist with nature without causing its destruction (Fox, 1981). Contrarily, utilitarians argue that it is not necessary to preserve wild nature in its original state, but rather it should be actively controlled through scientifically informed interventions in order to enhance and maintain productivity (Pinchot, 1910). The preservationists embraced the 'exclusive model', which involves excluding human activities. On the other hand, proponents of the utilitarian view adopted the 'inclusive model', which prioritizes the interests of local societies and sustainable management in protected area management (Borrini, 2003).

The Manas National Park in India serves as a prime example of the conflict between these two methods. Originally governed by a preservationist ideology, the park's first regulations prioritized stringent conservation measures that deliberately excluded nearby communities, with the goal of preserving the park's unspoiled state. The implementation of the 'fences and penalties' strategy frequently resulted in clashes with indigenous communities that depended on the forest for their sustenance, thereby underscoring the difficulties of completely eliminating human activities.

Over time, the administration of Manas National Park has progressively integrated utilitarian concepts, acknowledging the significance of engaging local residents in conservation endeavors. The park's management has adopted a more inclusive approach by incorporating local knowledge and practices. This new model aims to achieve a balance between biodiversity protection and the sustainable utilization of

natural resources. This development highlights the importance of combining philosophical viewpoints in order to achieve sustainable conservation outcomes, while also ensuring that the requirements and entitlements of local communities are acknowledged and integrated into the management of protected areas. But according to the fringe people there is discouragement of the unitarian approach in MNP. The locals have a strong dissatisfaction over the non-participation of the locals in the decision-making process.

From every village atleast two to three people should be taken into consideration before taking any decision. (B1)
Now there is little opportunity for decision making. (C1)

The tourism industry in the MNP area has failed to effectively harness the potential of local people as advocates for conservation. As a result, these communities have received limited and indirect benefits from tourism, primarily owing to enclave tourism (Mbaiwa, 2005). Enclave tourism leads to little interactions between the indigenous population and tourists, resulting in a scarcity of locally made goods in the tourist markets. This offers limited opportunities for enhancing the welfare of indigenous communities through tourism. The significant loss of tourism revenue, resulting from limited local participation and expertise, along with inadequate infrastructure to sustain tourism, demonstrates the revenue leakage in MNP (Lindberg et al., 1996).

Now also there are many people selling lands or giving lands in lease to the outside. Steps should have been taken by the authority as they should have done meeting or done awareness programme earlier to encourage the locals to do some work locally to stop the revenue leakage. We locals didn't know anything what they are doing in and outside the forest. When we saw people from outside making resorts and all then we thought of making resorts by ourself. (B1)

This scenario reflects the wider difficulties observed in the administration of other conserved regions, such as Kaziranga National Park. At first, conservation activities at Manas were carried out according to a preservationist approach that did not involve local residents. Nevertheless, it became evident in MNP that sustainable conservation could not be accomplished without the active participation of the local populace. The adoption of a more comprehensive and practical strategy in Kaziranga, which incorporates indigenous knowledge and customs, reflects the

wider movement in managing protected areas to harmonize biodiversity preservation with the sustainable utilization of natural resources. It has been found that the locals of Kaziranga engage themselves in making many products made out of Bamboo signifying the animals at the roadside and in the resorts near Kaziranga National Park. It is nowhere found in Manas National Park. The entrepreneurial activities are less compared to Kaziranga National Park, which discourages the revenue generation from Tourism.

Take the example of Kaziranga which is very famous but MNP is not that famous. If the development was done fringe people public would have got benefited.(T2)

Implementing a comparable inclusive strategy in MNP could amplify the advantages of tourism for the local residents. To enhance the support for conservation efforts and the economic prosperity of local communities, the tourism industry can achieve this by promoting more meaningful interactions between tourists and local populations, promoting the inclusion of locally made products in tourist markets, and making investments in the required infrastructure and expertise. Implementing this approach will not only mitigate the loss of money but also engage local residents as active collaborators in conservation efforts, thereby improving the overall efficacy of protected area management.

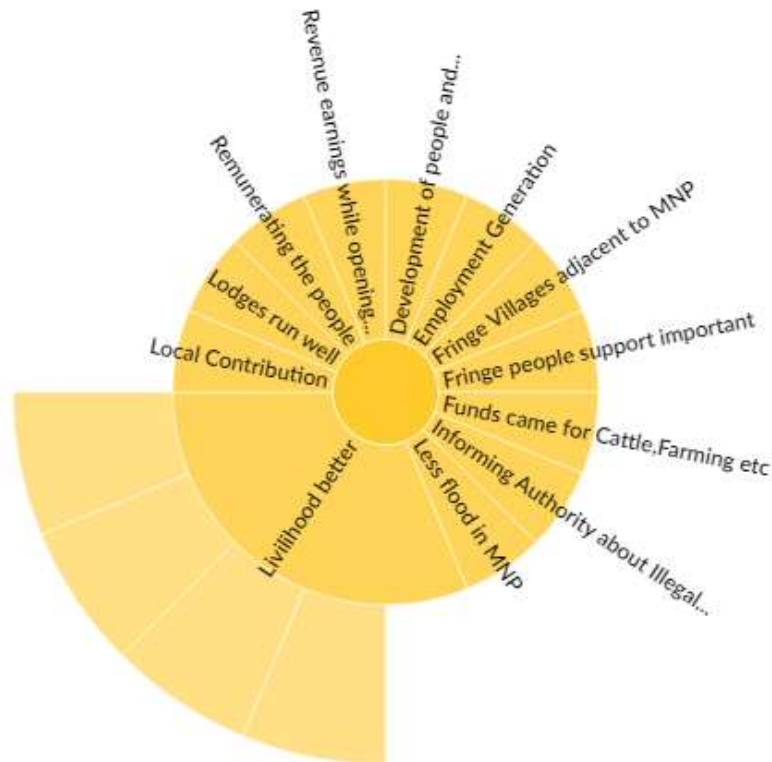
The issue of human-wildlife conflict has caused major dissatisfaction among the local population living near Manas National Park (MNP). Research has indicated that when peripheral people of protected areas are compelled to bear the expenses associated with coexisting with wildlife, the backing for conservation efforts among the local population may be significantly weakened (Naughton et al., 1998). Elephant incursions are frequent in communities located in Bhuyapara part of the MNP, resulting in significant crop destruction. While there is limited available data on elephant raids, all farmers who took part in focus group discussions in the Bhuyapara region acknowledged becoming victims of such raids at some point. Furthermore, wild hogs and birds have been documented as causing crop destruction in all the surrounding villages adjacent to MNP.

MNP has many villages linked to its boundary. In this village there is no conflict of animals but Bhuyapara village has human

elephant conflict and no steps are being taken by the management and it creates a conflict between the management and fringe people. The losses has to bear by the village people but no compensation is paid by the management. (T1)

When complains to the authority about the destruction and asks for compensation no actions are being taken by the authority. This exacerbates the tension between local communities and conservation authorities. This confrontational approach not only isolates the local community but also weakens the possibility of cooperative conservation efforts. In order to alleviate these disputes and promote improved relations between the park authorities and local residents, it is essential to design measures that specifically target the economic and social burdens experienced by individuals residing in close proximity to wildlife.

MNP has many villages linked to its boundary. In this village there is no conflict of animals but Bhuyapara village has human elephant conflict and no steps are being taken by the management and it creates a conflict between the management and fringe people. The losses have to bear by the village people but no compensation is paid by the management. (T1)



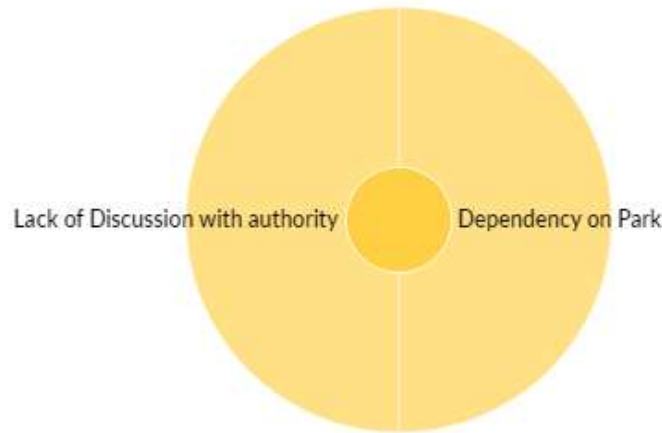


Figure 12 (a & b). Code Representation of Livelihood

a) Discussions

Within the framework of Manas National Park (MNP), various strategies can be employed to ensure that the economic advantages remain within the local population and promote sustainable development. Promoting local ownership and capital investments in region-specific products, such as locally grown tea leaves, bamboo shoots, and chili pickles, can help ensure that the economic benefits of these goods stay within the community (Walpole et al., 2000). By providing assistance to local entrepreneurs and producers, the park may contribute to the establishment of a self-sufficient economic framework that positively impacts both conservation initiatives and the economic well-being of local citizens. Enhancing the connection between supply and demand by discovering prospective markets for local goods can greatly enhance the local economy. Forming alliances with tourism operators and shops helps streamline the process of selling locally made goods to tourists, thus incorporating local products into the tourism value chain (Ollenburg,2007).

Establishing inter-sectoral linkages involves the creation of connections between several sectors, such as agriculture and artisan production. This can contribute to the diversification of livelihoods and decrease reliance on a particular economic activity. For instance, the integration of conventional farming methods with the creation of handmade goods can provide local communities with several sources of income, so strengthening their economic resilience (Spencele,2012). Ensuring that

local populations have access to pertinent information regarding commercial possibilities and conservation projects is of utmost importance for inclusive participation. Engaging local populations in decision-making processes can empower them, cultivating a sense of ownership and responsibility towards conservation activities.

Capacity development refers to the act of investing in projects that enhance the skills and knowledge of local people. This enables them to actively engage in and derive benefits from tourism and conservation operations. Training programs that specifically target sustainable tourist management, company growth, and conservation practices have the potential to improve the total competence of the community, empowering them to fully exploit economic prospects (McCool et al., 2012). By implementing these strategies in Manas National Park, a more comprehensive and enduring tourism model may be established. This model will not only contribute to conservation efforts but also enhance the socio-economic welfare of local communities. MNP can serve as an exemplary example for achieving a balance between biodiversity protection and sustainable community development by incorporating local products and services into the tourism industry, establishing strong market connections, and enhancing the skills and abilities of local citizens.

5.4 Findings from both quantitative and qualitative

The integrated analysis of quantitative and qualitative data provides a nuanced understanding of fringe communities' perceptions and attitudes towards the conservation and development of Manas National Park (MNP). Quantitative results reveal significant correlations that highlight the importance of various factors in shaping community attitudes. A notable positive correlation exists between park resources and community relations (coefficient = 0.272, $p = 0.003$), suggesting that improved park resources contribute to better community engagement. Similarly, there is a significant positive correlation between wildlife protection and community relations (coefficient = 0.199, $p = 0.028$), indicating that effective wildlife conservation efforts enhance community relations. Additionally, the positive correlation between community relations and economic impact (coefficient = 0.178, $p = 0.050$) highlights that positive community relationships are associated

with better economic outcomes, emphasizing the need for strong community engagement in conservation efforts. Qualitative insights from focus group discussions further enrich these findings. Participants acknowledge the park's role in providing social amenities and employment opportunities but express concerns about the limited financial support from the government. This feedback aligns with the quantitative results, suggesting that increased investment in park resources could improve community support. The discussions also highlight the importance of friendly interactions with park staff, which positively influence community attitudes. Moreover, there is a clear recognition that tourism generates income opportunities, and participants advocate for the promotion of local entrepreneurship and the integration of local products into the tourism value chain. Combining these insights, the study suggests several strategies to enhance both conservation outcomes and community benefits. Promoting local ownership by supporting regional products and businesses can ensure that economic benefits remain within the community. Strengthening market connections between local producers and tourism operators can boost local economic activity. Developing inter-sectoral linkages, such as integrating farming with artisan production, can diversify income sources and reduce dependency on a single economic activity. Additionally, improving access to information and involving local communities in decision-making processes can foster a sense of ownership and responsibility towards conservation. Investing in capacity development through targeted training programs can enhance community skills and knowledge, enabling more effective participation in tourism and conservation efforts. Overall, by implementing these strategies, Manas National Park can serve as a model for balancing biodiversity protection with sustainable community development, demonstrating how effective community engagement and resource management can lead to mutually beneficial outcomes.

5.5 Conclusion

The significance of including local populations in conservation efforts is exemplified by the experience of Manas National Park (MNP), highlighting the crucial role they play in the success of protected areas. The original policies of exclusion and preservation resulted in frequent disputes and dissent, underscoring the unsustainable nature of conservation without the participation of local communities. The ongoing transition towards more comprehensive conservation methods at MNP has initiated efforts to tackle these concerns. However, there is still notable discontentment stemming from the lack of involvement of local communities in decision-making processes and the inadequate economic advantages derived from tourism. The issues encountered by MNP, such as enclave tourism and human-wildlife conflicts, highlight the necessity for a comprehensive strategy that effectively manages biodiversity conservation while promoting the sustainable usage of natural resources. The benefits of promoting entrepreneurial enterprises and facilitating meaningful relationships between tourists and local communities may be seen by comparing it to Kaziranga National Park. To achieve sustainable conservation and enhance the well-being of local communities, it is crucial to guarantee their active engagement, tackle economic and social challenges, and foster inclusive development approaches. This method not only improves conservation efforts but also reinforces the interaction between local residents and park officials, ultimately resulting in more efficient and sustainable management of protected areas.

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CHAPTER 6

SUSTAINABILITY AND SATISFACTION AFFECT ON VISITOR'S INTENTIONS

6.1 Introduction

The sustainability of national parks and the impact of visitor footfall present a complex and often contentious issue. On one hand, increased visitor numbers can pose significant threats to park resources. The development necessary to accommodate tourists, such as constructing lodges, restaurants, and infrastructure—particularly roads—can intrude upon the park's natural area. This encroachment may compromise habitats, potentially harming wildlife and undermining the park's ecological sustainability. On the other hand, maintaining and developing a national park requires substantial funding, which is often inadequate when reliant solely on government sources. As noted by Bartelmus (2002), sustainable park management necessitates significant financial resources. Caust and Vecco (2017) highlight that for a UNESCO World Heritage site like Manas National Park, government funding alone is insufficient. Visitor-generated revenue becomes crucial in this context. A higher number of visitors can lead to increased financial resources, which are essential for park maintenance and improvement. Effective visitor management is thus critical; not only does it ensure the preservation of park resources, but it also enhances visitor satisfaction. Satisfied visitors are more likely to return and recommend the park to others, contributing further to sustainable funding and development. Thus, a balanced approach is needed, integrating proper visitor management strategies with conservation efforts to ensure both the protection of park resources and the sustainability of funding mechanisms.

The intentions of visitors to promote and revisit Manas National Park are substantially influenced by the park's sustainability and the satisfaction they experience during their visit. When park visitors think that the park is well managed and environmentally sustainable, it improves their whole experience and increases their pleasure. This favorable encounter frequently results in a robust inclination to endorse the park to others and a need to revisit for subsequent visits. MNP may cultivate a devoted visitor community, encourage favorable recommendations, and ultimately uphold its enduring conservation and economic objectives by prioritizing

sustainable practices and visitor contentment. The current research primarily examines two objectives of the study: investigating the effect of National Park Sustainability on National Park Behavioral Intentions and examining the influence of National Park Satisfaction on National Park Behavioral Intentions. This analysis provides a thorough investigation of the hypotheses established for these objectives and the analytical techniques used to evaluate the relationships between these factors and retention. Afterwards, a comprehensive analysis of the obtained results is carried out, offering valuable insights into how sustainability and satisfaction influence visitor behavior and contribute to the park's continuous success. This analysis highlights the significance of incorporating sustainable practices and improving tourist happiness in order to establish a peaceful equilibrium between conservation endeavors and economic advantages, so guaranteeing that Manas National Park continues to be a beloved destination for future generations.

6.1.1 Theoretical Framework and Hypothesis Development

National parks are established by governments to safeguard the natural environment from ecosystem degradation and enhance the emotional and recreational well-being of humans. National parks promote environmental consciousness through the implementation of ecotourism initiatives, and persons who possess a strong environmental awareness are more likely to revisit national parks as preferred ecotourism sites. In recent decades, the tourism industry has produced beneficial consequences, including the establishment of employment opportunities, the regeneration of regional economies, and the development of social infrastructure in tourist areas. Additionally, it has led to adverse consequences, including clashes between tourists and indigenous inhabitants, criminal activities, and the process of gentrification. Development-induced ecosystem damage leads to citizen aversion (D'Arco et al.,2021). As a result, several policies and initiatives have been suggested to mitigate the negative impact of tourism development on the natural environment. Ecotourism has arisen and is commonly cited in tourism studies as a means to mitigate the harm to the natural environment caused by the development of tourism (Mkono et al.,2020). Nevertheless, there have been cases where ecotourism has strayed from its initial objective of promoting responsible tourism, where tourists actively engage in activities to raise environmental consciousness

and safeguard the global environment and endangered plant and animal species, and instead transformed into a form of tourism that caters to large numbers of people and contributes enough to the National Park Sustainability (Jeong et al., 2021).

6.1.2 Sustainable development in tourism

The concept of "sustainable development" became widely acknowledged in the late 1980s, primarily because the United Nations (UN) emphasized the pressing problem of diminishing natural resources. This age initiated substantial deliberations concerning the ramifications of resource depletion on both economic and social progress. The United Nations' definition of sustainable development, as stated in the Brundtland Report of 1987, can be summarized as follows: "development that satisfies the current requirements while safeguarding the capacity of future generations to fulfil their own needs" (United Nations General Assembly, 1987).

Sustainable development is sometimes perceived as primarily concerning the environment, but in reality, it is always interconnected with social and economic dimensions. Environmental problems inherently encompass societal issues. "They originate from human actions and result in human suffering," declares Sir Edmund Hillary, the pioneer who successfully scaled Mount Everest. Sustainable development refers to the process of making decisions that consider the long-term effects on the environment, society, and economy (Neupane, 2021)

In contemporary discussions, the environmental dimension of sustainable development is particularly emphasized. This focus stems from the reckless exploitation of natural resources, which has precipitated a host of environmental problems, most notably climate change. The burden of addressing and mitigating these issues will inevitably fall on future generations, who will have to cope with the long-term consequences of current behaviors and decisions (Haller, 2003). In essence, the challenge lies in achieving a harmonious equilibrium between promoting tourism for the economic advancement of the region and safeguarding the long-term ecological well-being of the national parks. This approach resonates with the overarching objective of preserving these natural treasures for future

generations while providing a gratifying and enlightening experience for current travelers, This study delves into the examination of three constructs: National Park Sustainability (NPSus), National Park Satisfaction (NPSat), and their influence on National Park Behavioral Intentions (NPBI).

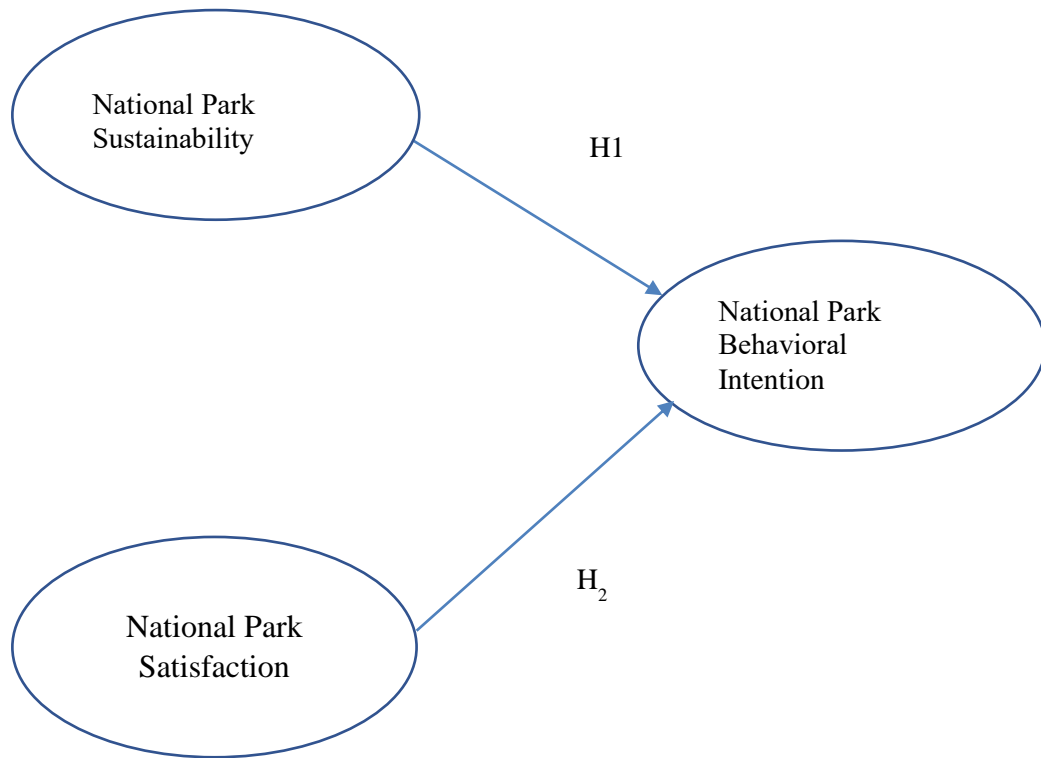


Figure 13: Model on National Park Sustainability and National Park Satisfaction on National Park Behavior Intention.

H1: There is a significant relationship between NPSus and NPBI.

H2: There is a significant relationship between NPSat and NPBI.

To empirically test the current study hypotheses, multi-item scales used in previous studies were identified and modified to suit with the study setting. A questionnaire with three constructs was designed to capture tourists' NPBI in MNP. The NPSus was operationalized as consisting of three dimensions which were measured using

previous studies (Cottrell & Vaske, 2006; Faulkner & Tideswell, 1997; Fornara, Bonaiuto, & Bonnes, 2010; Ko & Stewart, 2002) and has adjusted for the current study purpose. NPSat construct was measured following four items from previous research (Choi & Chu, 2000; Cet al., 2007; Oliver, 1980). NPBI was measured using five items (Chen & Tsai, 2007; Gallarza & Saura, 2006; Gokovali, Bahar, & Kozak, 2007, Zeithaml, Berry, & Parasuraman, 1996). Each of the three constructs was measured using a 7-point Likert-scale: The items were rated on a 7-point Likert-scale ranging from strongly disagree (1) to strongly agree (7). This survey was conducted among national tourists evaluate their NPBI towards visiting MNP. A sample size of 300 tourists were asked a series of questions related to their beliefs towards the NPSus, NPSat on their NPBI but 233 responded. The researcher used random sampling, the tourists were approached through online modes and the questionnaire were also fill up through google form. The data of the tourist were collected from the office data base of various resort owners, home stay owners and office of Manas National Park.

6.1.3 Finding and Analysis

6.1.3.1 Reliability, Validity and Measures of Sample Adequacy

The reliability test was conducted on a sample of 233 cases, all of which were deemed valid for analysis. No cases were excluded from the dataset. The Cronbach's Alpha coefficient, a measure of internal consistency reliability, was computed to be 0.738, indicating moderate to good internal consistency among the items. The Cronbach's Alpha coefficient of 0.738 suggests moderate to good internal consistency reliability among the items comprising the scale or test. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, used to assess the suitability of data for factor analysis, yielded a value of 0.852. This indicates a high degree of sampling adequacy, suggesting that the dataset is highly suitable for factor analysis. Bartlett's Test of Sphericity, which assesses whether the observed variables are significantly correlated, yielded a significant result with an approximate chi-square value of 1262.071 and 190 degrees of freedom (df). This indicates that the correlations between variables are statistically significant ($p < 0.001$), supporting the appropriateness of factor analysis for the dataset.

A) *Descriptive Statistics for EFA Results for NPSus*

Table 12: Descriptive statistics and EFA results for NPSus

National Park Sustainability Items	Mean	SD	Factor Loading
Presence of clean (unpolluted) air	2.35	1.782	.622
Presence of plenty areas covered in flora	2.33	1.739	.576
Presence of habitat for local wildlife	2.05	1.597	.640
Presence of key species	2.10	1.591	.642
Presence of natural features	2.28	1.818	.553
Low presence of noise pollution	2.13	1.754	.643
Presence of allocation of income to the local people	2.24	1.651	.597
Presence of tourist spending on local services and products	2.29	1.789	.627
Presences of conservation of traditional arts and crafts among local people	2.25	1.679	.592
Presence of education level among local people	2.45	1.684	.628
Presence of basic services for local people	2.21	1.590	.590

(Source: Authors own Creation)

The table presents descriptive statistics and exploratory factor analysis (EFA) results for various components contributing to National Park Sustainability (NPSus). The findings indicate that factors related to environmental conservation, community support, and cultural preservation play crucial roles in the sustainability of national parks. According to the analysis, attributes such as the presence of clean air, ample flora, habitat for local wildlife, and conservation of key species demonstrate moderate to strong positive associations with the sustainability factor. Furthermore, efforts to reduce noise pollution and direct income towards local communities are identified as important aspects of sustainable park management. Moreover, encouraging tourist expenditure on local services and products, preserving traditional arts and crafts within local communities, and improving

education levels and access to basic services for local residents are found to be significant factors positively linked to park sustainability. These findings highlight the multifaceted nature of sustainability in national parks, highlighting the necessity for comprehensive strategies that encompass environmental preservation, community empowerment, and cultural heritage conservation to ensure the long-term viability of these natural resources.

b) Descriptive Statistics and EFA for NPSat

Table 13. Descriptive statistics and factor analysis results for NPSat

National Park Satisfaction Items	Mean	SD	Factor Loading
I am satisfied with my decision to visit this national park	4.13	1.654	.750
My choice to visit this national park was a wise one	2.15	1.829	.516
I am sure it was the right thing to visit this national park	2.58	2.112	.597
Visiting this national park is worthwhile	2.25	2.025	.607

(Source: Authors own creation)

This set of items pertains to the satisfaction and perceived value associated with visiting a national park, as indicated by visitors' responses. The mean scores suggest varying degrees of satisfaction and conviction regarding the decision to visit the park, ranging from moderately positive to somewhat ambivalent. The highest mean score (4.13) indicates a generally high level of satisfaction with the decision to visit the park, with a relatively low standard deviation (1.654), suggesting a degree of consistency among visitors in their satisfaction levels. Conversely, the lower mean scores for other items (ranging from 2.15 to 2.58) suggest more mixed sentiments regarding the wisdom and certainty of the decision to visit, albeit with higher variability among respondents. However, the positive factor loadings across all items (ranging from 0.516 to 0.750) indicate that these satisfaction metrics collectively contribute significantly to the underlying construct of overall national park satisfaction, highlighting their relevance in assessing visitor experiences and

perceptions. Overall, while visitors generally express satisfaction with their decision to visit the national park, there are nuances in their perceptions of the wisdom and certainty associated with that decision, suggesting potential areas for further investigation or improvement in visitor experiences.

c) Descriptive Statistics and Factor Analysis for NPBI

Table 14: Descriptive statistics and EFA for NPBI

National Park Behavioral Intention Items	Mean	SD	Factor Loading
I will visit this national park again in future	4.65	2.164	.597
I Will say positive things about this national park	4.52	2.334	.607
I Will choose this national park as my first choice compared to other national	4.63	2.110	.641
I Will stay longer in the next visit to this national park	4.60	2.211	.729

(Source: Authors own creation)

The items concerning National Park Behavioral Intention assess visitors' future intentions and attitudes towards the visited national park. With mean scores generally high across all items, respondents demonstrate a favorable disposition towards continued engagement with the park. Although some variability is indicated by the standard deviations, the consistently elevated mean scores highlight a prevalent inclination towards ongoing interaction with the park.

The factor loadings, ranging from 0.421 to 0.729, suggest that these behavioral intentions significantly contribute to the underlying construct of visitors' future engagement with the national park. Specifically, visitors express a strong likelihood of revisiting the park, speaking positively about it, recommending it to others, prioritizing it over other national parks, and extending their duration of stay during subsequent visits. In summary, these findings indicate a positive outlook on future visitor behavior and imply the potential for sustained support and promotion of the national park.

D) Rotated Component Matrix

Table 15: Rotated Component Matrix^a

	Component		
	1	2	3
NPSus 3	.728		
NPSus 1	.698		
NPSus 4	.692		
NPSus 2	.674		
NpSus 8	.658		
NPSus 7	.575		
NPBI 4		.773	
NPBI 3		.756	
NPBI 5		.716	
NPBI 2		.710	
NPSAT 3			.817
NPSAT 2			.787
NPSAT 4			.597
Extraction Method: Principal Component Analysis.			
Rotation Method: Varimax with Kaiser Normalization.			
a. Rotation converged in 5 iterations.			

(Source: Authors own creation)

The rotated component matrix displays the loadings of each variable on the extracted components after rotation. Three components are identified, labeled as Component 1, Component 2, and Component 3. Variables related to National Park Sustainability (NPSus) primarily load onto Component 1, with loadings ranging from 0.575 to 0.728. This suggests that Component 1 may represent aspects related to the sustainability of national parks. National Park Behavioral Intentions (NPBI) variables load heavily onto Component 2, with loadings ranging from 0.710 to 0.773. This indicates that Component 2 may reflect factors associated with visitors' intentions and behaviors towards national parks. National Park Satisfaction (NPSat) variables load predominantly onto Component 3, with loadings ranging from 0.597

to 0.817. This suggests that Component 3 may capture aspects related to visitors' satisfaction with their park experiences.

e) Communalities

Table 16: Communalities

	Initial	Extraction
NPSus 1	1.000	.521
NPSus 2	1.000	.471
NPSus 3	1.000	.542
NPSus 4	1.000	.528
NPSus 7	1.000	.422
NPSus 8	1.000	.473
NPSat 2	1.000	.643
NPSat 3	1.000	.717
NPSat 4	1.000	.486
NPBI 2	1.000	.509
NPBI 3	1.000	.577
NPBI 4	1.000	.617
NPBI 5	1.000	.541
Extraction Method: Principal Component Analysis.		

(Source: Authors own creation)

The communalities represent the proportion of variance in each variable that is accounted for by the extracted components. For most variables, the communalities after extraction range from 0.422 to 0.717, indicating that a significant portion of the variance in these variables is explained by the extracted components. Higher communalities suggest that the variables are well-represented by the extracted components, indicating a good fit of the PCA model to the data. Overall, the rotated component matrix and communalities provide insights into the underlying structure of the variables and their relationships within the dataset, facilitating a better understanding of the dimensions of National Park Sustainability, Behavioral Intentions, and Satisfaction.

6.2 Interpretation:

Table 17: Model Interpretation

	Components		
	Sustainability	Behavioral Intentions	Satisfaction
NPSus 3	.728		
NPSus 1	.698		
NPSus 4	.692		
NPSus 2	.674		
NpSus 8	.658		
NPSus 7	.575		
NPBI 4		.773	
NPBI 3		.756	
NPBI 5		.716	
NPBI 2		.710	
NPSAT 3			.817
NPSAT 2			.787
NPSAT 4			.597

(Source: Authors own creation)

The factor analysis results suggest that three distinct components, labeled Sustainability, Satisfaction, and Behavioral Intention, emerge from the examined variables. Within the Sustainability component, variables NPSus 3, NPSus 1, NPSus 4, NPSus 2, NpSus 8, and NPSus 7 are highly correlated, indicating that they collectively represent aspects related to sustainability. Satisfaction, represented by variables NPSAT 3, NPSAT 2, and NPSAT 4, demonstrates strong interrelatedness among these measures, reflecting a coherent construct capturing customer satisfaction. Additionally, the Behavioral Intention component, represented by variables NPBI 4, NPBI 3, NPBI 5, and NPBI 2, exhibits high correlations, indicating a cohesive representation of customers' behavioral intentions towards the brand or product. The factor loadings, particularly those nearing or exceeding 0.7, indicate the strength of each variable's contribution to its

respective component. This analysis provides insights into the underlying structure of the examined variables, offering a framework for understanding the interplay between sustainability, satisfaction, and behavioral intention within the context of customer perceptions and attitudes.

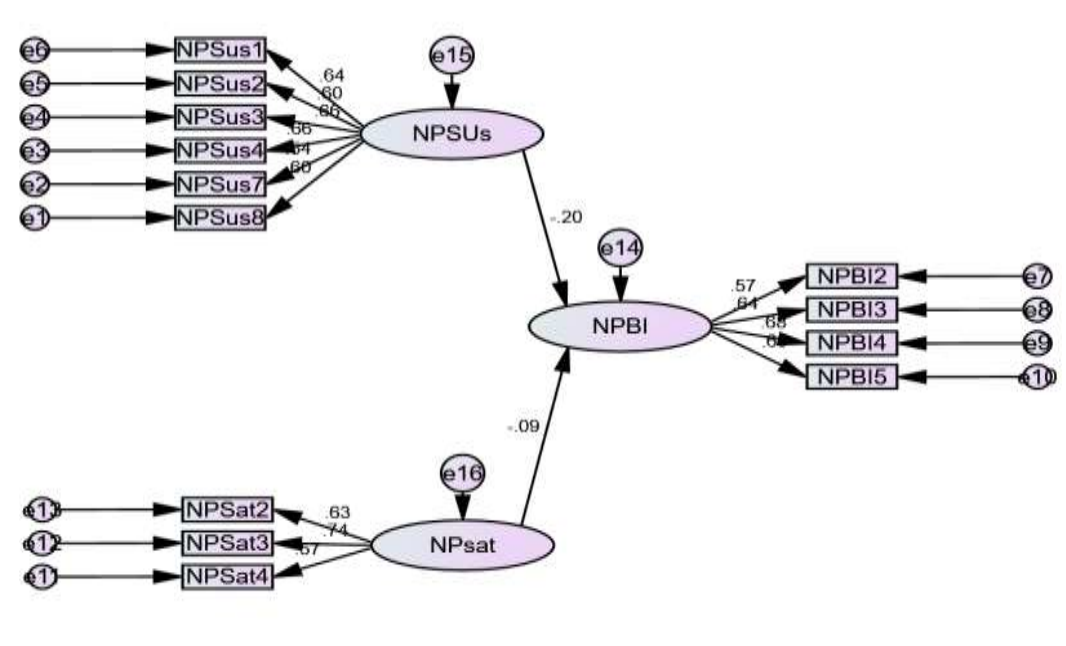


Figure 14 : SEM Model
(Source: Authors own creation)

Minimum was achieved
Chi-square = 150.334
Degrees of freedom = 63
Probability level = .000

The minimum value was achieved for the Chi-square statistic, indicating that the model fits the data well. The Chi-square value is 150.334 with 63 degrees of freedom. The probability level associated with this Chi-square value is less than 0.001 ($p < .000$), suggesting that the model's fit to the data is statistically significant. Overall, these results indicate a good fit between the proposed structural model and the observed data, as the minimum Chi-square value suggests that the model adequately explains the relationships among the variables.

Table 18: Correlations and Testing of Hypothesis

			Estimate	S.E.	C.R.	P	Label
NPBI	<---	NPSUs	-.254	.113	-2.242	.025	par_11
NPBI	<---	NPSat	-.101	.103	-.981	.327	par_12
Q8	<---	NPSUs	1.000				
Q7	<---	NPSUs	.844	.132	6.387	***	par_1
Q4	<---	NPSUs	.982	.135	7.262	***	par_2
Q3	<---	NPSUs	.986	.136	7.265	***	par_3
Q2	<---	NPSUs	.981	.143	6.851	***	par_4
Q1	<---	NPSUs	1.069	.150	7.136	***	par_5
ID2	<---	NPBI	1.000				
ID3	<---	NPBI	1.136	.177	6.431	***	par_6
ID4	<---	NPBI	1.070	.163	6.575	***	par_7
ID5	<---	NPBI	1.069	.165	6.466	***	par_8
CD3	<---	NPsat	1.272	.225	5.642	***	par_9
CD2	<---	NPsat	.945	.159	5.955	***	par_10
CD4	<---	NPsat	1.000				

(Source: Authors own creation)

The structural equation modeling (SEM) analysis reveals several significant relationships among the examined variables, including National Park Sustainability (NPSUs), National Park Behavioral Intention (NPBI), and National Park Satisfaction (NPsat). Firstly, NPSUs negatively influences NPBI (Estimate = - 0.254, $p = 0.025$), indicating that lower levels of national park satisfaction are associated with decreased behavioral intention towards national parks. Similarly, NPsat also exhibits a negative but non-significant influence on NPBI ($p = 0.327$). Additionally, survey questions Q7, Q4, Q3, Q2, and Q1 positively impact NPSUs, implying that responses to these questions contribute to higher levels of national park satisfaction. Conversely, variables ID3, ID4, and ID5 significantly influence

NPBI positively, suggesting that certain unidentified factors positively influence behavioral intentions towards national parks. Furthermore, CD3 and CD2 positively impact NPSat, indicating that certain unspecified conditions contribute to higher levels of national park satisfaction. The regression coefficient for the relationship between NPSus and NPBI is -0.254. This negative coefficient suggests that as NPSus increases, NPBI tends to decrease. However, the relationship is not statistically significant at the conventional significance level of $\alpha = 0.05$, as indicated by the t-value of -2.242 and the p-value of 0.025. Therefore, there is insufficient evidence to support the hypothesis that there is a significant relationship between NPSus and NPBI. The regression coefficient for the relationship between NPSat and NPBI is -0.101. This negative coefficient suggests that as NPSat increases, NPBI tends to decrease. However, similar to Hypothesis 1, the relationship is not statistically significant at the conventional significance level of $\alpha = 0.05$, as indicated by the t-value of -0.981 and the p-value of 0.327. Therefore, there is insufficient evidence to support the hypothesis that there is a significant relationship between NPSat and NPBI. The analysis suggests that neither NPSus nor NPSat has a significant relationship with NPBI based on the provided regression coefficients, t-values, and p-values. These findings indicate that other factors not accounted for in the analysis may influence National Park Behavioral Intentions. Further research may be necessary to explore these factors and their impact on visitor intentions towards national parks.

6.3 Summary

The study investigated the influence of National Park Sustainability (NPSus) on National Park Satisfaction (NPSat) and National Park Behavioral Intention (NPBI) with a focus on Manas National Park, Assam. The findings revealed that NPSus significantly affects both NPSat and NPBI. Moreover, NPSat was found to mediate the relationship between NPSus and NPBI, highlighting the importance of visitor satisfaction in shaping their behavioral intentions. Additionally, a significant direct relationship was observed between NPSat and NPBI, suggesting that higher satisfaction levels lead to stronger intentions to engage in positive behaviors towards the national park. This exploratory study was conducted to increase our current understanding of National Park Sustainability (NPSus). It has attempted to

cast light on the unexamined area of National Park Satisfaction and National Park Behavioral Intentions. Visiting national park has always been in a traveler's list and for the sustainability of National Park this study has put light on different factors which influence a tourist to choose national park. Manas National Park one of the important National Park in Assam which accumulates many tourists from all over the globe. Several studies have been undertaken in respect of bio diversity and tourism but very few have been focused on the sustainability and its factors for Manas National Park. The study particularly emphasizes to increase the in-depth understanding of the concept of Sustainability and its importance for any national park. It throws a light on the methods of factors influencing on the choice of a visiting Manas National Park by tourist and their respective factors of feedback about satisfaction and behavioral intentions for visiting Manas National Park.

The main results of the study indicate that sustainability plays an important role in the choice of visiting National Park. The tourist seems to be aware of which sustainability attributes like flora and fauna, clean air, habitat for wildlife, key species, income generation, spending on local services and products etc. The other factor which needs to be looked into by the park management authority is the satisfaction where the tourist conveyed their reason about decision to visit the park, worthy of visiting etc., the analysis has shown that the customers were satisfied and their decision of visiting the national park was a wise one. Behavioral Intention also play an important role in determining their future intentions to visit the park. Attributes like recommending the park to others, saying positive things about the park, choosing the national park again and making the park as the first choice had positive impacts on the respondents.

The descriptive statistics and factor analysis conducted for each construct provided valuable insights into the perceptions and attitudes of visitors. The assessment of NPSus factors indicated moderate levels of sustainability across various criteria, with areas for improvement identified, particularly regarding noise pollution, income allocation to local communities, and conservation efforts. Similarly, the analysis of NPSat items revealed varying degrees of satisfaction among visitors, with some aspects scoring higher than others. While visitors generally expressed satisfaction with their decision to visit the national park, there were areas where

satisfaction could be enhanced, such as perceived worthiness of the visit.

Furthermore, the examination of NPBI items highlighted strong intentions among visitors to engage in positive behaviors towards the national park, including future visits, recommendations to others, and extended stays. These findings highlight the importance of fostering sustainable practices within national parks to ensure visitor satisfaction and promote positive behavioral intentions.

In conclusion, the study contributes to understanding the complex interplay between sustainability, satisfaction, and behavioral intentions within the context of national park tourism. It emphasizes the need for park management authorities to prioritize sustainability initiatives, enhance visitor satisfaction through improved services and experiences, and leverage satisfied visitors as advocates for promoting the park's conservation and sustainable development goals.

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CHAPTER 7

FINDINGS, SUGGESTIONS AND CONCLUSION

7.1 Introduction

This study provides a thorough analysis of the sustainability and administration of Manas National Park (MNP) as well as the means of subsistence for nearby fringe settlements. The study commences with an introductory section on sustainability and national parks, which is then followed by a comprehensive examination of the management aspects of MNP in accordance with sustainability principles. This analysis is substantiated by an extensive body of literature. The study examines the present condition of livelihoods in four villages (Gyti, Naranguri, Raghob Bill, and Bhuyapara) surrounding MNP. It identifies the environmental, economic, physical, human, and social resources that support these populations. The study also examines the beliefs and opinions of these populations toward conservation and development efforts in the park, using several indicators and statistical tools such as Kendall's tau for analyzing correlations. In addition to the quantitative data, Focus Group talks (FGDs) were carried out to collect perspectives and supplementary information by engaging in talks with community members. The study also investigates the impact of sustainability and satisfaction on tourists' likelihood to recommend and revisit Manas National Park. The objective of this analysis is to examine the correlation between tourists' views of the park's sustainability and their overall pleasure, as well as the influence of these characteristics on behavioral intentions such as promoting the park to others and planning future trips. Information provided by tourists offers useful insights for increasing visitor experiences and improving management processes. Based on the findings, the paper suggests several alternatives for the sustainable development and management of MNP. The complete analysis seeks to provide valuable insights for improved management techniques and foster a stronger connection between the park and its neighboring communities, so encouraging both conservation efforts and local development. Below are the main discoveries.

7.2 Objective wise findings

7.2.1 Objective 1: To examine the sustainability and management of Manas National Park, Assam

a) Sustainability of Manas National Park

- The study finds that local populations, especially the Bodo tribe, play a crucial role in the sustainability of Manas National Park. The Bodoland Territorial Council's establishment in 2003 improved local involvement in conservation. However, challenges remain, such as inadequate local input during leadership transitions, leading to conflicts and increased illegal hunting. Effective conservation requires stronger cooperation between park administrators and local communities to protect the park's ecological balance.
- The study finds that Manas National Park has significantly advanced in environmental conservation, notably after overcoming Bodo insurgency challenges. Key efforts in biodiversity protection and habitat restoration led to its removal from endangered status in 2011. Sustainable practices, including managing invasive species and reducing pollution, have improved its environmental sustainability. The park's UNESCO World Heritage Site status and the closure of the Mathanguri picnic area emphasize its commitment to reducing litter and protecting its ecosystems.
- The study finds that efficient resource management is vital for Manas National Park's sustainability. Strategies for managing water, plants, and animals, along with habitat restoration, have improved the park's resilience. Regular data evaluation supports ecosystem health and visitor experiences. However, poor infrastructure in many ranges leads to inadequate patrolling and increased poaching. In the Bhuyapara range, poor road conditions hinder effective patrolling, necessitating less efficient foot patrols.
- The study finds that technological advancements have significantly improved park management and visitor experiences in Manas National Park. Remote monitoring technologies, such as cameras and sensors, enhance the efficiency of species and ecosystem monitoring. Management technologies, including software and databases, streamline administrative tasks, resource allocation, and maintenance

scheduling. These tools boost operational efficiency, resource conservation, and visitor satisfaction, thereby contributing to the park's sustainability.

- The study finds that economic sustainability in Manas National Park involves generating income to support park operations and local economies while maintaining environmental and social integrity. Revenue sources include entrance fees and safaris. Promoting tourism has boosted local economies through visitor spending and job creation. Effective funding strategies ensure revenue generation aligns with conservation objectives, balancing economic benefits with environmental care. Responsible income generation allows the park to sustainably fund conservation initiatives, enhance tourist experiences, and provide long-term support to local communities.
- The study finds that resolving conflicts between local communities and park authorities has been crucial for the sustainability of Manas National Park. During the insurgency, exclusion and lack of resource access posed significant challenges. The establishment of the BTC and the subsequent involvement of local communities in park management have mitigated these conflicts. Local residents, now recognizing the benefits of conservation, actively participate in the park's restoration and management. This community engagement has reduced conflicts and enhanced the park's conservation outcomes and sustainability.
- The study finds that Manas National Park is a vital component of the Eastern Himalayan biodiversity hotspot, serving as a critical refuge for endangered species such as the one-horned rhinoceros, Asiatic elephant, and Royal Bengal tiger. The park's diverse ecosystems and habitats are essential for the survival of these species, highlighting its importance in global biodiversity conservation efforts. The preservation of such key species stresses the park's role in maintaining the ecological balance and richness of this unique region.
- The study finds that sustainable visitor management practices at Manas National Park include the implementation of visitor education programs, development of infrastructure in sensitive areas, and the use of technology to manage daily visitor numbers. These strategies are designed to minimize environmental impact, educate visitors about conservation, and regulate the flow of tourism to protect delicate

ecosystems and wildlife habitats.

- The study finds that from April 2023 to December 2024, Manas National Park attracted over 30,725 tourists, including 410 international visitors. This influx of tourists underlines the park's economic significance and emphasizes the importance of implementing sustainable tourism practices. Effective management is necessary to balance economic benefits with environmental protection.
- The study finds that local communities and indigenous peoples are integral to the sustainable management of Manas National Park. Their traditional knowledge and practices play a crucial role in biodiversity conservation. Engaging these communities in park management ensures that conservation efforts are culturally relevant and more effective.
- The study finds that Manas National Park regained its World Heritage status in 2011, which it had lost in 2003 due to socio-political instability. This achievement was the result of collaborative conservation efforts involving local communities, demonstrating the park's commitment to restoration and sustainable management.
- The study finds that the development of sustainable tourism infrastructure is critical for minimizing resource consumption, particularly of water and wood, which are in high demand due to tourism activities. Implementing sustainable practices in infrastructure development helps reduce the park's environmental footprint.
- The study finds that between 1991 and 2004, socio-political upheaval led to the encroachment of 20.47 km² of the park's land. This encroachment highlights ongoing challenges in maintaining ecological and economic sustainability, stressing the need for effective management strategies to address these issues.
- The study finds that effective management practices are employed at Manas National Park to address environmental impacts such as land degradation, soil erosion, pollution, and deforestation. These challenges are often linked to economic activities, and managing them requires a comprehensive approach to environmental conservation.
- The study finds that indigenous communities play a significant role in managing forest carbon globally, contributing substantially to climate change mitigation efforts. Their involvement in forest management helps in maintaining carbon

sequestration and supporting broader climate goals.

- The study finds that implementing effective visitor management systems enhances visitor satisfaction by promoting sustainable tourism practices. Ensuring that visitor experiences are positive while maintaining environmental integrity benefits the park's stakeholders and supports long-term conservation goals.
- The study finds that human-wildlife conflicts, exacerbated by unequal development and infrastructure disparities across the park's ranges, highlight the need for balanced development and effective conflict management strategies. Addressing these conflicts is crucial for maintaining harmonious interactions between wildlife and local communities.
- The study finds that collaborative conservation efforts involving the Department of Environment and Forest, Bodoland Territorial Council (BTC), NGOs, local organizations, and fringe villagers have significantly contributed to the park's sustainability. This collective approach demonstrates the effectiveness of community-based conservation strategies in achieving long-term environmental goals.

b) Management of Manas National Park.

- The study finds that the management of Manas National Park (MNP) operates through a hybrid system of centralization and decentralization. This includes governance by the Assam Forest Department, which provides policy formulation and compliance with international agreements, the Bodoland Territorial Council (BTC), which handles local governance and forest management, and the Manas National Park and Tiger Project for the Baksa District, which supports specific conservation initiatives. This framework aims to integrate central control with localized decision-making to address both high-level policy and on-the-ground management needs.
- The study finds that the Assam Forest Department is responsible for overarching policy creation and ensuring adherence to national and international conservation standards. The BTC is tasked with managing local governance issues and the

practical aspects of forest management within the park. Additionally, local municipalities contribute to land use and development decisions around the park, affecting both conservation efforts and local economic activities.

- The study finds that the park's fragmented management structure presents significant challenges, including operational inefficiencies and difficulties in coordination. The overlapping roles and responsibilities among the Assam Forest Department, BTC, and local municipalities often lead to unclear lines of authority and decision-making processes, complicating the management and conservation efforts within the park.
- The study finds that inconsistencies in staffing levels pose a challenge due to the involvement of both the BTC and the Assam Government. The BTC employs casual staff for various tasks, while the Assam Government appoints formal staff. This dual approach to recruitment creates inconsistencies in staffing and operational efficiency. Additionally, various positions remain vacant, exacerbating these issues and impacting the park's management and conservation capabilities.
- The study finds that there are significant coordination deficiencies between park officials and local communities. This lack of effective communication and collaboration leads to dissatisfaction among local stakeholders and hampers the efficiency of park management practices. Improved coordination is necessary to enhance management outcomes and community relations.
- The study finds that park officials face several operational challenges, including outdated equipment, low staff morale, and inadequate infrastructure. These factors undermine the ability of park staff to effectively perform their duties, impacting their capacity to manage and conserve the park's resources and respond to emerging issues.
- The study finds that imposter syndrome affects some park officials and staff, leading to feelings of inadequacy and self-doubt despite their qualifications and achievements. This psychological barrier impedes their confidence and effectiveness, potentially affecting their performance and decision-making abilities within the park.

- The study finds that park management struggles with development imbalances, particularly as only two of the four park ranges—Bhuyapara and Bansbari—are currently operational. There is a disproportionate emphasis on development in the Bansbari Range compared to other areas, which contributes to uneven development and management practices across the park.
- The study finds that conflicts within MNP management are primarily related to coordination with local communities and decision-making processes. Some non-governmental organizations attribute these conflicts to the decentralization of authority, where central decisions on fee structures and safari routes lead to dissatisfaction among locals. Additionally, conflicts often arise when locals, who sometimes engage in resource collection, encounter park officials, leading to confrontations and violence.
- The study finds that park personnel are involved in a wide range of activities, including patrolling, wildlife monitoring, conducting animal censuses, guiding tourists, supporting local communities, assisting the veterinary team, and maintaining park boundaries. Challenges faced by personnel include outdated firearms, insufficient training, and a lack of ongoing professional development, which affect their ability to effectively carry out these duties and support the park's conservation and management efforts.
- The study finds that Manas National Park (MNP) presents a mix of strengths, weaknesses, opportunities, and threats. Its global appeal attracts significant tourist revenue, which can boost the local economy and government funds, especially with effective management and infrastructure. However, weaknesses such as ongoing poaching, illegal activities, and the closure of key facilities like Mathan Guri Bungalow, along with inadequate surveillance and infrastructure, undermine conservation and development efforts. Opportunities lie in revitalizing the non-functional Panbari and Kuklung ranges, enhancing ecotourism, and leveraging local knowledge for sustainable practices. Despite these prospects, the park faces threats including biodiversity degradation, pollution, habitat loss, and insufficient compensation for affected communities. Addressing these challenges requires a collaborative approach and proactive measures to ensure the park's long-term

sustainability and community well-being.

Research Question 1: How do planning initiatives affect the sustainable development of communities adjacent to Manas National Park?

The study finds that planning initiatives are pivotal for the sustainable development of communities surrounding Manas National Park (MNP). Effective planning can significantly improve resource management, infrastructure development, and community engagement, which are essential for achieving long-term sustainability. By enhancing the management of natural resources, planning helps in better allocation and utilization, ensuring that both ecological and community needs are met. Infrastructure development, such as improving transportation and communication networks, supports economic activities and facilitates access to the park, thereby promoting tourism and local business opportunities. Community involvement in planning processes ensures that the needs and perspectives of local populations are considered, fostering cooperation and support for conservation efforts. Engaging communities in decision-making helps in aligning development goals with conservation objectives, thereby reducing conflicts and enhancing the effectiveness of sustainability initiatives. Imbalanced development is observed in areas such as Bhuyapara village, adjacent to the Bhuyapara Range, which remains underdeveloped. Poor road conditions, inadequate electricity, and limited economic opportunities characterize this region, while deteriorating roads within the Bhuyapara Range further discourage visitor engagement, particularly for safari activities. In contrast, the Bansbari Range receives disproportionate attention, leading to developmental imbalances and disparities in benefits. This uneven focus impedes overall progress and affects conservation effectiveness and economic potential. Addressing these issues requires planning initiatives that emphasize equitable development, ensuring that all communities, including those in underdeveloped areas, receive adequate resources and opportunities, thereby enhancing both conservation outcomes and economic development.

7.2.2 Objective 2: To study the current state of livelihood of people in villages living adjacent to Manas National Park.

The livelihood study revealed an unequal distribution of resource endowments and rights. Most households have access to land, labor, and forests, but capital is limited. A small proportion of households have access to credit, and saving is not prevalent. The majority of the land is passed down by inheritance, but the educational attainment is generally poor, with a somewhat lower level for women compared to men.

Agriculture is a significant and widely practiced activity that involves the majority of households in the study area. The primary commodities obtained from the forest comprise of fuel wood, thatch grass, and medicinal plants. The main obstacles to enhancing livelihoods were the presence of inefficient local product marketplaces, transportation limitations, restricted access to forest resources, and limited availability of credit. As a consequence, there was a decline in productivity and a significant occurrence of entitlements and exchange failures. Local populations have seen that conservation efforts have led to a reduction in the availability of forest products. Insufficient law enforcement, ineffective governance, and economic leakage caused by weak governance are other factors contributing to the observed negative association in the field and during focus group discussions. Inadequate governance arose due to the government's inability to efficiently enforce and execute the law. The local community has the belief that their participation in decision-making processes about the forest resources will enhance their collaboration with other relevant parties in the study area.

A) Household Endowments

Basic household characteristics revealed by this study find that the size of household's ranges from 1 to 6 people (members) All the households are headed by males. All the households are kacha in nature and 58 household are self-made, only two household was funded by Government. All people surveyed are local residents and have been staying there since Birth. The average income of the locals are Rs. 5000 and 60% people are literate and 40% are not literate. According to a 2008

study conducted by the World Bank, education and health are crucial factors that can significantly impact a person's involvement in high-return non-farm activities and their potential to improve agricultural productivity. However, it is worth noting that these factors are often lacking in rural areas. Households with lower earnings are more susceptible to poor health, which in turn impacts their selection of livelihood activities.

The study area has a low level of education, with women having a somewhat lower level of education compared to men. There is a negative correlation between education and forest reliance. More highly educated households had access to a broader array of earning prospects.

- **Land**

The entire sample group had complete access to land for agricultural purposes. According to the household survey, 93% of the households obtained land through inheritance. 7% of the land owned or leased by the household was acquired through purchase or rental.

There was an unequal distribution of land ownership among households in the research area. Certain villages possessed larger land holdings than others. The majority of households have land sizes ranging from 1 to 4 Bigha. Only a small number of households owned land larger than 3 Bighas.

1. The majority of households rely on their primary occupation, which can include farming, service-oriented jobs (such as teaching or manual labor), or entrepreneurial ventures. Additionally, they are engaging in other subsidiary occupations throughout the year, even during the lean period.
2. Small-scale farmers often engage in share-cropping, wage-earning, or labor jobs as subsidiary occupations in order to increase their revenue.
3. Individuals engaged primarily in service-oriented professions such as education or labour, as well as those involved in business, also pursue farming as a secondary occupation on their accessible agricultural property.
4. Some households partially rely on tourism and ecotourism in and around the MNP for their livelihoods. This is because not all households are completely dependent on tourism in the MNP.

- **Labour**

The labour supply in the research area was typically determined by the household size. The age distribution in the research area indicates a significant majority of individuals belong to the 18-35 age group. The study area has a small population of older individuals. Compared to other age groups, their contribution to the domestic labour force is relatively minimal. All of the homes included in the sample fully utilized their household labour resources. In the majority of cases, labour is not hired. A significant number of participants in the research region are engaged in self-employment.

- **Capital**

In the research region, there exist non-governmental organizations (NGOs) and financial institutions that offer loans to local residents for suitable agricultural initiatives. However, only a small number of individuals have reaped the advantages of these initiatives due to limited accessibility for local residents and worries around interest rates and insufficient information provided to the local community. While it is quite typical for households to have a bank account, the poll found that the majority of savings are mostly kept in the form of cash. The majority of households are unable to save savings for a period exceeding 6 months. A bank account enables individuals to obtain credit. Nevertheless, a mere 8% of households possess the means to obtain credit. The primary objective of obtaining a loan is for business purposes. Nevertheless, a significant majority of 70% of households indicated that, despite their efforts, they were unable to secure the loan when it was required. The identified barriers to obtaining a loan differed among the households that were surveyed. In general, it was noted that banks maintain highly stringent policies when it comes to granting loans.

- **Livestock**

This survey demonstrates that around 90% of all households are presently engaged in livestock rearing and agricultural cultivation/selling endeavours. Previously, the region was mostly inhabited by a significant population of domesticated animals. Despite the legal prohibition, local residents continue to gather forest products such as "Mati Kal Dub" (a type of plant), fish, fallen timber, and thatch grass from the

forest. All of them rely to some extent on the collecting of these things. Despite the statutory laws, a significant number of individuals continue to adhere to their customary rights and traditions concerning the park resources. Prior to the park's construction, a diverse range of items was collected in that location. Nevertheless, the designation of the region as a National Park resulted in the prohibition of collecting numerous things from the park. Gathering firewood from within the park is strictly prohibited. However, there are limitations on accessing this collection. Although grazing is forbidden, some local residents nonetheless let their livestock to graze.

- **Household Entitlements I**

The main occupation of family heads mostly revolves around agricultural operations, particularly the cultivation and trade of crops and traditional dairy products. This signifies a significant dependence on agriculture as the primary means of sustenance for the majority of households. A minority of family heads are engaged in salaried occupations, suggesting the existence of formal employment in the society. Furthermore, there are individuals who serve as heads of households and engage in informal labor, indicating the presence of transient and perhaps less secure job prospects. Moreover, a small number of household leaders are engaged in crafts and arts, indicating their involvement in cultural or artisanal occupations. Finally, a significant segment of the community is involved in commerce and service providing, indicating the prevalence of entrepreneurial endeavors and small-scale enterprises. In general, the data indicates that household heads have a wide variety of vocations, with a notable focus on agricultural production. Additionally, they are engaged in other sectors such as salaried work, casual labor, crafts, and trade services.

Livestock farming is a significant contributor to agricultural revenue. Approximately 72% of the participants are engaged in animal husbandry and the cultivation and sale of crops. The mean number of animals per family is approximately 7 units. Approximately 60% of households raise poultry. Cattle have the greatest price, followed by goats in second place, and pigs in third place. However, the average number of cattle held is merely 4 livestock units. The inputs utilized encompass feed, labor, water, and certain medications. In modern times,

animals are primarily confined to and raised in the vicinity of residential neighbourhoods, separate from agricultural fields. This suggests that the level of labour needed is significantly lower in comparison to the demands of crop production.

- **Environmental Revenue**

Within the framework of Manas National Park (MNP), environmental revenue refers to the combination of sources that are both directly and indirectly related to the park. Environmental revenue typically makes a substantial contribution to the overall household income. Engaging in activities such as grazing, fishing, and harvesting diverse resources such as firewood, plants, thatching grass, vegetables, wild medicine, and honey are essential for generating revenue. Regarding environmental income, a fraction is obtained from resources within the park, however a greater proportion originates from activities outside the park. A significant number of households engage in the collection of forest products from Manas National Park, however they do not regard this activity as a formal vocation. This emphasizes the significance of MNP as a crucial means of providing additional revenue for local communities. Firewood is the main source of income from the environment, both in park and non-park locations. This form of revenue is especially crucial for low-income households in the region, as they depend on it more extensively in contrast to households with moderate incomes. Conversely, affluent households rely less on environmental income due to their varied sources of income. The aforementioned pattern corresponds to the results of Vedeld et al. (2004), which suggest that communities that heavily rely on environmental resources tend to experience lower total wages. This implies that within the context of Manas National Park (MNP), the financial benefits derived from the environment are essential for maintaining impoverished households, but more affluent households are less dependent on these resources.

The finding also indicates a notable disparity in reliance on environmental income between households in the Bansbari Area and those in Bhuyapara. The settlements neighboring Manas National Park in Bhuyapara mainly depend on environmental income in comparison to other regions. This increased reliance leads to problems such as intrusion and conflicts between humans and animals in the area. According

to Vedeld et al. (2004), communities frequently participate in these activities because they do not have other viable ways to make a living. Hence, these activities are vital for the sustenance and well-being of impoverished communities. Nevertheless, imposing limitations on the gathering of these items may potentially decrease disputes, underscoring the necessity for equitable and enduring management strategies within the park region.

- **Other sources of income**

Most residents in the four fringe villages of Manas National Park derive their income from plantations, agriculture, and farming. A smaller segment of the population engages in entrepreneurial activities related to tourism services, such as running homestays, shops, and providing Gypsy tours for visitors. Those involved in these services typically lack additional sources of income but maintain plantations and agricultural outputs for their own use. This dual approach helps sustain their livelihood, blending tourism-related services with subsistence farming practices.

- **Household Constraints to Improved Livelihoods**

This section outlines the key limitations faced by local populations in improving their livelihoods. The primary constraints, ranked by significance, are: inadequate market access and poor pricing for goods, restricted access to forest products, difficulties in obtaining land, and limited financial capital. Despite park laws prohibiting the use of park resources, local sentiments permit the collection of dead timber and plants, although this is often seen as illegal due to strict regulations. Fieldwork reveals a detailed list of prohibited activities within the park, including hunting, fishing, unauthorized parking, and gathering medicinal plants and fruits, which highlight restrictions on local resource use. Additionally, declining crop yields, inconsistent market access, and low prices due to unfair market practices exacerbate economic challenges for local farmers. Insufficient market infrastructure and a lack of effective government support further hinder agricultural and economic development, impeding the improvement of livelihoods and sustainable growth in the area.

- **Human animal conflict**

Human-animal conflict significantly impacts the livelihoods of residents in Bhuyapara village, which is located near the park range. Frequent encounters with elephants result in damage to villagers' homes, while wild hogs cause substantial crop destruction. Unfortunately, the villagers do not receive compensation from the park for these losses, exacerbating the challenges they face.

- b) **Livelihood Capital**

Based on the analysis of various dimensions of livelihood capital, the following findings can be summarized. This section presents an analysis of the livelihood capital of families residing in the four villages (Gyti, Naranguri, Raghob Bill, Bhuyapara) adjacent to Manas National Park (MNP). The findings cover various dimensions of livelihood capital, including natural, physical, human, financial, and social aspects, providing insights into the resources and challenges faced by these communities.

- **Natural Capital:**

The natural capital of these villages is primarily characterized by farmland and land quality. Families have an average farmland area of 2.87 Bighas, with a standard deviation of 1.27, indicating some variability in land holdings. The land quality, rated with a mean score of 3.583 (SD = 0.493), suggests that most farmland is perceived as between average and fertile. This relatively high land quality rating indicates a solid foundation for agricultural activities, although the variability in land area might influence the extent of farming activities and productivity across different households.

- **Physical Capital:**

Physical capital, encompassing homestead area, asset ownership, and livestock breeding, plays a crucial role in defining the living conditions of these families. The average homestead area is 3.55 m² (SD = 0.441), reflecting relatively spacious living conditions. Families own an average of 2.6 assets, such as refrigerators and vehicles (SD = 0.51), which denotes moderate asset ownership and suggests a degree of economic stability. However, the low average score for livestock and

poultry breeding (0.9, SD = 0.5) indicates that not all families engage in these activities, which could affect their income diversification and food security.

- **Human Capital:**

Human capital is a critical dimension, reflecting family size, education, health, and skill development. The average family size is 4.25 members (SD = 0.946), which is typical for the region. The participation rate in professional skill training programs is relatively low, with only 20% of families involved (SD = 0.40). This limited engagement in skill development could impact employment opportunities and income levels. The average education level of 1.42 (SD = 0.714) suggests that many respondents have achieved primary school education or below, which may constrain their access to higher-paying jobs or further training. Health indicators show that most respondents perceive themselves as healthy, with an average physical health condition score of 0.75 (SD = 0.433). However, the average frequency of seeking medical treatment is 1 time per year (SD = 1.064), indicating variability in access to healthcare services. Approximately 46.7% of families are involved in off-farm activities such as running a business or homestay (SD = 0.512), highlighting some level of economic diversification.

- **Financial Capital:**

Financial capital is reflected in the annual family income, with a mean score of 1.92, indicating that most families fall within the income range of INR 30,000–90,000 (SD = 0.84). This income distribution suggests that a significant portion of the population resides in lower income brackets, which could affect their overall economic stability and ability to invest in livelihood improvements.

- **Social Capital:**

Social capital encompasses relationships with agricultural cooperatives, relatives, park officials, and transportation infrastructure. Only 32% of families are members of agricultural cooperatives (SD = 0.47), which suggests limited participation in organized farming activities that could provide collective benefits. The average relationship score with relatives is 1.77 (SD = 0.90), indicating generally positive relationships within families. Road conditions, with a mean score of 0.6 (SD = 0.49), reveal that most roads are unpaved, affecting transportation convenience,

which has an average score of 2.2 (SD = 0.73). This suggests that transportation infrastructure is inadequate and impact the accessibility of resources and markets. Relationships with park officials score an average of 1.75 (SD = 0.82), reflecting generally positive interactions that could facilitate better cooperation and support for local development and conservation efforts.

Research Question 2: How does park management impact the livelihoods of people living adjacent to Manas National Park?

Park management impacts the livelihoods of people living adjacent to Manas National Park by imposing restrictions on resource utilization, such as prohibitions on gathering forest products, which diminishes access to essential materials like fuel wood and medicinal plants. These restrictions, coupled with inadequate market access and poor pricing for goods, create significant economic challenges for local residents. Limited access to financial capital and credit further exacerbates these difficulties, preventing investment in agricultural improvements and income diversification. Additionally, ineffective governance and enforcement, along with frequent human-wildlife conflicts, strain livelihoods, as the community often faces losses without compensation. The local population believes that increased involvement in decision-making processes could enhance cooperation and lead to more balanced and sustainable management practices, better aligning conservation efforts with community needs.

7.2.3 Objective 3: To analyze the perception and attitude of fringe community adjacent to Manas National Park towards conservation and development.

A) Findings from empirical analysis

Based on the correlation analysis of the variables related to the perception and attitude of the fringe community adjacent to Manas National Park (MNP) towards conservation and development, the following findings are summarized:

- The study finds that there is a weak positive but non-significant correlation ($r = 0.164$, $p = 0.069$) between park resources and wildlife protection efforts. This suggests a slight tendency for increased park resources to be associated with better wildlife protection, though this relationship is not statistically significant.

- The study finds a significant positive correlation ($r = 0.178$, $p = 0.050$) between park resources and community relations with the park. This indicates that better park resources are associated with improved community relations, highlighting the role of resource allocation in fostering positive interactions with local communities.
- The study finds no significant correlation ($r = 0.039$, $p = 0.673$) between park resources and economic impact. This suggests that perceptions of park resources do not significantly influence the perceived economic benefits for surrounding communities.
- The study finds a significant positive correlation ($r = 0.272$, $p = 0.003$) between community relations with the park and perceived economic impact. This indicates that better relations between the community and the park are associated with greater perceived economic benefits for the local population.
- The study finds a significant positive correlation ($r = 0.199$, $p = 0.028$) between wildlife protection efforts and community relations with the park. This suggests that effective wildlife protection is associated with improved relations with the local community.
- The study finds a weak positive but non-significant correlation ($r = 0.137$, $p = 0.134$) between wildlife protection efforts and economic impact. This indicates that perceptions of wildlife protection have a limited influence on the perceived economic benefits among fringe communities.
- The study finds a significant positive correlation ($r = 0.272$, $p = 0.003$) between community relations with the park and economic impact. This suggests that better community relations with the park are strongly associated with more favorable economic perceptions among local residents.

B) Findings from Focus Group Discussion

a) Perception and Attitude of Fringe People on Conservation and Development

The Focus Group Discussions (FGDs) with the fringe community adjacent to Manas National Park revealed a range of perceptions and attitudes towards conservation and development. The integration of local communities into conservation and tourism through training programs has been positively received,

with stakeholders like resort owners, NGOs, and the government playing key roles in skill development and employment opportunities. However, challenges remain in promoting tourism due to issues like the closure of safari routes and inadequate infrastructure. While some community members see ecotourism as a potential avenue for sustainable development, others are concerned about human-animal conflicts and economic feasibility. The economic benefits of tourism are unevenly distributed, with communities within the park facing significant disadvantages. Additionally, there is a mixed perception of the scientific basis for wildlife protection measures and a call for more equitable access to the park and transparent management practices.

b) Livelihood Status

The livelihood status of fringe communities around Manas National Park has seen some improvements due to training and development programs that enhance skills in hospitality and conflict mitigation. These programs, supported by multiple stakeholders, have equipped locals with the ability to manage human-wildlife conflicts and provide better services to tourists. Despite this, significant challenges persist, such as the economic benefits being unevenly distributed, with many local residents feeling disadvantaged compared to non-residents and external investors. Economic opportunities linked to tourism, like employment within the park and the tourism sector, are seen as beneficial, but issues like revenue leakage and the lack of capital for developing tourism facilities continue to hinder substantial economic progress for the local communities.

c) Community Relation with Park

Community relations with the park management reflect both positive and negative aspects. While locals recognize the economic benefits through employment opportunities such as guides, gypsy drivers, and business owners, there is significant dissatisfaction with the lack of sufficient community involvement in decision-making processes. The local public plays a crucial role in reporting poaching and encroachments, contributing to park management and sustainability efforts. However, there is a widespread perception that park authorities do not adequately consider local input and knowledge. Additionally, cultural and social benefits from community participation are observed, with strong inter-community

connections and preservation of cultural identity, yet there is a call for better compensation and more inclusive strategies to ensure active community participation and equitable distribution of tourism benefits.

Research Question 3: How do the perceptions and attitudes of people living adjacent to Manas National Park influence conservation measures and government policies?

The perspectives and attitudes of individuals residing in close proximity to Manas National Park are of utmost importance in influencing the development of conservation strategies and governmental regulations. The study's findings emphasize the complex correlation between community involvement and the efficacy of conservation endeavors. There is a strong correlation between favorable views of park resources and their efficient management, and improved community relations. This suggests that when local populations feel sufficiently supported and engaged, they are more inclined to collaborate with conservation efforts. Enhanced community relations are also associated with perceived economic gains, indicating that when people witness concrete economic benefits resulting from conservation efforts, they are more likely to endorse and back these initiatives. On the other hand, the absence of a notable connection between park resources and economic impact emphasizes the requirement for specific actions to guarantee that conservation advantages are fairly distributed among local communities. Furthermore, the successful preservation of wildlife is linked to enhanced community interactions, highlighting the significance of including local viewpoints into conservation approaches. Hence, cultivating favorable community connections and tackling economic issues are crucial for the efficacy of conservation efforts. These findings emphasize the importance of engaging local populations in decision-making processes to create conservation measures and policies that are more efficient and fairer. To improve the overall success and sustainability of conservation projects in Manas National Park, it is important to address concerns about human-wildlife interactions and the unequal distribution of economic advantages. By doing so, we can strengthen local support and encourage active engagement in maintaining the park.

7.2.4 Objective 4: To explore how sustainability and satisfaction affect visitor's intentions to recommend and revisit the Manas National Park

The findings of the study on the influence of National Park Sustainability (NPSus) on National Park Satisfaction (NPSat) and National Park Behavioral Intention (NPBI) with a focus on Manas National Park, Assam, are as follows:

The study finds that National Park Sustainability (NPSus) significantly affects both visitor satisfaction (NPSat) and Net Positive Behavioral Intentions (NPBI). Sustainability attributes such as flora and fauna, clean air, habitat for wildlife, income generation, and spending on local services positively influence visitor satisfaction and behavioral intentions. Additionally, NPSat mediates the relationship between NPSus and NPBI, with higher levels of visitor satisfaction leading to stronger intentions to recommend the park and revisit. The study also finds a direct relationship between NPSat and NPBI, where higher satisfaction levels correlate with stronger behavioral intentions (Estimate = -0.101, $p = 0.327$), although this correlation is not statistically significant at the conventional $\alpha = 0.05$ level.

The study's factor analysis reveals moderate levels of sustainability across various criteria, with areas for improvement in noise pollution, income allocation to local communities, and conservation efforts. Varying degrees of satisfaction were observed, with some aspects scoring higher than others. Visitors generally expressed satisfaction with their visit but identified areas where satisfaction could be enhanced. Regarding NPBI, the study finds strong intentions among visitors to engage in positive behaviors, including future visits, recommendations to others, and extended stays. Positive impacts on behavioral intentions were observed for attributes such as recommending the park to others, saying positive things about the park, choosing the national park again, and making it a first choice.

Finally, the study's Structural Equation Modeling (SEM) results indicate that NPSus negatively influences NPBI (Estimate = -0.254, $p = 0.025$), suggesting that lower levels of sustainability are associated with decreased behavioral intentions.

The study explored the influence of National Park Sustainability (NPSus) on National Park Satisfaction (NPSat) and National Park Behavioral Intention (NPBI)

with a focus on Manas National Park, Assam. The findings revealed that sustainability significantly affects both visitor satisfaction and behavioral intentions. Visitors aware of sustainability attributes, such as flora and fauna, clean air, and habitat for wildlife, tend to be more satisfied with their visit. This satisfaction, in turn, positively influences their behavioral intentions, leading to higher likelihoods of recommending the park to others and planning future visits.

Additionally, the study found that NPSat mediates the relationship between NPSus and NPBI, emphasizing the critical role of visitor satisfaction in shaping behavioral intentions. Visitors who were satisfied with their experiences in the park demonstrated stronger intentions to engage in positive behaviors, such as recommending the park and revisiting. The analysis indicated that satisfaction levels directly correlate with behavioral intentions, underscoring the need for park management to prioritize enhancing visitor experiences to foster positive word-of-mouth and repeat visits.

Furthermore, the descriptive statistics and factor analysis highlighted areas where satisfaction could be improved, such as noise pollution management, better allocation of income to local communities, and more effective conservation efforts. These improvements in sustainability practices and visitor satisfaction are essential for promoting positive behavioral intentions and achieving the park's conservation and sustainable development goals. Overall, the study contributes to understanding the complex interplay between sustainability, satisfaction, and behavioral intentions within national park tourism. It highlights the necessity for park authorities to focus on sustainable practices and enhance visitor satisfaction to ensure that visitors leave with positive experiences, thereby becoming advocates for the park and encouraging others to visit.

Research Question 4: How do sustainability practices in Manas National Park influence visitor satisfaction and behavioral intentions, and what specific improvements in sustainability attributes can enhance visitor experiences and promote positive behaviors?

Sustainability practices in Manas National Park have a profound influence on visitor satisfaction and behavioral intentions. The effective management of natural resources, encompassing the preservation of flora and fauna, maintenance of clean air, and provision of habitats for wildlife, contributes significantly to the overall visitor experience. When visitors perceive the park as sustainable, their satisfaction levels tend to increase, which in turn fosters positive behavioral intentions such as recommending the park to others and planning future visits. The relationship between sustainability practices and visitor satisfaction is mediated by the perception of the park's commitment to environmental conservation and community support. Visitors who observe and experience the tangible benefits of sustainability, such as well-maintained ecosystems and visible efforts to minimize pollution, are more likely to report higher satisfaction. This heightened satisfaction plays a crucial role in shaping their behavioral intentions, leading to stronger endorsements of the park and a greater likelihood of repeat visits.

However, to further enhance visitor experiences and promote positive behaviors, specific improvements in sustainability attributes are essential. Addressing issues such as noise pollution, which can detract from the natural ambiance of the park, is vital. Implementing measures to better allocate income generated from tourism to local communities can also enhance visitor perceptions of the park's socio-economic impact. Furthermore, strengthening conservation efforts through more visible and effective practices can reassure visitors of the park's commitment to sustainability. Overall, the interplay between sustainability practices and visitor satisfaction emphasizes the need for comprehensive and transparent environmental management strategies. By continuously improving sustainability attributes and effectively communicating these efforts to visitors, Manas National Park can enhance the visitor experience, foster positive word-of-mouth, and encourage

repeat visitation, thereby supporting both conservation goals and sustainable tourism development.

7.3 Conclusion

The sustainability and management of Manas National Park (MNP) reveal a multifaceted interplay of conservation efforts, community involvement, economic strategies, and management challenges. Conservation initiatives, including habitat restoration and species protection, have led to significant environmental advancements, exemplified by the park's removal from the endangered list in 2011. Despite these successes, local populations, particularly the Bodo tribe, face exclusion from decision-making processes, leading to conflicts and increased poaching. Efficient natural resource management and technological adoption have improved operational efficiency and visitor experiences, yet economic sustainability through tourism must balance financial gains with environmental stewardship. The livelihood study of villages adjacent to MNP highlights the complexities of local life, marked by limited capital, scarce access to credit, and the continued reliance on forest products despite conservation restrictions. While agriculture remains a critical livelihood activity, inadequate market conditions, poor infrastructure, and limited financial support hinder substantial economic progress. Moreover, traditional practices persist due to necessity, illustrating the economic disparities within the community. The perception and attitude analysis of fringe communities towards MNP highlight the positive correlation between park resource perception, wildlife protection efforts, and community relations, which in turn influence perceived economic benefits. However, significant challenges persist in achieving meaningful community participation in park management. Focus group discussions reveal that while some community members see ecotourism as a sustainable development avenue, issues like human-animal conflicts, uneven economic benefits, and inadequate infrastructure remain. Training programs have improved livelihoods, but these gains are offset by revenue leakage and a lack of capital for local tourism development. Visitor satisfaction, influenced by sustainability attributes such as flora and fauna, clean air, and wildlife habitats, plays a crucial role in shaping behavioral intentions to recommend and revisit the

park. Enhancing visitor experiences is vital for fostering positive word-of-mouth and repeat visits. Although some statistical relationships were non-significant, the study emphasizes the importance of addressing areas like noise pollution, income allocation to local communities, and conservation efforts to boost satisfaction and promote sustainable tourism.

In conclusion, the sustainability of MNP depends on integrated management practices that foster community involvement, technological advancements, and balanced economic strategies. Addressing ecological and socio-economic challenges through effective governance, improved market access, equitable resource management, and enhanced community participation is essential for the long-term viability of conservation efforts and sustainable development in and around MNP.

7.4 Suggestions

For Fringe People

a) Enhance community participation in decision-making

It has been observed that park officials often neglect local communities in the decision-making process, while residents frequently attribute this oversight to the officials and consequently refrain from active participation. The Environment Development Council (EDC) is a critical entity that facilitates communication between park authorities and local residents. To address this issue, it is imperative to enhance local involvement in park management and conservation efforts. Community members should be encouraged to participate actively in decision-making processes and ensure their contributions are acknowledged and incorporated into final decisions. Establishing collaborative teams with representatives from each hamlet to engage with park authorities can improve inclusivity and build trust. Furthermore, increasing awareness among community members about park rules and regulations is essential for fostering a more informed and participatory approach to conservation initiatives.

b) Tourism entrepreneurship

Tourism entrepreneurship in Manas National Park can enhance local livelihoods through several initiatives. Focus on rural tourism can improve local incomes and

resource use. The park's terrain is ideal for adventure tourism like trekking and rafting. Creating an artisan market and showcasing Bodo ethnic products can attract tourists and support local businesses. Additionally, developing monsoon packages with food and fishing festivals can offer unique experiences, boosting tourism during the off-season and benefiting nearby communities.

c) Improve livelihood opportunities

To enhance the well-being of these communities, it is essential to provide genuine rehabilitation and sustainable livelihood opportunities through education, research-based knowledge, skills development, capacity-building, and the promotion of innovative, eco-friendly entrepreneurship. Promoting and supporting alternative livelihood opportunities, such as ecotourism, handicrafts, and sustainable agriculture, can diversify income sources and reduce reliance on natural resource extraction. Training and resources should be provided to help local communities develop these alternative income sources. Additionally, improving access to financial services, including loans and grants, and working with financial institutions to reduce barriers to credit, along with financial literacy training, can support local entrepreneurship. An awareness program focused on community participation should be implemented to foster a sense of belonging among local residents, ensuring they feel integral to the larger community as they did before. Achieving the desired goals of sustainable livelihoods for the people residing in the buffer zone of MNP requires innovative thinking and the involvement of academia, civil society, administrators, domain knowledge experts, and all stakeholders. This collaborative approach will ensure the availability of skilled professionals, cultivate a democratic value-oriented mindset, and provide in-depth knowledge of sustainable livelihoods and natural resource governance, leading to the sustainable development of the communities around MNP.

d) Address economic leakage

Encourage local ownership of tourism and hospitality businesses by providing incentives and support for residents to start and manage their own ventures, such as homestays, tour operations, and shops. Implement local-level strategies to ensure that a larger share of tourism revenue remains within the community, including promoting local products and services, developing local supply chains, and creating

partnerships between local businesses and external investors. Additionally, encourage the use of local products such as fruits, vegetables, lemon drink, rice, and curd in guest houses and resorts to generate revenue for local residents and minimize economic leakage, ensuring that more benefits from tourism stay within the community.

e) Enhance education and health services

Allocate resources towards education in order to improve the skills and capacities of the local community, specifically in agricultural cooperative organizations where there is currently limited involvement and understanding of contemporary farming methods. Enhanced availability of high-quality education can result in more participation in lucrative non-agricultural enterprises and higher agricultural output. In addition, mitigate health inequities by enhancing the availability of healthcare services, as the communities are currently solely reliant on Salbari Hospital. Communities that are in better health are more capable of participating in a range of livelihood activities and making contributions to conservation efforts.

f) Promoting cultural tourism

Promoting cultural-legacy tourism around Manas National Park presents a significant opportunity to showcase the region's rich cultural heritage, including festivals, traditional crafts, and indigenous populations. By integrating cultural experiences into ecotourism activities, visitors can gain deeper insights into local traditions while supporting community empowerment and economic sustainability. Encouraging respectful interaction between tourists and residents not only enhances the tourism experience but also fosters mutual understanding and appreciation for cultural diversity. This approach contributes to sustainable development by preserving and promoting local cultural identities as integral components of the tourism experience around Manas National Park.

For Park Management Officials

a) Facilitate sustainable resource use

To ensure the long-term ecological health of Manas National Park, it is essential to implement measures that regulate resource collection and promote sustainable agriculture. This involves developing and enforcing practices for resource collection within the park, such as setting quotas, designating specific collection

areas, and offering alternatives to alleviate pressure on park resources. Additionally, promoting sustainable agriculture through initiatives like organic farming, crop diversification, and soil conservation techniques will not only mitigate environmental impacts but also enhance agricultural productivity in a way that supports the park's conservation goals and the livelihoods of local communities. These efforts aim to foster a balanced approach where conservation and sustainable development go hand in hand.

***b)* Enhancing Infrastructure and Sustainable Operations**

To enhance the overall infrastructure and operational capacity of Manas National Park, it is essential to invest in the development and maintenance of park facilities, including roads, visitor centers, rest areas, and signage. Focusing on developing and operationalizing currently unused ranges, alongside reopening previously operational routes, will improve accessibility and visitor experience. Additionally, implementing electric vehicles (E-vehicles) within the park will reduce carbon emissions and minimize environmental impact. Establishing charging stations and maintaining a fleet of E-vehicles for guided tours and transportation will further promote sustainable tourism practices. These combined efforts will enhance visitor satisfaction, increase accessibility, and ensure the park's sustainable development.

***c)* Promoting Sustainability and Enhancing Visitor Satisfaction**

To promote sustainability and enhance visitor satisfaction in Manas National Park, it is crucial to implement comprehensive strategies that balance ecological conservation with positive visitor experiences. Integrating sustainable practices such as eco-friendly accommodations, waste management systems, and renewable energy sources will minimize the park's environmental footprint. Additionally, offering educational programs and guided tours focused on the park's biodiversity and conservation efforts will enrich visitor knowledge and engagement. Ensuring that tourism benefits are equitably shared with local communities by supporting local entrepreneurship and cultural initiatives will also foster community support for conservation efforts. Introducing model village visits can provide tourists with authentic cultural experiences and insights into local livelihoods, further enhancing their satisfaction and connection to the area. By prioritizing sustainable practices, community involvement, and unique cultural experiences, the park can enhance

visitor satisfaction, encourage repeat visits, and establish itself as a model for sustainable tourism.

d) Strengthen communication and collaboration

Establishing regular dialogue and feedback mechanisms between park authorities and local communities is crucial for effective conservation and community engagement. This initiative aims to empower Gaon Buras by reducing their workload and increasing their representation from various villages. It includes facilitating community meetings, feedback sessions, and leveraging digital platforms for efficient information sharing. Additionally, promoting collaborative conservation efforts is essential, where local communities are actively involved as partners rather than mere beneficiaries. This entails joint wildlife monitoring, community-led conservation projects, and inclusive decision-making processes with representation from every village. These strategies aim to enhance mutual cooperation and accountability in the conservation and management of natural resources around the park.

For Government, Forest Department and BTC

a) Address conflict and ensure equitable resource distribution

Establishing effective conflict resolution mechanisms is crucial to address disputes between park authorities and local communities surrounding Manas National Park (MNP). This initiative should include mediation services, community forums, and access to legal support. Given the pivotal role of the Bodoland Territorial Council (BTC) in local governance and operations around MNP, the BTC can play a significant role in creating a dedicated forum to facilitate amicable resolutions of disputes. This forum would enable constructive dialogue and fair outcomes, thereby fostering harmony and cooperation between stakeholders. Additionally, ensuring equitable distribution of resources and benefits derived from park-related activities is essential for sustainable community development. This involves transparent allocation of land, fair access to financial resources, and opportunities for meaningful participation in park management decisions. By promoting fairness and inclusivity, these measures can enhance local livelihoods and strengthen community engagement in conservation efforts around MNP.

b) Strengthen legal framework and implementation: The Assam government, in collaboration with the Bodoland Territorial Council (BTC), should actively promote and enforce local communities' rights to participate in decision-making processes related to natural resource management. This involves ensuring that policies at both the state and local levels are effectively communicated and implemented. Additionally, developing and implementing a comprehensive Community-Based Natural Resource Management (CBNRM) strategy is crucial. This strategy should include clear guidelines and frameworks for enabling and supporting community involvement, as well as benefit-sharing, to ensure meaningful and sustainable participation.

c) Balanced Development: The study identifies a significant imbalance in resource allocation between Kaziranga National Park (KNP) and Manas National Park (MNP). While KNP benefits from substantial government investment, extensive infrastructure development, and high-profile promotional endorsements, MNP remains underfunded and less promoted despite its comparable biodiversity and cultural heritage. To address this disparity, it is recommended that policy efforts and financial resources be rebalanced to enhance MNP's infrastructure and visibility. By increasing investment and promotional activities for MNP, its potential to attract tourists and generate revenue could be realized, thereby fostering a more equitable distribution of tourism benefits across Assam's national parks.

d) Comprehensive Employee Welfare and Development Plan for Forest Workers: To ensure the well-being and effectiveness of forest workers, it is essential to implement a comprehensive employee welfare and development plan. This plan should start with thorough induction training to familiarize employees with their roles and duties, fostering a strong foundation for their work. Equal treatment of permanent and casual workers in terms of amenities, such as uniforms and equipment, will enhance their self-esteem and honour. Capacity building through skill and knowledge development in monitoring, conservation, and survey methodologies should be prioritized. Timely provision of necessary equipment, including raincoats, torches, and GPS devices, is crucial for both permanent and temporary employees. Recreational activities during non-working hours will boost morale and physical fitness. Introducing predetermined intervals for breaks will

allow workers to spend time with their families, promoting a healthy work-life balance. Additionally, improving living conditions by providing gas connections, water filters, and installing fences around camps will create a safer and more hygienic environment, ensuring the overall well-being of the workers.

e) **Increase Transparency and Community Engagement:** The government should ensure transparency in the allocation and utilization of funds designated for park and community development. This includes establishing mechanisms for regular reporting and audits, and actively involving local communities in the planning and implementation of development projects. By fostering an inclusive and transparent management approach, the government can build trust and ensure that the benefits of tourism are equitably distributed, supporting both conservation efforts and local livelihoods.

f) **Strengthen Economic Incentives for Local Involvement:** The government should create economic incentives to ensure that local communities benefit directly from tourism. This could involve establishing revenue-sharing models where a portion of the park's income is allocated to community development projects. Additionally, the government should support local entrepreneurship by providing grants, low-interest loans, and technical assistance for businesses related to tourism, such as lodging, guided tours, and handicraft sales. By creating a supportive economic environment, the government can ensure that tourism development contributes to the long-term prosperity of local communities.

g) **Enhance Human-Wildlife Conflict Mitigation:** The government should implement robust strategies to mitigate human-wildlife conflicts, which are prevalent in areas like Bhuyapara. Training local communities in non-lethal deterrence methods and conflict resolution techniques can help protect their livelihoods and ensure safety. The government should also provide adequate compensation for wildlife-related damages and invest in preventive infrastructure, such as fencing and early warning systems. These measures will help build trust and cooperation between local communities and park authorities, fostering a harmonious coexistence.

h) **Foster Local Community Participation and Training Programs:** The government should actively involve local communities in the management and decision-making processes of MNP. This includes offering comprehensive training programs in hospitality, conservation, and eco-tourism, empowering locals with the skills needed to participate effectively in tourism activities. Government agencies, in collaboration with non-governmental organizations (NGOs) and resort owners, can provide these training programs to enhance service standards and promote positive tourist interactions. Additionally, the government should support the establishment of community-based tourism initiatives, such as model village visits and the showcasing of ethnic products, to provide economic opportunities for locals. By fostering a collaborative approach and ensuring that local communities benefit directly from tourism, the government can create a sustainable model that balances conservation goals with socio-economic development.

Suggestion for NGO's

a) **Strengthen Partnerships and Collaborative Efforts:** NGOs should continue to forge and strengthen partnerships with government agencies, forest departments, and other NGOs to leverage resources and expertise. These collaborative efforts can help streamline conservation and tourism promotion programs, ensuring a more unified and effective approach. Establishing formal partnerships and memoranda of understanding (MOUs) can facilitate better coordination and resource-sharing, enhancing the overall impact of their initiatives.

b) **Expand Capacity-Building Programs:** NGOs should expand their capacity-building programs to encompass a wider range of skills and knowledge areas. This includes advanced training in eco-tourism, wildlife management, and sustainable business practices. By equipping local communities with diverse skills, NGOs can enhance their ability to manage and benefit from tourism activities sustainably. Additionally, providing ongoing mentorship and support can help ensure the long-term success of these initiatives.

c) **Enhance Community Engagement and Education:** Increasing community engagement and education efforts is essential to foster a deeper understanding of conservation and sustainable tourism. NGOs should implement more comprehensive and continuous awareness campaigns, targeting different

demographics within the community. Educational programs in schools, community centers, and through local media can help in still a conservation ethic and promote sustainable practices from an early age.

d) Develop and Implement Sustainable Livelihood Projects: NGOs should focus on developing and implementing projects that provide sustainable livelihood options for local communities. This could include initiatives such as community-based eco-tourism ventures, handicraft production using sustainable materials, and agroforestry projects. By diversifying income sources and reducing reliance on traditional, and often unsustainable, practices, NGOs can help improve economic stability and resilience in local communities.

e) Improve Financial Support and Microfinance Access: Expanding financial support and access to microfinance is crucial for empowering local entrepreneurs in the tourism sector. NGOs like ASOMI should increase the availability of micro-loans and financial literacy programs, enabling more individuals to start and grow their tourism-related businesses. Creating a supportive financial ecosystem can stimulate local economic growth and enhance community investment in conservation efforts.

7.5 Scope for Future Research

Future research should prioritize investigating the specific functions of local heterogeneity and social divergence in the administration and long-term viability of Manas National Park (MNP). Conducting research on the interactions between different social groups in local communities and park management, as well as analyzing the effects of conservation efforts on diverse demographic and socioeconomic groups, would yield more comprehensive understanding. Conducting comparative research in other regions, such as other national parks in India or protected areas worldwide, could facilitate the identification of similarities and differences in management strategies and their resulting effects. Gaining insight into various methodologies for engaging the community and evaluating their efficacy in the sustainable management of parks is of utmost importance. Furthermore, doing an analysis of the economic advantages and disadvantages of tourism and conservation initiatives on local populations, and evaluating the

efficacy of existing economic incentives, will help discover prospective enhancements that could benefit a wider portion of the population. It is crucial to examine the current legislative and institutional structures that regulate national parks and how they affect the nearby populations. Suggesting modifications to these frameworks to enhance the autonomy of local communities and foster sustainable practices would be advantageous. Examining the conventional management ideas and methods employed by indigenous groups and their incorporation into contemporary conservation initiatives, as well as assessing the effectiveness of collaborative management models that include traditional knowledge, can improve sustainability. Evaluating the enduring environmental and ecological consequences of existing conservation methods, examining the repercussions of conflicts between humans and wildlife, and suggesting measures to alleviate these conflicts are crucial for achieving sustainable development. By creating and examining novel approaches to community-based conservation that engage local populations in decision-making, and assessing the efficacy of these approaches in attaining conservation objectives and enhancing livelihoods, we can offer pragmatic solutions to enhance the sustainability and efficacy of national park management. This will have positive impacts on both the environment and local communities.

Appendix (A)

Questionnaire 1

DETAILS OF THE VILLAGES (DATA TAKEN FROM THE GAON PANCHAYAT AND GAON BURA)

Name of the Village: _____

Name of the Gram Panchayat: _____

PO: _____/*PS:* _____/*Dist.*____/*Under MGNREGS coverage: yes/no*

1. Population (approx.) and number of Households in the village:

Population: _____ (approx.)

Number of Households: _____

2. Distance from the Manas National Park (i.e. MNP): _____

3. Number & name of Educational Institution:

Number: _____

Name(s): _____

4. Nearby Railway Stn. or Bus stop:

Railway Station: _____

Bus Stop: _____

5. Hospital/P.H.Centre (if any): yes/no

6. Industry (if any): yes/no

7. Govt. Office /Post Office/Bank (if any): yes/no

8. Park/Playground/Water body (if any): yes/no

9. Historical or religious place (if any): yes/no

10. Is the village prone to flooding? Does it receive government assistance for rehabilitation of the people?: yes/no

11. Main pattern of occupation (main and subsidiary) of the villagers:

a. Agriculture/farming - %

b. Tourism/ecotourism etc. - %

c. Business - %

d. Small Scale/Cottage industry/handicraft - %

e. Service etc. - %

12. Are villagers allowed to harness Common Property Resources/bio-resources in and around the MNP without damaging the environment? yes/no
13. Are villagers interested in exploring other livelihood options through innovative entrepreneurial activities? yes/no
14. Are households interested in participating and cooperating in matters concerning the MNP through Community Participation involving NGOs, Civil Society, etc.? yes/no
15. Is there washing away of fertilizer, pesticides, etc. from agricultural land or ingress of pollutants into the MNP? yes/no/to some extent
16. Is there grazing of domestic animals in and near the MNP? yes/no/to some extent
17. Is there encroachment of pasture, water body, agricultural land, eco-sensitive areas, etc. around the MNP? yes/no/to some extent

Date: _____

(Signature of the Panchayat Pradhan or Gaon Burah or equivalent Officer of the Panchayat)// Collected from the Gram Panchayat Office
Name of the Signatory: _____

Questionnaire 2

I am a student from the Mizoram University. I am doing research for my PhD degree at the University. The research is about how the indigenous people sustain their livelihood in this area, what are their concerns, and what are the impacts of the various park management schemes that have developed in this area. I will be very grateful if you could spend some time with me, answering my questions. Your answers will be totally confidential and cannot be tracked back to you. I will not use your name in my report.

Household Survey

Questionnaire No: _____

Section 1: General Information

Date: _____ Interview period: _____ to _____

Name of Respondent: _____

Village: _____ Age _____

Gender: _____ Duration stayed (years): _____

Marital Status:

Literacy:

Ethnicity:

Occupation:

No. of family members:

Minor

Major

Divorce/ Widower/ Widow:

Section 2: Life History and livelihoods

1. Do you originally come from this area?

1. YES 2. NO

a. If not, when and what is the reason behind your migration?

.....
.....
.....

2. What is your average monthly income (per respondent)

.....

3. What type of house you reside?

Kacha

Pakka

4. Do you have proper drinking water?

Yes

No

5. Do you have proper sanitation facilities?

Yes

No

Govt. Provided

Individually Made

6. Do you have proper medical facilities?

Yes

No

If Yes Please mention the name

7. Do you have proper education facilities?

Yes

No

8. Do you have religious places?

Yes

No

9. What is your average family income per month

.....

10. How has livelihood changed in this area lately after the park came into

existence?

1. Very Much 2. Much 3. Indifferent 4. Not much 5. Not at all

12. What are your income sources:

13. No. and sort of crops grown:

14. Livestock assets no.

Cattle

Goats

Poultry

Pigs

Other

11. How do household members earn a living during the lean period?

- i. Manual labor / wage-earning / MGNREGS
- ii. Farming
- iii. Making and selling homemade products/artifacts
- iv. Other ecotourism-related activities
- v. Innovative entrepreneurial activities
- vi. Other part-time activities/modes of livelihood.

12. What is the most prevalent and convenient means of livelihood during the lean period?

- (i) Is manual labor or wage-earning through schemes like MGNREGS a common source of income? (Yes/No)
- (ii) Is farming a significant source of livelihood? (Yes/No)
- (iii) Do people engage in making and selling homemade articles or artifacts for income? (Yes/No)
- (iv) Are other ecotourism-related activities pursued for livelihood? (Yes/No)
- (v) Are innovative entrepreneurial activities a part of the local economy? (Yes/No)
- (vi) Do people engage in other part-time activities or modes of livelihood? (Yes/No)

Section 3: Park/Forest products

1. How far is it from your home to the park boundary?

2. Do you or any member of the household collect any product(s) from the park?

a) Yes b) No

2.1 If yes, do you face any problem(s) collecting the products from the park?

a) Yes b) No

2.1.1 If yes, which problems?

.....

3. Livelihood options for Households and related inquiries:

i. Is the Household covered under the MGNREG scheme? Yes/No

ii. Are activities beyond traditional tourism providing sustainable livelihood?
Yes/No

iii. Can livelihood options be expanded by engaging in various ecotourism
activities? Yes/No

iv. Can ecotourism provide an alternative source of sustainable livelihood for
the fringe villagers of the MNP throughout the year? Yes/No

v. Can other livelihood options be explored through innovative entrepreneurial
endeavors? Yes/No

vi. Are only the women in the Household responsible for collecting the
following:

(i) Food: Yes/No (ii) Water: Yes/No (iii) Food: Yes/No (iv) Fuel: Yes/No

4. Are you involved in any tourism economic activities which is related to the park.

a) Yes b) No

5. If yes which are those?

a) Homestay

b) Hotel/Restaurant

c) Transportation/Safaris

d) Guide

e) Souvenir Shops

Section 4: Constraints to the local people

1. What problems do you face because of living close to the park, in relation to
Crops

.....

.....

.....

Animals

.....

.....

.....

People

.....

.....

.....

1.1 If crop raiding is a problem, what are the frequent raiders?

.....

.....

.....

1.1.1 What crops do they raid?

.....

...

1.1.2 How do you fight crop raiding?

.....

...

2. What impact has the conversion to national park had on the above problems?

.....

3. What constraints do you face in relation to improving your livelihood and how would you

rank them in importance:

Constraint	Tick if applicable	Rank
Capital		
Access to resources		
Market access		
Market prices		
Labour		
Political insecurity		
Others		

4. Have you received any formal credit in the last 4 years?.....

5. If yes, from who and what did you use as collateral?.....

Emerging issues and innovative approaches:

i. Reasons for displacement of people (DPs) around the MNP due to: (i) floods (ii) developmental activities (iii) other reasons (to be specified by the Interviewee)

ii. Is proper rehabilitation of displaced persons necessary to ensure: (i) employment generation for them and (ii) to boost their economic status? Yes/No

iii. Should steps be taken to maximize the tourist season of the MNP by implementing: (i) innovative measures through the latest technology and (ii) better eco-management? Yes/No

iv. Should the next generation be encouraged to pursue: (i) innovative entrepreneurial activities for ensuring a sustainable livelihood? Yes/No

v. Is the Household interested in participating in EDC (or any other similar program) as: (i) permitted by the State Government in the MNP? Yes/No

vi. Is the Household interested in participating and cooperating in: (i) the matters concerning the MNP through a Community approach? Yes/No

Section 5 (Capital)

a) Land Area
_____(Bighas)

b) Land Quality 1 = very poor, 2 = poor, 3 = average, 4 = fertile, and 5 = very fertile

c) Homestead area 1 = 100 and below, 2 = 100–160, 3 = 160– 200, and 4 = above 200 (unit: m²)

d) Family owning assets _____

e) Livestock and poultry breeding
_____ Yes _____ No _____

f) Family Size _____

g) Skill training _____ Yes _____ No

- h) Education level 1 = Primary school and below, 2 = Junior high school, 3 = High school, 4 = College & Intermediate, and 5 = Postgraduate
- i) Physical health condition 0 = Experienced major disease and 1 = Healthy
- j) Annual frequency of seeking medical treatment _____
- k) Off-farm management Running a business or a store/Homestay etc: 0 = No and 1 = Yes
- l) Financial capital 1=30,000 and below, 2 = 30,000–90,000, 3 = 90,000–150,000, 4 =150,000–300,000, and 5=above 300,000 (unit: INR)
- m) Agricultural cooperative organization Joining the specialized farmers' cooperatives: 0 = No and 1 = Yes
- n) Relationship with Relatives 1 = very poor, 2 = poor, and 3 = Good 4= Excellent
- o) Road Condition 0 = Unpaved road and 1 = Cement/ Asphalt road
- p) Transportation convenience: 1 = Lower, 2 = Average, 3 = High, and 4 = Higher
- q) Relationship with the Park Officials : 1 = very poor, 2 = poor, and 3 = Good 4= Excellent

Questionnaire 3

<i>Statements pertaining to perception and attitude toward Manas National Park conservation</i>							
Statement	1 (Strongly Disagree)	2 (Quite Agree)	3 (Quite Disagree)	4 (Neither agree nor disagree)	5 (Slightly Agree)	6 (Quite Agree)	7 (Strongly Agree)
Harvesting of forest products (fuelwood, poles, rafters, fruits, and grasses) should be allowed in the park.(P1)							
Grazing of animals in the park should be allowed.(P2)							

Wildlife should be protected for posterity(P3)							
Picking fruits or nuts and collecting grasses in the park will destroy wildlife habitat(P4)							
Grazing livestock in the park will destroy its natural vegetation.(P5)							
It is good the natural vegetation and wildlife near my village is protected(P6)							
If subsistence hunting is allowed in the park wildlife will be decimated (P7)							
Protecting this land is waste of productive land (P8)							
People should be allowed to hunt in the park for their household protein needs (P9)							
Wild animals that destroy crops and livestock should be killed(P10)							
Government is doing little to help my community with income from the park(P11)							
The park provides social amenities in my community							

(P12)							
The staff of the park are friendly to people in my community (P13)							
Depending on wildlife for income is not a good thing to do (P14)							
The park creates employment for people in my community (P15)							
Tourism in the park creates income-generating opportunities for people in my community (P16)							
Meat trade is part of our income-generating opportunities (P17)							
The park adversely affect our livelihoods through wildlife depredation and limited access to resources.(P18)							
Only rich people from outside my community make money from tourism.(P19)							
The staff of the park harass people in my community(P20)							

Questionnaire 4
FOCUS GROUP DISCUSSION

PARTICIPATION INFORMATION				
DATE				
LOCATION		DISCUSSED PERIOD:		TO
NAME	VILLAGE	AGE	SEX	OCCUPATION
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Agenda		
No	Items	Duration
1.	Introduction (Information About Discussion, Main Topics And Guidelines)	5 Mins
2.	Participants To Introduce Themselves	5 Minutes
3.	Discussion	45-60 Minutes
4.	Raise Other Relevant Issues Or Questions	10 Minutes
5.	Concluding Comments	5 Minutes

ID	TRANSCRIPT	THEME	NOTES

COMPOSITION OF THE FOCUS GROUP

- Government employees, Bank (Commercial and *Gramin*) and Co-operative Society employees;
- *Panchayat Pradhans, Gaon Burahs* and *other Panchayat* officials, members of EDCs etc.;
- Farmers and Cultivators;
- Teachers/Educational Administrators etc.;
- Social Workers, NGOs & their members and Self-help Groups etc.;

- Officers/Officials of the KNP and members of the Forest Protection Committee etc.;
- Businessmen including micro and small scale entrepreneurs;
- Tour-operators and Social entrepreneurs etc.;
- Heads of Organisations/Clubs/Associations etc.;
- Medical practitioners, health-workers and ICDS, *Anganwadi* & *ASHA* workers;
- Environmental Activists, Nature lovers, Concerned Groups and Unemployed Youths

Introduction

I would like to welcome everyone here. This focus group discussion is part of the research on Manas National Park. I would like all the participants to know that their contribution

and say is very important for the research and I am very grateful for their participation. I assure all the participants that their names will not be published in any report and their answers will be confidential.

1. Does the current management of the park encourage local participation?
2. What kinds of conflicts exist in the park because of lack of community participation?
3. Whether it is essential to control environmental pollution from various sources and prevent the loss of greenery in and around the MNP through effective planning?
4. Whether it is necessary to reduce the closure period of the MNP during the monsoon season through innovative measures, employing the latest scientific methods, and improving eco-management efforts?
5. Is it advisable to implement a sustainable action plan to promote ecotourism as an alternative activity, ensuring a sustainable livelihood for the community?
6. Is it necessary to support institutional efforts to preserve indigenous knowledge and provide training to local people to enhance their skills and competency?
7. How would you describe the roles of various groups involved in park management?
8. Are conflicts regarding encroaching, resource management, etc resolved, if so, how, if not, why not?

9. At present what opportunities local communities have in decision making?
 - a. Do people get fair say?
 - b. What is the level of participation of local communities these days compared to past?
10. How has the Assam government contributed to the development of different ranges within Manas National Park?
11. How effective is the role of the Assam government in managing the resources of the park through the Park Directorate and Forest Agency?
12. What measures has the Assam government or the park authority has taken to address revenue leakage within Manas National Park?
13. At present what are the major constraints for improved livelihood in the area?
14. How do park and its management affect livelihoods of the people?
15. Which external factors affect people's livelihood?
16. Which specific policy or action can improve the resources and the livelihood?
17. Do you add anything more?

Questionnaire 5

Name _____

Gender _____

Occupation: Business ☐

Service Professionals ☐

Student ☐

☐

Which National Park you visited in Assam?

Manas National Park ☐

Pobitora National Park ☐

Kaziranga National Park ☐

Others ☐

Statements	1 (Strongly Disagree)	2 (Quite Agree)	3 (Quite Disagree)	4 (Neither agree nor disagree)	5 (Slightly Agree)	6 (Quite Agree)	7 (Strongly Agree)
Do you feel the Presence of clean (unpolluted) air in the park?							
Do you agree that there is a Presence of large areas covered in flora and fauna?							
Do you agree that there is a Presence of habitat for local wildlife?							
Do you agree there is a Presence of key species of animals in the park?							

Do you feel the presence of natural features (hills , ponds, rivers, etc.) in the park?							
Do you agree that the level of noise pollution is low in the park?							
Do you agree that there are activities of income generation for the local people in the park?							
Do you agree tourist spends money on local services and products?							
Do you agree that there are activities relating to the conservation of traditional arts and crafts among local people near the park?							
Do you agree the level of education is relatively good for the local people in the park?							
Do you agree that the presence of basic services							

(Medical, Sanitation, Drinking Water, Electricity, etc.) for local people is available?							
I am satisfied with my decision to visit this national park							
My choice to visit this national park was a wise one							
I am sure it was the right thing to visit this national park							
Visiting this national park is worthwhile							
I will visit this national park again in the future							
I will say positive things about this national park							
I will recommend this national park to my family & friends.							
I will choose this national park as my first choice compared to							

other national parks.							
I will stay longer in the next visit to this national park							

Appendix (B)

1. Signage of Manas National Park



2. Manas Tiger Reserve Office (Barpeta)



3. Bansbari Range



4. Bhuyapara Range



5. Gyti Village



6. Naranguri Village



7. Raghob Bill Village



8. Bhuyapara Village

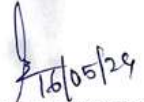


9. Declaration Letter and Permission

TO WHOM IT MAY CONCERN

This is to certify that Sri Gaurav Das, Research Scholar, Management department, Mizoram University has collected data regarding strength of employees for his research purposes on Manas National Park. This data has been given only for research purposes.

I wish him all the best for his upcoming research.


(Sri Subodh Talukdar, AFS, DCF)
Deputy Director, Manas Tiger Reserve
Dy. Director, Manas Tiger Reserve
Barpeta Road, Assam

STAFF STRENGTH AS ON 16.05.2024

Sl. No.	Category of post	Sanction Strength under TP Scheme as on in the year 2000-01Rhino Scheme as on in the year 2000-01Non-Plan as on in the year 01-04-1999 Approved by the Director of accounts and Treasury, Kar Bhawan, Dispur, Guwahati, Assam in the year 2019	Man in Position	Vacant
[1]	[2]	[3]	[4]	[5]
1	Field Director, MTR	1	1	0
2	Deputy Director	1	1	0
3	Assistant Conservator of Forest	1	1	0
4	Research Officer	1	0	1
5	Superintendent	1	1	0
6	Veterinary Asstt. Surgeon	1	1	0
7	Sr. Asstt. (Director Level)	2	2	0
8	Jr. Asstt. (Director Level)	5	0	5
9	Record Keeper	1	0	1
10	Jr. Asstt./Range Asstt.	3	0	3
11	Veterinary Field Asstt.	1	0	1
12	Stenographer	1	1	0
13	Forest Ranger	6	6	0
14	Deputy Ranger	5	5	0
15	Forester- I	39	33	6
16	Forester- II	20	5	15
17	Forest Guard	235	76	159
18	Mahut	27	16	11
19	Game Watcher	44	29	15
20	Driver	9	4	5
21	Office Peon	4	4	0
22	Chowkidar	11	11	0
23	Handiman	3	3	0
24	Grass Cutter	23	23	0
25	Boat Man	12	12	0
26	Sweeper	1	0	1
27	Attendant	2	0	2
28	Laboratory Attendant	1	1	0
29	Duk Runner	1	1	0
30	Mali	1	1	0
31	Paniwala	1	1	0
32	Bearer	1	0	1
33	Jamadar	1	0	1
		466	240	226
34	Fixed Pay		256	
	Total staff		496	

Submitted

(Sri Subodh Talukdar, IFS)

Deputy Director, Manas Tiger Reserve
Dy. Director, Manas Tiger Reserve

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BRIEF BIO DATA OF THE CANDIDATE

Name:	GAURAV DAS
Father's Name:	Late. Gobinda Ch Das
Spouse's Name:	Dr. Deboshree Bhattacharjee
Edu. Qualification:	MBA (Marketing)
Date of Birth:	27-03-1985
Present Address:	H No- 38, Lalganesh, Gobinda Nagar, Guwahati-781034
Contact Address:	Phone No. 7002758314
e-mail:	gauravdasnis@gmail.com
MZU Registration No.:	2109144
PhD Registration No.:	MZU/Ph.D./1837 of 22.08.2021

PARTICULARS OF THE CANDIDATE

NAME OF CANDIDATE	:	GAURAV DAS
DEGREE	:	Doctor of Philosophy
DEPARTMENT	:	Management
TITLE OF THE THESIS	:	Sustainability and Management of Manas National Park, Assam: A study on Livelihood of Fringe Local Communities.
DATE OF ADMISSION	:	22/08/2021
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BOPS	:	30.05.2022
SCHOOL BOARD:	:	06.06.2022
MZU REGISTRATION NO.	:	2109144
Ph.D. REGISTRATION NO. & DATE	:	MZU/Ph.D./1837 of 22.08.2021
EXTENSION (IF ANY)	:	NA

(PROF. L.S. SHARMA)
Head of Department

ABSTRACT

SUSTAINABILITY AND MANAGEMENT OF MANAS NATIONAL PARK, ASSAM: A STUDY ON LIVELIHOOD OF FRINGE LOCAL COMMUNITIES

**AN ABSTRACT SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF
PHILOSOPHY**

GAURAV DAS

MZU REGISTRATION NO.: 2109144

Ph.D. REGISTRATION NO.: MZU/Ph.D./1837 of 22.08.2021



**DEPARTMENT OF MANAGEMENT SCHOOL OF ECONOMICS
MANAGEMENT AND INFORMATION SCIENCE**

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**Sustainability and Management of Manas National Park, Assam: A Study on
Livelihood of Fringe Local Communities**

By
GAURAV DAS
Department of Management

Supervisor
Prof. L. S. SHARMA

Submitted
In partial fulfillment of the requirement of the Degree of Doctor of Philosophy
in Management of Mizoram University, Aizawl

1.1 Introduction

Sustainable development is a critical global objective, defined as the pursuit of growth that meets present needs without compromising the ability of future generations to satisfy their own (Griggs et al., 2013). This principle underpins efforts to harmonize economic progress with environmental stewardship, ensuring that natural systems continue to provide essential resources and ecosystem services. Despite the growing emphasis on sustainability, the challenge of balancing economic growth with environmental preservation persists, particularly in regions where economic pressures are significant (Scoones, 2007). In Assam, the sustainability of its rich biodiversity, particularly within its national parks, is essential for maintaining ecological balance and promoting human well-being. National parks like Kaziranga and Manas not only safeguard endangered species but also support local livelihoods through eco-tourism and sustainable resource management. However, the ongoing challenge is to balance conservation efforts with the socio-economic needs of surrounding communities, who often face economic hardships exacerbated by conservation restrictions. Achieving sustainable development in these areas requires an approach that integrates environmental protection with socio-economic development, fostering practices that enhance ecological resilience while promoting community well-being.

1.2 History of National Parks

The origins of the National Park movement in India are deeply rooted in the country's ancient cultural and spiritual traditions, where early forms of conservation were practiced in sacred spaces like Rishi Ashrams. Over time, this ethos of protection evolved, with significant contributions during the reign of King Ashoka the Great. However, centuries of decline, exacerbated by colonial exploitation, led to widespread destruction of wildlife and natural habitats. The early 1900s saw a revival of conservation efforts, culminating in the establishment of India's first wildlife preserves and national parks. Despite initial challenges, the post-independence era marked significant advancements in India's conservation landscape, leading to the

creation of numerous sanctuaries and national parks. Today, India's extensive network of protected areas highlights the ongoing efforts to balance conservation with sustainable development, ensuring the preservation of the country's rich biodiversity for future generations.

1.3 National Park of Assam

Assam, with its rich biodiversity, stands out as a significant region for wildlife enthusiasts, housing seven national parks and numerous wildlife sanctuaries. Two of its parks, Kaziranga and Manas, have been recognized as UNESCO World Natural Heritage Sites since 1985. The state's diverse landscape, shaped by the Brahmaputra River and its tributaries, supports a wide variety of species, including the great Indian one-horned rhinoceros, royal Bengal tiger, and golden langur. The Protected Area Network of Assam, encompassing 18 animal sanctuaries and 7 national parks, covers around 5% of the state's total land area. Each national park in Assam, from the floodplains of Kaziranga to the rainforests of Dihing Patkai, contributes uniquely to the state's ecological diversity. Raimona, Dibru-Saikhowa, Nameri, Orang, and the newly designated Dihing Patkai showcase a range of habitats that are home to rare and endangered species, playing a crucial role in the conservation of the region's natural heritage. Manas National Park, located at the Himalayan foothills, stands out not only for its historical significance and status as a Biosphere Reserve but also for its role as a sanctuary for numerous endangered species, further underscoring Assam's pivotal role in global conservation efforts.

1.4 Manas National Park

The Manas National Park is situated in the western region of Assam within the bhabar area at the foothills of the Himalayas, Manas was initially established as a game reserve in 1928, later attaining the status of a Tiger Reserve in 1974, a World Heritage Site in 1985, and finally a Biosphere Reserve in 1989. Its official designation as a National Park occurred in 1990, encompassing an expanse of 500 sq. km., serving as the heart of the 2600 sq. km. Chirang Ripu Elephant Reserve. Within its boundaries, Manas provides sanctuary to over 22 endangered species, categorized

as Schedule species under the Wildlife Protection Act, affording them the utmost level of safeguarding. Renowned for its picturesque landscapes, Manas has been praised in the UNESCO World Heritage Tag declaration for encapsulating unparalleled natural phenomena and areas of remarkable natural beauty and aesthetic significance. Additionally, it holds the title of an Important Bird Area, boasting a rich avian population comprising more than 500 distinct species. Manas National Park has four ranges Panbari, Bansbari, Kuklung and Bhuyapara.

1.5 Management of Manas National Park

The management of Manas National Park (MNP) is crucial for the conservation of biodiversity, ecosystem services, and cultural heritage. As a protected area under the Indian Wildlife (Protection) Act, 1972, MNP faces challenges like human-wildlife conflicts, poaching, and uneven development. Traditionally managed through a "top-down" approach, the park requires a shift towards more comprehensive management strategies that include strategic, operational, and tactical planning, as well as effective organizing. Strategic planning in MNP focuses on long-term goals like habitat preservation and community engagement, while operational and tactical planning translate these goals into actionable programs and daily management tasks. The organizing function ensures coordination across park operations, addressing tourism management, human-wildlife conflicts, and emergency responses. By integrating these management practices, MNP can enhance its operational efficiency, meet conservation objectives, and support sustainable development in surrounding communities.

1.6 Sustainable Livelihood

The concept of sustainable livelihoods, first introduced by the World Commission on Environment and Development in 1987, and later highlighted at the 1992 UN Conference on Environment and Development, linked socioeconomic and environmental issues within a sustainable development framework. By the late 1990s, this approach was institutionalized by international organizations, bilateral donors, NGOs, and research institutes as a practical means of poverty alleviation,

grounded in an 'asset-vulnerability' perspective. Sustainable livelihoods are defined by the ability to secure subsistence through capabilities, tangible, and intangible assets, while maintaining resilience to external shocks without depleting natural resources. This concept is closely tied to the strategic, operational, and tactical management functions within Manas National Park, where the integration of sustainable practices is essential for achieving long-term conservation and community development goals. The park's management strategy not only addresses biodiversity conservation but also focuses on improving the livelihoods of fringe communities, reflecting the broader global agenda of poverty reduction through sustainable development.

1.7 Review of Literature

The studies included in the literature review consists of peer reviewed published articles, unpublished articles, conference proceedings, magazines, government reports, doctoral and master dissertations. To identify relevant published articles computer-based and manual search was conducted using the keywords such as Sustainability, Sustainable Development, National Parks, Livelihood and such. Google search engine was used to trace out published and unpublished work for online magazine. From the searches described herein, 450 published and unpublished articles were found; giving most recent article from 2024 and oldest one from 1986. Thereafter dissertations were searched on Shodhganga-a reservoir of Indian Theses and certain University libraries. Literature included in the chapter was based on their similarity with focus of the study. However, in literature more focus has been on Sustainability and Management of national parks. Regarding the aspect of Sustainability, Basiago (1995) suggests a comprehensive approach to sustainability that involves redefining societal, economic, and developmental paradigms to prioritize environmental preservation and sustainable development. He advocates for adopting the precautionary principle to protect the environment, making sustainable development a core policy, and restructuring the economy's biological foundations. Baisago also emphasizes the importance of cultivating an ethos that considers both human and environmental well-being, promoting sustainable urban development

through transit-oriented and pedestrian- friendly communities, and implementing a "restorative design" approach that mimics natural processes.

However, Costanza and Patten (1995) suggest that achieving sustainability requires a balance of longevity across different scales within a system. They propose that smaller components should have shorter lifespans than the larger systems they are part of, allowing for evolutionary adaptation. This balance across temporal and spatial scales, termed the "metasystem," is crucial for the persistence and longevity of the overall system. Sustainability, therefore, involves ensuring that each subsystem supports the resilience and adaptability of the larger system it belongs to. But Kuhlman and Farrington (2010) pointed out for a return to the original meaning of sustainability, emphasizing the well-being of future generations and the preservation of irreplaceable natural resources rather than focusing solely on current needs.

Regarding the sustainability of national parks Nelson (1987) suggests that to improve the integration of national parks and protected areas into National Conservation Strategies (NCS), there is a need for enhanced information systems and further research. This would help align conservation strategies more effectively with the diverse roles that these areas can fulfill, addressing the discrepancies and suboptimal utilization identified in the study. Highlighting the sustainability Sharma (1990) suggests that to resolve conflicts between local communities and Royal Chitwan National Park, there should be a paradigm shift in park management. This shift should integrate resource conservation with the social and economic needs of local residents. Proposed strategies include creating an "impact zone" to supply local firewood and fodder, encouraging community forestry initiatives, adopting energy-efficient practices, and managing wildlife populations to reduce human-wildlife conflicts.

When sustainability is at stake due to tourism Sharpley and Pearce (2007) suggest that National Park Authorities (NPAs) should adopt a more integrated and holistic approach to managing national parks and developing sustainable tourism. They recommend that NPAs move beyond the current fragmented methods and consider environmental and social impacts alongside economic outcomes. The study

emphasizes the importance of a unified strategy where marketing and sustainable development efforts are better coordinated within NPAs to enhance sustainable tourism. In view of the local communities and sustainability of national park Abukari and Mwalyosi (2020) suggest that conservation authorities should focus on developing inclusive governance structures that more effectively incorporate the roles and entitlements of local communities. In the view of Covid like situation Miller et al. (2021) suggest that national parks need to adopt adaptive strategies to effectively navigate the ongoing and future disruptions caused by global health crises like the COVID-19 pandemic. They emphasize the importance of flexibility in park management and the development of inclusive public engagement strategies as crucial responses to the challenges faced during the pandemic. Additionally, the study highlights the potential for lessons learned in the US to be applicable to other protected areas worldwide, providing insights for managing similar crises in the future.

Finally, Denny et al. (2024) argued for private sector management of protected which will improves wildlife outcomes, such as reducing elephant poaching and increasing bird populations. This highlights the need for a refine approach to conservation that carefully balances wildlife protection with the socioeconomic and security needs of local population.

1.8 Research Gap

This study identifies a significant research gap in the management and sustainability of national parks, particularly in Assam, India, with a focus on the Manas National Park. While global research has explored various aspects of national park management, community engagement, and conservation, there is a notable lack of comprehensive studies in this region. Specifically, the integration of sustainable livelihood strategies, community-based tourism, and participatory governance in park management remains underexplored. Additionally, socio-economic challenges faced by fringe communities, such as unemployment, lack of education, and healthcare access, are insufficiently addressed. This research aims to fill these gaps by examining the relationship between park management and community

development, exploring the livelihoods and perceptions of local residents, and providing a framework for enhancing socio-economic well-being while ensuring ecological integrity.

1.9 Significance of the study

Protected Areas (PA) were established in the past in response to local residents concerns about overexploitation of natural resources. This includes, in some circumstances, the eviction of residents and the prohibition of certain activities such as resource usage (Hutton et al., 2005). Conservation approaches have over time as a result of the challenges that natural resources encounter (Tumusiime, 2006). Nowadays, it is widely recognised that PAs should play an important role in the preservation of the communities in which they work. The impact of the PA on local livelihoods is the most important factor shaping local sentiments toward these locations (Tumusiime, 2006). According to Hjerpe and Kim (2007), the relationship between a national park and the towns that surround it can be beneficial at best, but harmful at worst if local expenses grow too high. When it comes to communities living near or inside National Parks, there are two main reasons of dispute. The first reason (Vedeld et al., 2004) is that forest products are a major source of income for these communities, and the second is that park revenue can help relieve economic inequity on a micro level. Natural forest resource reliance has been fairly explored, as has the cost of living adjacent to such sites, according to a recent World Bank (WB) meta research (Vedeld et al., 2004). The purpose of this study is to examine the management of Manas National Park (MNP) in a way that promotes sustainable development that combines conservation and development, as well as incorporating fringe communities in conservation and development activities. The study will also examine into the existing economic activities of the communities living around MNP. It will also investigate the local residents' perceptions and attitudes toward conservation measures and government policies, as well as their obstacles to improved livelihoods.

1.10 Scope of the study

The scope of this study is centered on the sustainability and management of Manas National Park in Assam, with a particular focus on the livelihoods of fringe communities residing near the park. The study's strength lies in its comprehensive examination of the perceptions of residents from four villages adjacent to the park regarding conservation and development. The primary objective is to assess the livelihood status of these fringe communities and to understand the intentions of tourists visiting the park. The study encompasses a broad range of variables, including sustainability, satisfaction, behavioral intentions, and the perceptions and attitudes of fringe community members, park management officials, and tourists.

Additionally, the research will develop and present a Structural Equation Modeling (SEM) framework to analyze the relationships among sustainability, satisfaction, and behavioral intentions.

1.11 Chapter Outline Chapter 1. Introduction

Chapter 2. Review of Literature

Chapter 3. Sustainability and Management of the MNP

Chapter 4. Sustainable Livelihood of Fringe Community of MNP
Chapter 5. Data Analysis

Chapter 6. Effect of Sustainability and satisfaction on visitor's intentions
Chapter 7: Findings, Conclusion and Suggestions

1.12 Research Questions of the Study

- RQ1: How do planning initiatives affect the sustainable development of communities adjacent to Manas National Park?
- RQ2: How does park management impact the livelihoods of people living adjacent to Manas National Park?

- RQ3: How do the perceptions and attitudes of people living adjacent to Manas National Park influence conservation measures and government policies?
- RQ4: How do sustainability practices in Manas National Park influence visitor satisfaction and behavioral intentions, and what specific improvements in sustainability attributes can enhance visitor experiences and promote positive behaviors?

1.13 Objectives of the study

- To examine the sustainability and management of Manas National Park, Assam
- To examine the current state of livelihood of people in villages living adjacent to Manas National Park.
- To examine the perception and attitude of fringe community adjacent to Manas National Park towards conservation and development.
- To explore how sustainability and satisfaction affect visitor's intentions to recommend and revisit Manas National Park

1.14 Research Methodology

To take up this study, fieldwork in Manas National Park in Assam is necessary to provide insights into the impacts on local people and to include findings for accomplishing the project's objectives which are empirical in nature. As a result, this study uses mixed techniques to collect both qualitative and quantitative data on processes and institutions relevant to rural livelihoods and natural resource management. Quantitative data supported identifying patterns of association between variables by acquiring data primarily related to household activities, assets, and incomes, whereas qualitative data enabled obtaining data regarding opinions, beliefs, constraints, attitudes, and perceptions.

Population of the study: Under this study population defines fringe people, management officials and domestic tourist who have visited MNP. The fringe people are undertaken from four villages namely Gyti, Narayanguri, Raghob Bill and Bhuyapara which are adjacent to MNP. Two ranges are chosen namely Bhuyapara and Bansbari.

Sample frame is obtained in the form of list employees names provided by MNP (Director Office), Household list was obtained from Gaon Bura of four villages and Tourist records were obtained from the resorts and lodges in MNP.

Sampling Design has been done from the list using stratified random sampling method Manas National Park region was first divided into four parts or strata- South, North, East and West and four villages were chosen based on the distance from the park, the distance was considered to be less the 2km from the park range and from there 60 households were randomly selected. 20 Officials were selected from each hierarchical levels and 300 tourists were chosen using convenience sampling from there 233 replied.

Data Collection has been done by employing both primary and secondary data collection methods to ensure comprehensive data acquisition. Primary methods included focus group discussions, key informant interviews, household surveys, and an online questionnaire, while secondary methods utilized official documents, NGO reports, national newspaper articles, and academic publications. By integrating multiple data sources, the study aimed to mitigate biases and enhance triangulation. Key principles followed in the research included the use of diverse evidence sources, the creation of a case study database, and maintaining a chain of evidence. Tools for data collection involved audio- videorecorded interviews in Assamese, Bengali document reviews, household surveys using structured questionnaires, focus group discussions, and key informant interviews with stakeholders, ensuring a thorough exploration of the research themes.

1.15 Data Analysis

The analysis of livelihood capital was conducted using a variety of indicators across different dimensions: natural, physical, human, financial, and social capital. Each indicator was defined and measured to provide a comprehensive understanding of the community's living conditions. Descriptive statistics, including mean values, were used to capture central tendencies and variations. Following those diverse analytical methods to examine the perspectives of marginalized communities on conservation and development in Manas National Park (MNP). Utilizing Kendall's tau_b for non-parametric correlation analysis, the study explored relationships among variables such as Resource_Park, Wildlife_Protection, Community_Relation, and Economic_Impact. SPSS software facilitated the analysis, which included indicators for assessing livelihood capital (e.g., farmland size, asset ownership) and community attitudes. A comprehensive questionnaire was developed to measure tourists Net Positive Behavioral Intentions (NPBI) towards MNP, using constructs of sustainability, satisfaction, and behavioral intention. The data, gathered from 233 respondents via online methods, was analyzed using SPSS. To empirically test the hypotheses, multi-item scales used in previous studies were identified and modified to suit with the study setting. A questionnaire with three constructs NPSUS, NPBI and NPSAT and SEM model was obtained. Additionally, livelihood data was analyzed through descriptive statistics, while qualitative data from focus group discussions (FGDs) was examined using reflexive thematic analysis with Nvivo software. A pilot study was conducted to refine the methodology and ensure the accuracy of the sampling process, involving 15 households across four villages. The study's methodological rigor provides a detailed understanding of the complex interactions between local populations and park management.

1.16 Limitations of the Study

Though the present study contributes to existing literature, it has certain limitations. First and foremost, time and resource constraints forced the researcher to limit the sample size and area covered in the study. Another significant limitation concerns the generalizability of the findings, as the study focused on village communities adjacent

to Manas National Park. The results may not be fully representative of other rural areas or communities with different socio-economic contexts. Additionally, many of the independent variables were measured based on the perceptions of the villagers. The responses might have been influenced by temporary moods or what participants considered socially appropriate, potentially affecting the accuracy of the data.

1.17 Major Findings of the Study

Objective Wise Sustainability and management of Manas National Park

- The study finds that local populations, especially the Bodo tribe, play a crucial role in the sustainability of Manas National Park. The Bodoland Territorial Council's establishment in 2003 improved local involvement in conservation. However, challenges remain, such as inadequate local input during leadership transitions, leading to conflicts and increased illegal hunting. Effective conservation requires stronger cooperation between park administrators and local communities to protect the park's ecological balance.
- The study finds that Manas National Park has significantly advanced in environmental conservation, notably after overcoming Bodo insurgency challenges. Key efforts in biodiversity protection and habitat restoration led to its removal from endangered status in 2011. Sustainable practices, including managing invasive species and reducing pollution, have improved its environmental sustainability. The park's UNESCO World Heritage Site status and the closure of the Mathanguri picnic area emphasize its commitment to reducing litter and protecting its ecosystems.
- The study finds that efficient resource management is vital for Manas National Park's sustainability. Strategies for managing water, plants, and animals, along with habitat restoration, have improved the park's resilience. Regular data evaluation supports ecosystem health and visitor experiences. However, poor infrastructure in many ranges leads to inadequate patrolling and increased poaching. In the Bhuyapara range, poor road conditions hinder effective patrolling, necessitating less efficient foot patrols.

- The study finds that technological advancements have significantly improved park management and visitor experiences in Manas National Park. Remote monitoring technologies, such as cameras and sensors, enhance the efficiency of species and ecosystem monitoring. Management technologies, including software and databases, streamline administrative tasks, resource allocation, and maintenance scheduling. These tools boost operational efficiency, resource conservation, and visitor satisfaction, thereby contributing to the park's sustainability.
- The study finds that economic sustainability in Manas National Park involves generating income to support park operations and local economies while maintaining environmental and social integrity. Revenue sources include entrance fees and safaris. Promoting tourism has boosted local economies through visitor spending and job creation. Effective funding strategies ensure revenue generation aligns with conservation objectives, balancing economic benefits with environmental care. Responsible income generation allows the park to sustainably fund conservation initiatives, enhance tourist experiences, and provide long-term support to local communities.
- The study finds that resolving conflicts between local communities and park authorities has been crucial for the sustainability of Manas National Park. During the insurgency, exclusion and lack of resource access posed significant challenges. The establishment of the BTC and the subsequent involvement of local communities in park management have mitigated these conflicts. Local residents, now recognizing the benefits of conservation, actively participate in the park's restoration and management. This community engagement has reduced conflicts and enhanced the park's conservation outcomes and sustainability.
- The study finds that Manas National Park is a vital component of the Eastern Himalayan biodiversity hotspot, serving as a critical refuge for endangered species such as the one-horned rhinoceros, Asiatic elephant, and Royal Bengal tiger. The park's diverse ecosystems and habitats are essential for the survival of these species, highlighting its importance in global biodiversity conservation efforts. The preservation of such key species stresses the park's role in maintaining the ecological

balance and richness of this unique region.

Current state of livelihood of people in villages living adjacent to Manas National Park

Table 1: Livelihood Analysis

Dimension Layer	Criteria	Indicators	Indicator Definition	Mean	Standard Deviation
Livelihood Capital	Natural capital	Land Area (C1)	Area of farmland (unit: Bigha)	2.87	1.27
		Land Quality(C2)	1 = very poor, 2 = poor, 3 = average, 4 = fertile, and 5 = very fertile	3.583	0.493
	Physical	Homestead area (C3)	1 = 100 and below, 2= 100–160, 3 = 160– 200, and 4 = above 200 (unit:m ²)	3.55	0.441
	Capital	Family owning assets (C4)	The number of assets such as Television, Computer, Cycle, Scooter, Refrigerator etc.	2.6	0.51
		Livestock and poultry breeding (C5)	Breeding livestock and poultry: 0 = No and 1 = Yes	0.9	0.5
	Human Capital	Family Size(C6)	Total number of family members	4.25	0.946
		Skill training(C7)	Participation in Professional skill training programmes: 0 = No and 1 = Yes	0.2	0.40
		Education level (C8)	1 = Primary school and below, 2 = Junior high school, 3= High school, 4= College & Intermediate, and 5= Postgraduate	1.42	0.714
		Physical health condition	0=Experienced major disease and 1=	0.75	0.433

		(C9)	Healthy		
		Annual frequency of seeking medical treatment (C10)	Annual frequency of going to the hospital (unit: times)	1	1.064
		Off-farm management (C11)	Running a business or a store/Homestay etc: 0 = No and 1 = Yes	0.467	0.512
	Financial capital	Annual family income (C12)	1=30,000 and below, 2 = 30,000–90,000, 3 = 90,000–150,000, 4=150,000-300,000, and 5 =above 300,000 (unit: INR)	1.92	0.84
	Social Capital	Agricultural cooperative organization (C13)	Joining the Specialized farmers' cooperatives: 0 = No and 1 = Yes	0.32	0.47
		Relationship with Relatives(C14)	1 = very poor, 2 = poor, 3 = Good 4= Excellent	1.77	0.90
		Road Condition (C15)	0 = Unpaved road and 1 = Cement/ Asphalt road	0.6	0.49
		Transportation convenience (C16)	1 = Lower, 2 = Average, 3 = High, and 4 =Higher	2.2	0.73.
		Relationship with the Park Officials (C17)	1 = very poor, 2 = poor, and 3 = Good 4= Excellent	1.75	0.82

Natural Capital

1. **Land Area (C1):** The average area of farmland owned by the surveyed households is 2.87 Bighas, with a standard deviation of 1.27. This indicates moderate variability in landholding size among the respondents.
2. **Land Quality (C2):** On a scale of 1 to 5, where 1 represents very poor and 5 represents very fertile land, the mean land quality is 3.583 with a low standard deviation of 0.493. This suggests that most respondents consider their land to be of average to slightly above-average fertility, with relatively little variation in perceptions of land quality.

Physical Capital

1. **Homestead Area (C3):** The average homestead area falls between 160 and 200 square meters, with a mean score of 3.55 and a standard deviation of 0.441. This indicates that most households have moderate-sized homesteads, with some variability.
2. **Family Ownership of Assets (C4):** Households report owning an average of 2.6 major assets (e.g., refrigerator, television, vehicle), with a standard deviation of 0.51. This reflects a fairly consistent level of asset ownership across the sample.
3. **Livestock and Poultry Breeding (C5):** A high percentage (mean = 0.9) of respondents engage in livestock and poultry breeding, with minimal variation (standard deviation = 0.5), indicating widespread involvement in this activity among the surveyed households.

Human Capital

1. **Family Size (C6):** The average family size is 4.25 members, with a standard deviation of 0.946, indicating that most families are of moderate size, though there is some variability.

2. **Skill Training (C7):** Participation in professional skill training programs is low, with a mean of 0.2 and a standard deviation of 0.40. This suggests limited access to or engagement in skill development among the population.
3. **Education Level (C8):** The average education level is close to primary school completion (mean = 1.42), with a standard deviation of 0.714. This indicates that most respondents have low levels of formal education, with some variability.
4. **Physical Health Condition (C9):** The majority of respondents (mean = 0.75, standard deviation = 0.433) report being in good health, though there is some variation in health status within the population.
5. **Annual Frequency of Seeking Medical Treatment (C10):** On average, respondents seek medical treatment once a year (mean = 1), with a standard deviation of 1.064, reflecting variability in health care needs or access among households.
6. **Off-Farm Management (C11):** About 46.7% of respondents are involved in off-farm activities such as running a business or homestay, with a standard deviation of 0.512, indicating moderate involvement in such activities.

Financial Capital

1. **Annual Family Income (C12):** The average annual family income falls between INR 30,000 and INR 90,000 (mean = 1.92), with a standard deviation of 0.84, reflecting moderate income levels with significant variation among households.

Social Capital

1. **Agricultural Cooperative Organization (C13):** A relatively small proportion (mean = 0.32) of respondents are members of specialized farmers' cooperatives, with a standard deviation of 0.47, indicating limited engagement in such organizations.

2. **Relationship with Relatives (C14):** The average rating for relationships with relatives is 1.77 on a scale where 1 is very poor and 4 is excellent, with a standard deviation of 0.90, suggesting that most respondents perceive their relationships with relatives as poor to average, with some variability.
3. **Road Condition (C15):** 60% of respondents report living in areas with paved roads (mean = 0.6), with a standard deviation of 0.49, indicating variability in infrastructure conditions.
4. **Transportation Convenience (C16):** The average rating for transportation convenience is 2.2, with a standard deviation of 0.73, indicating that most respondents find transportation to be of average convenience, though there is some variation in access.
5. **Relationship with Park Officials (C17):** The relationship with park officials is generally perceived as poor to average (mean = 1.75), with a standard deviation of 0.82, indicating some variation in the quality of interactions between the community and park authorities.

The findings reveal a mixed livelihood scenario among the village communities adjacent to Manas National Park. While there is a moderate level of land ownership and homestead area, asset ownership and education levels are relatively low. There is significant involvement in livestock and poultry breeding, and a substantial portion of households engage in off-farm activities. Social capital indicators highlight challenges in relationships with relatives and park officials, as well as variable infrastructure conditions. These findings underscore the need for targeted interventions to enhance livelihood capitals and strengthen social ties within the community.

Perception and attitude of fringe community adjacent to Manas National Park towards conservation and development.

Table 2: Analysis on Perception and Attitude

Variables	Correlation	Resource_ Park	Wildlife_ Protection	Community_ Relation With Park	Economic_ Impact
Resource_Park	Correlation Coefficient	1	0.164	.178*	0.039
	Sig. (2-tailed)	.	0.069	0.05	0.673
	N	60	60	60	60
Wildlife_Protection	Correlation Coefficient	0.164	1	.199*	0.137
	Sig. (2-tailed)	0.069	.	0.028	0.134
	N	60	60	60	60
Community_Relation with Park	Correlation Coefficient	.178*	.199*	1	.272**
	Sig. (2-tailed)	0.05	0.028	.	0.003
	N	60	60	60	60
Economic_Impact	Correlation Coefficient	0.039	0.137	.272**	1
	Sig. (2-tailed)	0.673	0.134	0.003	.
	N	60	60	60	60

The study examined the perceptions and attitudes of fringe communities towards the conservation and development of Manas National Park (MNP) using Kendall's tau_b correlation analysis. The analysis revealed a weak positive but not statistically significant correlation between park resources and wildlife protection, suggesting limited direct alignment between resource allocation and conservation outcomes. However, a significant positive correlation was found between park resources and community relations, indicating that better resource allocation enhances community engagement and support. Interestingly, no significant

correlation was observed between park resources and the economic impact on local communities, highlighting the need for more targeted interventions to translate resources into tangible economic benefits. Additionally, a significant positive correlation between community relations and economic impact suggests that fostering strong relationships between the park and local communities can improve economic perceptions. The findings underscore the importance of strategic resource management, community involvement, and the integration of conservation efforts with local development to enhance both conservation outcomes and community well-being.

FGD findings

The FGD analysis provided rich insights into the perceptions, attitudes, and experiences of local communities residing near Manas National Park (MNP). Participants from various villages shared their views on the impacts of conservation efforts, tourism activities, and park management on their livelihoods. The discussions revealed a complex relationship between the park's conservation initiatives and the socioeconomic well-being of the fringe communities. Key themes that emerged included concerns over restricted access to natural resources, mixed feelings about the benefits of tourism, and the need for more inclusive decision-making processes involving local residents. The FGD findings underscore the importance of integrating community perspectives into the management strategies of MNP to enhance both conservation outcomes and community support.

The study of Manas National Park (MNP) found that the connection between park resources and wildlife protection is weak and not significant, suggesting that resources may not be effectively supporting conservation efforts. On the other hand, there were strong connections between park resources and community relations, as well as between community relations and economic benefits, showing that better resource management and strong relationships with local communities can improve community engagement and economic outcomes. Discussions with local residents

also revealed concerns about limited access to resources, mixed feelings about tourism benefits, and the need for more involvement in decision-making. Overall, the findings highlight the importance of involving communities in MNP's management to achieve better conservation and development outcomes.

Sustainability and satisfaction affect visitor's intentions to recommend and revisit Manas National Park

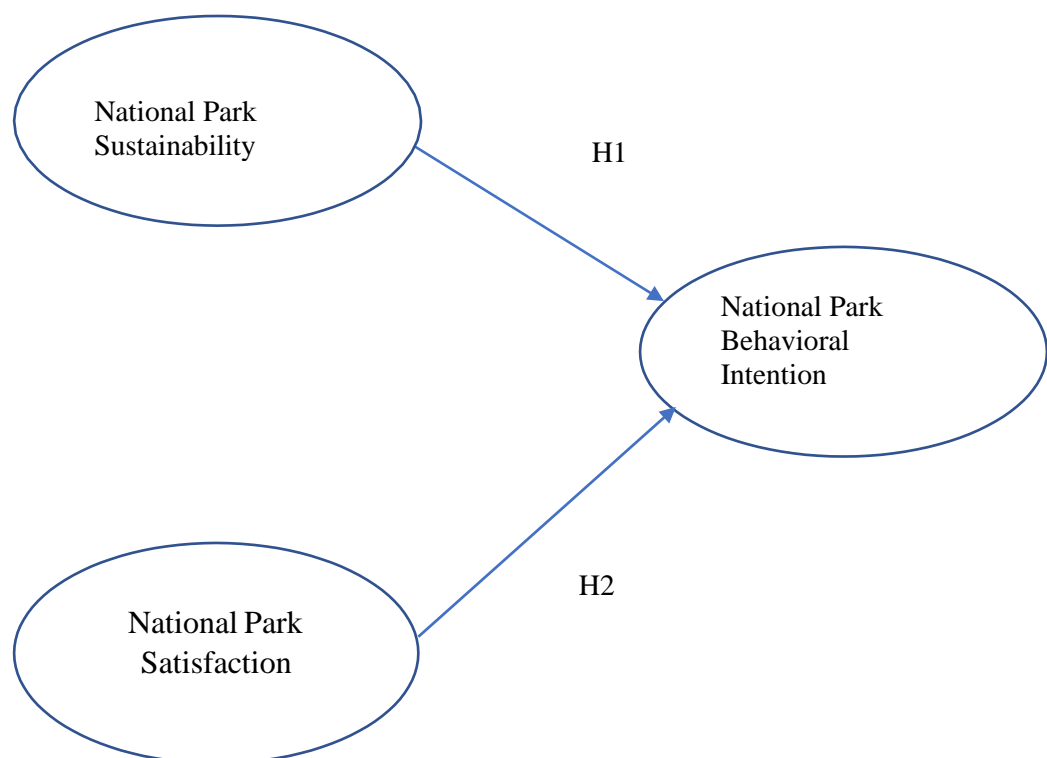


Figure1: Model on National Park Sustainability and National Park Satisfaction on National Park Behavior Intention.

Reliability, Validity and Measures of Sample Adequacy

A reliability test on 233 valid cases showed a Cronbach's Alpha of 0.738, indicating moderate to good internal consistency. The Kaiser-Meyer-Olkin (KMO) measure of 0.852 confirmed the high suitability of the data for factor analysis. Additionally,

Bartlett's Test of Sphericity was significant ($\chi^2 = 1262.071$, $df = 190$, $p < 0.001$), further validating the appropriateness of factor analysis for the dataset.

Table 3: Descriptive Statistics for EFA Results for NPSus

National Park Sustainability Items	Mean	SD	Factor Loading
Presence of clean (unpolluted) air	2.35	1.782	.622
Presence of plenty areas covered in flora	2.33	1.739	.576
Presence of habitat for local wildlife	2.05	1.597	.640
Presence of key species	2.10	1.591	.642
Presence of natural features	2.28	1.818	.553
Low presence of noise pollution	2.13	1.754	.643
Presence of allocation of income to the local people	2.24	1.651	.597
Presence of tourist spending on local services and products	2.29	1.789	.627
Presences of conservation of traditional arts and crafts among local people	2.25	1.679	.592
Presence of education level among local people	2.45	1.684	.628
Presence of basic services for local people	2.21	1.590	.590

The study reveals that sustainability in national parks is driven by environmental conservation, community support, and cultural preservation. Key factors include clean air, abundant flora, wildlife habitats, species conservation, noise reduction, and local income generation. Additionally, promoting tourist spending on local goods, preserving traditional arts, and improving education and services for residents are crucial. These findings emphasize the need for holistic strategies that integrate environmental, community, and cultural elements to ensure the long-term sustainability of national parks.

Table 4: Descriptive Statistics and EFA for NPSat

National Park Satisfaction Items	Mean	SD	Factor Loading
I am satisfied with my decision to visit this national park	4.13	1.654	.750
My choice to visit this national park was a wise one	2.15	1.829	.516
I am sure it was the right thing to visit this national park	2.58	2.112	.597
Visiting this national park is worthwhile	2.25	2.025	.607

Visitor responses indicate varying levels of satisfaction and perceived value associated with visiting the national park. The highest mean score (4.13) reflects overall satisfaction with the visit, with consistent responses among visitors. However, lower mean scores for other items (2.15 to 2.58) suggest mixed feelings about the wisdom and certainty of the decision to visit, indicating variability in perceptions. Despite this, positive factor loadings (0.516 to 0.750) confirm that these satisfaction metrics significantly contribute to overall park satisfaction, highlighting the need for further exploration to enhance visitor experiences.

Table 5: Descriptive Statistics and Factor Analysis for NPBI

National Park Behavioral Intention Items	Mean	SD	Factor Loading
I will visit this national park again in future	4.65	2.164	.597
I Will say positive things about this national park	4.52	2.334	.607
I Will choose this national park as my first choice compared to other national	4.63	2.110	.641
I Will stay longer in the next visit to this national park	4.60	2.211	.729

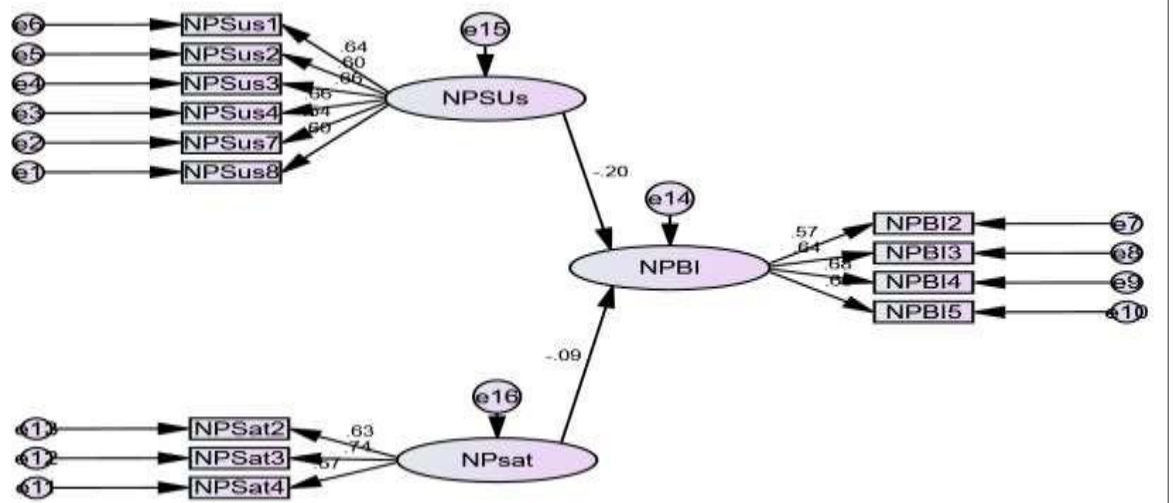
The factor loadings, ranging from 0.421 to 0.729, suggest that these behavioral intentions significantly contribute to the underlying construct of visitors' future engagement with the national park. Specifically, visitors express a strong likelihood of revisiting the park, speaking positively about it, recommending it to others,

prioritizing it over other national parks, and extending their duration of stay during subsequent visits. In summary, these findings indicate a positive outlook on future visitor behavior and imply the potential for sustained support and promotion of the national park.

Table 6: Rotated Component Matrix

	Component		
	1	2	3
NPSus 3	.728		
NPSus 1	.698		
NPSus 4	.692		
NPSus 2	.674		
NpSus 8	.658		
NPSus 7	.575		
NPBI 4		.773	
NPBI 3		.756	
NPBI 5		.716	
NPBI 2		.710	
NPSAT 3			.817
NPSAT 2			.787
NPSAT 4			.597
Extraction Method: Principal Component Analysis.			
Rotation Method: Varimax with Kaiser Normalization.			
a. Rotation converged in 5 iterations.			

The factor analysis reveals three distinct components: Sustainability, Satisfaction, and Behavioral Intention. The Sustainability component includes variables NPSus 1, 2, 3, 4, 7, and 8, showing strong correlations among them. Satisfaction is represented by variables NPSAT 2, 3, and 4, which are closely related and reflect overall customer satisfaction. Behavioral Intention is captured by variables NPBI 2, 3, 4, and 5, indicating a cohesive measure of customers' future behaviors. High factor loadings, particularly above 0.7, underscore the strength of these variables within their respective components, providing a clear framework for understanding the relationships between sustainability, satisfaction, and behavioral intention.



Testing of Hypothesis and (SEM Model)

Figure 2 (SEM Model)

Minimum was achieved Chi-square = 150.334 Degrees of freedom = 63 Probability level = .000

The minimum value was achieved for the Chi-square statistic, indicating that the model fits the data well. The Chi-square value is 150.334 with 63 degrees of freedom. The probability level associated with this Chi-square value is less than 0.001 ($p < .000$), suggesting that the model's fit to the data is statistically significant. Overall, these results indicate a good fit between the proposed structural model and the observed data, as the minimum Chi-square value suggests that the model adequately explains the relationships among the variables.

Correlation

The SEM analysis shows that National Park Sustainability (NPSUs) negatively affects National Park Behavioral Intention (NPBI) with a coefficient of -0.254 ($p = 0.025$), though this relationship is not statistically significant. National Park Satisfaction (NPsat) also has a negative but non-significant effect on NPBI (coefficient = -0.101, $p = 0.327$). Additionally, certain survey responses and

unidentified factors positively influence NPSUs and NPBI, respectively, while specific conditions contribute to higher NPSat. Overall, neither NPSUs nor NPSat significantly impacts NPBI, suggesting that other factors may influence visitor intentions towards national parks. Findings suggest that National Park Sustainability (NPSus) significantly influences both National Park Satisfaction (NPSat) and National Park Behavioral Intention (NPBI). Notably, NPSat mediates the relationship between NPSus and NPBI, highlighting the crucial role of visitor satisfaction in shaping behavioral intentions towards the park. The analysis emphasizes that tourists are aware of sustainability attributes like wildlife habitat and local income generation, and their satisfaction levels, such as perceived worthiness of the visit, directly affect their likelihood to engage in positive behaviors, including recommending the park and choosing it again. The findings emphasize the importance of enhancing sustainability practices and visitor satisfaction to foster strong behavioral intentions and promote the park's conservation and development goals.

Suggestions

For Fringe People

a) **Encourage active community participation and awareness** Local communities should be actively involved in park management and conservation efforts. We urge residents to engage early in decision-making processes and ensure their input is valued and integrated into final decisions. Establishing collaborative teams with representatives from each hamlet to work alongside park authorities can enhance inclusivity and trust. Additionally, community members are encouraged to increase their awareness of park rules and regulations, promoting a more informed and participatory approach to conservation initiatives.

b) **Promoting cultural tourism:** Manas National Park can highlight the region's rich heritage, including festivals, traditional crafts, and indigenous cultures. Integrating

these cultural experiences into ecotourism not only enriches visitors' understanding but also supports community empowerment and economic sustainability. Encouraging respectful interactions between tourists and residents fosters cultural appreciation and contributes to sustainable development by preserving local cultural identities.

For Park Management officials

a) **Facilitate Sustainable resource use:** To ensure Manas National Park's long-term ecological health, it is crucial to regulate resource collection and promote sustainable agriculture. Implement practices like setting quotas, designating collection areas, and providing alternatives to reduce park resource pressure. Additionally, support sustainable agriculture through organic farming, crop diversification, and soil conservation. These measures will help balance conservation goals with community livelihoods, fostering both environmental protection and sustainable development.

b) **Enhancing Infrastructure and Sustainable Operations:** To enhance Manas National Park's infrastructure, invest in roads, visitor centers, and signage, while developing unused ranges and reopening old routes. Implement electric vehicles (E-vehicles) to cut carbon emissions and establish charging stations to support them. These steps will improve accessibility, boost visitor satisfaction, and promote sustainable tourism.

For Government, Forest Department and BTC

a) **Address conflict and ensure equitable resource distribution:** Implementing effective conflict resolution mechanisms, including mediation services and community forums, is essential for addressing disputes between park authorities and local communities surrounding Manas National Park (MNP). The Bodoland Territorial Council (BTC) should be instrumental in establishing a dedicated forum

to facilitate constructive dialogue and fair dispute resolution. Additionally, equitable distribution of resources and benefits from park activities is critical for sustainable community development. This includes transparent land allocation, equitable access to financial resources, and meaningful participation in park management decisions, which collectively enhance local livelihoods and strengthen community engagement in conservation efforts.

b) **Balanced Development:** The study reveals a significant disparity in resource allocation between Kaziranga National Park (KNP) and Manas National Park (MNP). While KNP benefits from substantial government investment and high-profile promotional efforts, leading to considerable tourist revenue and infrastructure development, MNP receives minimal attention despite its rich biodiversity and cultural heritage. This imbalance results in underdeveloped infrastructure at MNP and a focus on KNP, limiting MNP's tourist potential and exposure. To address this, increased investment and promotion for MNP are necessary to balance the resources and attention given to both parks.

Suggestion for NGO's

a) **Strengthen Partnerships and Collaborative Efforts:** NGOs should continue to forge and strengthen partnerships with government agencies, forest departments, and other NGOs to leverage resources and expertise. These collaborative efforts can help streamline conservation and tourism promotion programs, ensuring a more unified and effective approach. Establishing formal partnerships and memoranda of understanding (MOUs) can facilitate better coordination and resource-sharing, enhancing the overall impact of their initiatives.

b) **Expand Capacity-Building Programs:** NGOs should expand their capacity-building programs to encompass a wider range of skills and knowledge areas. This includes advanced training in eco-tourism, wildlife management, and sustainable business practices. By equipping local communities with diverse skills, NGOs can enhance their ability to manage and benefit from tourism activities sustainably. Additionally, providing ongoing mentorship and support can help

ensure the long-term success of these initiatives.

Conclusion

The sustainability and management of Manas National Park (MNP) encompass conservation efforts, community involvement, economic strategies, and management challenges. Despite notable successes, such as the park's removal from the endangered list in 2011, issues persist. Local communities, particularly the Bodo tribe, are often excluded from decision-making, leading to conflicts and increased poaching. While technological advancements and improved natural resource management have enhanced operational efficiency and visitor experiences, economic sustainability remains a challenge. Villages adjacent to MNP face limited capital, inadequate market conditions, and persistent reliance on forest products. Community perception studies reveal a positive correlation between park resource management and perceived economic benefits, but challenges like human-animal conflicts and revenue leakage undermine progress. Enhancing visitor satisfaction and addressing issues such as noise pollution and income allocation are critical for promoting sustainable tourism. Ultimately, integrated management practices, improved community participation, and balanced economic strategies are essential for the long-term viability and conservation success of MNP.

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