

Exploring Potential of Agri-Tourism for Sustainable Riparian Livelihood of the Brahmaputra River Valley Using SWOT Analysis: A Case Study of Lower Jia Bhoroli Basin, Naduar, Tezpur, Assam

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Abstract:

Agri Tourism is redefining conventional tourism by introducing the concept of agricultural in tourism among rural communities. The Jia Bhoroli River plays a significant role in its lower basin, influencing agriculture and the livelihoods of the riverine communities. However, climate-induced challenges such as frequent flooding, erosion, and channel migration disrupt agricultural practices of riparian zone, which led farmers to explore non-agricultural livelihoods for resilience. This study examines the impact of riverine dynamics on agriculture, emphasizing the region's potential as a vegetable production hub and the emerging opportunities in Agri-tourism as an alternative sustainable livelihood. Using qualitative and quantitative methods, it identifies challenges in land use and lack of proper infrastructure while highlighting the untapped potential of Agri-tourism in the Jia Bhoroli basin. The findings with SWOT analysis indicate that with targeted policy reforms and improved watershed management, this region has the potential to become a benchmark for sustainable rural development through growth in tourism, agriculture and allied activities. The study underscores the significance of blending traditional knowledge with contemporary practices like use of blockchain, R.S & G.I.S technology in agriculture, highlighting the crucial role of government support and public-private partnerships in promoting sustainable development of the watershed.

Keywords: Agri-Tourism, Sustainable Riparian Livelihood, Flood, SWOT, Rural Development.

1. Introduction:

“Farm in the family and family in the farm”-Agritourism India, (ATDC).

“Agri-tourism is defined as travel, which combines, agriculture and rural setting with a product of agriculture operation all within a tourism experience” (Pandurang Taware - Father of Agri-Tourism, India). “Livelihood” which mean way of living life, it refers to individuals who sustain themselves by fulfilling basic needs like food, water, shelter, and clothing through various economic activities. The “Sustainable livelihood” which refers to the way of living, which meets the requirement of the people without compromising the need of future generation (Chambers, R., & Conway, G. 1992) but when it comes to “Sustainable Rural livelihood”, it is very crucial due to the lack of proper infrastructure and awareness. The rural area adjacent to river basin faces many hurdles in their life long journey as the rivers are dynamic in nature, as

they change their courses from time to time due to several external factors in the catchment area (Wells and Dorr, 2015).

The basic challenge for sustainable agriculture is to make better use of available biophysical and human resources (Pretty et al.,1996). In rural areas, livelihood diversification is only the way to secure a better quality of life, particularly where the population is heavily dependent on agriculture, fishing, and livestock rearing(Ellis & Allison, 2004).

In Assam, a northeastern state of India where 86% of the population is rural, agriculture forms the backbone of livelihoods. However, recurring floods at Brahmaputra and its tributaries especially the Jia Bhoroli River have devastatingly affected local communities and their livelihood by destroying agricultural land and displacing thousands of families from their birth places(Dutta & Sonowal, 2020). Assam has experienced annual losses of over ₹328.95 crore due to flooding, with thousands of villages and the infrastructure affected (ASDMA,2024).

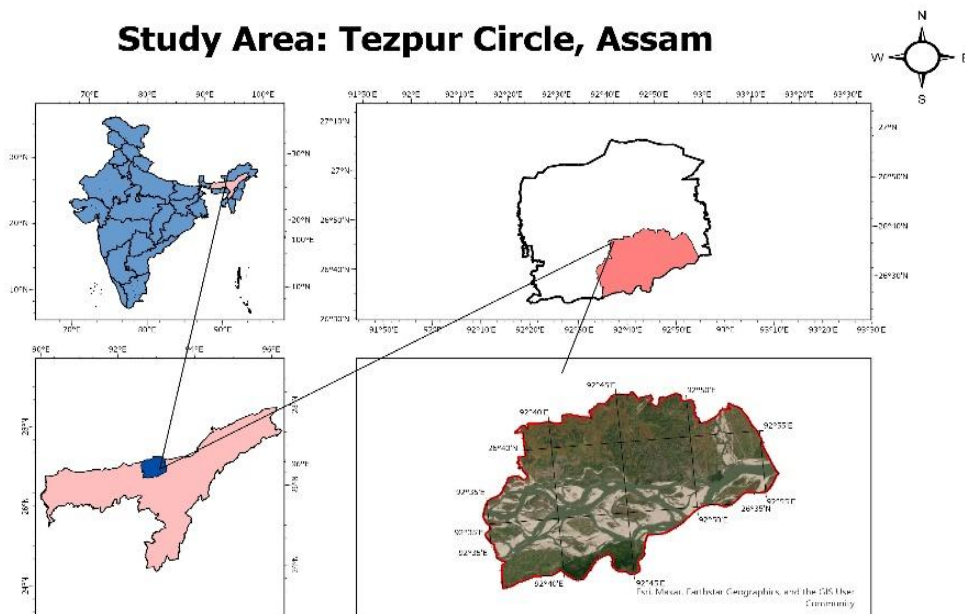
A SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis is a useful technique for comprehending its potential and difficulties. The internal and external elements influencing the expansion and sustainability of Agritourism are identified with the aid of this analytical framework (Harding & Long, 2017). Stakeholders can create strategic plans for long-term success by assessing the following: challenges like market fluctuations or climate change; opportunities from eco-conscious tourists; weaknesses like inadequate infrastructure; and strengths like natural beauty and cultural traditions.

This study aims to explore the impact of Jia Bhoroli River on the local people of the area who inhabits in the proximity of the river, which include the social life of the people and it also gives insight about the diversification of livelihood due to insecurity from flood. The finding indicates that via expansion in the agricultural and tourism industries, this region has the ability to set the standard for sustainable rural development with certain modification of policies and better watershed management. It emphasizes the value of maintaining regional customs while using creative strategies to strengthen rural economies. In the present situation, possible advantages, difficulties, and approaches for growing Agritourism in this area are examined. The study emphasizes how important it is to combine traditional knowledge with modern methods, such as using blockchain and R.S. & G.I.S. technology in agriculture, and how important government assistance and public-private partnerships are to fostering the watershed's sustainable development. In light of the need for sustainable agriculture and worldwide environmental concerns, this study adds to the conversation on Agritourism and rural development.

2. Study area:

The Jia Bhoroli River is one of the significant tributaries of Brahmaputra River flows through Naduar and Tezpur of Sonitpur district, Assam which is also known as kameng river in Arunachal Pradesh. It is originated in Tawang district, A.P from glacial lake below Gori Chen snowcapped mountain. The river lies in two states of India namely Arunachal Pradesh and Assam, total length of the river is 264 km and has drainage basin of about 11,843 square km, where 87.4% lies in A.P and 12.6% lies in Assam. Fig: 1.1 Study area.

Jia Bhoroli being a north-bank tributary of the Brahmaputra River, it has its own small tributaries which includes the Bichom, Tipi, Nam Sonai, Dharikati, and Mansiri, in the right bank, while the left bank tributaries are the Pacha, Papu, Diyu, Namiri, Upper Dikrai, Khari Dikrai, and Bor Dikrai, all of which originate from the Himalayan Mountain ranges.



In the lower reach of the river basin i.e. Jia Bhoroli in Assam opts braided pattern of river channel with a very frequent channel migration in the region. The local economy is predominantly agrarian, with agriculture relying on the river for irrigation. The presence of fertile alluvial soil along the riverbanks supports the cultivation of various crops. Additionally, fishing is a significant source of income for many families, with the river providing both sustenance and economic opportunities.

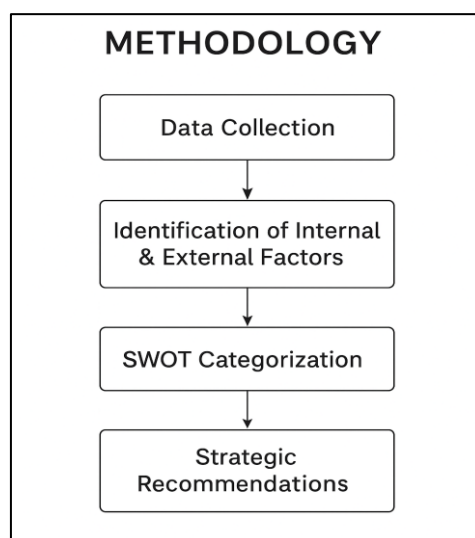
3. Objectives:

- i) To find the potential of Agri Tourism in Jia Bharali watershed using SWOT analysis.

4. Methodology:

This study primarily includes field survey focusing on the villages which are very close proximity to Jia Bhoroli River. A survey of n=120 households was conducted from both side river bank villages. The point of view of local people upon tourism related to agriculture i.e. Agri Tourism was discussed through focus group discussion (FGD).

SWOT analysis is used for evaluating the potential of Agri-tourism to figure out the Strength, Weakness, Opportunities and Threats in the study area.



The study has examined relevant secondary data from government reports, academic publications, and online sources to gain insight into the broader context of agricultural practices, land use patterns, and tourism trends in the Brahmaputra Valley.

5. Results and Discussion:

5.1 SWOT Analysis:

Agri-Tourism has strong potential in Jia Bhoroli, Tezpur, Assam due to its scenic riverine landscape, fertile agricultural zone, and linkage with local culture. A comprehensive SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats) is as follows:

5.1.1 Strengths of Agri Tourism in Jia Bhoroli:

The rich biodiversity, scenic riverine landscape, fertile soil with alluvial, sand, slit, clay, abundant water resources and traditional rural lifestyle, makes it ideal for Agri based tourism. It is also known as Vegetable basket of the region. The tourist can enjoy the fresh and live farming activities like cropping and nourishing crops, plucking vegetables for self-cooking in the river side and other allied activities like animal husbandry, poultry and fishing especially Silghariya fish, scientifically known as *Labeo dyocheilus*, also called the “Brahmaputra labeo”. Such activities are highly beneficial for children in the 21st century, as they provide a positive environment and real-life experiences of exploring the natural beauty of our planet. These experiences help nurture children’s curiosity, connection with nature, and overall well-being.

The proximity to other Tourist spots and New Four lane National Highway 715 connectivity, will attract eco-tourists who are interested in natural beauty, wildlife, river rafting, and sustainable rural experiences with traditional Assamese farming, weaving, and cuisine, which can be integrated into tourism experiences to showcase local culture and generate community income.

Also, local initiative, particularly the Kanyaka Multipurpose Agri Farm initiative, demonstrates feasible Agri-tourism models with cottages, organic farms, and riverbank restoration, and such model can be extended to other remote villages of the Jia Bhoroli Watershed.

Lastly, through the use of Geographic Information System (GIS) it is found that there is availability of huge patch of suitable crop land for agriculture and allied tourism activities. This cultivable land is recover after the westward shift of the Jia bhoroli river channel (Debnath et al., 2023) and through field survey it is found that labour in the river basin are very experienced farmer because of their traditional knowledge on agriculture and overall farming system.

5.1.2 Weaknesses of Agri-Tourism in Jia Bhoroli:

According to the Assam State Disaster Management Authority 2025, heavy rainfall in the upper reaches of Arunachal Pradesh leads to flooding in low lying areas of villages in Tezpur and Naduar, Assam. The Jia bhoroli catchment area witnesses heavy flood in monsoonal season which lead to inundation of major agricultural land, displacement of people, and crop failure which hampers stable farm operations.

Illegal sand mining carried out without the consent of the Water Resources Department, along with the absence of systematic watershed management, has intensified riverbank erosion and altered the river's natural course. These disruptions often result in uncontrolled flooding, causing severe damage and chaos in nearby villages.

Diversification of livelihood from Agriculture to non-agricultural practices due to insecurity from flood inundation and river channel shift, also the lack of cold storage facilities puts immense pressure on farmers to sell their agricultural produce early at cheaper rates, as keeping the products for a longer period may lead to spoilage, resulting in reduced profits

The inadequate infrastructure in remote riparian villages such as roads, electricity, sewage, and good internet connectivity which limits extensive tourism development. Low awareness among local farmers regarding hospitality and tourist management may reduce service quality and lack of government-certified eco or Agri-tourism facilities and weak marketing channels hinder visibility of local rural Agri tourism.

5.1.3 Opportunities of Agri-Tourism in Jia Bhoroli:

The development of integrated Agri-tourism circuits connecting Tezpur, Nameri National Park, Kaziranga National Park and Jia Bhoroli valley can diversify Assam's tourism portfolio.

Government initiative for rural and sustainable tourism under the Department of Assam Tourism Policy and Dekho Apna Desh scheme under Ministry of Tourism, Govt. of India can provide financial and training support. Recently, an initiative by Govt. of Assam on Concert Tourism to attract international tourist may boost the local rural economy of Assam (Government of Assam Tourism Department, 2025).

Use of modern technology like blockchain for accessing direct linkage with the producer to the consumer without the middlemen for selling the Agri and allied products which may uplift the livelihood of the local farmers. Also, with the use of remote sensing and geographic information system, it will provide better land use and land cover mapping for future prediction, systematic sand dredging from the river bed and flood alarming system in the riparian zone.

During the non-monsoonal season, when floods are minimal, the riparian areas of Assam become ideal for cultivating diverse vegetables such as potato, cabbage, cauliflower, carrot, brinjal, gourd, onion, pumpkin, and radish. These crops ensure stable yields and higher profits, making this the most productive period for farmers. The season also promotes Agri-tourism, allowing visitors to experience farming activities in a safe, flood-free environment. Such seasonal diversification enhances income stability and supports rural sustainability in flood-prone regions of Assam (Mandal, R. 2010).

The extension of the Kanyaka Multipurpose Agri Farm initiative to the nearby riparian villages could generate cooperative ventures in dairy, fishery, and horticulture with visitor experiences and uplift the socio-economic condition of the locality.

5.1.4 Threats of Agri-Tourism in Jia Bhoroli:

The major threat in the region is that of river channel shifting since many decades, environmental degradation, riverbank erosion, and unorganized sand mining threaten the ecological balance necessary for sustainable Agri-tourism.

Low-income and poverty level of the riparian population will create hindrance and competition from better-organized eco-tourism hubs like Kaziranga and Nameri may divert potential visitors.

Over-tourism or commercial exploitation could harm the fragile ecosystem and disturb local social harmony and the presence of illegal migrants in remote riparian villages may lead to conflicts with tourists. Poor infrastructure of the roads and incomplete embankment construction may be the threat, and also political and policy fluctuations could delay funding and infrastructure projects essential for Agri-tourism.

Strength	Weaknesses	Opportunities	Threats
Scenic Natural beauty, fertile alluvial, sand, silt and clayey soil, suitable soil for crops and vegetable production.	Flood and river channel shifting.	Integrated Agri-Tourism Circuit.	Extreme flood damaging infrastructure and breaching of embankment.
Connectivity of new four lane National Highway No.715.	Poor infrastructure like lack of Cold Storage.	Initiative for rural and sustainable tourism by Tourism Department of India and Assam.	Environmental degradation, river bank erosion, over exploitation, illegal sand mining.
Availability of skilled and experienced cultivators/farmers.	Lack of systematic watershed management.	Use of blockchain, Remote sensing and G.I.S technology for agricultural system.	Low income and poverty level of local people for competing well established farm in nearby region.

Table. 1.2 Theoretical framework of SWOT analysis for Agri-Tourism in Jia bhoroli.

6. Conclusion:

The SWOT evaluation highlights that Agri-tourism in Jia Bharali has solid foundations in natural scenic beauty, traditional farming system and agrarian culture. Through this SWOT analysis, it reveals that with proper modern technology, improved infrastructure, environmental management, and community-based training, the riparian areas of Jia bhoroli will be the finest destination of Agri tourism, also it will be the way of earning and to improve the livelihood of riparian zone to ensure sustainable and inclusive growth. Although flooding poses major challenges to agriculture in Assam, farmers are adopting innovative methods and adaptive

strategies to strengthen their resilience. Continuous research and consistent support from both government and non-governmental organizations are vital to maintain agricultural productivity in this flood-affected region. and good watershed management. This research finding will be helpful for the researchers, Govt. agencies and policy maker to have a sustainable watershed management of any river basin.

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