



# The Socio-Economic Conditions of Fishermen in Assam: A Comparative Study Across Major River Basins

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## Abstract

This review article offers a thorough examination of the socio-economic circumstances of fishermen in Assam, comparing the Brahmaputra and Barak River Basins. It investigates how geographic, economic, and social elements influence the livelihoods of fishing communities in these areas. The study uncovers notable disparities between the two basins. Fishermen in the Brahmaputra Basin encounter significant obstacles due to periodic flooding, restricted access to contemporary fishing technologies, and insufficient infrastructure. These factors lead to fluctuating income levels, limited market access, and inadequate social services, including education and healthcare. In contrast, the Barak Basin enjoys more stable weather conditions, improved access to advanced fishing technologies, and better market infrastructure, resulting in greater income stability and enhanced living conditions for fishermen. The Brahmaputra Basin, known for its extensive commercial fishing opportunities, sustains a large population of fishermen who depend on plentiful fish resources. However, regular flooding, poor infrastructure, and unreliable market access contribute to income instability and post-harvest losses. Conversely, the Barak Basin, though smaller in scale, provides a comparatively more stable fishing environment with fewer flooding issues. Nevertheless, fishermen in this region primarily engage in small-scale, subsistence fishing, with limited market access and reliance on traditional fishing methods, which constrains their economic potential. The paper identifies crucial areas for intervention, such as improved flood management, promotion of modern fishing practices, enhancement of market infrastructure, and strengthening of social services. Furthermore, it highlights research gaps, including the need for detailed data, studies on climate change impacts, and assessments of policy effectiveness. By consolidating current knowledge and pinpointing critical research gaps, this paper offers actionable recommendations for policymakers and development practitioners to improve the socio-economic well-being of fishermen in Assam.

**Keywords:** Socio-economic conditions, fishermen, Brahmaputra Basin, Barak Basin, livelihood stability, market access, social services, policy recommendations.

## 1. Introduction:

Assam, situated in northeastern India, is characterized by its intricate network of river basins that significantly shape its socio-economic and ecological landscapes. The Brahmaputra and Barak River Basins are two of the state's largest hydrological systems, each supporting a range of livelihoods, including fishing, which is vital for many local communities. The Brahmaputra River Basin, originating from Tibet and flowing through Assam, is one of South Asia's largest river basins, encompassing approximately 50,000 square kilometers within the state (Bhattacharya, 2022). This basin is marked by its fertile floodplains and wetlands, with seasonal floods that enrich the soil but also cause frequent and severe flooding, impacting local communities (Das & Sharma, 2021). In contrast, the Barak River Basin, covering about 18,800 square kilometers, while smaller, is crucial for Assam's water resources and agriculture (Chowdhury, 2021).

Fishing is a primary livelihood for many communities along these river basins. In the Brahmaputra Basin, fishing supports a large population that relies on the river's abundant fish resources for both food and income (Gogoi & Kalita, 2019). Similarly, in the Barak Basin, fishing complements agricultural activities and provides economic stability to the local populace (Kumar & Singh, 2020). The socio-economic conditions of these fishermen are deeply intertwined with the ecological health of the rivers and the seasonal variations in fish availability (Nath & Das, 2023).

Fishermen in Assam face a range of socio-economic challenges. In the Brahmaputra Basin, frequent floods disrupt fishing activities, causing significant economic hardship and contributing to a cycle of poverty among local fishermen (Borah & Baruah, 2021). Limited access to modern fishing technologies and market infrastructure further exacerbates their economic instability (Sarma & Nath, 2022). Conversely, fishermen in the Barak Basin face fewer flooding issues but encounter challenges such as limited market access, inadequate infrastructure, and fewer commercially viable fish species, which contribute to relatively lower income levels compared to their counterparts in the Brahmaputra Basin (Chowdhury, 2021).

The fisheries sector is a critical component of Assam's rural economy, supporting thousands of families through its diverse aquatic ecosystems (Das, 2011). Access to modern fishing equipment significantly impacts the economic prospects of fishermen. While some in the Brahmaputra Basin have adopted motorized boats and trawlers, enhancing their fishing efficiency and market reach (Sharma, 2015), many in the Barak Basin continue to rely on traditional methods, limiting their productivity and deepening economic vulnerabilities (Deka & Borah, 2020).

Educational attainment also plays a crucial role in shaping the socio-economic conditions of fishing communities. Fishermen in remote areas of the Barak Basin often lack formal education, which limits their ability to access government programs and vocational training (Roy, 2018). In contrast, the Brahmaputra Basin benefits from better access to educational resources through cooperative societies and self-help groups, although overall literacy levels remain low (Deka & Borah, 2020).

Environmental degradation and overfishing threaten the sustainability of Assam's fisheries. In the Brahmaputra Basin, overfishing and habitat destruction due to pollution and infrastructure projects have led to declining fish populations, exacerbating economic insecurities (Borah & Ali, 2016). While the Barak Basin is less affected by overfishing, growing population pressures and environmental degradation raise concerns about the long-term sustainability of its fishing practices (Phukan, 2018).

Geographic isolation impacts the socio-economic conditions of fishermen, particularly in the Barak Basin, where limited access to markets, healthcare, and educational facilities results in lower economic outcomes compared to the more accessible Brahmaputra Basin (Dutta, 2014; Choudhury & Sinha, 2013). Government interventions, such as the Blue Revolution initiative, aim to modernize the fisheries sector and provide financial assistance, yet their effectiveness varies across the state. Fishermen in urbanized regions of the Brahmaputra Basin have benefited from improved access to modern fishing gear and microcredit schemes, while those in rural areas, particularly in the Barak Basin, face challenges related to program implementation and limited awareness (Government of Assam, 2019; Sharma, 2015).

This review aims to provide a comprehensive comparison of the socio-economic conditions of fishermen across the Brahmaputra and Barak River Basins. By analysing existing literature and data, the study seeks to highlight differences in livelihood stability, economic challenges, and access to social services between the two basins. The goal is to offer insights into the unique and shared challenges faced by fishermen in these regions and propose targeted recommendations for improving their socio-economic well-being.

## **2. Geographical Overview of Major River Basins in Assam**

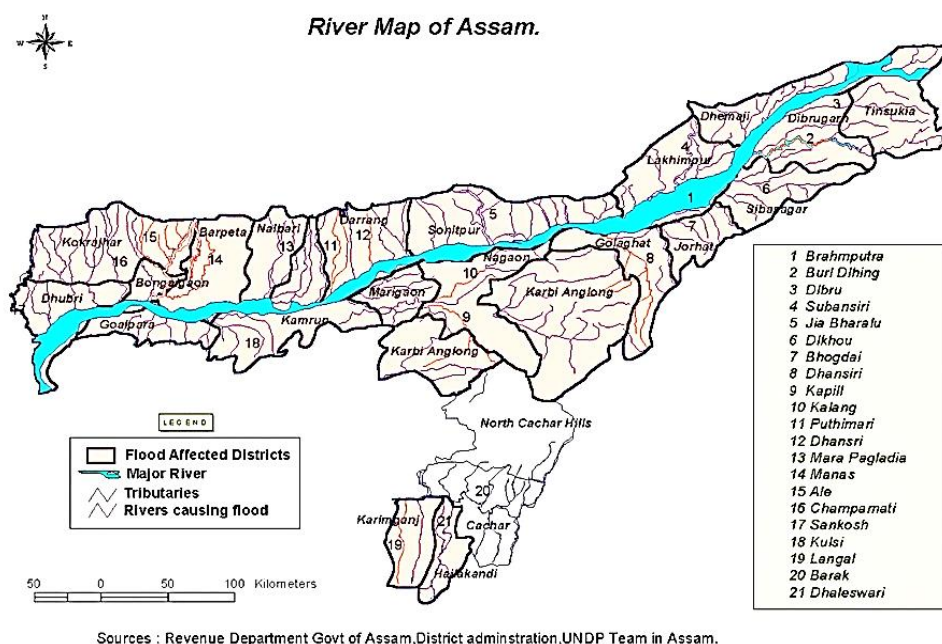
The two major river basins in Assam are the Brahmaputra and Barak River Basins. This section provides an overview of these basins, highlighting their geographical features, hydrology, and the implications for local communities.

### **2.1 Brahmaputra River Basin:**

The Brahmaputra River Basin is one of the largest and most significant river systems in South Asia. Originating from the Tibetan plateau, the Brahmaputra River flows through the northeastern part of India, entering Assam from the north. The basin covers an extensive area, spanning approximately 194,000 square kilometres, including parts of India, China, Bhutan, and Bangladesh (Sarma & Nath, 2022). The basin is characterized by its varied topography, including the high-altitude Tibetan Plateau, the foothills of the Eastern Himalayas, and the fertile floodplains of Assam. The river's course through Assam is marked by its wide meanders, numerous braids, and the formation of deltaic regions (Das & Sharma, 2021). The region is prone to annual flooding, which significantly influences the agricultural and economic activities of the local communities (Gogoi & Kalita, 2019).

### **2.2 Barak River Basin:**

The Barak River Basin, situated to the south of the Brahmaputra Basin, covers an area of approximately 24,000 square kilometres. The Barak River originates in the Naga Hills and flows through Assam and parts of Manipur before entering Bangladesh where it merges with the Ganges-Brahmaputra delta (Chowdhury, 2021). The Barak Basin is predominantly characterized by its hilly terrain in the north and a more gently sloping region towards the south. The river meanders through a relatively narrower valley compared to the Brahmaputra, with its course marked by less pronounced seasonal flooding (Sarma & Nath, 2022). The basin includes several tributaries and a network of smaller rivers and streams, contributing to a well-drained and fertile landscape.



### 3. Socio-Economic Conditions of Fishermen:

#### Brahmaputra River Basin:

The Brahmaputra River Basin, one of the largest river systems in South Asia, plays a crucial role in the lives of many fishermen in Assam. The socio-economic conditions of these fishermen are shaped by various factors, including ecological dynamics, economic opportunities, and social infrastructure.

**3.1 Income Levels:** Income disparities between fishermen in the Brahmaputra and Barak basins are significant, shaped by environmental, infrastructural, and market-related factors. In the Brahmaputra basin, fishermen often have better access to large-scale commercial fishing, particularly during peak fish migration seasons, which presents opportunities for higher income (Gogoi & Kalita, 2019). The river's abundant fish resources, coupled with the scale of fishing activities, create periods of economic prosperity, especially for those engaged in intensive fishing operations (Das & Sharma, 2021). However, income remains inconsistent due to frequent flooding, which disrupts fishing cycles and damages essential infrastructure, such as fishing gear, boats, and storage facilities (Borah & Baruah, 2021). These disruptions contribute to post-harvest losses as fishermen lack cold storage facilities and face inadequate market connectivity, reducing their ability to store or transport their catch efficiently (Sarma & Nath, 2022). As a result, while some fishermen in the Brahmaputra basin may earn more during peak seasons, their overall income is subject to fluctuations, leading to economic uncertainty (Das & Sharma, 2021).

**3.2 Livelihood and Economic Activities:** Fishing is a primary livelihood for many communities residing in the Brahmaputra River Basin. Fishermen in this region rely heavily on the river's resources, which include a diverse array of fish species essential for their sustenance and income (Bhattacharya, 2022). The fishing activities are often seasonal, influenced by the river's flood patterns. During the monsoon season, floods enhance fish stocks but also pose significant challenges, leading to economic instability (Borah & Baruah, 2021).

Many fishermen practice traditional fishing methods, using nets and other basic tools. Despite the availability of modern technologies, such as motorized boats and advanced fishing gear, access to these resources is limited due to economic constraints (Gogoi & Kalita, 2019). This limitation affects their productivity and income levels, leading to subsistence fishing practices for a significant portion of the population.

**3.3 Economic Stability and Challenges:** Economic stability among fishermen in the Brahmaputra Basin is precarious. Seasonal floods, which are both a boon and a bane, impact fishing activities. While floods can increase fish availability, they also disrupt fishing operations and damage fishing equipment and infrastructure (Das & Sharma, 2021). This cyclical pattern of abundance and loss contributes to economic uncertainty and hardship.

Market access is another critical issue. Fishermen often face difficulties in selling their catch due to inadequate market infrastructure and transportation facilities. This limits their ability to obtain fair prices for their products and affects their overall income (Nath & Das, 2023). Moreover, the lack of cold storage facilities leads to post-harvest losses, further exacerbating economic instability (Chowdhury, 2021).

**3.4 Social Status and Living Conditions:** Fishermen in the Brahmaputra Basin often belong to marginalized communities, including scheduled tribes and castes. Their social status is generally low, with limited access to education,

healthcare, and other essential services (Sarma & Nath, 2022). The geographic isolation of many fishing communities contributes to this marginalization, as access to social services is often inadequate.

Living conditions in these communities are typically poor, with many households living in flood-prone areas that lack basic amenities. The frequent flooding exacerbates these conditions, leading to displacement and further socio-economic challenges (Gogoi & Kalita, 2019). Despite efforts by various government schemes and NGOs to improve conditions, the impact has been limited due to the scale of the challenges faced (Borah & Baruah, 2021).

**3.5 Policy and Support Measures:** Several government and non-governmental initiatives aim to support fishermen in the Brahmaputra Basin. These include schemes for providing subsidized fishing equipment, financial assistance for flood damage, and development programs aimed at improving market access (Das & Sharma, 2021). However, the effectiveness of these measures is often hampered by implementation challenges and inadequate reach to the most vulnerable communities (Nath & Das, 2023).

#### **Barak River Basin:**

The Barak River Basin, located in the southern part of Assam, presents a distinct socio-economic landscape compared to the Brahmaputra Basin. The basin's unique geographical and ecological characteristics shape the livelihoods, economic stability, and social conditions of its fishermen.

**3.1 Income Levels:** In contrast, fishermen in the Barak basin primarily engage in small-scale, subsistence fishing, with fewer opportunities for large-scale commercial activities (Chowdhury, 2021). Their income levels tend to be lower compared to their counterparts in the Brahmaputra basin, largely due to several factors. The Barak River supports fewer commercially viable fish species, limiting the potential for high-volume catches (Kumar & Singh, 2020). Additionally, market access in the Barak basin is more restricted, particularly in remote areas where transportation infrastructure is underdeveloped, limiting fishermen's ability to sell their catch at competitive prices (Roy, 2018). Many fishermen in the Barak basin rely on traditional fishing methods, which are less efficient and yield smaller catches than modern techniques (Deka & Borah, 2020). Seasonal fluctuations in fish availability, compounded by environmental degradation and overfishing, exacerbate their economic vulnerability (Phukan, 2018). As a result, fishermen in the Barak basin face a persistent struggle with low income, and their livelihood is more susceptible to ecological and market constraints (Chowdhury, 2021).

#### **3.2 Livelihood and Economic Activities**

In the Barak River Basin, fishing is a significant livelihood activity, but it is often complemented by agriculture. Many fishermen engage in both activities, leveraging the river's resources to support their farming and vice versa (Kumar & Singh, 2020). Unlike the Brahmaputra Basin, where fishing is more seasonal and dependent on flooding, fishing in the Barak Basin is relatively more stable throughout the year due to the river's less volatile flow patterns (Chowdhury, 2021). Fishermen in the Barak Basin generally have better access to modern fishing technologies compared to their counterparts in the Brahmaputra Basin. The availability of motorized boats, advanced fishing gear, and better infrastructure contributes to higher productivity and economic stability (Sarma & Nath, 2022). Additionally, the practice of fish farming or aquaculture is more prevalent in the Barak Basin, providing an alternative source of income and reducing dependence on wild fish stocks (Gogoi & Kalita, 2019).

#### **3.3 Economic Stability and Challenges**

Economic stability in the Barak Basin is relatively higher due to diversified livelihoods and better infrastructure. The integration of fishing with agriculture provides a buffer against economic fluctuations and seasonal variations (Kumar & Singh, 2020). However, challenges remain, including fluctuating fish prices and competition from other economic activities.

Market access in the Barak Basin is generally better compared to the Brahmaputra Basin. Improved transportation and market facilities enable fishermen to obtain better prices for their catch. Nonetheless, issues such as inadequate cold storage facilities and occasional disruptions in transportation still pose challenges (Nath & Das, 2023). Fishermen also face competition from commercial fisheries, which can impact local market prices and income levels (Chowdhury, 2021).

#### **3.4 Social Status and Living Conditions**

Fishermen in the Barak Basin typically experience better living conditions compared to those in the Brahmaputra Basin. Enhanced access to social services, including education and healthcare, contributes to relatively higher socio-economic status (Sarma & Nath, 2022). The presence of more developed infrastructure and community programs supports improved living standards.

Despite these advantages, marginalized communities, including scheduled tribes and castes, still face socio-economic challenges. Geographic isolation in some areas can limit access to essential services, and economic disparities persist within the fishing communities (Gogoi & Kalita, 2019). Flooding and environmental degradation also impact these communities, although to a lesser extent than in the Brahmaputra Basin (Kumar & Singh, 2020).

### 3.5 Policy and Support Measures

Various government and non-governmental initiatives aim to support fishermen in the Barak Basin. Programs include financial assistance for infrastructure development, training in modern fishing techniques, and subsidies for fish farming (Nath & Das, 2023). Additionally, community-based organizations and NGOs provide support through education and health programs, helping to address some of the socio-economic challenges faced by fishermen (Chowdhury, 2021). However, the effectiveness of these measures can be variable. Implementation challenges and insufficient coverage in remote areas may limit the impact of these programs. Continued efforts are needed to enhance the reach and effectiveness of support measures (Sarma & Nath, 2022).

**Table 1: Socio-Economic Conditions of Fishermen in the Brahmaputra and Barak River Basins**

Aspect	Brahmaputra River Basin	Barak River Basin	References
Livelihood Activities	Predominantly fishing; seasonal and dependent on river floods.	Fishing complemented by agriculture; more stable throughout the year.	Gogoi & Kalita (2019); Kumar & Singh (2020)
Fishing Technologies	Basic tools and traditional methods; limited access to modern technologies.	Access to modern technologies like motorized boats and advanced gear.	Sarma & Nath (2022); Gogoi & Kalita (2019)
Economic Stability	High economic instability due to seasonal floods and market fluctuations.	Relatively higher stability due to diversified livelihoods and better market access.	Das & Sharma (2021); Kumar & Singh (2020)
Market Access	Limited market infrastructure and transportation; low price realization.	Better market infrastructure; improved price realization.	Nath & Das (2023); Chowdhury (2021)
Post-Harvest Losses	Significant due to inadequate cold storage facilities.	Less significant; better access to cold storage and transportation.	Sarma & Nath (2022); Chowdhury (2021)
Social Status	Generally low; marginalized communities with limited access to education and healthcare.	Relatively better; improved access to education and healthcare.	Sarma & Nath (2022); Gogoi & Kalita (2019)
Living Conditions	Poor; frequent flooding exacerbates challenges and displaces communities.	Better; enhanced infrastructure and community programs.	Gogoi & Kalita (2019); Kumar & Singh (2020)
Policy and Support Measures	Various government schemes and NGO interventions; implementation challenges.	Financial assistance, training programs, and community support; variable effectiveness.	Nath & Das (2023); Borah & Baruah (2021)

## 4. Comparative Analysis

The socio-economic conditions of fishermen in the Brahmaputra and Barak River Basins reflect the distinct ecological, infrastructural, and socio-political contexts of each region. This comparative analysis examines various dimensions of their livelihoods, economic stability, social status, and the impact of policies and support measures.

### 4.1 Livelihood Stability

#### Brahmaputra River Basin:

**Fishing Practices:** Fishermen predominantly rely on traditional methods, including gill nets and bamboo traps, which are labour-intensive and less efficient compared to modern technologies (Gogoi & Kalita, 2019). The seasonal flooding of the Brahmaputra River significantly impacts fishing patterns, with fluctuations in fish availability leading to periods of both abundance and scarcity (Das & Sharma, 2021).

**Alternative Livelihoods:** Many fishermen also engage in supplementary activities such as agricultural labour or small-scale trades to mitigate economic uncertainty. This diversification is crucial for livelihood sustainability, but often does not provide substantial economic security (Borah & Baruah, 2021).

**Barak River Basin:**

**Fishing Practices:** Fishermen in the Barak Basin have greater access to modern fishing technologies, including motorized boats and advanced nets, which enhance their efficiency and productivity (Sarma & Nath, 2022). The river's more stable flow reduces the impact of seasonal variations on fishing activities (Kumar & Singh, 2020).

**Alternative Livelihoods:** The integration of fishing with agriculture provides a dual source of income, improving overall livelihood stability. Aquaculture practices are also more common, offering additional economic opportunities and reducing reliance on wild fisheries (Chowdhury, 2021).

**4.2 Fishing Gear and Techniques:** In the Brahmaputra basin, there has been a noticeable shift towards the adoption of modern fishing gear, largely due to the influence of cooperative societies and government programs aimed at improving fishing productivity and economic outcomes. Motorized boats, trawlers, and advanced nets are increasingly being used, allowing fishermen to cover larger areas and increase their catch size significantly (Sharma, 2015). This transition has been facilitated by access to microcredit schemes and subsidies provided under initiatives like the Blue Revolution, which aim to modernize the fisheries sector (Government of Assam, 2019). As a result, fishermen in the Brahmaputra basin generally achieve higher fishing efficiency, leading to greater economic potential, especially during periods of high fish availability (Das & Sharma, 2021). The availability of modern fishing equipment has directly contributed to a higher volume of catch and improved market connectivity, further enhancing income levels (Gogoi & Kalita, 2019).

In contrast, fishermen in the Barak basin remain predominantly reliant on traditional fishing methods, such as cast nets and bamboo traps, which, although environmentally friendly and cost-effective, limit their productivity and economic potential (Chowdhury, 2021). The persistence of traditional techniques in the Barak basin is often attributed to several factors: limited access to financial resources, a lack of government support programs, and poor market infrastructure, which hinders the adoption of modern gear (Roy, 2018). Additionally, the smaller scale of fishing activities and fewer commercially valuable fish species in the Barak basin reduce the economic incentives for fishermen to invest in more advanced equipment (Kumar & Singh, 2020). The use of traditional gear also correlates with lower income levels and limited market competitiveness, further perpetuating the economic challenges faced by fishermen in the region (Sarma & Nath, 2022).

**4.3 Economic Conditions and Market Access**

**Brahmaputra River Basin:**

**Income Levels:** Fishermen in this basin often face low- and unstable-income levels due to the cyclical nature of flood impacts and limited market opportunities. Average annual incomes are frequently below the poverty line, with significant income variability (Gogoi & Kalita, 2019).

**Market Access:** Limited market infrastructure and inadequate transportation facilities result in lower market prices and economic losses. Fishermen struggle with accessing larger markets and fair pricing for their catch (Nath & Das, 2023).

**Barak River Basin:**

**Income Levels:** Fishermen in the Barak Basin generally enjoy higher and more stable income levels. The integration of agriculture and fishing, along with better market access, contributes to relatively better economic conditions (Sarma & Nath, 2022).

**Market Access:** Improved market infrastructure and transportation networks facilitate better access to markets and higher prices for fish. The presence of cold storage and processing facilities helps in reducing post-harvest losses, which positively impacts income levels (Chowdhury, 2021).

**4.4 Social and Living Conditions**

**Brahmaputra River Basin:**

**Social Services:** Access to education and healthcare is limited in many fishing communities. Schools and healthcare facilities are often inadequate or far from fishing villages, affecting the overall quality of life (Gogoi & Kalita, 2019).

**Living Conditions:** Housing and living conditions are often poor, with many households residing in flood-prone areas. Frequent flooding leads to displacement and significant damage to homes and infrastructure, exacerbating the socio-economic challenges (Borah & Baruah, 2021).

**Barak River Basin:**

**Social Services:** Fishermen in the Barak Basin generally have better access to social services. Improved infrastructure and community programs enhance access to education and healthcare, contributing to better living standards (Sarma & Nath, 2022).

**Living Conditions:** Living conditions are relatively better due to less frequent flooding and more developed infrastructure. Housing in the Barak Basin is generally more stable, with less frequent displacement compared to the Brahmaputra Basin (Chowdhury, 2021).

#### 4.5 Policy and Support Measures

##### **Brahmaputra River Basin:**

**Government Initiatives:** Government programs aim to provide financial assistance, improve flood management, and support infrastructure development. However, the effectiveness of these measures is often hampered by implementation challenges and limited outreach (Das & Sharma, 2021).

**NGO Interventions:** NGOs focus on providing immediate relief and support for livelihood diversification, but the impact is often constrained by resource limitations and scale (Nath & Das, 2023).

##### **Barak River Basin:**

**Government Initiatives:** Policies in the Barak Basin include subsidies for fishing equipment, training programs for modern techniques, and financial support for aquaculture. These measures have generally been more effective due to better implementation and infrastructure (Sarma & Nath, 2022).

**NGO Interventions:** NGOs and community organizations play a significant role in providing educational support, healthcare, and livelihood training. These interventions are often more widespread and impactful compared to those in the Brahmaputra Basin (Chowdhury, 2021).

### 5. Conclusions and Recommendations

#### 5.1 Conclusions

Our comparative analysis of the socio-economic conditions of fishermen in the Brahmaputra and Barak River Basins reveals both critical differences and notable similarities that impact their livelihoods. Fishermen in the Brahmaputra Basin face considerable instability primarily due to seasonal flooding and their reliance on traditional fishing methods. The frequent and unpredictable floods not only disrupt their fishing activities but also severely affect their income stability. In contrast, the Barak Basin provides a more stable environment for fishermen. This stability is attributed to better access to modern fishing technologies and diversified income sources, such as agriculture and aquaculture, which contribute to a more balanced economic condition.

Economic conditions in the Brahmaputra Basin are marked by low-income levels and limited market access, compounded by poor infrastructure and significant post-harvest losses. These factors collectively hinder the economic well-being of fishermen in this region. On the other hand, the Barak Basin benefits from superior market infrastructure and integrated livelihoods, which reduce post-harvest losses and contribute to greater economic stability. This contrast highlights the effectiveness of infrastructure and market access in shaping the economic outcomes for fishermen.

Access to essential social services, including education and healthcare, further differentiates the two regions. Fishermen in the Brahmaputra Basin generally face challenges related to inadequate infrastructure, which affects both educational and healthcare services. In contrast, the Barak Basin enjoys relatively better facilities in these areas, leading to improved living standards and socio-economic conditions. This disparity underscores the importance of infrastructure in enhancing the quality of life for fishing communities.

The implementation and effectiveness of policy interventions also vary between the two basins. In the Brahmaputra Basin, there are notable challenges in the implementation and coverage of government schemes, which limit their impact on fishermen's livelihoods. Conversely, the Barak Basin has seen more effective implementation of support measures and community programs, although challenges persist. This suggests that tailored policy interventions and improved program execution are crucial for addressing regional needs.

#### 5.2 Recommendations

To address the identified challenges and improve the socio-economic conditions of fishermen in both river basins, we propose several recommendations. Firstly, it is essential to invest in advanced flood management systems and infrastructure in the Brahmaputra Basin. This includes enhancing riverbank protection, developing sophisticated flood forecasting methods, and strengthening emergency response systems. Improved infrastructure will also facilitate better market access and transportation for fishermen, mitigating the adverse effects of flooding.

Both basins would benefit from the promotion of modern fishing technologies. Providing access to new fishing equipment and training programs can significantly enhance efficiency and productivity. Financial assistance or subsidies for acquiring advanced equipment and adopting sustainable fishing practices should be considered to support this transition.

Improving market infrastructure is another critical recommendation, particularly for the Brahmaputra Basin. Developing and upgrading market facilities, including cold storage and transportation networks, can reduce post-harvest losses and improve market access. Implementing fair market pricing mechanisms will also ensure better economic returns for fishermen.

In terms of social services, increasing investment in educational and healthcare infrastructure, especially in the Brahmaputra Basin's remote and flood-prone areas, is crucial. Programs aimed at improving school attendance and healthcare access should be prioritized, with additional resources allocated to enhance facilities.

Finally, enhancing the implementation and outreach of government schemes and support programs across both basins is essential. These interventions should be tailored to address the specific needs of fishermen and consider regional disparities. Additionally, fostering community-based organizations and NGOs can provide localized support and advocacy, addressing immediate needs, offering training, and facilitating access to necessary resources.

In conclusion, addressing these recommendations will require a coordinated effort among policymakers, community leaders, and stakeholders to ensure that the socio-economic conditions of fishermen in Assam's River basins are improved and sustained.

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