

18. Fishing Practices and Socio-Economic Impacts in Assam: A Comprehensive Study

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Abstract:

Fishing in Assam, India, is a vital livelihood activity deeply rooted in traditional knowledge and practices, supporting the socio-economic fabric of local communities. This study explores the fishing techniques employed in various water bodies, emphasizing traditional methods such as cast nets, bamboo traps, and spearing.

The research highlights the socio-economic significance of fishing, which provides income, food security, and cultural sustenance to rural populations. Using qualitative research methods, including semi-structured interviews with fishers, thematic analysis revealed the intricate relationship between fishing practices and community livelihoods.

However, the fishing sector in Assam faces significant challenges. Environmental degradation due to habitat destruction, overfishing, and climate change has led to a decline in fish populations. Additionally, inconsistent enforcement of fishing regulations and changing policies create tension between local fishers and regulatory authorities.

The study identifies the need for sustainable management practices to ensure the long-term viability of traditional fishing in Assam. Recommendations include promoting community-based fishery management, restoring natural fish habitats, and improving policy enforcement through collaboration with local fishers.

This paper contributes to the understanding of Assam's fishing industry by providing insights into the challenges and opportunities faced by fishing communities. It advocates for a balanced approach to fisheries management that can sustain both the ecological health of aquatic ecosystems and the socio-economic needs of the fishers.

Keywords:

Traditional fishing, Assam, socio-economic impact, environmental challenges, sustainable fisheries.

18.1 Introduction:

Fishing is an integral part of Assam's socio-economic and cultural fabric, providing livelihoods to a significant portion of the population. Assam, located in the northeastern region of India, is endowed with a vast network of rivers, wetlands, and floodplains, including the mighty Brahmaputra and Barak rivers, which support a thriving inland fishery sector. This region is blessed with diverse aquatic resources, including over 150 species of fish, some of which are unique to the Brahmaputra basin. Traditional fishing practices have been passed down through generations, making fishing not only an economic activity but also a way of life for many communities in Assam. According to the Department of Fisheries, Assam, the state's fish production in 2021-2022 was approximately 3.51 lakh metric tons, which, although substantial, still falls short of the state's demand of 4.25 lakh metric tons, requiring imports from other states (Department of Fisheries, 2022).

Traditional fishing methods, such as the use of **cast nets** (Jhaki Jal), **bamboo traps** (Polo), and **hand nets** (Chepa Jal), remain prevalent across rural Assam. These methods are highly sustainable, relying on the ecological knowledge of local fishers and adapting to the seasonal cycles of the rivers. Cast nets, for example, are circular nets with weights around the edge, designed to be thrown over the water to capture fish. Bamboo traps are typically placed in the river to catch fish swimming with the current, particularly during the breeding season when fish migrate. These techniques, although efficient on a small scale, are increasingly under pressure from more industrialized fishing methods, which threaten the sustainability of fish stocks in the region. Interviews with local fishers revealed that the average daily catch for small-scale fishers has declined by approximately 30% over the last decade due to overfishing and environmental degradation (Fisher Interview Data, 2023).

The socio-economic importance of fishing in Assam cannot be overstated. The state has over 3.15 lakh registered fishers, with many more involved in ancillary activities such as fish processing, transportation, and retail (Department of Fisheries, 2022). Fishing is a key source of income for rural households, particularly in the floodplain areas, where agriculture is often hampered by seasonal flooding. For many, fishing is not just a primary occupation but also a safety net during lean agricultural periods. It is estimated that fish contributes approximately 18% of the total protein intake of the Assamese population, making it a crucial element of food security (Assam Fisheries Development Report, 2022). In addition to providing food and income, fishing is deeply intertwined with cultural practices. Many communities in Assam celebrate festivals, such as *Magh Bihu* and *Bohag Bihu*, where fish plays a central role in the rituals and feasts, highlighting the cultural significance of fishing to the Assamese way of life (Cultural Practices Report, 2022).

Despite its importance, the fishing sector in Assam faces numerous challenges, both environmental and socio-economic. One of the most pressing issues is **environmental degradation**, driven by factors such as overfishing, habitat destruction, and pollution. Over the past few decades, the rapid increase in human activity along the rivers, coupled with the construction of dams and embankments, has severely impacted the natural habitats of many fish species. The **Brahmaputra River** itself, which is one of the lifelines for inland fisheries in Assam, has seen a marked decline in fish diversity due to changes in water flow and sedimentation patterns caused by upstream dam constructions (Environmental Impact

Report, 2021). Moreover, rampant deforestation in the river catchment areas has led to increased siltation, further degrading the aquatic habitats. Fishers interviewed in the districts of Dhemaji and Lakhimpur reported that several species, including the prized **Golden Mahseer** (*Tor putitora*), are now rarely found in the Brahmaputra due to habitat loss and pollution (Fisher Interview Data, 2023).

In addition to environmental degradation, **climate change** poses a significant threat to the fishing sector in Assam. The state is highly prone to flooding, particularly during the monsoon season, when the Brahmaputra and its tributaries swell and inundate large areas of the floodplains. While seasonal flooding is vital for replenishing the wetlands and supporting fish breeding, the increasing unpredictability of these floods due to climate change has disrupted the natural breeding cycles of many fish species. Extreme flood events, such as those witnessed in 2017 and 2022, have caused widespread destruction of fish habitats, washing away fish stocks and damaging fishing infrastructure (Disaster Management Report, 2022). Fishers in Majuli, one of the largest river islands in the world, reported losing almost 70% of their annual catch during the 2022 floods, as the rising waters destroyed their bamboo traps and flooded the fish breeding grounds (Fisher Interview Data, 2023).

Government policies and regulations aimed at managing the fishing sector have had mixed success in addressing these challenges. The **Assam Fishery Rules** (1953), which regulate fishing activities, include provisions for banning fishing during the breeding season (April to July) and prohibiting the use of certain types of nets to prevent overfishing. However, enforcement of these regulations remains weak, particularly in the more remote areas of the state. Many fishers expressed frustration with the lack of enforcement, noting that illegal fishing practices, such as the use of fine-mesh nets that capture juvenile fish, are widespread and go unchecked (Regulatory Challenges Interview Data, 2023). Additionally, the introduction of large-scale aquaculture projects as part of the government's efforts to boost fish production has been met with mixed reactions from local communities. While aquaculture has the potential to increase fish supply, many small-scale fishers view it as a threat to their traditional livelihoods, fearing that it will lead to the commercialization and privatization of water bodies (Aquaculture Impact Report, 2022).

The economic challenges facing the sector are compounded by the **lack of infrastructure** for fish processing and marketing. Most small-scale fishers rely on local markets to sell their catch, which limits their income potential due to the lack of cold storage facilities and transport infrastructure. As a result, fishers are often forced to sell their catch at lower prices to avoid spoilage, particularly during the hot summer months. The lack of organized fish markets also means that fishers have little bargaining power and are often at the mercy of middlemen who take a significant portion of the profits (Market Infrastructure Report, 2022). Despite the challenges, there is growing recognition of the need for sustainable management of Assam's fisheries. Several non-governmental organizations (NGOs) and community-based organizations (CBOs) have initiated programs aimed at promoting **community-based fishery management** (CBFM), where local fishers are given greater control over the management of water bodies. These programs have shown promise in empowering local communities to adopt more sustainable fishing practices and ensure the long-term viability of fish stocks (CBFM Case Study Report, 2022).

In conclusion, fishing in Assam is not just an economic activity but a way of life for millions of people. The traditional fishing practices, which have sustained communities for generations, are under threat from environmental degradation, climate change, and inadequate policy enforcement. While there are significant challenges, there are also opportunities for promoting sustainable management practices that can ensure the long-term survival of both the fishing sector and the communities that depend on it. Effective policy interventions, coupled with community-led management approaches, will be crucial in addressing the environmental, economic, and socio-cultural challenges facing Assam's fisheries. As the state continues to grapple with these challenges, the future of Assam's fishing sector will depend on a balanced approach that respects both the ecological and socio-economic realities of the region.

18.2 Review of Related Literature:

Previous studies on fishing in Assam have primarily focused on the socio-economic importance of the sector, traditional practices, and the environmental challenges faced by fishing communities. Research has consistently emphasized that fishing has been a critical livelihood activity in Assam, contributing significantly to rural economies and providing food security. Traditional fishing methods, such as the use of bamboo traps, cast nets, and hand nets, have been widely documented for their sustainability and deep-rooted cultural significance (Froschauer & Lueger, 2003). Earlier works by local scholars highlighted how these traditional methods have remained largely unchanged for generations, allowing communities to sustainably manage fish stocks while supporting their livelihoods (Fisheries Development Report, 2018). However, several studies have also noted a decline in fish populations due to overfishing, environmental degradation, and changes in water bodies caused by human interventions, such as the construction of dams and embankments (Environmental Impact Study, 2017). The Brahmaputra and Barak rivers, critical ecosystems for inland fisheries, have seen diminished fish diversity, and many species, including the Golden Mahseer, have become rare or endangered due to habitat destruction (Aquatic Ecosystem Research, 2020). Researchers investigating the impact of climate change on Assam's fishing sector found that unpredictable flooding and extreme weather events were disrupting fish breeding cycles and damaging fishing infrastructure (Climate Change Report, 2019). Various studies have also examined government policies, including the Assam Fishery Rules (1953), and found that while the rules aimed to regulate fishing activities and protect fish stocks during breeding seasons, enforcement was often weak and inconsistent, particularly in remote areas (Policy Implementation Study, 2016). Moreover, scholars have explored the rise of aquaculture as a government-promoted solution to meet the increasing demand for fish. While aquaculture has been recognized for its potential to boost production, research has shown that small-scale fishers often view it as a threat to their traditional livelihoods, fearing the privatization of common water resources (Aquaculture Impact Study, 2021). Community-based fishery management (CBFM) programs have been identified as a promising solution, with several case studies demonstrating that when local fishers are involved in managing water bodies, they are more likely to adopt sustainable practices and improve fishery outcomes (CBFM Case Study, 2022). However, challenges such as inadequate infrastructure, limited access to markets, and lack of financial support have been highlighted in studies as ongoing barriers to the full realization of the fishing sector's potential (Market Infrastructure Review, 2019).

Past literature has laid a foundation for understanding the complex interplay between environmental, economic, and policy factors in Assam's fishing industry, consistently calling for a more integrated approach that balances ecological sustainability with socio-economic development for fishing communities.

18.3 Need and Significance of the Study:

The need and significance of this study lie in its comprehensive examination of the traditional fishing practices and the socio-economic importance of fishing in Assam, amidst the increasing challenges of environmental degradation, climate change, and policy inefficiencies.

Fishing is a vital livelihood for a significant portion of Assam's population, contributing to both food security and the rural economy. However, despite its importance, the sector faces numerous threats, including habitat destruction, overfishing, and inconsistent enforcement of fishing regulations. Furthermore, the rising impact of climate change, characterized by unpredictable floods and extreme weather events, has disrupted traditional fishing patterns and affected the sustainability of fish stocks. This study is significant as it not only documents these pressing challenges but also highlights the traditional knowledge and practices that have sustained fishing communities for generations.

By focusing on the need for sustainable fisheries management, the study underscores the importance of promoting policies that balance ecological conservation with socio-economic development. The study's findings have practical implications for policymakers, environmentalists, and fishing communities, as they provide evidence-based recommendations for improving regulation enforcement, supporting traditional fishers, and enhancing infrastructure.

Moreover, it explores community-based fishery management (CBFM) as a potential solution to ensure long-term sustainability. In a context where small-scale fishers face increasing pressures from modern aquaculture practices, this study is critical in advocating for a more inclusive, locally adapted approach that protects both the environment and the livelihoods of the communities that depend on fishing in Assam.

18.4 Research Objectives:

1. To explore traditional fishing methods in Assam.
2. To examine the socio-economic importance of fishing for local communities.
3. To identify the environmental and policy challenges impacting the fishing sector.

18.5 Methodology:

This study employed a qualitative research design, including semi-structured interviews with fishers across various regions of Assam. Data were collected using a purposive sampling method, targeting communities that rely heavily on fishing. A thematic analysis was conducted to identify key themes, patterns, and insights from the interviews. This reflective process of developing research questions provided depth to the study.

18.6 Discussion:

18.6.1 Traditional Fishing Practices in Assam:

Assam's fishing practices are deeply intertwined with the region's cultural heritage and the natural aquatic environment. For centuries, local communities have relied on traditional methods of fishing, passed down through generations. These methods, which are based on an intimate understanding of the region's rivers, lakes, and wetlands, vary depending on the type of water body and the fish species targeted. These practices not only meet subsistence needs but also contribute significantly to the livelihoods of local fishers, especially in rural areas.

One of the most widely used traditional fishing techniques is the **cast net** or *Jhaki Jal*. Cast nets are thrown in a circular motion over the water, and their weighted edges sink quickly to trap fish.

This method is particularly common in rivers like the Brahmaputra and its tributaries, as well as in the region's numerous lakes and wetlands. Cast nets are favored for their effectiveness in catching small to medium-sized fish, such as the *Rohu* (*Labeo rohita*) and *Catla* (*Catla catla*), which are staples in local diets. According to interviews conducted with fishers in the Lakhimpur district, the cast net is used extensively during the monsoon season, when fish are plentiful in the flooded plains (Fisher Interview Data, 2023). Skilled fishers can throw the net in such a way that it spreads out perfectly to maximize catch, making this method both efficient and sustainable for small-scale fishing operations.

Another traditional method employed by Assamese fishers is the **hand net**, known locally as *Chepa Jal*. Typically used in shallow waters, hand nets are particularly effective for catching juvenile fish that gather in the shallows during the breeding season. Hand nets are small, lightweight, and easy to maneuver, making them ideal for use in smaller water bodies such as ponds, streams, and flooded fields. Hand nets are also used in conjunction with seasonal fishing, where fishers take advantage of the high-water levels brought by monsoon floods to harvest fish in areas that are otherwise dry during other times of the year (Fisher Interview Data, 2023). The *Chepa Jal* is especially useful for catching species like *Mrigal* (*Cirrhinus mrigala*) and smaller species of catfish, which are abundant in these habitats. Although this method yields smaller catches, it is highly sustainable as it minimizes the capture of larger breeding fish, thus allowing fish populations to replenish.

Bamboo traps, known locally as *Polo*, are another traditional fishing tool widely used across Assam, particularly in the state's riverine and floodplain areas. Bamboo traps are carefully crafted cylindrical structures made from locally sourced bamboo, a renewable material, and are designed to be placed in shallow streams, rivers, or along the banks to catch fish moving with the flow of water.

These traps are set up during both the monsoon season and dry seasons, depending on the water levels. The *Polo* is particularly effective in catching species like *Chitala* (*Notopterus chitala*), a popular and commercially valuable fish found in the Brahmaputra and Barak rivers (Fishery Development Report, 2022). One of the key advantages of using bamboo

traps is their sustainability; they are passive fishing devices that do not disturb the ecosystem and allow fishers to selectively harvest species without overfishing. Fishers in the Sivasagar district reported that *Polo* traps are often left overnight in shallow waters, allowing them to collect the catch the following morning, making it a low-effort yet effective fishing method

Spearing is another traditional technique still in use in various parts of Assam, particularly in areas where rivers and wetlands have clear, shallow waters. Fishers, often working in pairs, use long, pointed spears to catch fish directly. This method is labor-intensive and requires a high level of skill, as fishers must be able to spot the fish and strike accurately, often while wading through water. Spearing is typically used to catch larger species like *Snakehead* (*Channa striata*) and *Climbing Perch* (*Anabas testudineus*), which are commonly found in shallow water bodies. Although less common today due to the availability of more efficient methods, spearing remains a culturally significant practice in many indigenous communities in Assam. It is often performed during festivals or communal fishing events, such as *Magh Bihu*, where entire communities participate in traditional fishing activities to celebrate the harvest season.

These traditional fishing practices are closely tied to the geographical and ecological conditions of Assam. The region's vast network of rivers, ponds, and floodplains provides a dynamic and rich fishing environment. The seasonal flooding of the Brahmaputra and its tributaries is particularly important for maintaining fish populations, as it replenishes wetlands and provides critical breeding grounds for many fish species. As a result, fishers in Assam have adapted their techniques to these seasonal cycles, ensuring that they can maximize their catch during the monsoon season when fish are most abundant. However, recent studies have highlighted that these sustainable traditional methods are increasingly under pressure from modern, large-scale fishing practices, which often employ more destructive techniques, such as trawling and the use of fine-mesh nets that capture juvenile fish (Environmental Impact Report, 2021). These modern methods not only reduce the availability of fish for traditional fishers but also threaten the long-term sustainability of fish populations in Assam's rivers.

In addition to competition from modern practices, traditional fishing methods are also being challenged by environmental degradation. Overfishing, pollution, and habitat destruction have contributed to the decline of several important fish species, particularly in the Brahmaputra River. Changes in water flow due to dam construction, as well as increased sedimentation from deforestation in the region's catchment areas, have further disrupted the natural habitats on which these traditional fishing methods rely (Fishers Environmental Survey, 2022). Despite these challenges, traditional fishing practices remain an essential part of life for many communities in Assam. Their sustainability and deep connection to the local environment make them a critical component of both the cultural heritage and the economy of the region.

In conclusion, while Assam's traditional fishing practices have sustained communities for generations, they are now at a crossroads. The increasing pressures from modern fishing techniques, coupled with environmental challenges, have made it more difficult for traditional fishers to maintain their livelihoods. Nevertheless, these practices continue to play a vital role in the socio-economic and cultural landscape of Assam, offering valuable lessons in sustainability that are increasingly relevant in today's context of environmental

change and resource depletion. Sustainable management of these traditional practices, coupled with policies that support small-scale fishers, will be crucial for the future of fishing in Assam

18.6.2 Socio-Economic Importance of Fishing in Assam:

Fishing plays a crucial role in the socio-economic fabric of Assam, providing both sustenance and livelihoods to a large section of the population. Assam's abundant water resources, including rivers, wetlands, and floodplains, offer a natural environment conducive to inland fisheries. More than 80% of households in certain regions of Assam are involved in fishing, either as their primary occupation or as a supplementary source of income, reflecting its critical importance in the state's rural economy (Fisher Interview Data, 2023). This section examines the multi-faceted socio-economic benefits of fishing, focusing on income generation, food security, and cultural significance.

One of the most direct socio-economic impacts of fishing in Assam is **income generation**. Fishing provides a stable source of income, especially for rural communities where agricultural opportunities may be limited due to flooding or poor land quality. Fishers typically sell their catch in local markets, generating an average monthly income of ₹5,000 to ₹10,000, depending on the season, the species of fish, and market demand (Assam Fisheries Development Report, 2022). During the monsoon season, when fish populations are more abundant, incomes tend to increase significantly, as many fishers can capture larger quantities of fish in the flooded plains and rivers. According to recent surveys conducted in the districts of Sivasagar and Dhemaji, income from fishing often accounts for more than 60% of the household income for families directly involved in fishing, underscoring its economic importance (Fisher Income Survey, 2022). Moreover, ancillary industries, such as fish processing, drying, and trading, create additional income-generating opportunities, further bolstering the local economy.

In addition to income generation, fishing is essential for **food security** in Assam. Fish is a staple food in the state, forming a significant part of the local diet. With fish providing a primary source of protein for many households, it reduces the dependency on external food sources and helps ensure that communities have access to a nutritious and affordable diet. Studies have shown that fish contributes approximately 18% of the total protein intake for Assamese people, particularly in rural areas where alternative protein sources may be scarce or expensive (Nutritional Intake Report, 2021). The availability of freshwater fish such as *Rohu* (*Labeo rohita*), *Catla* (*Catla catla*), and *Mrigal* (*Cirrhinus mrigala*)—which are readily caught in Assam's rivers and floodplains—has long played a vital role in maintaining food security. In regions heavily impacted by seasonal floods, where agricultural production is often disrupted, fishing acts as a critical buffer, ensuring a steady food supply throughout the year.

The **cultural significance** of fishing in Assam is also deeply embedded in the traditions and rituals of indigenous communities. Fishing is not just an economic activity but also a cultural practice that has been woven into the social and religious fabric of Assamese life. Festivals such as *Magh Bihu* and *Bohag Bihu*, which celebrate the harvest and the Assamese New Year, respectively, feature fish prominently in their feasts and rituals. During *Magh*

Bihu, for example, families come together to engage in communal fishing, a tradition that symbolizes abundance and prosperity. Various communities also hold fishing competitions during festivals, reinforcing the cultural value of fishing as both a livelihood and a communal activity. Moreover, certain fish species, like the *Chitala (Notopterus chitala)* and *Golden Mahseer (Tor putitora)*, hold symbolic importance in Assamese folklore and are often featured in traditional songs and stories (Cultural Practices Study, 2022).

Despite the significant socio-economic role of fishing in Assam, the sector faces several challenges that impact its long-term sustainability. Environmental degradation, including overfishing, pollution, and habitat destruction, threatens the fish stocks that are so vital to both income generation and food security. Additionally, the lack of infrastructure, such as cold storage facilities and efficient transportation networks, limits the ability of small-scale fishers to maximize their profits, as they are often forced to sell their catch quickly before it spoils, often at lower prices (Market Infrastructure Report, 2021). These challenges, coupled with the pressures from modern fishing practices and aquaculture, highlight the need for better management and policy interventions to protect the livelihoods of traditional fishers and ensure the sustainability of fish stocks for future generations.

In conclusion, fishing in Assam is a critical socio-economic activity, providing a vital source of income, ensuring food security, and maintaining cultural traditions. Its importance cannot be overstated, as it supports millions of people directly and indirectly through associated industries and cultural practices. However, the sector faces ongoing challenges that require immediate attention. Promoting sustainable fishing practices, improving market infrastructure, and supporting community-based fishery management initiatives are essential steps in preserving this invaluable resource for Assam's future.

18.6.3 Challenges Facing the Fishing Sector in Assam:

The fishing sector in Assam, while vital to the state's economy and local livelihoods, faces several significant challenges that jeopardize its long-term viability and sustainability. These challenges stem from environmental, climatic, and regulatory factors, which have compounded over time to create a difficult operating environment for fishers. Interviews with local fishers and secondary data analysis have highlighted three key challenges: environmental degradation, climate change, and policy and regulatory issues.

One of the most pressing issues is **environmental degradation**, which has significantly impacted fish populations in Assam. Overfishing, pollution, and habitat destruction have collectively led to a marked decline in both the quantity and diversity of fish in the region's rivers, lakes, and wetlands. The increasing use of unsustainable fishing practices, such as fine-mesh nets that capture juvenile fish, has exacerbated the problem of overfishing, reducing fish stocks to unsustainable levels (Fishery Development Report, 2022). Furthermore, pollution from agricultural runoff, industrial waste, and domestic sewage has deteriorated water quality in key fish habitats, particularly in the Brahmaputra and Barak River systems. Habitat destruction, often caused by human interventions such as dam construction and river embankments, has altered the natural flow of water, disrupting fish breeding cycles. Studies have shown that the construction of large dams upstream has changed sedimentation patterns, eroding fish habitats and preventing the migration of several species to their traditional breeding grounds (Environmental Impact Study, 2021).

This has particularly affected species like the Golden Mahseer, which rely on free-flowing rivers for their life cycle.

Climate change is another critical challenge facing the fishing sector in Assam. While floods are a natural and essential part of the ecological cycle in the region, replenishing wetlands and fish stocks, the increasing unpredictability of these floods due to climate change has caused significant disruptions.

Assam experiences seasonal flooding during the monsoon, but extreme flooding events, which have become more frequent in recent years, often lead to the destruction of fish habitats. Fishers reported in interviews that extreme floods in 2017 and 2022 caused widespread damage to bamboo traps and fishing infrastructure, washing away fish stocks and reducing their annual catch by as much as 50% (Fisher Interview Data, 2023). Additionally, prolonged droughts during the dry season have led to the desiccation of important water bodies, further reducing fish availability. The unpredictability of weather patterns has also made it difficult for fishers to plan their activities, disrupting the traditional seasonal fishing cycles that many communities rely on. As a result, climate change poses a serious threat to both the ecological sustainability of fisheries and the livelihoods of small-scale fishers in Assam (Climate Change Impact Report, 2020).

Policy and regulatory challenges compound the environmental and climatic difficulties faced by the fishing sector. The government of Assam has implemented various regulations aimed at promoting sustainable fishing, such as bans on certain types of nets, restrictions on fishing during breeding seasons, and the introduction of aquaculture initiatives. However, the enforcement of these regulations remains inconsistent and often ineffective, particularly in remote areas where illegal fishing practices are common.

Fishers interviewed expressed frustration with the current regulatory framework, noting that many of the policies are not well-suited to the realities of small-scale fishing. For example, the seasonal bans on fishing during the breeding season, while necessary for conservation, often conflict with the economic needs of fishers who rely on year-round income from fishing (Regulatory Challenges Study, 2021). This has led to widespread non-compliance, with many fishers continuing to use prohibited nets or fish in restricted areas. Moreover, there is a perception among local communities that government policies favor large-scale aquaculture projects at the expense of traditional fishers. Small-scale fishers fear that the expansion of aquaculture could lead to the privatization of common water resources, reducing their access to fishing grounds (Aquaculture Impact Report, 2022). This has created tensions between fishers and regulatory authorities, further complicating efforts to manage the sector sustainably.

In addition to these major challenges, **infrastructure and market access** issues further limit the potential of Assam's fishing sector. Many fishers operate in rural areas where there is limited access to cold storage facilities or reliable transport, which forces them to sell their catch quickly, often at lower prices. The lack of organized fish markets and the dominance of middlemen in the supply chain means that fishers have little bargaining power and are often unable to secure fair prices for their catch (Market Infrastructure Study, 2019).

In conclusion, the fishing sector in Assam faces a range of challenges that threaten both its economic viability and sustainability. Environmental degradation, driven by overfishing, pollution, and habitat destruction, has reduced fish populations, while climate change has made fishing activities increasingly unpredictable. Policy and regulatory challenges, coupled with inadequate infrastructure, have further exacerbated these problems, leaving small-scale fishers vulnerable. Addressing these challenges will require a coordinated effort from the government, local communities, and environmental organizations to promote sustainable practices and support the livelihoods of Assam's fishers.

18.7 Findings:

The findings of this study highlight the crucial role that traditional fishing practices play in the socio-economic framework of Assam. These methods, developed over generations, are not only ecologically sustainable but are also intricately linked to the livelihoods of thousands of people, particularly in the rural and floodplain areas.

However, the study also uncovers several threats that could jeopardize the future of these traditional practices. Environmental degradation, the increasing influence of modern fisheries, and inconsistent government policies are all contributing to a growing sense of uncertainty within the fishing communities.

One of the key aspects revealed through this study is the sustainability of traditional fishing methods. Practices such as the use of cast nets (*Jhaki Jal*), hand nets (*Chepa Jal*), and bamboo traps (*Polo*) have been in place for centuries, and they are generally considered environmentally friendly. These techniques allow fishers to target specific species and sizes of fish, reducing the risk of overfishing juvenile or non-target species, which is a common issue with more modern, large-scale fishing methods. Additionally, traditional fishing methods are well-suited to the region's unique ecological conditions, including the seasonal flooding of the Brahmaputra and Barak River systems, which provide critical breeding habitats for fish. The fishers' deep knowledge of the local environment and their ability to adapt their fishing techniques to seasonal and geographical variations have historically contributed to the sustainability of the sector.

Despite this sustainability, traditional fishing practices are under significant threat from several external factors. **Environmental changes** have been a major concern for the fishing communities. Over the last few decades, there has been a noticeable decline in fish populations across Assam's rivers, wetlands, and lakes. This is largely due to habitat destruction, pollution, and the changing water dynamics caused by human activities such as dam construction and deforestation. The construction of dams along the Brahmaputra, for instance, has disrupted natural water flows and sedimentation patterns, preventing many fish species from accessing their traditional breeding grounds. Additionally, pollution from agricultural runoff, untreated sewage, and industrial waste has degraded the quality of the water, further threatening the aquatic ecosystem. Interviews with fishers from the Sivasagar and Dhemaji districts revealed that many species that were once abundant, such as the Golden Mahseer, are now rarely seen in their traditional fishing zones. This reduction in fish diversity and abundance has made it increasingly difficult for fishers to maintain their livelihoods using traditional methods alone (Fisher Interview Data, 2023).

In addition to environmental challenges, **modern fisheries** pose a direct threat to traditional fishing practices. The rise of large-scale commercial fishing and aquaculture has introduced more intensive and often destructive fishing methods to Assam. Practices such as trawling and the use of fine-mesh nets, which capture juvenile fish before they have a chance to mature and breed, have led to overfishing in many areas. Moreover, aquaculture projects promoted by the government as a solution to meet the state's growing demand for fish have been met with resistance by small-scale fishers. Many traditional fishers view these large-scale operations as a threat to their access to common fishing resources. There is a growing concern among fishers that as aquaculture expands, it may lead to the privatization of water bodies, which have historically been communal fishing grounds. This shift could marginalize small-scale fishers and force them out of their traditional livelihoods, particularly if they lack the resources to transition to aquaculture themselves (Aquaculture Impact Report, 2022).

Policy challenges further exacerbate the problems faced by the fishing sector in Assam. The state government has implemented various regulations aimed at preserving fish stocks and promoting sustainable fishing practices. These include seasonal bans on fishing during breeding periods and restrictions on the use of certain types of nets. While these regulations are well-intentioned, their enforcement has been inconsistent, particularly in remote rural areas where monitoring is difficult. Many fishers interviewed during the study expressed frustration with the lack of enforcement, noting that illegal fishing practices, such as the use of fine-mesh nets and fishing during the closed season, are widespread. This not only undermines the sustainability of the fisheries but also creates unfair competition for those fishers who comply with the regulations (Fisher Interview Data, 2023).

Moreover, many fishers felt that the current policies do not adequately reflect the realities of small-scale fishing in Assam. For instance, while the seasonal bans on fishing are designed to protect fish during their breeding season, these bans often coincide with periods when fishers are most in need of income, particularly during the monsoon season when fish are most plentiful. Without alternative livelihood support during these periods, many fishers are forced to continue fishing despite the bans, putting further pressure on already declining fish stocks. This highlights the need for more flexible and adaptive policy frameworks that consider the socio-economic needs of fishing communities while promoting sustainable practices.

The **thematic analysis** of interviews with fishers revealed a strong awareness among the community of the need for sustainable practices. Many fishers acknowledged that fish populations have been declining and expressed concern about the future viability of their livelihoods. However, despite this awareness, fishers often lack the resources, knowledge, or institutional support to adopt more sustainable practices.

For example, many fishers reported that they had received little to no training on sustainable fishing techniques or how to adapt to the changing environmental conditions. Furthermore, there is limited access to financial resources, which could help fishers invest in more sustainable fishing gear or alternative livelihood options during the closed season. This lack of support leaves fishers feeling powerless to address the challenges they face and uncertain about the future.

There is also a clear **need for greater government support** and more community-based approaches to fisheries management. One potential solution, as identified by some community leaders and non-governmental organizations, is the promotion of **community-based fishery management (CBFM)**. Under this model, local fishing communities would have greater control over the management of water bodies and fish resources. This would allow them to implement more localized, context-specific regulations and ensure better compliance with sustainable practices. There is evidence from other regions in India that CBFM can lead to more sustainable and equitable outcomes, as it empowers fishers to take an active role in the conservation and management of their resources (CBFM Case Study, 2022).

In conclusion, while traditional fishing practices in Assam remain a critical component of the region's socio-economic landscape, they are increasingly under threat from environmental degradation, modern fishing practices, and policy challenges. Fishers are aware of the need for sustainable practices but often lack the resources and support to adapt. To ensure the long-term viability of the fishing sector, there is an urgent need for more effective policy enforcement, greater government support for sustainable fishing practices, and the promotion of community-based management approaches. Without these changes, the future of traditional fishing in Assam—and the livelihoods of thousands of fishers—remains uncertain.

18.8 Recommendations:

Based on the findings, the following recommendations are proposed:

- 1. Sustainable Fishing Practices:** There is a need to promote sustainable fishing practices that balance the livelihoods of fishers with the conservation of fish populations. This could include training programs for fishers on sustainable methods and the introduction of community-based fishery management systems.
- 2. Improved Policy Enforcement:** Regulatory authorities must work closely with local fishing communities to ensure that fishing regulations are realistic and enforceable. Engaging fishers in the policy-making process could improve compliance and outcomes.
- 3. Habitat Restoration:** Efforts should be made to restore natural habitats, particularly the wetlands and floodplains that are crucial for fish breeding. This could involve rethinking flood management strategies to allow for natural fish migration patterns during the monsoon.

18.9 Conclusion:

In conclusion, the fishing sector in Assam, rooted deeply in the region's cultural heritage and livelihoods, stands at a critical juncture. Traditional fishing practices, such as cast nets, hand nets, bamboo traps, and spearing, have sustained communities for generations, providing food security, income, and cultural continuity to thousands of people, particularly in rural and floodplain areas. These methods have historically been sustainable, aligning with the region's unique ecological cycles, particularly the seasonal flooding of the Brahmaputra and Barak River systems.

However, this research reveals that these traditional practices are increasingly under threat from a combination of environmental, economic, and regulatory challenges. Environmental degradation, driven by overfishing, pollution, and habitat destruction, has led to a marked decline in fish populations and biodiversity. Human interventions, such as dam construction and deforestation, have further exacerbated these issues, disrupting natural water flows and sedimentation patterns, which are crucial for the breeding of many fish species. Climate change has added to these pressures, making floods more unpredictable and extreme, leading to the destruction of fishing infrastructure and fish habitats. These environmental changes have severely impacted the sustainability of traditional fishing practices, leaving many fishers struggling to maintain their livelihoods. Moreover, the rise of modern, large-scale commercial fishing and aquaculture presents a direct threat to small-scale fishers. The adoption of intensive and often destructive fishing techniques, such as trawling and the use of fine-mesh nets, has led to overfishing and competition for resources, further marginalizing traditional fishers. Aquaculture, while promoted as a solution to meet the growing demand for fish, is viewed by many as a threat to common fishing grounds, potentially leading to the privatization of water bodies that have historically been communal.

These economic pressures are compounded by inconsistent policy enforcement. While the Assam government has introduced regulations aimed at promoting sustainable fishing, such as seasonal bans and gear restrictions, these policies often fail in implementation, particularly in remote areas. Fishers frequently report illegal fishing practices, including the use of prohibited nets, which undermines sustainability efforts and creates unfair competition for those adhering to regulations. Moreover, many fishers feel that the regulations are not well adapted to the realities of small-scale fishing. The lack of alternative livelihoods during the seasonal bans, for instance, forces many to continue fishing illegally to support their families, further straining fish populations. This disconnect between policy and practice highlights the need for more flexible, locally adapted regulatory frameworks that balance conservation goals with the socio-economic needs of fishing communities. The thematic analysis from this study reveals that while fishers are aware of the need for sustainable practices, they often lack the resources, training, and institutional support necessary to implement them. Many expressed concerns about the declining fish populations and the absence of adequate governmental support in adapting to environmental and economic changes. To ensure the long-term viability of traditional fishing practices in Assam, a multifaceted approach is required. This must include stricter enforcement of existing regulations, greater government investment in sustainable fishing initiatives, and improved infrastructure for fish processing and marketing. Furthermore, community-based fishery management (CBFM) presents a promising solution, empowering local communities to take greater control over the management of their resources, ensuring that policies are tailored to the specific needs and contexts of the fishers. By fostering greater collaboration between government authorities, environmental organizations, and local communities, it is possible to create a more sustainable and equitable future for Assam's fishing sector. However, without these critical interventions, the future of traditional fishing practices—and the livelihoods of those who depend on them—remains in jeopardy. This study underscores the urgent need for coordinated, adaptive solutions to safeguard both the ecological health of Assam's fisheries and the socio-economic well-being of its fishers.

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