

Exploring The Status Of Aquaculture In Assam- Problems And Prospects: A Descriptive Study

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Abstract: *Aquaculture in Assam is an emerging industry. It is the practice of raising aquatic organisms such as fish, mollusks, crabs, and plants in captivity. Farming requires intervening in the raising process to improve output, such as regular stocking, feeding, and predator protection, among other things. Cattle ownership, whether individual or corporate, is also an aspect of farming. The state's physical geography, which includes several water bodies, is ideal for aquaculture. However, in comparison to the state's geographical and climatic blessings, the current state of this sector in the state is not encouraging. A well-developed aquaculture industry can significantly increase the state's economy. The state has been confronted with numerous challenges, both financial and otherwise, for which it has been unable to fully exploit the resources despite its immense potential. Assam's government has recently taken several steps to encourage young people to pursue careers in aquaculture. This paper attempts to do a thorough investigation into the current state of aquaculture in the state. It also examines the industry's present issues as well as the threats that deter people from participating in aquaculture. This study also explores the bounteous prospects of the emerging industry that are still untapped.*

Keywords: *Aquaculture, economy, physical geography, problems, prospects.*

1. INTRODUCTION:

Increased output is one of the primary concerns of the National Policy during various plan periods. According to the Government of India's scientific policy, our country's resources potentials must be used to boost the country's economic development. This will lead to an increase in per capita income, output, and consumption, as well as a better socioeconomic situation for the people, as well as a reduction in malnutrition and vulnerability. Natural resources for aquaculture are living and self-renewing. The economist looks at aquaculture as a separate industry. If we consider aquaculture as an industry, the key benefits are nutritional and food security, income, job creation, and infrastructure preservation. Aquaculture is the process of breeding, raising, and harvesting commercially valuable aquatic flora and fauna in salt or fresh water. Fisheries and aquaculture is a science, an art, and a business all bundled into one. It is a science in terms of the procedures for breeding and producing aquatic flora and fauna, an art in terms of successfully managing the task, and a business in terms of dealing in fish and other aquatic products. Aquaculture

provides a viable option to meeting the growing market demand for fish, fish protein, and other aquatic products. According to FAO (1988), aquaculture refers to the farming of aquatic organisms such as fish, mollusks, crabs, and plants. Farming entails some type of intervention in the raising process to improve output, such as regular stocking, feeding, and predator protection, among other things. Individual or corporate ownership of the cattle being farmed is also a part of farming. Aquatic organisms collected by a person or corporate body that has owned them during their raising period are considered aquaculture, whereas aquatic organisms exploitable by the public as a common property resource, with or without required licences, are considered fisheries harvest.

To learn more about the history, ancient writings and hieroglyphics have shown traces of aquaculture dating back over 4,000 years. A Chinese man named Fan Lai composed *The Classic of Fish Culture* around 475 BC to teach others how to cultivate fish for nourishment (Julie, K 2019). From its beginnings to the present, aquaculture has evolved into a more sophisticated design. Scientists and researchers have conducted numerous studies involving the examination of various dimensions. Xuepeng Li et. al (2011) had conducted a study in the field of aquaculture industry and stated that Chinese aquaculture accounts for roughly 70% of global aquaculture production. Aquaculture has grown as one of the most important primary sectors and a centre of economic activity in both the local and global economies, encompassing a wide range of freshwater and marine fish, shellfish, crustaceans, and aquatic plants. Concerns regarding aquatic pollution, illness, genetic degradation of aquaculture species, decreased comparative profitability, a lack of understanding of market threats, and financial crises have developed in line with the expansion of aquaculture. As a result, it was necessary to obtain a better understanding of the industry and provide sound recommendations for its long-term development. The study's main purpose is to establish the state of the aquaculture industry in China, as well as the challenges it faces, and to give recommendations for its long-term growth. Liao and Shyu (1992) in their investigation into the culture style of the species under aquaculture in Taiwan, the potential candidates for culture, current culture status, and existing problems, they discovered that in order to develop the aquaculture industry in Taiwan further, techniques for brood stock raising, proper disease prevention and treatment, and water resource management must be established as soon as possible. Increased species diversity in grown species will benefit the aquaculture business. In the future of aquaculture, continued development of sea-ranching, as well as innovations in current culture techniques, should be prioritised. According to Agbelege and Olanrewaju's research (2010), aquaculture has the potential to assist extend the resource base and alleviate the burden on capture fisheries while also creating jobs, foreign exchange, and improving the farmers' socioeconomic status. They've also found identified environmental problem, scarcity of good quality seed and feed, high cost of feed, lack of capital, and poor management skills unfavorable environmental condition and limited source of water are some major problems related with aquaculture. According to Hutabarat (2008) view on aquaculture in Central Java, Indonesia that Aquaculture business activities are thought to be a major driver of the country's economic growth, particularly during this global economic downturn. Furthermore, coastal aquaculture development is a future potential commercial activity in terms of potency area availability, geographical and climate conditions, living resources, productivity level, and projected domestic and global market. As a result, development plans should be restarted in order to transform the available comparative advantages into competitive aquaculture product advantages. Degradation of environmental, water pollution and ultimately will increase disease outbreak in the aquaculture systems are the major problems related to the development of aquaculture in that region. Krishnan and Birthal (2008) have studied about

aquaculture development in India and given a detail economic overview with special reference to coastal aquaculture. Coastal aquaculture became a boom industry in India in the 1990s. It was highlighted as a promising area for increasing exports and generating foreign cash. The industry has more than delivered on its promises, and there is yet more to come. The function and growth of fisheries in general, and aquaculture in particular, in India are discussed in their study. Growth, sources of growth, contribution to national gross domestic product, influence on rural economy, socioeconomic impacts, production of backward connections, and coastal aquaculture export growth in terms of composition, direction, and penetration are all examined. With the streamlining of policy measures for production and marketing, the paper ends on a positive note for the development of coastal aquaculture in the country. Aquaculture is a rapidly growing fisheries sector in India with an annual growth rate of over 7%. Freshwater aquaculture contributes over 95% of the total annual aquaculture production of 5.77 million ton (Jayasankar, 2018; pp. 157-165). Katiha et.al (2005) in their research, found that in India, inland aquaculture has emerged as a fast-growing enterprise and a viable alternative to the declining capture fisheries. From investigation on Indian inland aquaculture with respect to its resource base, output trends, systems and activities, yield gaps, adoption and impact on aquaculturists, economics, returns to inputs, investment needs, and future prospects, because Indian aquaculture is mostly confined to the inland sector and focused on carp, this activity has attracted special attention. Freshwater aquaculture has seen enormous growth in the last 15 years, but there is still a lot of room for horizontal expansion and productivity gains (vertical expansion). The fact that the average farm fish output is barely one-third of what was attained in farm experiments demonstrates this. The discrepancy was mostly attributable to the fact that on-farm studies used far more input. The majority of aquaculturists practiced extensive aquaculture, although those with semi-intensive operations profited the most from technology adoption.

Moreover these types of comprehensive studies in global and national level, various researches have been in the state level too. Barman et.al (2012) in their investigation found that because of the enormous demand for fish in the region, aquaculture is rapidly increasing in most of north-eastern India. However, because of the various food consumption habits of the population, this expansion is not consistent, even though all of the states in the region have high aquaculture potential. Assam, Manipur, and Tripura have the largest populations and a long habit of eating fish. The northeastern states also have abundant water resources suitable for aquaculture. The region's high rainfall provides an additional chance to create techniques to collect water during the rainy season and store it for use in aquaculture all year. Das (2016) in his research stated that Assam's subtropical climate is ideal for the development of freshwater fish farming in a variety of bodies of water. Aquaculture is vital not only for nutrition but also for the state's rural economy. Through the integrated utilization of locally available biological resources, he was able to generate a yield of roughly 1800 kg/ha/yr from small seasonal farmhouse ponds in his pilot project with a group of resource-poor tribal farmers. Saikia and Das (2010) emphasized the use and benefits of bamboo branches (Xeng) in their Xeng fishery report, which is based on primary data collected in the Barpeta district of Assam. They discovered that these bamboo branches (locally known as Xeng) have a dual role of protecting fish and providing food in the form of periphyton settled on their rough surfaces. According to preliminary research, fish output in ponds using Xeng is roughly 16.78 t ha⁻¹ y⁻¹, which is 25% higher than in ponds not using Xeng. According to Gogoi et.al (2015) the fisheries sector in Assam contributes more than 2% of the state's Gross State Domestic Product (GSDP) and plays an essential role in providing livelihood to a large portion of the state's people. Assam has an ideal sub-tropical climate for the growth of fresh

water fish farming, with 3.91 million hectares of water and 1.58 million hectares of paddy fields. To increase productivity, the state's large fishing resources must be appropriately used by using scientific fish farming techniques. However, these resources' fishery potential is still underused. As a result, aquaculture reforms should address challenges in the area of increasing fish production in order to provide rural farmers with a sustainable income from both capture and culture fisheries. Because Assam is the most water-rich state in the country's north-east, Sharma et al. (2012) discovered that the fisheries sector is crucial to the state's socio-economic growth and livelihood security. However, its water resources' fisheries potential is still underused. As a result, aquaculture reforms should focus on concerns such as increasing fish output in an environmentally benign and long-term manner, ensuring impoverished fishermen's livelihood security from capture and culture fisheries. The underutilized native ornamental fish resources in India have enormous potential for the development of the Indian ornamental fish trade, which will open up new employment opportunities. For the sector's overall development, state and federal governments should intervene in providing enhanced scientific technology to farmers and other stakeholders. Abdullah et.al (2016) in their investigation on determine farmers' problems and prospects of fish farming and its implications on increased fish production in Kaijuri union of Faridpur district of Bangladesh. According to their primary data analysis, pond fish farming expansion will necessitate significant investment in infrastructure, capacity building, and institutional strengthening. It is necessary to provide proper marketing facilities, such as infrastructural development and refrigerated transportation. The availability of credit, the formation of cooperative societies, the availability of electricity, and appropriate support to provide underground water during the dry season are some of the other facilities that might help farmers increase their output. As a high-potential economic sector, sufficient attention to alleviate the problem of rural farmers is urgently required. Fish farmers in the study region should receive assistance from a variety of professionals, including biologists, veterinarians, zoo technicians, agronomists, and even government officials. Nonetheless, farmers should participate in a knowledge-based orientation training program. Dwarah and Mall (2020) in their paper has focused in the diversified fish farming for sustainable livelihood in Cachar district. They pointed that freshwater aquaculture is one of India's fastest-growing industries, with large-scale employment opportunities. Small and marginal fish farmers, on the other hand, dominate the sector, using old technology that result in low production and have little impact on their livelihood. Fish farming's commercial success is largely dependent on its scientific culture practices and effective farming strategy, which will aid not only individual socio-economic development but also the country's overall economic growth. An economic analysis of the species diversification approach of fish farming was conducted in their paper, using a case-based research method. They discovered that using an effective and cost-effective diversification method including the cultivation of Gudusiachapra and Carps in small-scale composite culture ponds will result in a return on investment of more than 100%. As a result of this research, a unique farming practice of small indigenous high-value species with minimal investment has been proposed, which will increase the revenue of fish farmers. Borah and Bhagawati (1999) in their research paper have focused mainly on the adoption behavior of rural farmers towards different aquaculture technologies in Assam. Authors discussed at that point of time the communication at how farmers in five villages in Assam's Jorhat district are adapting to high-yielding aquaculture technologies. Although 77.2 percent of respondents said in the survey held by the author that they had adopted various aquaculture technologies, just 28.8 percent said they had implemented the entire package of procedures as recommended. The reasons for aquaculture technology adaptation as well as non-adoption

were found. The most common reason for non-adoption/partial adoption was a large investment, followed by a lack of funding and insufficient input availability. Farmers' educational and economic status was found to be favorably connected to the level of aquaculture technology adoption.

Making a comprehensive review on the existing literature, this paper aims to study the present status of the aquaculture in the state of Assam and also to explore the problems and potentials of the aquaculture industry in the state. The rest of the paper is structured as follows. Section 2 the methods used to conduct the research and section 3 explores the present status of aquaculture in Assam, and discusses the problems and potentials associated with it. Section 4 concludes the paper.

2. METHODS:

This study is descriptive by nature. It primarily focuses on describing the nature of aquaculture prevailing in Assam based on secondary sources of data. These sources include different Assam government's document, research papers, reports and websites.

3. RESULTS AND DISCUSSION:

3.1 Present status of aquaculture in Assam:

The State Fishery Sector is exceptionally rich, with approximately 2.86 lakh ha of water resources in the shape of ponds and tanks, derelict water bodies, beel, etc., and two major river systems, the Brahmaputra and Barak, and their tributaries encompassing over 4820 km with 53 tributaries. The sector has the potential to play a significant role in the state's socioeconomic growth. Fish production and allied activities have a lot of potential to offer employment opportunities across the state, particularly in rural areas. In 2016-17, the state's fish production totaled 3.07 lakh MT, compared to a 3.42 lakh MT estimated nutritional requirement. Horizontal expansion is the major fish production technique, which is performed by the construction of additional ponds and the reclamation and rehabilitation of existing ones, followed by fish culture. Vertical expansion, on the other hand, is emphasised through increased productivity and the adoption of improved and advanced culture practises as well as superior long-term management techniques.

Exploring the current status it is seen that despite the abundance of resources for fish production, only a small part of the population practises scientific fish farming and management. In some of the beels and low-lying areas, a culture-based capture fisheries enhancement programme has been implemented, resulting in an increase in productivity of up to 1600 kg/ha/year. Riverine fisheries are exploited with minimal effort put into conservation and no specific intervention. Assam Fisheries Development Corporation Ltd; Fisheries Administrative Departments, Government of Assam; Deputy Commissioners and Sub-Divisional Officers and Panchayats lease out revenue fisheries, such as rivers and beels, to individuals and cooperative groups.

Table 1 and Table 2 give the present status of aquaculture (the fishery farming) of Assam. Table 1 is highlighting the various resources like beels (ox-bow lakes), forest fisheries, individual ponds, community tanks etc and their numbers along with their water spreading area. Table 2 shows the trend of fish and fish seed production in these available water bodies.

Table 1- Present status of resources, numbers and water spread area

Resources	Number	Water Spread Area
Beels/ Ox-bow lakes	Registered: 430 Unregistered: 767	60215 (ha) 40600 (ha)
Forest fisheries	71	5017 (ha)
Derelict water bodies/swamps/ low-lying	3882	116444 (ha)
Reservoir fisheries	2	2553 (ha)
Individual ponds	369304	56566 (ha)
Community tank	6328	5152 (ha)

Source: Directorate of Fisheries, Government of Assam

Table 2- Trend of fish and fish seed production

Year	Fish Production (lakh MT)	Fish seed production (million nos.-fry)
2012-13	2.54	4364
2013-14	2.67	4546
2014-15	2.82	4585
2015-16	2.94	5678
2016-17	3.07	6758

Source: Directorate of Fisheries, Government of Assam

Table 2 shows an increasing trend in both the annual fish production and fish seed production which is a satisfactory sign for the overall economy of the state.

Various schemes have been announced and implemented for the uplift of the sectors by the Government. Among these schemes, *Matsya Jagaran- Ghare Ghare Pukhuri Ghare Ghare Maach*, Majuli development programme etc are important. Besides, Assam's Directorate of Fisheries has already implemented the NeGP-A e-Governance initiative. For improving the service delivery mechanism in Farmer Centric services utilising IT/ICT technology, pilot sites have already been built at Kamrup (Meen Bhawan – State Information Office Cell), District Fishery Development Office, Nagaon, and District Fishery Development Office, Nalbari. Moreover, the Directorate of Fisheries, Assam has recently launched an e-Procurement process and tenders for six RIDF projects, including the development of Motilung Fish Seed Farm (Goalpara), Botalikhosa Beel (Jorhat), Tulungia (Bongaigaon), Padum Pukhuri Fish Seed Farm (Morigaon), and the establishment of a State Brood Bank Farm at Hazara Fish Seed Farm (Nalbari).

The majority of person working in the fishery sector, whether in culture or capture fisheries, are not financially stable. The initial investment in establishing a fish pond or a farm attracts a relatively big sum of money. Furthermore, fish output in the state is low in comparison to its potential due to a lack of awareness, knowledge, and ability in scientific fish cultivation procedures and management. The state's fishing industry has risen to a key position in the state economy as a result of consistent efforts by the state and federal governments, as well as increased interest from the farming community in recent years. Many rural teenagers and entrepreneurs have recently turned to fish farming as a commercial

venture. In 2016-17, the state's fish production increased to 3.07 lakh MT, up from 1.58 lakh MT in 2000-01.

As per some latest data, the production of fish has increased by 33.67 percent from 2.94 lakh metric tonnes in 2016-17 to 3.93 lakh metric tonnes in 2020-21. Fish intake per capita has increased from 8.5 kg to 11.88 kg per year. In the same time period, fish seed production climbed by 74.11 percent, from 5,678 million to 9,886 million (The Sentinal, Assam). Moreover in the last five years, 12,610 individual ponds covering 1,523.74 hectare, 4,029 community ponds covering 468.1 hectare, 1,824 rearing tanks covering 229.94 hectare, 4,204 beel fisheries covering 763.87 hectare, 995 existing ponds covering 259.64 hectare, and 1,420 integrated fish farming covering 629.9 hectare have been built. In comparison to only 900 hectares before to 2016-17, more over 2,000 hectares have been brought under new ponds. For the period 2016-17 to June 2021-2022, 521 fish seed hatcheries were developed under various projects. In the same time span, 20 new fish feed mills have opened. There have been 13 Recirculatory Aquaculture System (RAS) introduced, as well as 38 batteries of modular cages in various beels. Banks have received 87,000 applications for KCC, of which 8,500 have been approved thus far. There are 22 Fish Producers' Organisations (FPO) and 13 Farmers' Producers Companies (FPC) in total (FPC). 20,000 fisherman have been given livelihood assistance, with the central portion being Rs.3,000 and the beneficiaries' share being Rs.1,500. A draught State Fishery Policy is now being finalised, which will significantly improve the fisheries sector.

3.2 Problems faced by aquaculture in Assam:

Seed and feed, two essential components of sustainable fisheries, are in short supply throughout the state, resulting in low fish production. Fish production in 2015-16 was 2.94 lakh MT, compared to 3.36 lakh MT required, leaving a 0.42 lakh MT shortfall. The average fingerling and feed production is 135 million and 3000 MT, respectively, compared to a requirement of 350 million fish fingerlings and 90000 MT feed. To close the production gap and make the state self-sufficient in fish seed, feed, and table fish production, the Fishery Department has already proposed some daring initiatives as part of a three-year action plan and a seven-year strategic action plan under the Sustainable Development Goals.

A shortage of high-quality fish seed, feed, and other aquaculture key inputs, as well as insufficient fish seed production and rearing infrastructure, are among the challenges facing the industry. Low temperatures and a long winter season, a lack of appropriate finance, a lack of species diversification, an unorganised market and marketing infrastructure for fish seed and table fish, and a lack of post-harvest infrastructure.

Other major issues include a lack of funds, difficulty obtaining institutional loans, and a lack of expertise. Inadequate understanding of the financial tools available to establish a fish farming business Due to a lack of skilled labour available for pond preparation, a lack of soil and water testing facilities, a lack of technological expertise, a lack of suitable land for fish farming, Soil acidity is high, and water bodies are poisoned. Finding good quality fish seed is difficult. It's difficult to find competent brooders when breeding. The cost of fingerlings/carried over seeds is prohibitively expensive. Due to a lack of designed fish feed, There is a scarcity of fishing input suppliers in the area.

Other issues with aquaculture in Assam include the high cost of fish medicine, a lack of good quality fish seeds in the requisite size and quantity at stocking time, and so on. Fish farming as a business is not appealing because it does not produce the promised results. Nothing is gained from fish farming other than a means of subsistence. Other obstacles include a high risk factor for starting a fish farming firm, a lack of local government backing,

and a lack of social awareness about the benefits of fish farming. Other factors include a lack of fish market infrastructure, a low selling price at the farm gate, fish farmers' inaccessibility to the fish market, a lack of a good distribution channel, and middleman exploitation. The market's lack of suitable storage and conveyance facilities adds to the difficulties.

3.3 Potentials of aquaculture in Assam:

The north-eastern state of Assam in India has a sub-tropical atmosphere. Assam is blessed with more than 2.86 lakh ha. of different water resources. In Assam, the fisheries sector plays as a pivotal role in socioeconomic development and employment generation in the State. The geographical location and its climatic conditions are prime factor for the expansion and improvement of fresh water fish culture in the state. Contribution to social wellbeing Aquaculture plays an important role in global efforts to eliminate hunger and malnutrition through supplying fish and other aquatic products rich in protein, essential fatty acids, vitamins and minerals. Aquaculture can also make significant contributions to development by improving incomes, providing employment opportunities and increasing the returns on resource use. In view of the importance of the sector in providing nutrition to the people, employment generation and livelihood to the rural sector, and in view of the bright prospects for the sector to grow further, State Government has been giving due emphasis to the sector. The prospects can be discussed in detail as follows:

Employment Generation: Agriculture is without a doubt one of Assam's most important contributions to the state's economy, and fish farming has a large employment potential. It is not an exaggeration to say that 80 percent of Assamese consume fish, but regrettably, just a few locals engage in this lucrative form of agriculture. The government, on the other hand, has a role to play in encouraging adolescents to take up fish farming as a source of income, which will help the country's economy grow faster.

Aquaculture improves health and well-being of the people: Aquaculture helps to food quality by producing high-protein, essential fatty acid, vitamin, and mineral aquatic food products. The health benefits of eating fish products are especially important for heart disease prevention and for a variety of vulnerable groups, such as pregnant and breastfeeding women, newborns, and pre-school children. Aquaculture adds to nutritional well-being in this way. Food fish output from aquaculture may be extended in a more sustainable manner using existing resources and technical developments. This is only achievable if the sector's socioeconomic benefits are distributed widely across society.

Scope for integrated fish farming: Rice is a key crop and a staple food in practically every family in Assam. Various civilizations have been observed to evolve as a result of paddy and fish production. Paddy-cum-fish agriculture is one of the most prominent rural farming traditions. In Assam, the majority of farmers are on a low-income basis. As a result, paddy-cum-fish farming allows them to raise their output while also increasing soil productivity and increasing paddy production. This method has the potential to significantly improve the socio-economic situation of paddy farmers in Assam. However, aquaculture in Assam is currently mostly focused on the culture of large carp (Munilkumar and Nandeesh, 2007) and the paradigm should be modified to include the culture of tiny fishes in order to develop ornamental fish culture and trade in the region.

Entrepreneurship development through paddy cum fish culture: With over 200,000 hectares of paddy fields in Assam, the development of paddy cum rice farming systems might be a key driver of rural economic growth. In Assam, roadside canals, wetlands, water-logged rice fields, and other seasonal water bodies abound. Fish that have adapted to the environment of ponds and roadside canals can be used to generate cash. In comparison to

other types of culture systems, it can be advantageous since numerous resources, such as rice, fish, and ducks, can be farmed in the same niche. Practising culture techniques such as cage culture and pen culture in the wetlands and paddy fields can be an added advantage for further increase in fish production.

Generating rural employment: The aquaculture practice is having the potential to break the unemployment rate, particularly in the rural areas of Assam. If supported and guided by external sources like Government, the new generation might opt for aquaculture as their alternative way of job and they can earn better.

Empowerment of women: Women's involvement in the profitable fish sector can provide a significant boost to total household income. In this sense, the transfer of innovations from scientific laboratories to agriculture for a wide range of aquaculture techniques will be extremely beneficial to entrepreneurship and women's empowerment. The formation of self-help organisations and cooperative societies will offer up new possibilities for funding from various government programmes. Women will be able to boost their household income and purchasing power, raise their social status, reduce poverty, and better utilise existing resources if the programme is implemented successfully (Sonowal and Biswas, 2018).

Scope of ornamental fish framing: Assam is home to 265 native ornamental fish species, many of which are in high demand on the worldwide market. Currently, India's ornamental fish export trade turnover is around Rs. 10 million, with the north-eastern states accounting for 85 percent of the overall export trade. As a result, the sector has a lot of potential for generating income through the breeding and development of native ornamental fish species (Gogoi et. al., 2015).

4. WAY FORWARD AND CONCLUSION:

Because of the industry's importance in supplying nutrition to the people, creating jobs and providing a livelihood for the rural sector, and because of the sector's excellent potential for future growth, the State Government has placed a strong emphasis on it. A major effort is needed to raise awareness and develop the skill sets of fish farmers and their farming practises so that, in the future, they will be able to expand their operations with money made available locally. Farmers in Assam are new to fish farming with technology, and given sufficient training and access to new techniques and money, fish farming will be a boon to the region. The goal is to close the gap between supply and demand for fish. The government is also pursuing a number of conservation and propagation projects for native fish species. This enabling environment has many facets and necessitates strong political will, long-term policy, public sector assistance, and investment.

The Government of Assam's Fishery Department is doing everything possible to promote holistic fisheries development through various government schemes, with a focus on measures such as horizontal resource expansion, popularisation of culture-based fisheries in wetlands/beels, semi-intensive fish farming in ponds and tanks, intensive fish culture in ponds and tanks of progressive fish farmers, and stock augmentation.

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