

The potential of fish economy in the geomorphological context of Assam

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ARTICLE DETAILS

Article History

Received: 09 August 2017

Accepted: 13 August 2017

Published Online: 15 August 2017

Keywords

Geomorphological

Beels

Aquaculture

fish- culturing

fish-economy

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ABSTRACT

The state of Assam, located in the North –Eastern part of India, possesses near perfect geomorphological conditions for freshwater fishing with abundant large rivers, beels, wetlands etc. However, the state is still unable to suffice the need of its residents in terms of fish production and is importing fish from other states of the country to meet with the demand. In the days of advancements in aquaculture, the people of Assam and the government also need to adopt more innovative strategies and techniques for more efficient culturing and catching of fish. The fish economy can be a potent weapon to solve the ever worsening problem of unemployment in Assam. The paper aims at shedding some light into the current plight of the fishing sector of Assam and also emphasis is given on integrating newer and more scientific approaches with the traditional practices of fishing in the state.

INTRODUCTION

Fishes contribute a significant part to the total life forms on earth and also were among the earliest complex life forms. Today, they serve as a major food source for people all over the globe. The task of supplying fish from their natural habitat to one's plate provides livelihood to a lot of people, about 660-820 million worldwide which is 10-12% of global population [1]. Fishes live in both marine and inland waters. In India, about 10 million people depend on fish for their bread and butter. Assam, a state of India is located in the North Eastern part of the country covering an area of 78,438 Sq. Km from 24007' N- 28000' N latitude and 89042'E – 96002'E longitude. The mighty river Brahmaputra flows from East to West through Assam. The Barak River is another large river towards the southern part of Assam. Along with these two large rivers, Assam hosts a total of 53 tributaries. To add to this already impressive number of water bodies are Beels, Ponds, and wetlands etc which are aplenty everywhere in this state. The region experiences tropical –sub tropical type of climate and enjoy plenty of rainfall (1500-3750 mm) which fill the water bodies; sometimes to an unwanted extent. With such a vast water resource Assam should have been topping the charts in country's freshwater fish production(as it doesn't share its political boundary with the sea, marine fishing is irrelevant in Assam's case), while in reality Assam is not even self-sufficient in fulfilling the fish demand of its residents. This poses the questions as to what are the reasons behind the underperformance of the state's fishery sector, what is the current status in numbers and what can be done to revive this sector to reach its true potential.

Methodology:

The present study is conducted through secondary data collected from different sources. An effort has been made to shed some light into the global findings in the fishing sector .Care has been taken to maintain the credibility of the information collected.

RESULTS

Fishery sector of Assam in Numbers:

To start off, there are a total of 216 species of fish found in Assam belonging to 104 genera under 37 families and 10 Orders [2]. The water resources of Assam is quite significantly large buoyed by the unique basin like configuration surrounded by hills and mountains. The Brahmaputra river, which is the 5th largest river in the world in terms of discharge covers the entire stretch of Assam from East to West, leaving a total of 31,500 sq.km prone to flood (According to Rashtriya Barhayog) which is 39.58% of the total land area .

Sr No	Resources	Number	Water Spread Area
1	River fisheries	Main Rivers 2, Tributaries 53	4820 Km ²
2	Beels/Ow bow lakes	Registered 430 Unregistered 767	60215(Ha) 40602(Ha)
3	Forest Fisheries	71	5017(Ha)
4	Derelict water bodies/swamps/low lying	3887	1,16,444(Ha)
5	Reservoir fisheries	2	2553(Ha)
6	Individual Ponds	361393	55430(Ha)
7	Community tanks	6308	5141(Ha)

Table 1: Resource pattern with water spread area (Source: Department of fisheries, Government of Assam)

The fish production in the recent years has been gradually increasing (refer to Table 2), however it is still not enough to meet the standard 11kg per person per year.

Year	Fish Seed Production (In Millions)	Fish Production (In Lakh Tons)
2006-07	2062.61	1.81
2007-08	3206.86	1.90
2008-09	3428.69	2.06
2009-10	3326.23	2.18

2010-11	4263.96	2.32
2011-12	4490	2.43
2012-13	4363	2.54
2013-14	4546	2.67
2014-15	5793	2.82
2015-16	5995	2.97

Table 2: Fish seed production and Fish Production in Assam from 2006-16(Source: Department of fisheries, Government of Assam)

As of 2016, a total 0.17 Lakh Tons of fish were imported to Assam, still with a deficit of 0.34 Lakh tons of fish production. Present per capita consumption of fish lies at 9kg (According to Department of fisheries, Govt of Assam), which is below the requisite 11kg per capita fish consumption. Not surprisingly, 95% of the people in Assam are fish eaters. The state stands in the 6th position in inland fish production, which is a stark contrast to its potential. The ponds and tanks contributes to 40.36% of the total fish production of the state followed by beels (20%), rivers (15.97%) and paddy fields (15.43%)[3].

The fishing practices and manpower involved:

The people of the state have been fishing in the abundant water bodies since time immemorial. However, in today's time, the people involved in the fishing activity can broadly be classified into three categories -1) People belonging to the community who catch fish as the main source of income 2) People who catch fish to supplement their major source of income 3) People who catch fish, not as a source of income but as a source of nutrition. Kaibartas, are the community which is primarily involved in the fishing industry of Assam. However, not all people of the community are involved in the fishing business nowadays and are employed in other sectors. Most people who are engaged in fishing business seem to fall into the second category, as suggested by a survey conducted in Darrang and Nagaon districts, where it was found that only 16.67% and 25% of people associated with fishing business in Darrang and Nagaon districts respectively depended on fishing as their major source of income [4].

The fishing methods employed are still rudimentary. The traditional methods are still the only methods in operation. The fishing equipments are primarily made of bamboo, which is abundant in Assam. Some traditional bamboo made fishing equipments include "Zakoi", "Khaloi", "Sepa", "Polo", "Dalnga", "Juluki", "Khalaha" etc. Different names are given to different fishing nets ("Jal" is the Assamese word for Fishing Net) that are used like "FasiJal", "GhatJal", "TongiJal" etc. Hand fishing is also a common practice. The names of the equipments and also the predominance of usage of one equipment over the others vary with place and also the community. Selection of fishing method and gears are influenced by various factors such as physiography of the water body, nature of fish stock, characteristics of the material from which gear are fabricated and standard of living [5]. Although, the traditional techniques are eco friendly and are easy to make with naturally available raw materials, new innovations are the need of the hour for more efficient fishing.

DISCUSSION

In order to advance to a better result in terms of fish production, there is a need to adopt new methods and also a changed perspective. Assam boasts of copious fresh water resources, making good use of them is where the state is lagging behind. There are steps that can be taken up for a better

outcome like a) Pond culture-This is one of the earliest aquaculture systems. As most of the ponds in this region are of earth and mud, it promotes the culture of fish species which are low in the food chain such as carps and milkfish. However, to prevent acid leaching the boundaries of the ponds should be sealed with cement. In some cases, they are bounded by plastic sheets in order to prevent fish which tend to escape such as walking catfish (*ClariasSp*), mud crabs (*Scylla serrate*). Management and operation of fish ponds depend highly on the nature and characteristics of the ponds(stagnant, drainable etc), species and stages of the stocking material,level of operation (mono culture, extensive or intensive) and environmental conditions of the ponds(Temperature, evaporation rates,salinity in brackish water ponds,Phetc) like in the Philippines, for milkfish culture, ponds are fertilized for the growth of "lab lab" which is a complex mixture of microscopic plant and organisms which develop on the pond bottom as pond scum[6]. b) Integrated fish culture- Integrated farming contributes to the maximum utilization of resources such as farm land, labour and capital and thus results in higher income, higher productivity and more equitable distribution of farm labour[7].The Chinese have integrated fish culture with livestock like carp cum fish culture, in the Philippines, people have integrated tilapia with pigs enhancing the production. Integrated farming using tilapia and carps as stocking materials for pigs and poultry as the livestock are becoming more popular among rural and even industrial fish farmers in many countries in Asia. c) Recirculating systems culture- This system involves technical processes in reconditioning used water and recirculating it. Economy of water and full control of water quality are the obvious advantages of this system. d) Pen culture- Pens are a type of enclosure which blocks the entry of undesirable animals and fishes ensuring a better yield. It is also an eco-friendly and cost effective method of fish culture. The pens are made of bamboo and are entwined using can strips, coconut strips etc. This technique is best suitable to the marginal areas of the larger water bodies. e) Cage culture-This system sprouted in the early 1950s and is a common practice in many parts of the world. Cages are enclosures of metal rods, bamboos, mosquito nets etc with capacity to hold a certain amount of water and also permitting free circulation of water through the mesh. Cages are either fixed or floating. [3]The main advantages of this system include the ability to implement in diverse types of water bodies, low initial investment, observation and sampling of fish, a better control over culture of one particular species of fish [8].

On top of these, induced breeding of carps and catfishes, hatcheries for mass scale spawning, seed rearing and carp polyculture are some of the crucial outcome of the freshwater aquaculture development. Availability of balanced supplementary feed for different life stages for diversified cultivable species and appropriate disease management measures are some other significant developments [9].

Freshwater prawns have a high market value and can be a potential game changer for fish fortunes of Assam if mass cultivation can be achieved. Assam also owns a lot of fish species having ornamental value like Chital (*Chitalachitala*), Karoti (*Gonialosamanmina*), Botia (*Nemacheiluscorica*) to name only a few. This is also a facet that can be looked with greater importance.

For better performance of the fishery sector, some new steps in terms of infrastructure and action plan should also be taken like A) Setting up of hatcheries B) Providing of seed at the right time C) Cleaning up of polluted or inhospitable water

bodies for fish to survive D) Awareness programs to educate the masses about new technologies and fishing systems E) Strict implementation of prohibition of fishing activities in the spawning season.

CONCLUSION

A state like Assam, beleaguered with problems, need all the help it can get to thrive. One of the main problems of Assam, i.e., the unemployment issue can certainly be looked into under the lights of new advancements in aquaculture. However, it is quite obvious that Assamese people are still infatuated with Government jobs and are quite reluctant to adopt different avenues for a livelihood. One interesting fact is that fishing business is still looked down upon by a lot of people in Assam, something the youth of Assam must admonish, for a prosperous future for the state as a whole. Just like most other natural resources of Assam like Oil, coal, sillimanite, limestone etc, water bodies of Assam are also poorly managed and corruption among officials of the concerned departments is one of the major causes of the state's lackluster condition. A consensus that we must be able to make proper use of what we have is a must. A lot of research work is going on in the fishery sector; people all over the globe are witnessing reduced abundance of fish. Aquaculture single handedly can't compensate for it [10]. But, in Assam's case, we are underperforming so much that, even adopting only a few of the unconventional ideas, will go a long way in stirring up the entire fishery sector. Entrepreneurship in this sector can be a very potent tool. Integrated fish farming, pen culture, cage culture etc .are not extravagantly costly measures. People who are not convinced can try out these new systems on a trial basis in small extent and see the results themselves. The government must also realize that this is a truly potent weapon in changing the fortunes of Assam's economy. And the time for change is now.

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