

# Prospects of Fisheries and Aquaculture Market in Bihar for Sustainable Blue Economy in India

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**Abstract**—Blue Economy is related to Sustainable Development Goal 14 “Life Below Water”. India's strategic maritime position in the Indian Ocean, coupled with its extensive coastline, significant Exclusive Economic Zone (EEZ), and robust maritime trade, underscores its immense potential for Blue Economy growth. As the world's second-largest fish producer, India's fisheries and aquaculture sectors are critical for providing food, nutrition, employment, and livelihoods. However, the accessibility of seafood remains predominantly confined to coastal regions, limiting its potential to bolster economic and nutritional benefits in inland areas. The Bihar State's large part remains under flood water, rain water and water released by Nepal through rivers flowing towards India. Consequently, the rural population cannot cultivate land and is only dependent on food that grows with water. The hypothesis is that if the seafood market is brought in this region, then there is a lot of potential for the development of the blue economy in Bihar. It will not only help in economic development but will also help in generating employment and getting nutritious food. It can neutralize food scarcity due to water logged situations. Expanding the seafood market to interior regions, such as Bihar, which has unique geographical and demographic challenges, presents a significant opportunity for Blue Economy advancement. The state's reliance on freshwater fish and its vulnerability to waterlogged conditions highlight the untapped potential for introducing seafood markets. Such an initiative can address food security concerns, generate employment, enhance nutrition, and foster economic growth in waterlogged and flood-prone areas. Thus, the domestic market can provide big access to fisheries, aquaculture and other ocean products in India and can be a source of sustainable development.

**Keywords**—Blue economy, sustainable development, seafood market, Exclusive Economic Zone, food security.

## I. INTRODUCTION: THE IMPORTANCE OF OCEANS AND THE EMERGENCE OF THE BLUE ECONOMY

OUR blue planet, the Earth, contains a large maritime domain. The oceans cover approximately 72% of the earth's surface. Over 600 million people (around 10% of the world's population) live in coastal areas that are less than 10 meters above sea level [1]. Nearly 2.4 billion people (about 40% of the world's population) live within 100 km (60 miles) of the coast [2].

Oceans are central to life on Earth. They are rich in oil and natural resources, suppliers of oxygen, absorbers of CO<sub>2</sub>, a virtual heat sink and rich in biodiversity, and they have emerged as the global economic highways for the transit of trade.

In the last few decades human interference in the ocean has increased which affects the health of the ocean, marine habitat and climate such as pollution of our ecosystems, plastics

pollution, ocean acidification, overfishing, coral bleaching, sea temperature rise etc. Considering the importance of the ocean and to prevent such negative impact, a new paradigm “Blue Economy” emerged.

The concept of “Blue economy” was first introduced by Gunter Pauli in his book “The blue economy 10 years 100 innovations hundred million jobs in 2010” [3]. But the importance of the blue economy has been recognized at the United Nations Conference on Sustainable Development (UNCSD) held in Rio de Janeiro in 2012 where the Blue Economy was viewed as an ocean economy that aims at the “improvement of human well-being and social equity, while significantly reducing environmental risks and ecological scarcities” [4].

Blue Economy is related to Sustainable Development Goal 14 “Life Below Water”. The main objective of SDG 14 is “to conserve and sustainably use the world's oceans, seas and marine resources for sustainable development” [5].

We are so close to 2030 and many of the SGD- 14 targets are still not met and we are not close enough. So, we have to adopt a cohesive and integrated approach to address climate and environmental challenges in both manner within a country and among countries.

## II. INDIA'S BLUE ECONOMY SCOPE

India has a unique maritime location in the Indian Ocean. It has a coastline of more than 7500 km spread across nine coastal States, 12 major and about 200 minor ports with over 2 million km<sup>2</sup> of Exclusive Economic Zone are available here (Figs. 1 & 2) [6]. Approximately 95% of the country's trade by volume and 68% by value are moved through maritime transport [7].

We are seeing that there is immense potential for the development of the Blue Economy and it can play an important role in the overall development of India but it seems that India is not exploring and exploiting its full potential in the development of the Blue Economy. India was among the first in the world to create a Department of Ocean Development in 1981, now the Ministry of Earth Sciences (MoES) but we do not progress as much as we should to be. However, several countries have undertaken initiatives to utilize their blue economy. For instance, Australia, Brazil, the United Kingdom, the United States, Russia, and Norway have developed national ocean policies.

In sync with UN sustainable development, India needs to enhance its maritime capabilities and skills to increase employment and prosperity while making efficient and

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sustainable use of marine resources.

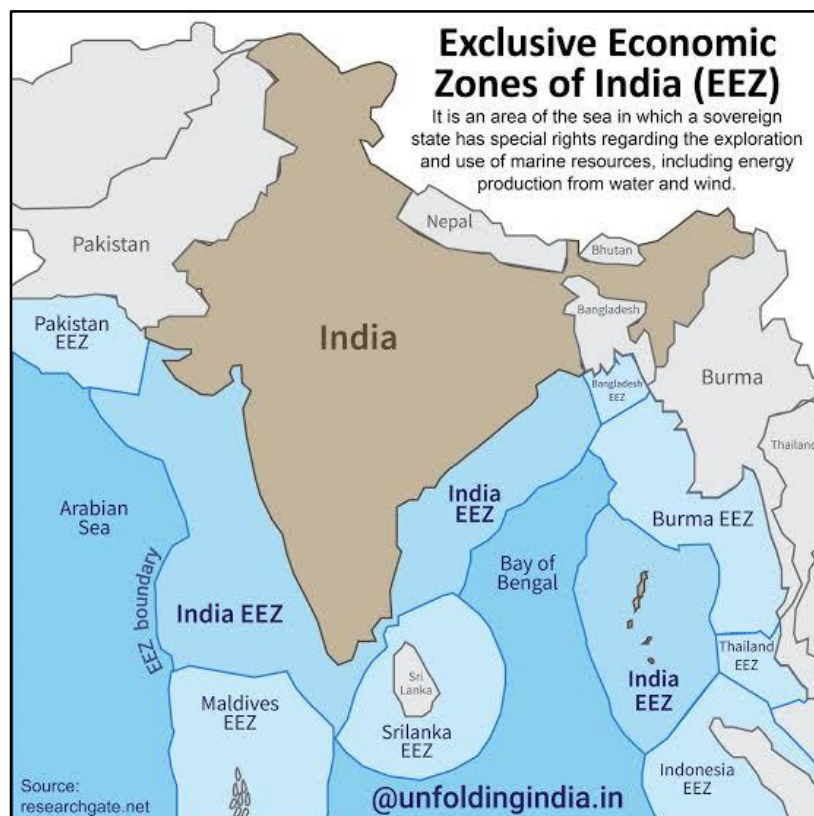


Fig. 1 India's Exclusive Economic Zone (EEZ) [8]

The Government of India's Vision of New India by 2030, announced in February 2019, highlighted the Blue Economy as one of the ten core dimensions of growth. The Blue Economy was mentioned as the sixth dimension of this vision stressing the need for a coherent policy integrating different sectors so as to improve the lives of the coastal communities and accelerate development and employment.

The Government of India has published India's Blue Economy: A Draft Policy Framework 2020. The draft Policy aim is to significantly enhance the contribution of the Blue Economy to India's GDP, improve lives of coastal communities, preserve our marine biodiversity and maintain the security of our marine areas and resources [8]. In this draft policy framework, seven priority areas are identified for the Blue Economy. Under this article we will try to look at the prospects of the marine fish market in Bihar under Priority Area 3: Marine Fishery Aquaculture and Fish Processing.

### III. FISHERIES SECTOR IN INDIA

The fishery in India emerged as a sunrise sector that provides food, nutrition, employment, income and livelihood. India is the second largest fish producing country in the world after China and accounts for 7.58% of the global production. Total 14.16 MMT of fish is produced during 2019-20 with a contribution of 10.44 MMT from the Inland sector and 3.78 MMT from the Marine sector [10] (Fig. 3). India produced 14% of Inland fish

and 4% of marine fish of the world while China produces 16% of inland fish and 15% of marine fish [11, p.137]. So, it is clear that India has a tremendous potential in the fresh and marine fisheries sector. Despite its potential, the marine fish market in India remains largely inaccessible to interior regions, with availability primarily limited to coastal states like Gujarat, Maharashtra, Goa, Kerala, Tamil Nadu, and Andhra Pradesh, of which Gujarat, Tamil Nadu, and Andhra Pradesh together contribute around 50% of the country's total marine fish production [11, pp.6-8].

If we extend the reach of the seafood market to the remotest part of India, it will not only increase the fisheries sector status but will also contribute to the country's economy. Through this paper we will try to see the possibilities and prospects of the Marine food market in Bihar.

#### *Fisheries Sector in Bihar*

Bihar is a landlocked and agriculturally dominated State but Bihar is blessed with tremendous natural resources of freshwater. Many small and big rivers coming from the Himalayan region make Bihar rich in terms of fresh water resources. The Ganges is the main river here and the Ghaghara, Gandak, Budhi Gandak, Bagmati, Kosi and Mahananda are its main tributaries and as we have mentioned above, National Waterway 1 is also being developed from Allahabad to Haldia which passes through the middle of Bihar. Bihar has about 3,200 hectare of rivers, 5,00,000 hectares floodplain wetlands

area, 9000 hectares of ox-bow lakes, 25,000 hectares of reservoirs and 80,000 hectares of ponds and tanks (Fig. 4) [8]. Due to being rich in such huge fresh water resources, the inland fish market is well developed here. As per the Bihar Annual

Budget 2019-20, Bihar produced 6.41 lakh tonnes of fresh fish during 2019-20. Bihar has a flourishing inland fish market but when it comes to the marine food market, it is neither produced nor marketed here (Fig. 5).

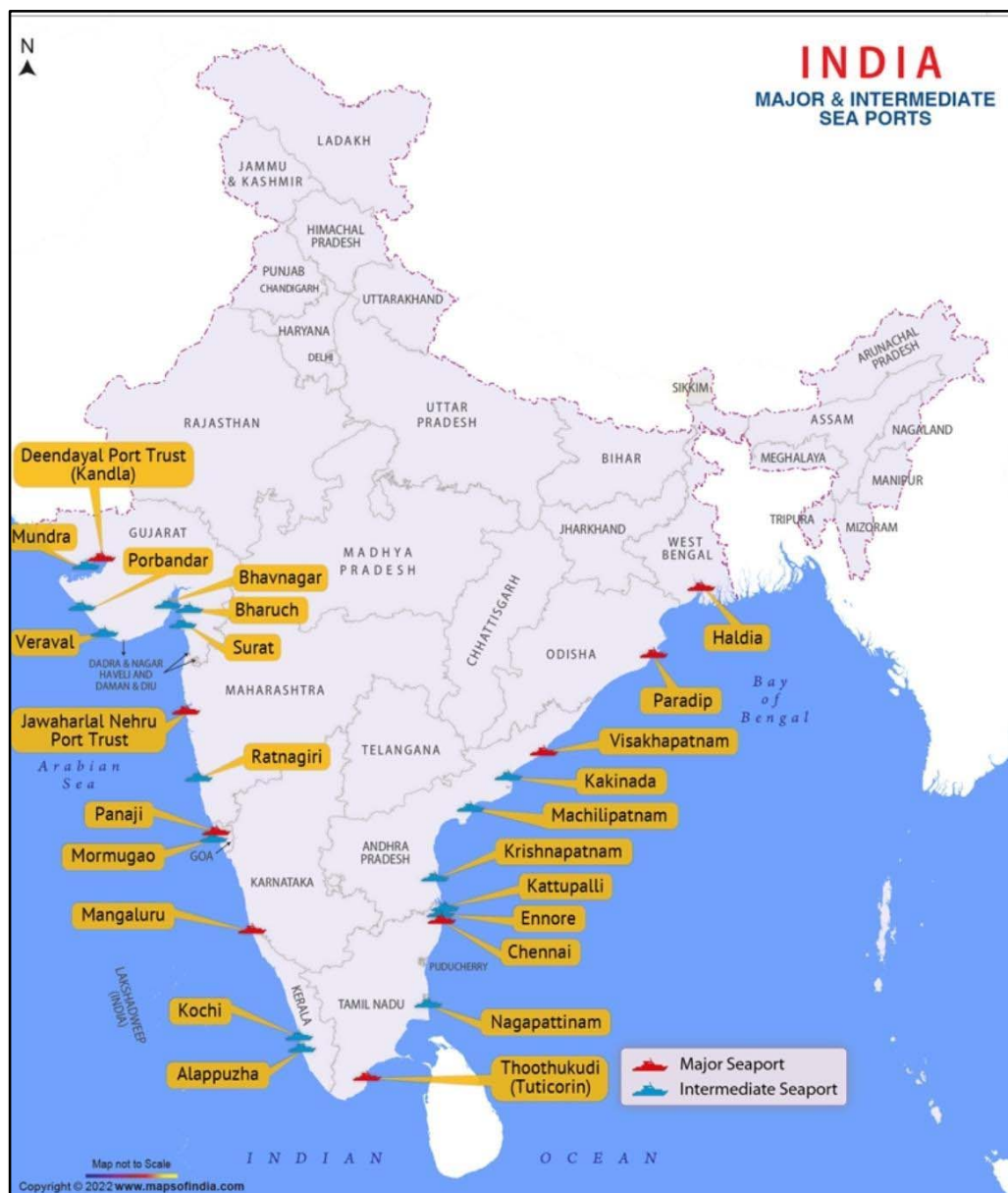


Fig. 2 India's Important Marine Ports [9]

*Possibilities of Fisheries and Aquaculture Market in Bihar*

Bihar is often perceived as an underdeveloped, agriculture-dominated state with limited industrial presence. However, the state is naturally endowed with abundant freshwater resources, offering significant potential for the growth of fisheries, aquaculture, and the fish processing sector.

If we look in terms of consumer availability about 75% of the people in Bihar are non-vegetarian [12] (Fig. 6). People are fond of eating non-vegetarian food like fish, snails, crab, chicken and

goat meat which are easily available here. Therefore, it is highly likely that there will be a large number of consumers for the seafood market in the region. There are many such areas in Bihar where water remains stagnant for 5 to 6 months in a year, which affects the agricultural production there (Fig. 7). In such areas fish becomes a source of protein and a means of livelihood for people. But it only helps people to survive, it is not developed on a commercial scale. Seafood market can be developed on a commercial scale in these areas, which can provide job opportunities to the people of these areas.

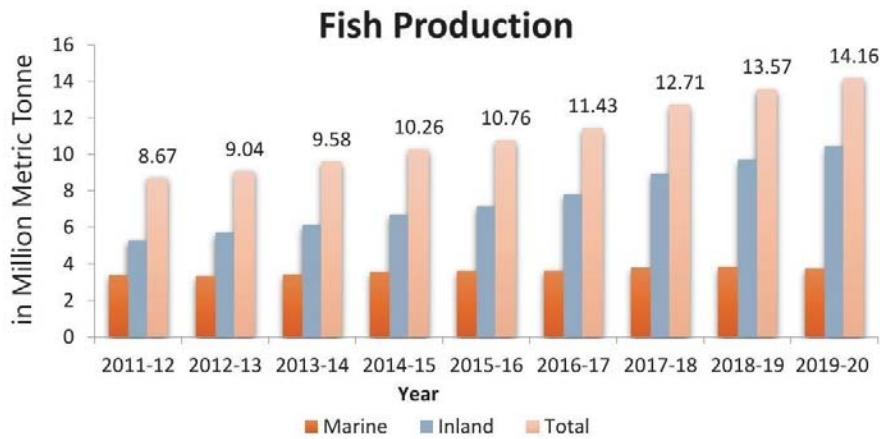


Fig. 3 Fish Production in India

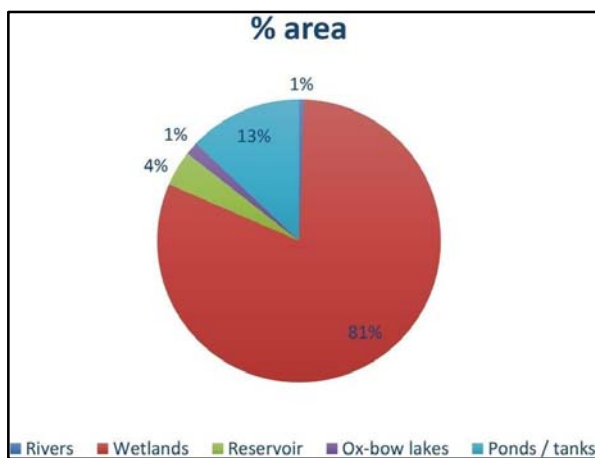


Fig. 4 Area of different water bodies in Bihar

As per the Bihar Annual Budget 2019-20, Bihar produced 6.41 lakh tonnes of fresh fish during 2019-20 while the estimated demand for fish is around 8.5 lakh tonnes [13, p.96]. To meet the demand, fish is imported from Andhra Pradesh, West Bengal and Nepal. This demand gap can be met by promoting the seafood market. The share of fisheries and aquaculture in the Primary sector GSDP (Gross State Domestic Product) was about 8% in Bihar during 2019-20 [13, p.96]. In such a situation the marine fish market can contribute significantly to meeting the fish needs of Bihar.

There has been a significant increase in the production of fish in Bihar especially after the Nitish government came to power, specifically after 2011, While the total production of fish was 2.99 lakh tonnes in 2011, it increased to 6.41 lakh tonnes in 2020 [14].

Bihar already has a large number of consumers of fish along with a huge inland fish market as mentioned above. Considering these facts, it appears that Bihar has immense potential to have seafood consumers and has immense potential for the growth of the seafood market.

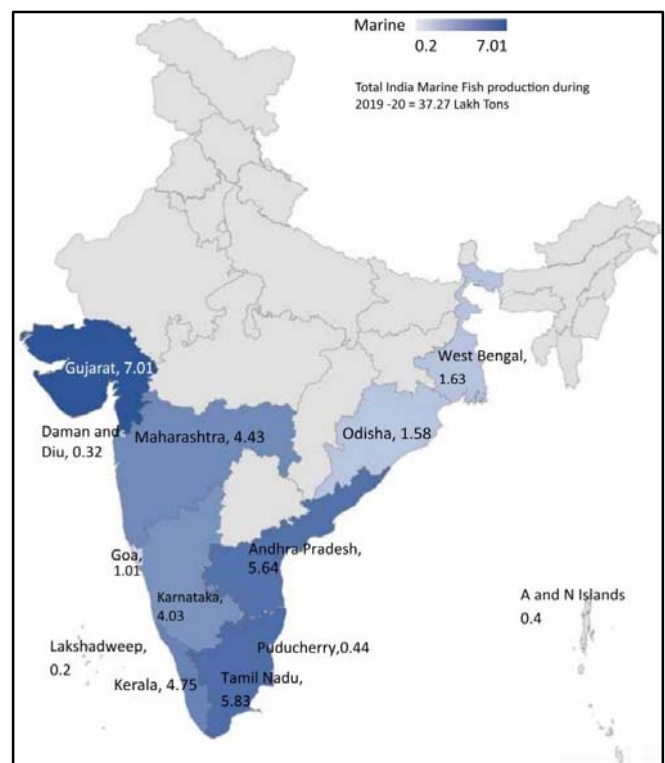


Fig. 5 India's total marine fish production state wise

#### IV. PROSPECTS

If the Government of Bihar takes concrete steps to promote the seafood market in the state, then it can prove beneficial for 105 million people of Bihar. Fish is the largest and cheapest source of animal protein in a poor state like Bihar. The development of the seafood market in Bihar will not only help in economic growth but will also help in generating job opportunities, poverty eradication, getting nutritious food and ensuring food security.

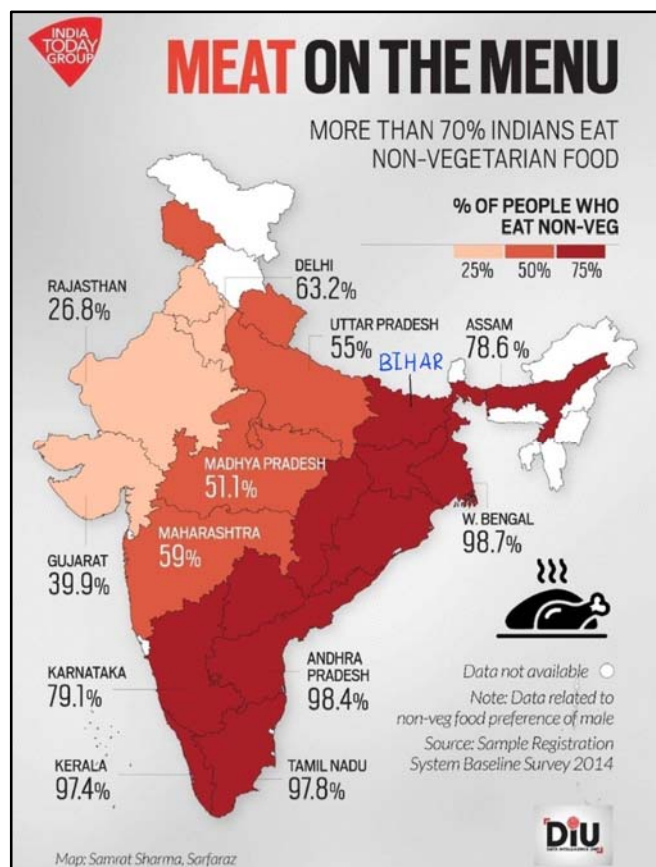


Fig. 6 Percentage of people who eat non-veg [16]

The fish industry currently contributes 8% to Bihar's Primary Sector GSDP (Gross State Domestic Product) [15]. Seafood market will contribute to the growth of GDP of Bihar as well as provide a huge employment opportunity thereby improving quality of life.

There is a strong link between unemployment and migration in Bihar. People have to migrate to other places in search of work. The unemployment situation in Bihar is very bad. According to CMIE (Centre for monitoring Indian economy Pvt. Ltd.) Report 2021, Bihar had an unemployment rate of about 13%, while India's unemployment rate was 7.7% [16]. The seafood market will prove to be helpful in reducing the number of people migrating in search of work along with providing employment opportunities to thousands of people of Bihar.

Bihar is the most flood prone state of India, millions of people of Bihar are suffering from unemployment, poverty and malnutrition. Marine food products will help in reducing poverty providing nutritious food and increasing employment opportunities as well as boost the economy of Bihar. According to NITI Ayog's Multidimensional Poverty Index (MPI) Bihar has the greatest number of poor people in India with 51.91% of population of Bihar is poor [17]. Seafood market has the potential to improve the poverty index and contribute to the GDP of Bihar.

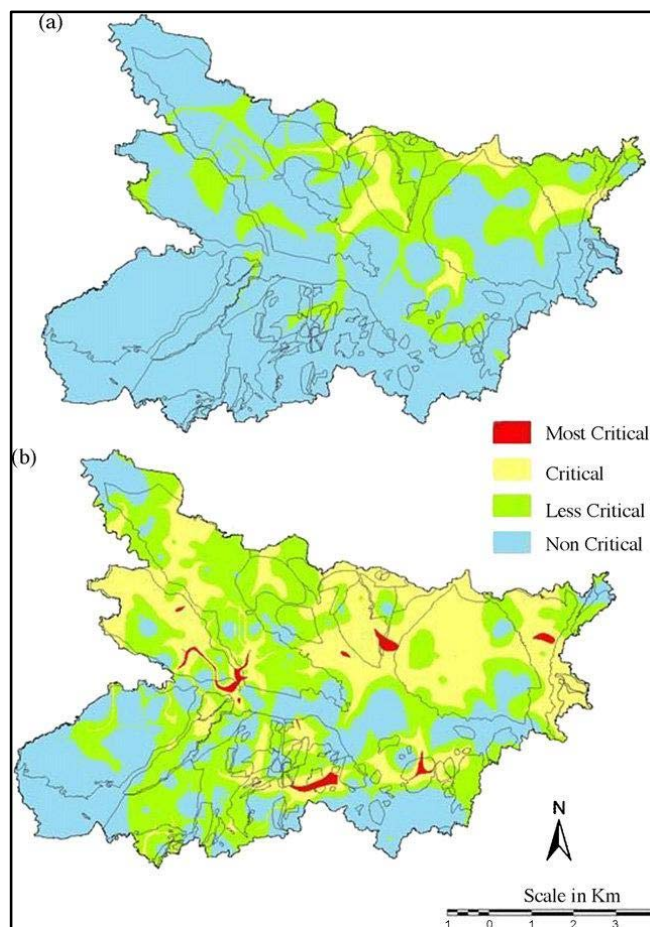


Fig. 7 Water logged area of Bihar: (a) Pre-Monsoon, (b) After Monsoon

## V. CONCLUSION

Exploring seafood market opportunities in Bihar presents significant potential for Bihar's socio-economic development. Bihar, traditionally known as a poor agrarian State, possesses abundant water resources through its extensive river systems, including the Ganges, making it ideal for promoting aquaculture and fisheries. Developing a robust seafood market can generate employment, diversify livelihoods, and boost the rural economy. Establishing infrastructure like cold storage units, processing facilities, and efficient transportation networks will be crucial in maintaining product quality and expanding market reach. Policy frameworks promoting public-private partnerships (PPPs) and providing financial incentives can attract investments and encourage local entrepreneurship. Training programs for farmers and fishers will facilitate the adoption of modern aquaculture techniques, enhancing productivity and sustainability. In fact, developing export-oriented strategies can position Bihar in national and international seafood markets, contributing to foreign exchange earnings. Environmental considerations must be prioritized to ensure the long-term viability of fisheries without harming local ecosystems. Integrating seafood production with tourism and culinary industries can further amplify economic benefits, creating unique cultural and gastronomic experiences. In sum,

through strategic planning, community involvement, and sustainable practices, Bihar can harness the seafood sector's potential, fostering economic growth, improving nutrition, and uplifting the living standards of its people.

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