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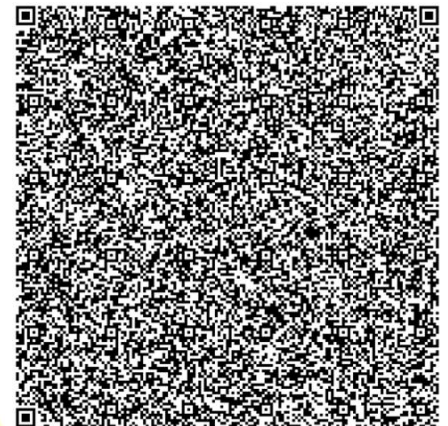
Socio-Economic Conditions of Fishermen in Sundarbans: Overview in Post Pandemic Situation

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Abstract

The Sundarbans is the largest mangrove forest in the world located in the delta of the Ganges and Brahmaputra rivers in West Bengal, India. Fishing is a major livelihood in the region along with wage labour, agriculture, and crab and prawn seed collection. Fishing is a seasonal occupation for communities in this area. The cultural belief systems and myths of traditional communities in the Sundarbans are dedicated to a deep respect for nature. This particular paper focuses mainly on two distinct areas of Sundarbans, Kakdwip and Gosaba Community Development Block, the Canning Subdivision of South 24 Parganas district in the Indian state of West Bengal. Fishing communities live in harsh conditions as most of their villages are in remote areas with minimal or no access to basic nutritional, sanitation, education and health facilities. As it is a seasonal occupation, for the rest of the year they remain unemployed. The fishing community mostly remain unemployed or with very minimum wages. In general, and in those unemployed times they live in extreme poverty and malnutrition. Women have lost their sources of livelihood as they are prohibited from fishing. Situations got harsher after the pandemic COVID-19. The noble corona virus left all the sections of society with utmost poverty and unemployment. Fishing communities in these two blocks are not out of the group. The effect of the global pandemic condition due to the Covid-19 lockdown has a significant impact on the socio-economic scenario of the Indian Sundarbans region. Due to the unavailability of transport facilities, the domestic workers are also unable to join their work in the urban areas. This livelihood is dependent on the tidal conditions which are not always coinciding with the stipulated local market timings where they can sell their catch locally, thereby dampening the impetus to go for fishing. The local market is also not a profitable place to sell the catch since the people visiting these local markets have ponds with fish within their homestead lands, and they seldom buy fish from these markets. This year all these processes could not be carried out, thereby affecting the fish farmers and this will have impacts on fish availability and the consequent fish prices in the future. Apart from all these issues, these regions are at a high risk of cyclones. As Kakdwip and Gosaba both are cyclone prone areas. Natural calamities devastated these two districts causing similar damage. The collapse of infrastructure related to health and nutrition programs due to the cyclone may lead to an adverse effect on the nutritional status of thousands of children in this region. In the phase of disaster recovery and mitigation, there needs to be a special focus on this issue through strong interventions. In a nutshell, we will discuss about the impact of COVID-19 on the social economic status of fishermen of the Sundarbans.

Key words: Mangrove, malnutrition, Kakdwip, Gosaba, cyclone.



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Introduction:

The Novel Coronavirus SARS-CoV2, popularly known as the Covid 19 pandemic, has limited human activities with multiple lockdowns in several parts of the world. By observing the outbreak's severity, World Health Organization (WHO) declared Covid 19 a global emergency on 30th January, 2020.

As the disease is highly transmissible and the vaccine was

not launched till Dec 2020, the ways to flatten the curve was quite impossible. Hence, the situation included the imposition of self-quarantine, social distancing, closedown of transportation, and lockdown throughout the country. The outbreak of covid 19 has also dangerously affected the livelihoods of fishing communities like other daily-earning

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workers across India. West Bengal is one of the vital fishing states in India, and fishing is carried out by fishing net, fishing craft, motorized boat, etc. Complete lockdown from 24th March to 31st May 2020 dramatically affected the fishing communities' day-to-day earnings during and immediately after the lockdown. Anglers could not land and catch the fish because harbours and landing centres remained closed. In total, lockdown disrupted the livelihoods of the fishing community who needed proper care for their betterment. Sundarbans is a sundry range of habitats, biodiversity, ecosystem and watersheds. Fish plays a vital role in the diet of the people of Sundarbans due to abundance of inland open water (capture fishery), inland closed water (culture fishery) and marine fisheries. Aquatic food system is contributing notably to ensure food and nutrition security through consistently supporting safer and good quality animal protein. Fisheries sector is not only playing an important role in maintaining nutritional demand but also socioeconomic status by contributing to the national Gross Domestic Product (GDP) and more than one-fourth (25.30%) to the agricultural GDP. The fishery sector has significant contribution towards country's economic development, food security, nutritional security and foreign exchange. According to Ministry of Statistics and Programme Implementation, 2020 this sector contributed Rs. 1,75,573 crores to the GDP during FY 2017-18. It is one of renewable natural resources which plays a momentous role in local economies and national economic development. Protection of Sundarbans to achieve sustainable livelihood of its present inhabitants is necessary.

Setting the Scene

Kakdwip lies mostly in maritime delta provinces where great variety of life and impacts of environmental and climatic hazards. The location of Kakdwip CD Block is in the south-eastern part of the Sundarbans area. River Hoogly flows through the western part of the district making maximum settlements to come under the village. Kakdwip block is bounded by Kulpi block in the north, Namkhana and Sagar Blocks in the south, Nandigram-I Block in Purba Medinipur district across the Hoogly estuary in the west and Patharpratima block in the east. Gosaba is located at 22°09'55" North and 88°48'28" E. It has an average elevation of 6 metres (20 ft). Gosaba is one of the main deltaic islands in the Sundarbans region, bounded by the Matla and Zilli rivers/ creeks. It is the last inhabited area before where the deep forests start. Gosaba is an intermediate panchayat (local self-government) under the South 24 Parganas district. Village panchayats under it are – Amtali, Bali I and II, Bipradaspur, Chhota Mollakhali, Gosaba, Kachukhali, Kumirmari, Lahiripur, Pathankhali, Radhanagar-Taranagar, Rangabelia, Satjelia and Sambhunagar.

Socio-Economic Conditions of Fisherfolk in Sundarbans Before COVID-19

Sundarbans, coastal delta is a home to a variety of natural resources including fish. A large population of this area is dependent on fishery activity and capture fisheries and is treated as the backbone of Sundarbans economy. Sundarbans is a home to 172 species of fish, 20 species of prawns, and 44 species of crabs. Fishing in Sundarbans faces threats to biodiversity, sustainability and livelihood of fish resources and fisher folk: like shrinking tiger prawn population, indiscriminate fish seed collection, lack of post-harvest and other infrastructure, natural calamities like cyclones and low pressures in the Bay of Bengal. For fishing, Sundarbans act as nursery grounds for important commercial species of continental shelf harvested in India and neighbouring countries. The Sundarbans delta provides a suitable environment regarding temperature, salinity and other physio-chemical parameters. Estuaries provide an abundant supply of nutrients from land drainage and quantities of organic detritus which is an important source of energy for a variety of estuarine consumers. Though fishing is the primary source of traditional fishermen which provides a substantial part of annual income limited options are available for non-fishery activities such as waged labour in sectors like agriculture, construction and poultry raising. During fishing season, owners take loans from professional money lenders to meet running expenses which are not covered by them taken from Aratdars. Indebtedness is a major problem among fishermen. The housing conditions are below standard. Most of them live in poor housing constructed temporarily in huts with hoogla thatches. Fishermen face lots of health and hygiene hardships. They are affected by diarrhoea, gastrointestinal disorders, asthma, malaria, typhoid, scabies, helminthiasis and nematode infection is very high. Their nutritional and food intake habits are poor. The problem of illiteracy is quite common in these areas. The literacy rate among women is negligible. Dropouts before completing primary education are seen. Most of the children of the fishing communities are engaged in this service of fishing in inland and sea fishing.

Role of Women in the Fishing Industry in the Sundarbans

The Indian Sundarbans faced a burden due to a lack of access to innumerable creeks, canals, and tidal rivers which separate the islands from each other and the mainland. The inhabitants of the Sundarbans depend on the natural resources for sustaining their livelihood and resources are more or less overexploited. Fishing is a major source of livelihood for communities living in and around Reserved Forests. Despite such resources in this area, the socio-economic status of people living here is pathetic, especially the women. In fishing as a livelihood, women have been



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traditionally occupied in pre and post-harvest processing of products and marketing the catch. Women are mainly engaged in fry collection and fish drying or processing, where the problems of extreme poverty, poor housing, health and sanitation, limited access to safe drinking water, low literacy rates, less access to support systems, resource opportunities and social exclusion. The process of fish drying is only for four months of a year and in the rest of the year, there are no viable alternative livelihoods for them. The dry-fish women workers belong to a backward community.

In Sundarbans, women are actively involved in both artisanal and commercial fisheries. They are engaged in a wide range of activities in fisheries and related activities like finfish, sell-fish seed collection, pre and post-harvest activities, net preparation and repair. Drying of fish is done as daily labour, household activities and activities in various organisations like SHGs and Food, Fodder, and timber. Fuel, wood collection. Sundarbans' rural livelihood is connected with seasonality. Each season has its problems and opportunities, unlike those fisherwomen who have different strategies for their livelihoods. Women in the fishing community are involved in fish drying from mid-October to the end of January or mid-February. In the other seasons of the year, women are involved in horticultural operations in the garden or as labourers. The watch and ward in the fish drying process is done by women. Packaging of dry fish is done by both males and females. The vending of dry fish is done by women. During bulk landings, women salt or dry fish; at times extract fish oil and preserve catch to use later. This helps gain in earnings and makes fish accessible to distant markets in interiors. Women involved in fish drying contribute nearly 23% of total family income annually.

Impact of COVID-19 on Women Fisher folk in Sundarbans- Women involved in the fishing community contribute a lot to the fishing industry. The contribution of women fisher folks includes fish farming, fish drying and sorting, net making and repairing. They are involved in every stage of aquaculture. Women along with Self-isolation and restriction of mobility reduce demand for fish and fish products, which has negative economic impacts on women's livelihoods and income immediately (harvesting, processing and trading), and in the future. In addition to a lack of economic opportunities, women fish vendors may be exposed to a greater risk of infection, since markets are places of close contact and have limited sanitation and hygiene facilities. This is all the more fundamental given women's decreased job security, especially those informally employed in the fisheries and aquaculture sectors and migrant workers in seafood processing factories. They are thus unlikely to be eligible for or have access to, social protection benefits offered by some governments to handle the COVID-19 outbreak. Moreover, lockdowns and mobility restrictions may modify the dynamics and power relationships between men and women within fisher folk households and communities.

Around 1.6 million are fisherwomen. These fisherwomen are engaged through several important links in the fishery industry right at the fishing jetty and continue till the fish reaches the buyers' table. The decline in catch by fishermen and drastically diminished market demand due to lockdown restrictions have reduced the number of wage days of these fishermen communities, particularly the supplemental income generated by the fisherwomen to support their families. Due to this crisis, women have to come out of their houses and get involved in other activities to supplement their livelihood which lead to various risks in their life. It is therefore recommended that special attention and support be given to women and children who are particularly vulnerable to sexual exploitation and abuse in times of crisis.

The contribution of women is crucial in the management and sustainability of the fishing sector. Keeping this in mind, India's 2017 National Policy on Marine Fisheries (NPMF) and 2018 Draft National Policy on Inland Fisheries and Aquaculture guide mainstreaming gender equity in inland and marine fisheries and aquaculture value chains. The policies advocated increasing participation of women in decision-making, strengthening women's associations and cooperatives, and providing financial support schemes for women's leadership capacities. Launching of mass literacy campaign for fisherwomen in Sundarbans is much needed. Vocational training for fisherwomen in Sundarbans must be provided for knowledge and skill development in sectors like dairy, beekeeping, mushroom cultivation, poultry, etc. for alternative livelihood options. Training for entrepreneurship development must be provided to fisherwomen as they are engaged in small trading enterprises.

Social and Economic Conditions of Fishermen in Sundarbans- Sundarbans is a hotspot threatened by sea-level rise and extreme weather conditions frequently. In 2020, COVID-19 spread across the world creating a global pandemic. Until vaccines were made available majority of countries responded by imposing travel restrictions. Curfews, quarantines, and closure of facilities and workplaces is an attempt to control transmission of novel coronavirus. Lockdown as a measure disrupted the lives and livelihood of the majority of the Sundarbans, especially the economically weaker and vulnerable groups. The consequences of the pandemic are interacting with existing



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vulnerabilities and exacerbated by additional hazards like coastal storms and cyclones. Along with the pandemic, in May 2020 the region was hit by cyclone Amphan. The combined devastation or both calamities pushed the communities in the Sundarbans to the limits of their resilience and coping capacities, demonstrating a need for urgent integrated action to address persistent systematic risks of the population in this region. The State of West Bengal decided to shut schools and educational institutions from March 16, 2020 and there was subsequent lockdown since March 24, 2020 which then continued till May 3, 2020. Needless to say, the lockdown has affected all areas of the country and the state. The more privileged people like us were all working from home. Gosaba and Kakdwip are the community development blocks that form an administrative division in Canning Subdivision of South 24 Parganas district in West Bengal, India. Pisciculture is an important source of employment in South 24 Parganas district. As of 2001, more than 4.5 lakh people were engaged in Pisciculture. Out of this 2.57 lakhs were from the 13 blocks in the Sundarbans

As per Census 2010, about 3, 80, 138 people directly or indirectly are involved in fishery activities in West Bengal and out of that 50 percent are below poverty line. People who work in the fisheries and aquaculture sector depend primarily on income from it to support their families. However, the COVID-19 greatly impacted their earning; it is observed that fish farmers' and traders' income from fisheries fell by nearly half, while fisher's income dropped by 32.80% on average. When social distancing restrictions first came into effect, the operations of many farms and enterprises were forced to close completely. Even social distancing measures have prevented many small-scale fishers from going fishing because of dealing in close contact at local marketplaces. Consequently, the income of fish farmers, fishers, and traders was seriously impacted due to COVID-19 protective measures. There are overall positive impacts on river and floodplain ecosystems and fish capture due to the timely onset of rain and less disturbance by humans because of the pandemic as said by the key informants. Due to the long stretch of lockdown, the reduction in level of environmental pollution triggered the revival of aquatic resources thus saving Mother Nature. Scarcity and higher prices of fuel due to transportation restrictions have also limited the fishing operations in some countries. Unlike fish farmers, the fishers have reported that the demand for natural fish has increased and the price shot up to some extent during the early stage of the pandemic in the northern region of the country. The demand increased because of the returning of many city dwellers and expatriates to village homes during the pandemic who always prefer naturally grown fish over culture fish as the former are tastier, more nutritious and have cultural significance. This is because people were staying at home for a long period without any income source and they relied only on their savings which restricted them from spending more for family maintenance. In addition, due to shortening the local market hours, fishers were not able to sell their catch as usual. The problems in the social and economic fields faced by them are:

Changes in Livelihoods – Livelihoods are vital means of making a living. Livelihood encompasses people's capabilities, assets and activities required to secure necessities of life. The most prominent livelihoods in the CD Block are agriculture, riverine fishing, honey collection, and crab collection. Most households rear cows, goats, ducks, and chicken. A significant portion of the population migrates outside the delta for job opportunities. Apart from this, bee-keeping and fish breeding are practised by some and many of the young men are involved in tourism. There are overall positive impacts on river and floodplain ecosystem and fish capture due to the timely onset of rain and less disturbance by humans because of the pandemic as said by the key informants. Scarcity and higher price of fuel due to transportation restrictions have also limited the fishing operations in some countries. Unlike fish farmers, the fishers have reported that the demand for the natural fish has increased and the price shot up to some extent during the early stage of the pandemic in the northern region of the country. The demand has increased because of returning of many city dwellers and expatriates to village homes during the pandemic who prefer naturally grown fish over culture fish as the former are tastier, more nutritious and have cultural significance. This is because people are staying at home for a long period without any income source and they relied only on their savings which restricts them from spending more for family maintenance. In addition, due to shortening the local market hours, fishers were not able to sell their catch as usual. Households exhausted food reserves and are dependent on the public food distribution system. Local people claim they are supplied with rice from a ration once a week, but it's hardly enough for the entire family. Many families did not receive rations and discrimination in the distribution of rations from the community and administration was common.

Migrant labourers- The strain on scarce resources has exacerbated not only the return of new unemployed migrant workers but also trapped the migrant workers in Sundarbans by imposed travel restrictions and so they were unable to seek work in other states. Their future employment opportunities after the pandemic were uncertain. This was one



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public safety issue as unemployed people might become desperate and local authorities and law enforcement were stretched beyond their operational limit to check crime rates. Many were prone to suicide which was another matter of public safety concern.

Drinking Water -Another aspect of daily life consists of fetching drinking water. With the summer setting in and all the members of the household staying at home all day, the consumption of water had gone up then, resulting in more numbers of trips to fetch water from the hand pumps, tanks, and stand post water supplies. This might impact the availability of drinking water shortly in some areas of the delta. Also, because of excess pressure on the pumping station, if the equipment malfunctions, mechanics from the cities couldn't travel to fix it.

Cooking fuel – Many houses use LPG gas cylinders for cooking. The lockdown had affected the earnings of most individuals thereby making it difficult for them to buy new gas cylinders. Many households were then using the timber which they obtained from the trees of their homestead land which got uprooted way back in November 2019 due to the Cyclone Bulbul. If the lockdown continued for a longer period, we anticipated that the felling of trees in the localities might take place.

Education –Education is an important tool for social development. Low literacy rates and educational disadvantages among traditional fishing communities act as barriers to many aspects of development in Sundarbans. Schools were closed in the delta and unlike in urban areas where most schools were conducting online classes, the students in the delta did not have such alternatives. Later on, a Bengali news channel had started hosting classes for senior classes. While this was a commendable initiative that more people had access to television than equipment needed to support online classes, the concern remained that not all households in the delta had televisions and those who had televisions might not be able to continue to pay subscription for the news channel in this difficult time when earning was being impacted upon.

Health facilities - The probability of disease transmission is higher for them as they live in a congested, unhygienic place and due to their migratory natures. Healthcare facilities were not easily accessible to fisher folk communities due to COVID-19 circumstances. Under COVID-19 situation, they faced difficulties to access sanitation supplies, testing process and treatments during time of emergency. Medical emergencies in the Gosaba and Kakdwip CD Block were attended to at Gosaba or at Canning, the nearest town. In this time of lockdown, the women workers of ASHA (Accredited Social Health Activist is a community health worker instituted by the government of India's Ministry of Health and Family Welfare as a part of the National Rural Health Mission) were actively visiting villages. On a normal day, transporting a patient to Gosaba from the remote islands is an uphill task comprising of arranging boats to reach the mainland, after which ambulances can be arranged. Under this state of lockdown, arranging transport would become even more difficult and this was a cause of worry for the villagers.

Transport and Communication –Due to complete lockdown, fishing activities were shut for which fisher folk suffered financially. There were reduced fishing activities due to lockdown, social distancing, declining demand or price of fish, closure of restaurants. Revenue generated from fish and shellfish industries was affected as hotels and restaurants were closed. Closure of transport facilities created dis-communication between semi-urban and urban fish markets. Other problems faced by fishing communities regarding fish due to pandemic were perishability, compliance, catch weight, lot and portion control, commodity pricing, storage conditions. Both the CD blocks comprise of a cluster of islands and the communication between the islands and to the mainland is mostly facilitated by ferries and three-wheelers. These have fixed routes and are the only public transport options. With the aim of restricting movement, the lockdown had stopped the operation of these transports. This had naturally affected the earning of these transport operators. Blockages of transport routes had negative impacts on disrupting local food supplies and obstruction of fresh food supply chains in turn increasing risk of food wastage and loss. As for telecommunications, most delta-dwellers who use mobile phones use prepaid connections which need to be recharged with talk-time and internet packages. They are used to visiting shops to get these recharges done and are not familiar of recharging online. With the recharge shops closed then, many were finding it difficult to recharge their phones and keeping the lines of communication alive.

Markets -People were permitted to go the markets maintaining the norm of social distancing. Markets were permitted to remain open for 2-3 hours in the morning where people were queuing up a few metres away from each other and buying vegetables, fish, chicken, eggs, groceries and medicines. Most villagers have a patch of land within their homestead land where they grow vegetables and they also have a pond where they grow fish, both for their consumption. In addition to this, they also have a stock of rice grains from their cultivable lands and most people are eligible for rice through the government's Public Distribution System. Unlike our plight in urban areas where we are



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compelled to buy rice, vegetables and fish from the market, many villagers in the delta are self-sustaining. However, with the lockdown being extended, it was a matter of concern for them as to how long this self-sustenance could go on. Grocery stores were permitted to stay open for a stipulated period when they were doing brisk business. Many people were also hoarding out of fear of running out of supply of essentials in the future since the remoteness of the islands might pose a problem for transportation of essentials from outside the CD Block.

Riverine Fishing – The lockdown had affected the transportation network and disrupted the supply chain, thereby impacting the demand for fish in the markets outside the CD Block. With no place to sell and no storage facilities available for fishermen in the area, riverine fishing was being practised less then. Also, this livelihood is dependent on the tidal conditions which are not always coinciding with the stipulated local market timings where they can sell their catch locally, thereby dampening the impetus to go fishing. The local market is also not a profitable place to sell the catch since the people visiting these local markets have ponds with fishes within their homestead lands, as mentioned earlier, and they seldom buy fishes from these markets.

Fish farming – Many delta dwellers also practise fish farming in tanks or chambers. The fry is usually bought from outside and there is no prominent hatchery in the area. The lockdown had restricted the movement of the seedlings from other States. The beginning of the summers is the ideal time for releasing them in the ponds when they need heat to survive and start growing in the monsoons. Complete lockdowns in harbours and fish landing centres drastically affected earnings of fishermen, an essential sector of food and nutritional security. The freshwater pisciculture were flooded with saline water which affected in fish production due to cyclone. That year all these processes could not be carried out, thereby affecting the fish farmers and this would have impacts on fish availability and the consequent fish prices in the future.

Crab collection-Crabs and honey collection are major forest products that inhabitants of mangrove delta collect from dense mangrove forests. Sundarbans is a home of various crab species and villagers depend on crab collection for their primary livelihood. Exports of crabs to markets in China, Thailand, Malaysia, Singapore ended in February, 2020 and crab farm owners were forced to shut down facing significant losses. This compelled crab farmers to sell locally with low prices resulting in reduction of crab collection. Economic distress during pandemic compelled many families to resort to crab collection from deep forest, endangering collectors who contend with wildlife attacks.

Honey collection- Availability of honey is all the year round and farmers can get higher, consistent income by harvesting wild honey. Many are collecting illegally to supplement severe impacts on yearly income. During pandemic, numbers of people were killed by tiger attacks at the time of livelihood collection since migrant workers returned home due to lockdown. Male members of the family enter forest illegally and tiger widows are not entitled to any government compensation. Affected families hardly inform authorities about deaths of family members engaged in illegal collection of honey.

Policies and Remedial Measures: The various programmes and policies implemented by both state and central governments for socio-economic development of fisher folk in Sundarbans, West Bengal have been categorized under general schemes, policies and programmes and special schemes and relief measures were carried out during COVID-19 and cyclone Amphan.

- A. *Employment policies and programmes for fisher folk communities in West Bengal*- Employment in fishing community Sundarbans ranges from capture and culture of fish from sea and inland waters to backyard pond management, fabrication of fishing gear, breeding, processing, marketing, export and import of fish. With drastic changes caused due to COVID-19 and cyclone Amphan, tide of unemployment emerged. This had a worst effect on women fisher folk especially single or widows. Some policies by both the governments includes MGNREGA, Karma Sathi Prakalpa during COVID, Prochesta Prokolpo during COVID, Sneher Paras during lockdown, Krishak Bandhu, Unorganized workers social security scheme etc.
- B. *Policies on decent work, focusing working conditions in fishing processing activities, marine and inland fishing*- Fishing communities are most neglected and marginalized section of society. They work in extreme hazardous conditions. Fishermen in Sundarbans work in dense forests where they are attacked by tigers or crocodiles. During pandemic many fishermen lost their lives due to tiger attacks which increased. The provision of selling fish in market, open streets without shade, no toilet facilities and unhygienic working environments are common for fisher folk in Sundarbans. Policies addressing on decent work conditions are Marine Fishing Regulation Act, Social Welfare Schemes, Social Welfare Measures and policies for social insurance and security are West Bengal Accident Insurance, Pradhan Mantri Suraksha Bima Yojana, Asangathit Shramikder,



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- C. *Policies on Social Inclusion for men, women, children, youth among fishing communities during pandemic-* Fishermen in and around the world are socially and capitally excluded. Fishing community is dominated by caste system. Policies like NIFAP and NPMF failed to address problems of social-economic benefits of fishing communities. The rights of fisherwomen and children are not clearly addressed. During pandemic, no specific policies were formulated for social upliftment of fishing communities. They received benefits and social support in general especially for those below poverty line.
- D. *Policies on occupational health and safety and sexual reproduction health of fishing communities-* Fishing communities are under general health policies that are implemented by central and state governments. Health schemes available for fishing communities in and after COVID-19 is Swastha Sathi Card which provides coverage of Rs. 5 lakhs for health issues.
- E. *Policies for education for fishing communities-* The statistical reports mention literacy rates among population over seven years of age at 78 percent with women's literacy rates (79.6%) being higher than those of men. Community values, marginalization, economic vulnerability, migration, child labour in fishing activities and domestic chores hinder literacy among fishing communities. There are policies on education and children's right to education adopted by government are Kanyashree, Shikhashree, Sabooj Sathi, Cooked Mid-Day Meal Project, Schools in Fish Landing Area and Child Sponsorship Project.
- F. *Policies for Housing in fishermen communities-* To provide free shelter to the poor, the Housing Department of the Government of West Bengal under schemes Gitanjali and Amar Thikana aimed to construct houses. Lakhs of fishing communities residing have been availing of these schemes. Another scheme available under the housing policy is Pradhan Mantri Awas Yojana for economically weaker sections of society.
- G. *Policies for Sanitation, drinking water, and energy policies for fishing communities-* The Ministry of Drinking Water and Sanitation, Government of India in collaboration with the Asian Development Bank supported by the state government to improve drinking water in its arsenic and fluoride-affected districts under National Drinking Water Development Program. The West Bengal Drinking Water Sector Improvement Project aims to provide safe, reliable continuous drinking water in arsenic and fluoride-salinity-affected areas of North 24 Parganas, South 24 Parganas, Purba Medinipur and Bankura. With the help of these policies, the facility of drinking water and solar lamps is available in fishing landing areas.
- H. *Government Support-* Both the state and central governments should support fishing communities affected during pandemic through subsidies on inputs or loans to build back better. Short term financial assistance is needed to support the fish producers in production and marketing issues which drastically reduced due to COVID.
- I. *Policies for Institutions and organisations development-* Building of resilience is necessary through development of new organisations, institutions and processes to deal with future adverse consequences. Risk informed developmental planning must be undertaken to create sustained change, inclusive of comprehensive and integrated analyses embracing range and complexity of current and future overlapping threats. Shor-sighted segmented planning and implementation to integrated transdisciplinary solutions that shape resilience and regenerate full resources prevent both planned and unforeseeable negative outcomes.

Conclusion

The fishery sector is extremely diverse, both freshwater and marine, but it nevertheless relies heavily on other ends like labour, markets, consumer demand, and inputs supply which have been and will continue to be impacted during and after the COVID-19 pandemic. Due to this unprecedented lockdown, labour availability was hampered, transport facilities were fully halted, and inputs like fish seeds, fish feeds, and technical advisory were also drastically disturbed. This pandemic has highlighted the approaches to enhance sectoral resilience to ensure that the resilience of fisheries and aquaculture is strengthened to endure future crises for promoting sustainability, livelihood, and food security. There is also a need to align current fishery sector policies and schemes to benefit stakeholders in the post-COVID-19 pandemic era. A majority of the stakeholders suggested policy reforms to get appropriate training on resource utilization and fish processing aspects besides the facilitation of credit with optimum subsidies. The transparency of scheme implementation would help in targeting needy farmers/stakeholders. Some stakeholders demanded price regulation for fish products in terms of minimum support prices to facilitate better marketing. To empower fish farmers, fish hatcheries need to be set up at the local level. The promotion of fish farming shall also be coupled with farm pond construction. This would enable many farmers to practise integrated farming and diversify their profession. This diversification would reduce the losses of farm households and farmers' net income can also be increased. The Panchayats, which are the elected governing bodies at the village level in India, were active in



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spreading the safety and awareness messages over microphone doing rounds in the villages. Additionally, they took the initiative to monitor the migrant workers coming into the villages, suggesting them to stay in home quarantine for the stipulated 14 days. The police were stationed at certain points monitoring the people in markets, enforcing the rules of lockdown and social distancing. Government with assistance with non-governmental organizations (NGOs) conducted interventions which provided short-term benefits ignoring long-term aspects of livelihood interventions.

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