

Marine Fisheries Insurance in India: Issues, Challenges and Future Strategies

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Abstract

India's marine fisheries industry is a booming player in the country's principal economic sphere. As things stand, it brings in between \$7 and \$8 billion each year, provides employment for about 0.93 million people, and contributes to the nation's food security. But marine capture fisheries are intrinsically risky because of climate change, lightning, cyclone activity, and the presence of allied factors such as rising sea temperatures, shifting precipitation patterns, rising sea levels, ocean acidification, and the spread of infectious diseases. The economic and social security of the fishing community are directly threatened by these occurrences. However, India's institutional frameworks for dealing with risk and uncertainty in the marine fisheries sector have been woefully inadequate. Insurance is one of the most widely used risk management tools because it can effectively contain and mitigate a wide variety of risks, including asset risks, production and management risks, market risks, and personal and health risks. With a few notable exceptions, the great majority of fishing industry stakeholders do not have access to insurance because it is underutilized compared to other agricultural subsectors across the country. Therefore, it is crucial to strengthen loss and damage mechanisms and boost social safety nets and resilience, especially by safeguarding fish farmers, fish workers, and any other category of people who directly engage in fishing and related allied activities in light of both domestic and international legal and policy frameworks. It is time to implement some of the finest practices employed in the Caribbean and Japan and to expand on the technological and governance innovations already in place by utilizing remote sensing and geographic information systems (GIS). With this aspect in mind, the researchers in this paper have traced the state of the fisheries insurance sector in the light of emerging environmental risks, the efficacy of legislative and policy frameworks to extend social security nets and resilience, particularly in the form of insurance, for the overall social and economic wellbeing of the fishermen community, and proposed viable strategies entailing the active role of government, awareness among stakeholders, the creation of a model parametric insurance plan, and the mobilization of scientific and innovative technologies in the fisheries insurance context.

Keywords: marine fisheries, insurance, legal framework, national policies, technological innovations.

Introduction

The marine fisheries industry in India is a dynamic participant in the primary economic sector. In current scenario, it brings in between 7 and 8 billion US dollars yearly, employs around 0.93 million people, and helps the country meet its nutritional requirements. All these benefits come in addition to the fact that it brings in revenue. India has a coastline that extends for 8,118 kilometres and is covered by nine marine states and four Union Territories. In terms of revenue, the contribution of fisheries to the national economy is more than that of other well-known enterprises in India, such as Bollywood and cricket, as well as the advertising money generated by Google and Facebook. Additionally, the fishing industry

provides employment for a larger number of individuals and assists larger number of families in maintaining their livelihoods (Bay of Bengal Programme, 2022).

Growing data indicates that climate change is causing changes in productivity, biodiversity, species distribution, and habitat in the oceans in addition to increased extreme weather events (Harley et al., 2006). Similar to this, the recent lightning strikes in coastal areas have renewed discussion regarding whether or not the growing frequency of lightning is related to climate change. A study conducted in the USA found that a rise in one degree Celsius would result in a 12 percent increase in the frequency of lightning strikes. (Romps et al., 2014). According to a study

published in *Geophysical Research Letter* in 2018, urbanization, an increase in population, and a warmer climate assure an amplification of human exposure to lightning risk. (Sengar, 2021). By the end of this century, it is anticipated that India will experience increase in lightning frequency and intensity of 10 to 25 percent and 15 to 50 percent, respectively, with coastal areas potentially being more vulnerable. (Chakraborty et al., 2021). According to data from the National Crime Records Bureau, 40% of deaths caused by natural disasters in 2021 were caused by lightning. The data also reveals that in India, the number of deaths attributable to natural disasters is often higher in coastal states than in inland areas. Furthermore, the Bay of Bengal region has experienced an increase in cyclonic activity over the past several decades. From 1990 to 2021, 190 cyclonic disturbances were documented there; on average, 6-7 cyclonic disturbances occur annually, posing a major threat to the fisheries sector. The frequency and power of cyclonic episodes are also rising in the Arabian Sea. When the last two decades are compared, the number of cyclonic disturbances in the area has grown by 47%. Other projections include increases in sea surface temperature, changes in precipitation, sea-level rise, and ocean acidification, all of which will directly affect marine fisheries and, in turn, the economic and social well-being of the fishing community (Krishnan et al., 2022).

These dangers are already apparent. Climate change has resulted in significant production losses in India. However, such losses were not covered by insurance. The marine fisheries sector in the region is worth USD33 billion. The volume of built-up capital appears to be increasing as the sector is modernized. However, capital estimates are not available. Fish catches appear to be constant, however considerable changes in production at the species level have been reported due to meteorological occurrences. In the case of Indian Oil Sardine, one of India's largest fisheries, weather events resulted in a 20-fold decrease in production below average during 2021, wiping away 3/4th of the fishery stakeholders' income. In the case of a fisher's life, the estimate should be calculated on the predicted lifetime income. Given current prices and trends, a

fisher in India will earn around INR5.4 million over the course of 20 years of active fishing. In comparison, the insurance coverage is just about INR0.5 million in case of death or permanent disability, which is about comparable to two years of his income. As a result, there is a need to improve coverage (Krishnan et al., 2022).

Fisheries that include marine capture are inherently dangerous. Climate change worsens the risk profile even more. Therefore, it is unlikely that the typical risk financing methods used by fishermen, such as personal loans, conditional loans, asset sales, and investments in fishing capacity, will be profitable in the long run. There is compelling evidence to suggest that non-institutional fisheries financiers, like family members and moneylenders, would be exposed to significant risks given the extent and severity of the climate challenge (Basu, 2006).

In addition, technological advancements in the fields of vessel propulsion, gear design, navigation-system, and information-communication have led to an increase in investments and a corresponding increase in the economic risks associated with marine fishery operations (Parappurathu et al., 2017). Risks associated with capture fisheries include loss or damage to fishing vessels, apparatus, and gear in operation, loss of catch, and fatalities among people at sea. Despite the fact that such risks and dangers are inherent to marine fishing operations, their economic ramifications have multiplied in recent years, especially for small-scale fishermen and boat owners.

In light of disease outbreaks, climate change-related weather conditions, harmful algal blooms (HAB), and other natural disasters connected with fish culture in marine environments (mariculture) are especially crucial. In recent years, extensive mortality and economic losses have been linked to common diseases such as argulosis and viral nervous necrosis (VNN) in fish, white spot and early mortality syndrome in shrimp, viral haemorrhagic septicaemia, spring viremia, and perkinsus disease in shellfish (Sahoo and Goodwin, 2012).

Despite the aforementioned situation, India's institutional frameworks for addressing risk and uncertainty in the marine fisheries and mariculture sectors have been utterly underdeveloped. An effective tool for confining and

mitigating a wide range of hazards, including asset risks, production and management risks, market risks, and personal and health risks, insurance is one of the most extensively utilized methods for risk management. With a few local exceptions, insurance in the fisheries industry is vastly underutilized as compared to other agricultural subsectors in the nation, making it unavailable to the vast majority of stakeholders. Notwithstanding this, the fishing industry across the nation is requesting more risk management solutions. As a result, it is necessary to enhance loss and damage assessment and relate it to insurance in light of both domestic and international legal and policy frameworks. After the WTO, there is potential for redistributing government funding to the fishing industry. The 2020 National Fisheries Policy and Pradhan Mantri Mastya Sampada Yojana (Press Information Bureau, 2022) aims to increase social safety nets and resilience, particularly by protecting fish farmers, fish workers, and any other categories of people who are directly engaged in fishing and related allied activities from the vagaries of nature. This insurance covers life, permanent or partial disability, hospital costs, and other assets. Given that 90% of fishers worldwide work in small-scale fisheries, this would also help achieve SDG 14.b.1—Securing sustainable small-scale fisheries (UN, 2015).

International Mechanisms for Risk Management

Warsaw International Mechanism for Loss and Damage

Warsaw international mechanism for loss and damage created in 2013, acknowledges that "loss and damage associated with the adverse effects of climate change includes, and in some cases involves more than, that which can be reduced by adaptation" (Hoffmaister, 2014). Its mandate includes "enhancing knowledge and understanding", "strengthening dialogue, coordination, coherence and synergies among relevant stakeholders", and "enhancing action and support, including finance, technology and capacity-building, to address loss and damage associated with the adverse effects of climate change". However, it makes no provisions for liability or compensation for loss and damage. The only reason loss and damage was even discussed in

Warsaw was because the entire delegation of developing countries staged a walkout at negotiations.

The Paris Agreement

The Paris Agreement provides for the continuation of the Warsaw International Mechanism but explicitly states that its inclusion "does not involve or provide a basis for any liability or compensation". The inclusion of this clause was the condition on which developed countries, particularly the United States, agreed to include a reference to loss and damage. Article 8 of the Paris Agreement states that 'the parties recognize the importance of averting, minimizing and addressing loss and damage associated with the adverse effects of climate change, including extreme weather events and slow onset events, and the role of sustainable development in reducing the risk of loss and damage' (Paris Agreement, 2015). The United Nations Framework Convention on Climate Change (UNFCCC) may have reached a watershed moment with the establishment of a Transitional Committee to operationalize payments for loss and damage at the 27th Conference of the Parties (COP27) to the UNFCCC. However, vulnerability discourses, procedures, and indices for appraising the impacts of climate change remain unsuitable for purpose in the context of loss and damage and broader climate financing. A huge obstacle remains in advancing climate justice and disaster risk reduction without addressing the question of socio-political "root causes," identifying which Parties are the most vulnerable (and thus eligible for financing), and accounting for intangible non-economic losses (Naylor and Ford, 2023).

Evolving Pace of Marine Insurance Law in India

In India, insurance has a deep-rooted history. It finds mention in the writings of Manu (Manusmriti), Yagnavalkya (Dharmasastra) and Kautilya (Arthasastra) (Dhar, 2018). The writings talk in terms of pooling of resources that could be redistributed in times of calamities such as fire, floods, epidemics and famine. This was probably the predecessor of modern insurance. Ancient Indian history has preserved the earliest traces of insurance in the form of ship trade loans and shipping contracts.

Since India's independence in 1947, the country's maritime industry has witnessed significant growth. Thus, in order to ensure the smooth development of marine insurance legislation in India, it has become imperative to create Indian law that caters best to the circumstances that exist in India. Before the marine legislation, matters connected to maritime law were decided according to the general law of contract and the English rulings, both of which were founded on the norms of contract derived from common law. In its most fundamental form, the Indian legislation governing marine insurance is an interpretation of the regulations that are included in the standard form of marine policy (Jain, 2020).

Marine Insurance Act, 1963

Marine fisheries insurance in India is regulated by the *Marine Insurance Act, 1963*. This Act provides for the regulation and control of all matters related to the insurance of marine fisheries (The Marine Fisheries Insurance Act, 1963, Act no. 11 of 1963).

The key provisions of the Marine Insurance Act related to marine fisheries insurance are as follows:

- i. **Insurable Interest:** The insurable interest for a marine fisheries insurance policy can be the interest of the owner of the fishing boat in the fishing gear or the interest of the fisherman in the fish caught.
- ii. **Marine Perils:** The policy must cover risks such as damage to fishing gear, theft, loss or damage to the fishing boat, crew or cargo while at sea.
- iii. **Contract of Indemnity:** The insurance policy should be a contract of indemnity. This means that the insurer agrees to indemnify the insured against the losses or damages suffered due to marine perils specified in the policy.
- iv. **Coverage:** The policy can cover losses due to perils caused by natural disasters, man-made perils, malicious damage, piracy and other oceanic risks.
- v. **Claims Process:** The insurance company must be notified immediately after any loss. The insured must provide proof of loss, such as bills of lading, invoices, and receipts. Insurers should properly investigate the claim for its authenticity.

- vi. **Warranties:** Warranties are promises made by the insured to the insurer to ensure that the risk profile of the policy is well distributed. The damages suffered due to the breach of warranties are not covered in the policy.

Marine fisheries insurance in India is important to protect the livelihood of fishermen who depend on oceanic activities for their source of income. The policy ensures the survival of the fishing industry and safeguards the welfare of fishermen against financial losses due to natural calamities or any unexpected events at sea.

The Marine Fisheries (Regulation and Management) Bill, 2019

The Bill is a response to the obligations made under the United Nations Convention on the Law of the Sea, 1982 (UNCLOS, 1982), as well as the agreements made with the World Trade Organization. Its purpose is to provide for the regulation and administration of fisheries in India's Exclusive Economic Zone as well as Indian fishing vessels operating in international waters (Kurien, 2019).

The key provisions of the Marine Fisheries Regulation and Management Bill in India were as follows:

- i. **Regulation of fishing activities:** The bill aims to regulate fishing activities by issuing licenses and permits for fishing vessels and gear. It also seeks to establish a system to monitor and control fishing activities to ensure compliance with regulations.
- ii. **Conservation and sustainable use of marine resources:** The bill aims to promote the conservation and sustainable use of marine resources by establishing measures to prevent overfishing, promote eco-friendly fishing practices, and minimize the impact of fishing on marine ecosystems.
- iii. **Strengthening institutional capacity:** The bill proposes to strengthen the institutional capacity of the government of India to regulate the fisheries sector. It seeks to establish effective monitoring and surveillance systems, promote research and development, and create an efficient market infrastructure for fisheries products.

iv. *Community-based co-management:* The bill promotes community-based co-management of marine resources, recognizing the role of fishing communities in the conservation and sustainable use of marine resources.

v. *Conservation Zones:* The bill proposes to establish conservation zones to ensure the protection of sensitive marine ecosystems and to promote sustainable use of marine resources.

The Marine Fisheries Regulation and Management Bill in India seeks to promote sustainable development of the fisheries sector while safeguarding the interests of fishing communities and ensuring the conservation of marine resources. The bill was redrafted as the Indian Marine Fisheries Bill, 2021.

The Indian Marine Fisheries Bill, 2021

This Bill seeks to promote the livelihood and socio-economic well-being of traditional and small-scale fishers, to provide for the sustainable development of fisheries resources in the exclusive economic zone of India and to ensure responsible harnessing of fisheries in the high seas by the Indian fishing vessels (The Draft Indian Marine Fisheries Bill, 2021).

Although the provision in the bill restricting the entry of foreign vessels into the EEZ has been met with approval, fishermen have voiced strong opposition to the proposition that licenses to fish in the EEZ would be issued only to vessels that were registered in accordance with the Merchant Shipping Act, 1958. In addition, there is a lack of clarity regarding the types of boats that are required to be registered. They continued to oppose the law because it would allow the Indian Coastal Guard officials to penalize individuals who netted non-permitted species, which is something that would ordinarily be impossible to prevent because fishermen do not participate in selective fishing and their nets catch all different kinds of fish. In addition, the right of traditional fishermen to access fishing resources would be violated by the measure since it would prohibit fishermen from going further than 12 nautical miles without first obtaining a license. It is possible that fishermen will wander farther than intended. It has been argued that these restrictions on traditional fishermen were

aimed at handing over fishing and trading rights to foreign corporate companies. If their vessels were impounded as a result of this, the fishermen would be reduced to a state of destitution (S Godson Wisely Dass, 2021).

National Fisheries Policy, 2020

The National Fisheries Policy, 2020 has been drafted by merging three existing policies, namely:

i. National Policy on Marine Fisheries, 2017 (NPMF)

ii. Draft National Inland Fisheries and Aquaculture Policy (NIFAP)

iii. Draft National Mariculture Policy (NMP)

Post-harvest elements have also been integrated into the draft policy

The National Fisheries Policy, 2020 aims to develop, harness, manage and regulate capture and culture fisheries in a responsible and sustainable manner. The Policy seeks to ensure a productive integration with other economic sectors, such as agriculture, coastal area development and eco-tourism, to meet the goals of the 'Blue Economy'. The Policy placed an adequate emphasis on reducing the vulnerability of fishing communities to the ever increasing impacts of climate change mediated global warming, extreme natural events such as cyclones and tsunamis, floods and droughts, and any other unprecedented situation such as the COVID-19 pandemic. This ensured that the resilience of the communities was built to offset such threats. In addition, the strategy placed an emphasis on building resilience and social safety nets, particularly through the insurance of life, their craft and gear, and other assets from the vicissitudes of nature. This would assist the fishermen in compensating for their losses incurred as a result of natural disasters and other events over which they have no control. In a similar manner, the policy will work toward the goal of providing crop insurance to aquaculture farmers as well as the insurance of their assets such as aerators, water pumps, and other such items (National Fisheries Policy, 2020).

The State of Fisheries Insurance in India

Before 1999, the only players in the insurance market in India were public insurance companies. The Life Insurance Corporation of India Limited (LIC) was in charge of life insurance, while the General

Insurance Corporation of India Limited (GIC) was in charge of general insurance. The Insurance Regulatory and Development Authority (IRDA), which was established in 1999, reached a significant milestone in this field when it liberalized the insurance market in the country, which ultimately resulted in the registration of over 35 private insurance companies (Pal et al., 2007). At this time, the Agricultural Insurance Company Limited (AIC) in India is responsible for the administration and implementation of all public insurance schemes pertaining to agricultural and allied industries in the country. Since 2002, this industry has seen the participation of a number of corporate firms, including ICICI Lombard, Bajaj Allianz, IFFCOTOKYO, HDFC ERGO, and Royal Sundaram, among others. In contrast to the agricultural and animal industries, the fishing industry in India does not have a long history nor a well-organized regulatory framework for its insurance market. At the local level, there are a few public sector insurance businesses and cooperative bodies, but the industry as a whole has received little attention at either the state or the central level. The exception to this is at the local level, where there are a few public sector insurance companies. The operations of the private sector in this area are likewise restricted to a small number of cases that are spread out across time and space (Parappurathu, 2017).

Currently, fishermen have access to insurance against accidents, fatalities, and specific other types of losses. The *Pradhan Mantri Suraksha Bima Yojana* is a group accident insurance program offered by the federal and state governments to fishermen. With the *Pradhan Mantri Matsya Sampada Yojana*, the central government introduced a new insurance program in 2020 that provides increased compensation for accidental fatalities or injuries to fishermen between Rs 25,000 and Rs 5 lakh (Flavia Lopes, 2021). Additionally, public insurance organizations like the New India Assurance Company Limited, Oriental Insurance Company Limited, and United India protection Company Limited offer protection for the total damage or loss of fishing vessels. Some private insurers may provide coverage for loss of fishing equipment for an additional fee. However, the annual premium typically runs from 3–5% of

the value of the vessels and can even be greater at times, and compensation is often only provided in the event of complete damage of vessels (S. Parappurathu, 2017).

Therefore, to adjust to the changing scenario, practical risk management solutions are needed. In this environment, insurance is increasingly being recognized as a risk management tool. With innovations, the insurance industry is likewise rising to the challenge. The advent of parametric insurance is one such innovation. Traditional insurance covers loss and damage (L&D) caused by specific perils. Parametric (or index-based) solutions, on the other hand, are a sort of insurance that covers the likelihood that a preset event will occur rather than compensating actual loss experienced. It is a contract that calls for a payment to be made in the event of a triggering event, and as such, it is not connected to any underlying infrastructure or physical assets. There is therefore hope for the marine fishing sector's insurance, despite its appalling track record, when combined with Fintech and ICT advancements taking place in India.

Major Challenges faced by Marine Fisheries Insurance Sector

There are a number of issues that explain the reasons behind low risk financing of the marine fishery sector in India (Devaraj and Vivekanandan, 1999). In most of the places, the fishers / mariculture farmers are either unaware or are less concerned about the need to insure their assets against various types of risks. In certain cases, people are well aware of insurance, but are reluctant due to high premiums involved, lack of provision for claim settlement in case of partial damage, hassles involved in claim settlement process, reservations about timely and assured settlement of claims and so on (Parappurathu, 2017).

As enrolment is lower due to the above reasons, the insurance companies have limited options to develop products that are affordable. The companies are also concerned about malpractices such as intentional dumping of fishing vessels, especially old and less energy-efficient ones, to secure claims. Unlike on land, the mechanisms to detect such malpractices are scanty.

At many places, the fishermen/fish farmers point to lack of availability of adequate insurance options as one of the reasons for their non-enrolment. This is particularly relevant for private insurance, wherein the industry has never explored the potential of launching suitable products for a number of risks citing low interest of fishermen, poor demand for insurance, low profitability, high risk involved, high moral hazard, and so on. In brief, insurance in India's fisheries sector suffers from problems such as lack of transparency, low affordability, high moral hazards and poor customer acceptance.

Impact of Climate Change on Marine Fisheries

Climate change is one of the biggest challenges that the fisheries sector is facing in recent times and time-bound adaptation and management plans are necessary to sustain the growth trajectory of fisheries and aquaculture in the country. The impacts of climate change on marine fisheries are amply visible in the Indian Exclusive Economic Zone (EEZ) and the surrounding high seas (Hambrey, 2017). Several studies carried out by the Fisheries Research Institutions in the country have brought out the changes in the distribution of fish species, their abundance, breeding behaviour and other phenological attributes, relating such changes to rising temperature or shift in salinity patterns in the oceans. The policy will encourage focussed studies on climate change impacts on fish stocks that can improve our understanding of such climate-induced changes and provide adaptive mechanisms to the fishing and farming communities in a time-bound manner so that their livelihoods are not impacted (Athulathmudali, et al., 2011).

As part of India's international commitments on climate change, the concept of green fisheries by reducing Green House Gases (GHG) emissions from fishing and fishing-related activities will also be encouraged through dedicated activities (NPMF, 2017).

Role of Government in Mitigating Risks- Lessons from Japan

The subsidy's insurance program in Japan is a case of successfully underwriting the reinsurance (BOBP, 2022). Its key characteristics are as follows:

- ⇒ The condition for obtaining the subsidy is that all the fishers operating vessels with a gross tonnage between 1 and 100 should be part of fishing

cooperative and enter a contract with the insurance association.

- ⇒ This arrangement provides an incentive to maximize the coverage of insurance and to better share risks and reduce costs.
- ⇒ The government reinsures the fishing vessel insurance association by a 'Stop of Loss' method.
- ⇒ The government reinsurance activates when the insurance association has paid out claims, which exceed 109 percent of the net premium income of one fiscal year. The government will reimburse 85 percent of the amount of pay-out's exceeding 109 percent.
- ⇒ Besides providing reinsurance and subsidizing the insurance premiums, the government provides tax exemption, approves the articles of the associations and the insurance stipulations including the insurance premium rates. The government also supervises the association and the central society or apex body.

Reforming Technology and Policy

Central-State collaboration can change coastal asset and fishery insurance. Risk financing culture in coastal areas requires government and insurance company action. Improved insurance-fisherman relations are also needed. Linking with fishermen/fish farmer cooperatives, producer associations, etc. will help. Ensuring the participation of grass-root level organisations (fishery cooperatives/NGOs/boat owner associations) as intermediaries or partners for insurance administration and deploying a brigade of rural insurance agents/service providers would strengthen grass-root support services. Micro-insurance could manage coastal asset insurance.

India can benefit from successful Asian and African initiatives in this area. Self-help groups can benefit from bundling microcredit with asset/disaster insurance programmes. Fishermen/fish farmers dislike excessive insurance premiums and the lack of specialised insurance products. To solve this, insurance schemes should offer instalment payments, partial coverage of fishing units, and augmented policies with fishing gear coverage. Insurance firms' willingness to compensate partial fishing vessel damage would change fishermen's views on insurance. To alleviate issues, governments should provide sufficient

dispute settlement systems and incentivize new companies to enter the market. They may also repurpose unhealthy subsidies to encourage insurance coverage. When possible, governments can use mandated insurance coverage to coerce. Vulnerable islands may receive special incentives. Technology and governance innovations can boost fishery insurance efficiency, transparency, and morality. In agriculture, weather index-based insurance schemes use satellite data and weather station inputs to trigger insurance payments for weather-related incidents. These can be applied to capture fisheries to streamline operations. It is important to note that there are two main categories of technology used in the marine fisheries sector: those that actively reduce risk and ultimately pave the way for social equity and the economic well-being of the fishing community, and those that serve organizational needs. Global Positioning System (GPS), Echo Sounder, Sound Navigation and Ranging, search and Rescue transponder, Automatic Identification System (AIS), Distress Alert transponder (DAT), Radio Detection and Ranging (RADAR), Community Radio Portal, Very High-Frequency Wireless Sets (VHF), mobile phones etc. are some examples of the former category (Chandrasekar, 2021). Additionally, the Internet of Things (IoT) in conjunction with big data, automation, artificial intelligence (AI), and machine learning (ML) technologies can predict and reduce loss, identify risks, and expedite the processing of insurance claims (Nic Gardner, 2020).

Recommendations

1. **Educating stakeholders about insurance:** There is a pervasive lack of knowledge among fishermen and aquaculture producers about risk finance culture and insurance alternatives. According to a study published in the Food and Agriculture Organization's World Review of Capture Fisheries and Aquaculture Insurance 2022 (Sudha Nambudri, 2022) this gap may be closed through suitable extension activities and popular campaigns. Many fishermen are confused by the concept of insurance. Therefore, people need education in order to make wise choices. Dual strategies have a chance of success. In a trilateral discussion involving insurance companies and the government, one side can include fisher groups and unions. Every port in India has a boat owners' association whose members could benefit from some formal training. Village panchayats and councils can organize an insurance mela. The intended audience is independent artisanal fishermen. There is a need to implement confidence-building measures and educate and sensitize insurance organizations to the needs of the fishing industry.
2. **Lowering insurance costs:** According to the findings of a study conducted by the Central Marine Fisheries Research Institute (2017), there is widespread dissatisfaction on the part of fishermen and fish farmers regarding the high cost of insurance premiums and the lack of options for tailor-made insurance policies (Press Trust of India, 2017; Parappurathu, 2017). A group insurance policy for all vessels, similar to the Group Accident Insurance Scheme (GAIS), might be obtained by the government through the use of a good information repository and through negotiation with insurance companies. For instance, information about a boat's age, engine capacity, size, and value that is recorded at registration can be used to determine the book value of a fishing vessel and purchase insurance for it. Training, vessel maintenance, etc. reduce operational risks. Insurance companies can inspect working vessels in a harbour with government help and adjust the premium.
3. **Creating a single insurance platform:** There are several offices, employees, sales representatives, networks, etc. for insurance businesses. These expenses are covered by higher premiums. The findings from the McKinsey Insurance 360° Benchmarking Survey, which has been conducted since 2001, clearly show the structural changes taking place in the insurance business and their anticipated influence on cost ratios. (Tonia Freysoldt et al., 2018). According to a 2015 global analysis by McKinsey, operational and IT expenses make almost half of an insurer's cost base. Consequently, a shared platform lowers the cost of infrastructure. For instance, Policybazaar.com. In 2008, the insurance aggregator Policybazaar was established. Through partnerships, Policybazaar.com gets information on costs, benefits, insurance coverage, and other topics directly from insurers. Users can browse and

purchase insurance from more than 40 providers using the website and app for Policybazaar. As a result, the insurer spends less on customer acquisition and the subscriber receives a reasonable quote.

4. **Designing insurance mix for low-cost access:** The government should explore micro-insurance, community-based insurance, and market-based insurance in addition to governmental insurance schemes. Insurance products should be SUAVE (Simple, Understood, Accessible, Valuable, and Efficient).
5. **Mandatory all-peril insurance** -- for 'unnamed crew' on all fishing vessels may be linked to licencing.
6. **Protecting migrant workers:** The government's social insurance scheme does not protect migrant employees, who are growing along the coast.
7. **Parametric insurance in fisheries:** To cover weather-related losses and damages, insurance companies offered parametric insurance. Given the complexity of the fishing industry, it must be preferable over conventional insurance. Therefore, it is imperative to create a model parametric insurance plan to direct the insurance industry and its pilot implementation. Insurance that is parametric or index-based can cover business losses brought on by climate change. Cyclone insurance is a type of parametric insurance in which the fishing units (for instance, a boat owner) are compensated at a fixed rate after the event (a cyclone) is triggered. However, parametric insurance will only be financially feasible for the insurer and the insured if the risk pool is sizable. The insurance industry finds this difficult, and they believe the government should play a significant role in streamlining the procedure (Krishnan et al., 2022). The Caribbean region is one such example of where the government actively participated in the development of parametric insurance products for fishermen to lessen the effects of climate-related occurrences. The Caribbean Oceans and Aquaculture Sustainability Facility, or "COAST," was created by the World Bank, the Caribbean Catastrophe Risk Insurance Facility, and the Caribbean Regional Fisheries Mechanism with

financial assistance from the US Department of State. Its goal is to increase resilience against the effects of climate-related disasters. Even though the government is the one who purchases the COAST insurance policy, it is special because the end beneficiaries are the fishermen and other industry professionals like boat captains and seafood merchants. These fishermen receive any rewards from the insurance coverage from the government (The World Bank, 2019). The COAST insurance policy has two components, Livelihood protection component and Tropical Cyclone component, and allows for tracking of parametric insurance payouts at the scale of individual beneficiaries (COAST, 2019).

8. **Revisit Laws and Policies:** To encourage more people to purchase fisheries insurance, it would be beneficial to progressively formulate directives that must be followed by everyone. As a first step, the relevant legislative provision may be introduced into the Marine Fisheries Regulation Acts of respective states in order to ensure that automated vessels over a specific size or catch capacity are required to have insurance coverage. In addition, the concerns that have been raised by the fishing community over the planned Marine Fisheries Bill of 2021 need to be addressed on an urgent basis. Because the proposed legislation is an effort to improve the livelihoods and social and economic well-being of traditional and small scale fishermen, in addition to reimagining social security solutions in the form of insurance, every conceivable effort should be directed toward reducing poverty and ensuring the economic stability of fishers.
9. **Fisheries data:** A fisheries insurance scheme should be based on a substantial amount of comparable statistical data on the incomes of potential policyholders as well as losses and damages suffered in the past if it is to be actuarially sound. This is necessary in order to figure out how much in premium rates and indemnities to pay. Such data should, ideally, be comprehensive and reflect the yields of fisheries and aquaculture as well as how they change from year to year and season to season. Data on losses and damages should be categorized according to the causes of the losses and damages, differentiating between the different

causes, such as those owing to fishermen's negligence in handling gear, fish farmers' poor management of fish ponds, lack of competent fish handling, etc. Furthermore, the various forms of aquaculture and fishing should be further separated out in the data. The FAO Global Production Database, which comprises time series of reported freshwater and marine fishery landings and aquaculture production from 247 countries and territories, is what we rely on, even for the most basic fisheries production data (Food and Agriculture Organization, 2020). The development of a comprehensive and inclusive fisheries insurance program by the insurance providers and the government is seriously hampered by the inaccurate, incomplete, or total lack of statistical data on fish production, fishermen, migrant workers, and equipment used for fishing operations.

Conclusion

As has been shown, the primary objective of insurance in the fisheries industry is to safeguard assets, maintain continuous fish production, and guarantee stable incomes in the event of financial losses due to natural disasters, human error, and other unforeseeable events. Stable fish production is crucial to the economy and society because of the food it provides, the money it brings in from exports, and the jobs it creates. For this reason, it is common for governments to subsidize premiums and cover some of the administrative costs associated with establishing fisheries insurance. Lack of awareness about insurance solutions amongst fisherman, high insurance premiums, the prevalence of traditional (indemnity based) insurance policies, ambiguity in legislative intendments, high hassles involved in the claim settlement process, reservations about timely settlement of claims, and so on, are all identified as major reasons behind poor adoption of insurance schemes in the fisheries sector, which is particularly concerning for developing economies. Proposed strategies include increasing the efficacy of technological solutions, creating novel institutional processes, addressing the trust gap, and changing people's mindsets through education campaigns as ways to achieve this goal. Micro insurance, which has already shown its ability to improve the lives of

resource-poor individuals in a number of countries, is one promising option that can contribute significantly to this goal. Development projects that work over the long term to improve the economic and social conditions of the fishing community are a valuable addition. As such, the government of India's record-breaking Rs. 30,572 crores investment in the fisheries sector under various schemes and programs, such as the Blue Revolution, Fisheries and Aquaculture Infrastructure Development Fund, and Pradhan Mantri Matsya Sampada Yojana for the period 2020-2025, can be seen as a game-changing move toward the sector's holistic development and the socioeconomic well-being of fishers, fish farmers, and other stakeholders (PIB, 2023).

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