Policy Brief

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SUSTAINABLE FISHING PRACTICE AND SOCIO-ECONOMIC VULNERABILITIES

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Key Outcomes

- The fisheries sector holds immense potential to drive sustainable economic growth, enhance food security, and uplift coastal communities.
- Systemic challenges such as poor governance, lack of infrastructure, and environmental degradation hinder its full potential.
- A survey of fishing communities in Sindh and Balochistan conducted by the AERC in 2023 for the world Bank, highlighted that around 93% of fishing households live below the poverty line, relying heavily on fishing income with limited diversification opportunities.
- A lack of systematic data recording for fish catch, recruitment, and mortality hampers sustainable management of the resources.
- Also, the insufficient data obstructs tracking fish species depletion, hindering research and policy development.
- To address these challenges, a multi-pronged approach is essential.
- Targeted social safety nets programs and microfinance programs can empower vulnerable groups, including women.
- Vocational training initiatives can enhance community resilience.

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Background

The potential of Pakistan's fisheries can be harnessed to achieve numerous benefits, including, but not limited to, employment generation in the local fish trade, higher incomes, and improved food security for both fishers and fish consumers. The development of the fisheries sector can help increase export earnings and national employment and can create new opportunities to improve resource use efficiency in the country.

The sector is considered to have the potential to create inclusive and green jobs, help coastal communities' livelihoods, make the country more resistant to climate change, improve nutrition and food security, and eliminate gender inequality.

Numerous villages along Pakistan's coastline have had fishing as their primary source of livelihood for centuries. The stagnant fisheries sector directly impacts the living standards of these communities.

A survey of fishing communities in Sindh and Balochistan conducted by the AERC in 2023 highlights that 93% of fishing households live below the poverty line, relying heavily on fishing income with limited livelihood diversification opportunities. The prevalence of child labor and low female participation further underscores the socio-economic vulnerabilities among these communities.

Poor fishing communities are facing severe economic challenges due to the depletion of fisheries' resources. In recent years, Pakistan's major commercial species, including demersal and pelagic fish and shrimp resources, have been heavily affected by overfishing. This overfishing is mainly attributed to ineffective management practices and the slow development of aquaculture in the country. If this trend continues, a further decline in fisheries and aquaculture production in the coming years is highly likely, which could lead to disastrous social and economic impacts. The sustainable management of fisheries is pivotal, though its enforcement requires a comprehensive assessment of its impact on the socio-economic well-being of the poor fishers.

Effective sustainable fisheries management relies on preserving fish populations and ecosystems to ensure their long-term health and biodiversity. To achieve this, policymakers mainly rely on a sustainability-focused approach, which involves implementing measures such as limiting catch to prevent overfishing, minimizing bycatch (the catching of non-target species), restricting the catch of undersized fish, and establishing seasonal fishing closures. Collecting data on fish population sizes, spawning patterns, and environmental factors is essential to inform these measures. Also, a robust monitoring system is needed to track fishing activities and fish populations to support this. Additionally, enforcing regulations and preventing illegal, unreported, and unregulated (IUU) fishing is crucial.

However, policymakers must identify vulnerabilities among the fishing communities and risks involved in implementing the sustainability approach from a broader perspective. That is, the approach adopted should not only safeguard and restore marine habitats but also protect the socio-economic vulnerabilities among the communities associated with them.

This policy brief is, primarily based on the review of the policies, legislation and recommendations put forward by (Patil, et al., 2018) to the World Bank. The report "Revitalizing Pakistan's Fisheries: Options for Sustainable Development" by Patil et al., (2018) builds on an extensive analysis of the Pakistani fisheries data, literature, and meetings with relevant officials and experts. The focus of (Patil, et al., 2018) remains on six key issues, of which 3 are sector-specific while the rest can be considered as cross-cutting

issues. The focus sectors mentioned in the report are (i) marine fisheries, (ii) inland fisheries, and (iii) aquaculture, while the cross-cutting issues included in the report are: enabling environment, value chain and optimizing benefits. Their report has highlighted the constraints faced by the fisheries sector and made recommendations aimed at the development of a road map for the revitalisation of the fisheries sector.

This policy brief consolidates Patil et al.'s (2018) findings and adds new insights from the data collected by the Applied Economics Research Centre for the World Bank funded study on "Fisheries Value Chain Assessment for its improvement" in year 2023, providing an updated assessment of the sector. Specifically, the policy brief aims to assess the sustainable management of fishing resources and their impact on the fishing community. To achieve the aim, the study has assessed the gaps in prevailing laws and regulations, and their consequences on the socioeconomic development of the fishing community.

Precisely, the policy brief evaluates the issues hindering sustainable fishing by assessing the institutional, regulatory, and infrastructural gaps resulting in overfishing and the fast depletion of fish stock. Sustainable fishing practices or any initiatives taken to protect endangered fish species would definitely severely affect the livelihoods of poor communities, further aggravating the poverty of fishing communities. The policy brief, therefore, discusses the social protection interventions to reduce the fishing communities' economic and social vulnerabilities resulting from the depletion of fish resources. The framework discussed aims to suggest strategies for the realization of the full potential of the sector based on the sustainability principle. The proposed interventions aim to protect not only the endangered fish species but also the vulnerable communities.

About the Study

This Piece of work is an extension of the research Project funded by the World Bank, which aimed to analyzed the fisheries value chain. The Applied Economics Research Centre, University of Karachi, conducted the research in 2023. The geographical focus of the report was the provinces of Sindh and Balochistan, targeted areas where fishing activities were more prevalent. The report comprehensively addressed pivotal aspects of the sector, encompassing regulatory frameworks, technical and socio-economic dimensions, as well as cross-cutting considerations. The assessment and recommendations in the report remained focused on the value chain actors and the linkages and leakages in the system. A detailed assessment of the report's recommendation highlights the need for a comprehensive framework for adopting sustainable fishing practice; an adaptation of such principles definitely limits the income of the poor fishing community, exacerbating their socioeconomic vulnerability.

Therefore, this piece of work aims to

i) Analyze the gaps in prevailing laws and regulations, and their consequences on the socioeconomic vulnerability of the fishing community.
ii) Propose a framework for the protection of endangered species.
iii) Provide a Social Protection Mechanism for the affected communities.

Assessment

The fisheries sector in Pakistan undoubtedly holds immense potential to drive sustainable economic growth, enhance food security, and uplift coastal communities. However, systemic challenges such as poor governance, lack of infrastructure, and environmental degradation hinder its full potential.

A multi-pronged approach is essential to address these challenges. Establishing modern storage and processing facilities can minimize spoilage and improve value addition. Targeted social safety nets and microfinance programs can empower vulnerable groups, including women, while vocational training initiatives can enhance community resilience. Public-private partnerships and regulatory reforms are critical for driving sustainable aquaculture practices and improving disease surveillance systems.

Further, the necessary technological advancements for improved fish catch and compliance with international laws and regulations enhance competitiveness in international markets and contribute to environmental benefits. The process plays a pivotal role in achieving inclusive growth.

Any initiative aimed at revitalizing the institutional structure and implementing reforms in the fisheries sector will definitely open new opportunities for the fishing community specifically and in general leads to overall development.

Issues and Challenges Hindering Sustainable Fishing Practices

Pakistan's fisheries sector is plagued by implementation gaps in policies, legislation, and regulations. The key issues and challenges that hinder the sector's sustainable management are discussed below.

1. Weak Licensing and Registration Procedure

The licensing system is there, but its effectiveness is hindered by:

- Limited enforcement of licensing regulations
- Lack of awareness among fishermen about licensing regulations

The weak enforcement has resulted in low registration rates of boats; only 50% of boats are reported to be registered in Sindh. This has resulted in low reporting of fish catch and promotes illegal fishing in the area.

2. Weak Enforcement of Fish Protection and Overfishing Regulations

Regulations aimed at protecting fish stocks and preventing overfishing again lack proper enforcement.

- As a result, unauthorized Trawlers and industrial fishing operations are commonly observed in the area

- Regulations are inadequately enforced, with limited penalties for non-compliance
- Weak implementation of rules governing net size and fish catch is leading to depletion of fishing resources, and the fast disappearance of fish species is now a commonly observed phenomenon
- Resources are Insufficient to regulate the scale of overfishing and habitat destruction
- Limited resources for monitoring and enforcement exacerbate the problem

3. Limited Institutional Capacity and Overlapping Functions

Multiple agencies are involved in regulating the sector, leading to:

- Overlapping functions and duplication of efforts
- Lack of coordination and communication among agencies in enforcing the regulations
- Exploitation of laws and regulations by unscrupulous operators

4. Unregulated Fishmeal Production

Policies and rules governing fishmeal production exist, but:

- Weak implementation allows for non-compliance; for example, specific species allowed for fishmeal production are often ignored.
- Undersized and by-catch move out in bulk daily from the fish harbours, but because of the absence of Waste management practices such as using ice boxes to move trash, undersized and by-catch, the quality of fishmeal produced is low in standard, and the value addition it is supposed to be creating is minimal.

The fishmeal industry relies on trash fish. Because of extreme poverty, fishers are now engaged in trash fishing, using prohibited nets. According to locals, around 40 to 50% of fishers in the Korangi Creek of Karachi city are involved in trash fishing. Trash fishing is also evident in Badin. Tash fishing has become a living source for many of the poorest fishing families.

5. Undocumented Environmental Concerns

The environmental impact is significant on the sector, but it remains less researched and undocumented.

- Pollution is a significant issue, with fishermen dumping polythene bags and industrial waste harming the environment. Pollution and Industrial waste have destroyed fish habitats

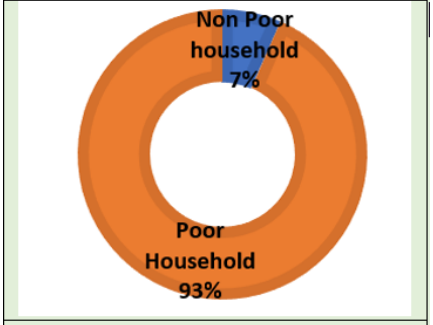
- The destruction of the mangrove forest and habitat degradation from human activity has significantly declined fish catch near shore.

Addressing these gaps will require a coordinated effort from government agencies, industry stakeholders, and civil society organizations.

a) Consequences for Fishing Community

The improper implementation of laws and regulations in Pakistan's fisheries sector are significant, with far-reaching consequences for the environment, livelihoods, and food security.

Figure 1: Poverty Head Count Ratio



Source: Based on a primary survey of the fishing community by the Consultant, 2023 for the World Bank.

Prevalence of Poverty: The majority of fishing households lives below the poverty line. The assessment of the surveyed communities shows that, after taking into account the poverty threshold using the International Poverty Index of US$1.90[1] (2011 PPP) per day per capita (adult equivalent[2]), 93% of the sample households are poor and lives below the income threshold needed to meet their basic dietary requirements – see figure 1.

Limited Livelihood Opportunities: There is minimal diversification in livelihoods, and most individuals lack the skills to transition to alternative occupations. Table 1 highlights that the major occupation after fishing within the surveyed community is aquaculture (fish farming), agriculture, and selling fishing gear and spare parts. Around 8% claim that they have no regular job/employment. The primary reason is that they usually follow the tradition of their forefathers and remain engaged in fishing-related work starting from childhood, with limited education as a consequence.

TABLE 1

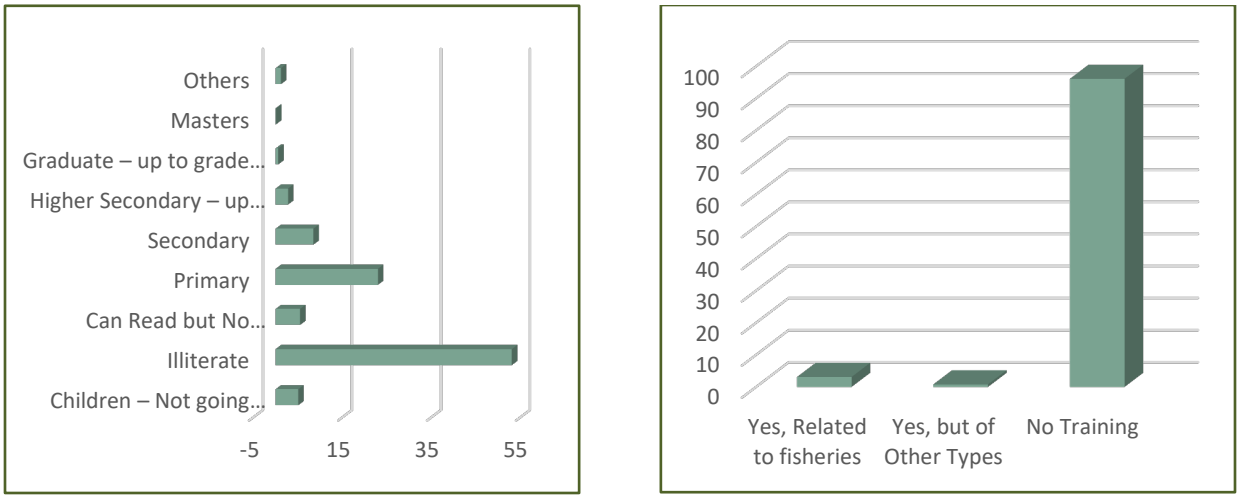
Distribution of Population in Labour Force by Occupation

Primary Occupation	In Labour Force
Fishing	74.8%
Daily wage Worker – labour	1.0%
Farmer	2.1%
Shopkeeper	0.4%
Transporter	0.6%
Teacher	0.6%
Farm Labour – Aquaculture	6.2%
Work in a Hotel	0.2%
No Proper Job - Nominal Earning	8.5%
Fish Retail Business	0.4%
Selling Fish Gear and Spare Parts	2.1%
Boat Making	0.8%
Making Handy Crafts	1.2%
Government Servant	0.2%
Maid	0.2%
Tailor	0.2%
Medical Health Worker	0.2%
Total Sampled Persons in Labour Force	**486**

Source: Based on a primary survey of the fishing community conducted by the Consultant, 2023 for the World Bank.

Low Human and Social Capital: Fishing communities have low human capital formation, which contributes to weak decision-making, low social cohesion, and a lack of leadership within the community. The targeted community (overall sample population) is either illiterate (53%) or has only primary level education (23%), and the majority of them are untrained (96%); however, of the 4% trained population, 3% are trained in fishing-related activity.

[1] Taken 1 US$ equals Rs. 287.15, Exchange Rate at the time of the study.
[2] OECD-modified Adult Equivalence scale is applied here. Adult equivalence scale is employed to capture the fact that consumption of children is less than the adult. OECD scale is widely used for poverty estimations.



Source: Based on a primary survey of the fishing community conducted by the Consultant, 2023 for the World Bank.

FIGURE 2: Distribution of Population by Education Level and Training

Policy Frame Recommended

The assessment above stresses that the community is not equipped to bear employment shocks. The depletion of fish stocks or the imposition of fishing restrictions (following the sustainability principle) could push vulnerable fishing communities into deeper poverty.

1. Framework for the protection of endangered species

The framework proposed here is based on the intensive review of literature, discussion with actors involved and authorities implementing the interventions. The implementation of the interventions will require the counselling of all the actors at all levels. The terms sustainability, overfishing, and ecosystem are unknown to many. Further, those who know are not directly connected to the fishers or law enforcement agencies. During the field visit, it was overwhelming to see that the community is aware of the fish depletion, though strictly at what rate they are unaware; which species will be extinct is also unknown to them.

Authorities are also unaware of the exact rate of species depletion. Research organizations have conducted scientific studies on fish species, but connecting the data by time and species requires attention. Possible interventions, such as restricting the catch of extinct species in localities where the rate of depletion is higher, remain dependent on scientific data.

Data collection and scientific assessment should be frequent. Transforming data into analysis, leading to policy formulation and enforcement, requires a coordinated effort among the actors involved. Further, some actors are in the business for profit-making; these actors are highly influential, e.g., commercial/industrial fishers. These influential actors need awareness. Without their engagement, the results will not be fruitful. The three main pillars of the proposed framework are;

a) *Data Collection and Scientific Assessment*

- Develop a comprehensive data collection system to monitor fish stock by species and location.
- Collected data on the number of boats involved, gear type and vessel type to gain more knowledge on fish habitat destruction.
- Collect data on fish catch by length and width to assess the ecosystem health.
- Conduct regular scientific assessments to analyze data and identify trends.
- Establish a coordination mechanism among government agencies, research organizations, and stakeholders to ensure effective collaboration and information sharing and to implement best practices based on scientific knowledge.

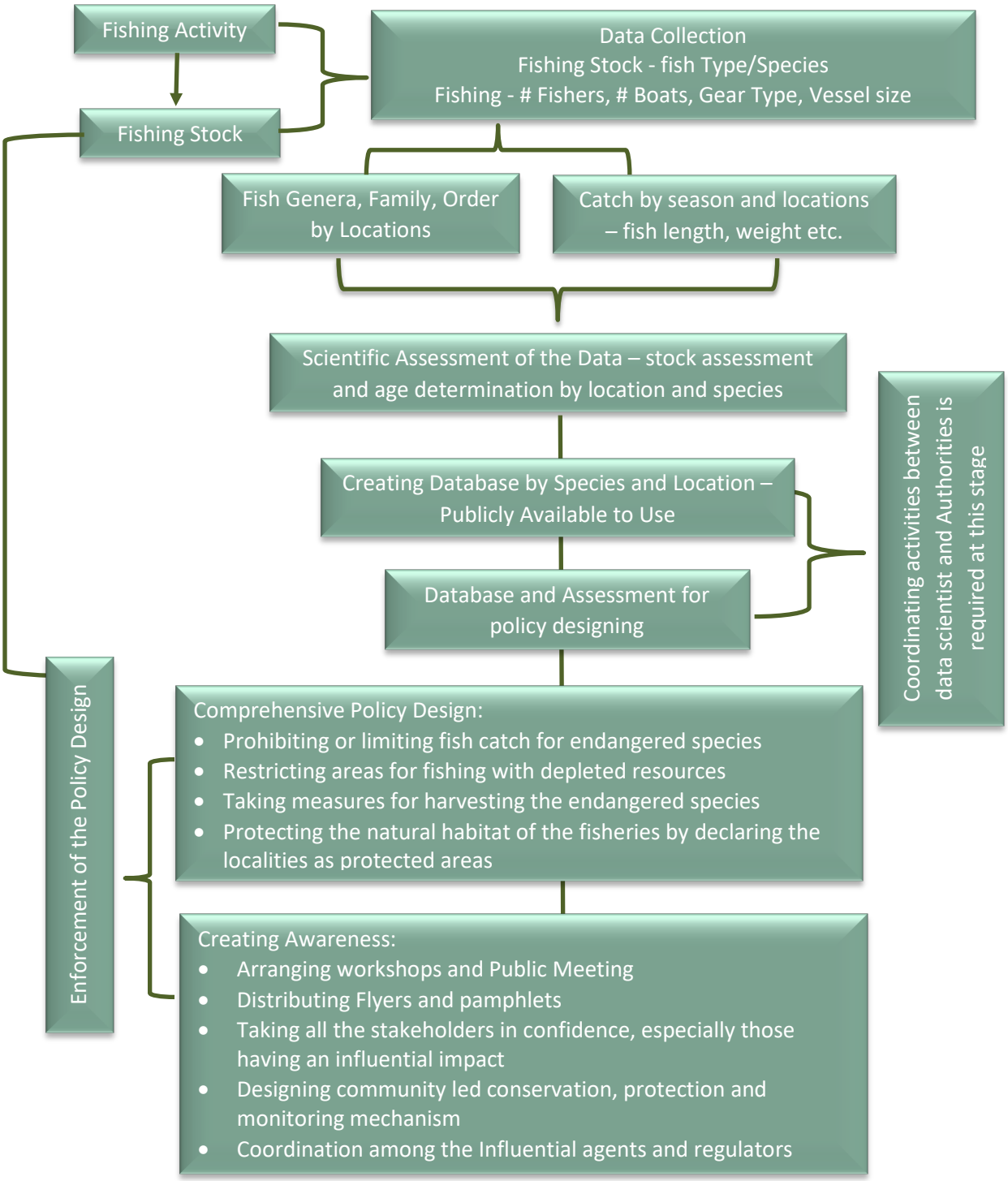
b) *Policy Formulation and Enforcement*

- Develop evidence-based policies to regulate fishing practices, protect vulnerable species, and promote ecosystem conservation.
- Establish a coordinated enforcement mechanism involving law enforcement agencies, fishers, and local communities.
- Develop a system for monitoring and evaluating policy effectiveness.

c) *Creating Awareness among stakeholders*

- Conduct targeted awareness campaigns for influential actors (e.g., commercial/industrial fishers) on the importance of sustainable fisheries management.
- Organize workshops and training sessions on key concepts such as sustainability, overfishing, and ecosystem for fishers, law enforcement agencies, and local communities.
- Design community-led conservation strategies to protect and monitor marine habitats by promoting sustainable fishing practices.
- Establish a stakeholder platform for regular dialogue and information sharing.

This enhanced framework emphasizes the importance of stakeholder engagement, data-driven decision-making and community-based initiatives. It also highlights the need for coordination and collaboration among government agencies, research organizations, and stakeholders to ensure effective implementation and enforcement of sustainable fisheries management policies.



Source: Author's Illustration

FIGURE 3: Framework for the Protection of Endangered Species

Social Protection Mechanism

Many of the fishing communities live in extreme poverty. The targeted communities also show a prevalence of high incidence of poverty rate – 93%. The communities are socially, culturally and economically dependent on fishing – the primary reason for being in Poverty. The major occupations after fishing are aquaculture farming, agriculture farming, and selling fish gear and spare parts. Diversification in livelihood appears to be minimal. Diversification in occupation is not much higher as people usually follow the tradition of their forefathers and remain engaged in fishing. Fishing requires that a person be trained from childhood. Hence, most of them have taken limited education and training in other fields; therefore, they remain engaged in fishing throughout their life.

Further, fishing from childhood means low human capital formation, leading to low decision-making and judgmental power, high inequality in the system, low cohesion among community members on issues, and low leadership quality. The study refers to these as low social capital formation.

In continuation with the above, low human capital formation leading to low social capital formation also leads to a low physical capital formation, such as low asset accumulation, deteriorating housing conditions and low acquisition of fishing-related assets (boats, fuels and nets mainly) – keeping the community in a poverty trap forever. The condition will worsen if the fish catch declines or any ban is imposed for resource protection by the authorities. Thus, Sustainable fisheries management should first consider the miseries of these poor fishing communities.

The framework we proposed begins by assessing how much the community depends on fishing. It then proposed to assess their coping capacity to income shocks, i.e. how much human, social and physical capital they possess to absorb the income shocks resulting from a decline in fishing income because of restrictions on fish catch. In the final stage, it proposed interventions for livelihood creation and human capital formation. The two interventions if properly implemented, will be helpful in dragging the community out from the poverty trap.

a) Proposed Interventions for Livelihood Creation

1. Enhancing the role of microfinance institutions providing small loans for microenterprise development. Developing skills should be a compulsory part of the activity. Microfinance institutions worldwide build on this ground, providing skills and finance to develop microenterprises.

2. As the community is socially and culturally dependent on fisheries, diversifying the livelihood around fishing-related activities will have a pronounced impact, such as shifting communities away from catching fish and towards harvesting endangered fish. Introducing them to cage culture. Providing free inputs at the beginning and taking small charges once the earnings stabilize.

3. Motivate local and foreign investors to set up processing industries close to fishing areas by offering incentives such as tax rebates and loans at low markups.

b) Proposed Interventions for Human Capital Formation

i) Through Public-Private Partnership:

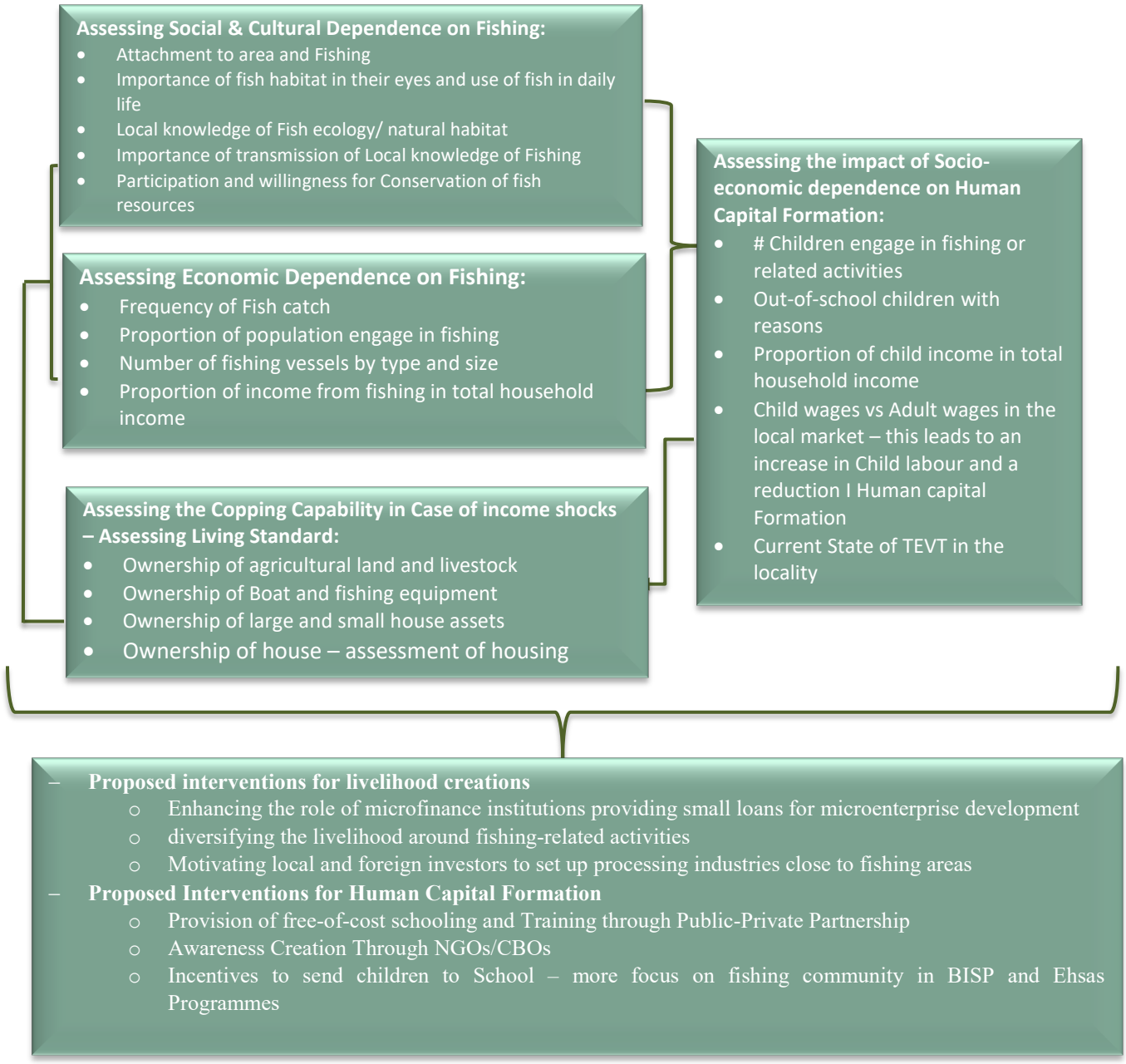
- Free-of-cost quality schooling for all till Matric.
- Free-of-cost provision of vocational training within the school premises.
- Launching a free-of-cost fishing-related training programme at the grassroots level under TEVT.
- Launching free-of-cost TEVT considering the skill demand in the localities.

ii) Awareness Creation through NGOs/CBOs

- Frequent workshops and meetings with community leaders and poor fishing households should be organized to motivate parents and the community to send their children to school.
- Their grievances should be properly documented and forwarded to authorities for policy planning or actions.

iii) Incentives to send children to School

- In the past government has taken many initiatives to increase school enrolment, such as free lunch, free tins of *Ghee* etc. These incentives can be revived after assessing their impact.
- *BISP* and *Ehsas* programmes could give more focus to the fishing.



Source: Author's Illustration

FIGURE 4: Social Protection Mechanism

Conclusion

- The fishery sector in Pakistan has great potential for nutrition security, economic growth and social development. Despite Pakistan having abundant fresh and brackish water resources, the sector is currently underdeveloped and faces a sharp depletion of the resource. The Blue Economy vision was adopted by the government for the sustainable seafood and aquaculture sector. The government of Pakistan is prioritizing the blue economy for revitalizing economic activities.

- In line with the government of Pakistan's national food security policy 2017, which aims to capitalize on fisheries and aquaculture, sustainable practices will help reverse the depletion of the ecosystem, which will continue to offer economic and livelihood gains.

- The policy brief highlighted sector-related challenges that affect the development prospects of fisheries in Pakistan and need government support. To foster the sustainable use of resources, an enabling policy and regulatory environment needs strengthening.

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