# Exploring Prospects, Challenges and Pathways to Economic and Sustainable Growth: Perception of Omani Fishermen

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**Abstracts:** Fishing is not lucrative among Omanis mainly due to lack of economic viability and Oman is roughly forgoing 2.4 billion Omani rial due to lack of active involvement of fishermen in the process of value chain of fishing despite many subsidies. If the country uses its fishing potential, it can create profitable, sustainable fishing sector that contributes significantly for economic diversification and employment generation. Developing a valid and reliable scale to measure fishermen's attitudes towards the fishery sector is an essential step in understanding the factors that influence their perceptions and behaviors. A well-designed scale can help those involved in fisheries decision making and researchers identify areas for improvement and develop targeted interventions to address issues in the fishery sector. Overall, the development of this questionnaire has provided a comprehensive understanding of the challenges facing fishermen and the prospects for the fisheries sector. The results suggest that the adoption of appropriate measures, such as improving access to finance, investing in new technologies, and strengthening government policies, can improve the livelihoods of fishermen and promote sustainable growth in the fisheries sector.

**Keywords:** Prospects, Problems, Measures, Perception, Fishermen, Attitudes, Questionnaire, Sustainable Growth.

## 1. INTRODUCTION

Fisheries and aquaculture are most ancient and important sectors in Oman with deep social and cultural significance. Before the discovery of oil resources, 80% of the population lived from agriculture and fishing. According to (Worldbank, 2015) Fresh and frozen food production at numerous location along with Sultanate of Oman's long coast stood at 580,240 as of 2019, and it increased to 716,272 tons in the year 2021.Omani fish and fish products are exported to 57 countries across the world. The dominant portion of this were from artisanal fishing – traditional fishing with low technology used- which account for 95% of the total catch in the year 2019. Also, (Prabhu, 2020) stated that the main problem with fisheries in Oman are lack of proper education and training among fishermen, earned little money from fishing, had low savings, lack of awareness of modern fisheries technology, post-harvest challenges etc. Oman vision 2040 proliferate the need of creation of profitable world class fisheries that are ecologically sustainable and net contributor to the economy of Sultanate (Belwal, 2015). Also stimulate a growth led by private sector in fisheries both capital and employment generation (Kutty, 2022).

The current fisheries sector GDP is estimated to be 165 million OMR which mainly understate the value of the sector because it does not attribute to processing and related logistical activities in the sector which enhance value chain. Sultanate of Oman's government is planning to invest more in ports markets, increasing fishing and processing capacity by investing on soft critical investment in the form of institutions, capacities and the financial support of the private sector through the investment in fisheries (World Bank 2015). Oman is planning to actively contribute to the exploitation available potential for the development of fishing sector, fulfillment of food security, creation of job opportunities through diversification of production system through sage, nutrient rich, affordable fish products with environmental friendly approaches (Times, 2023).

Fisheries in Oman is one of the fast growing sector and one of the most important source of economic diversification, Commercial fishing in Oman offers good opportunity for both local and international investors because of its geographical significance, large coastal lines and closeness to international waters which makes Oman has a clear advantage comparing to its neighbors. The investor and ecological friendly measures taken by the government has created robust environment for investors in fishing sector in Oman (Simpson, 2017).

The Large scale unscientific fishing caused damage to alteration of habitat, substantial reduction in biodiversity and fish stock (Farella et al. 2021). In Oman fisheries sector is able to cater more employment opportunities n transportation of fish food products and able to contribute more towards GDP. However lack of proper awareness of this opportunity is the major constraints of development of fishing sector n Oman (Dayalan, 2019) The fishermen in Oman is completely different from other developing countries when it comes to distribution of per capital income. This raise the question of sustainability in the small scale of fishing sector in Oman. (Belwal, 2015).

## 1.1. Statement of the Problem.

Fishing is not lucrative among Omanis mainly due to lack of economic viability and Oman is roughly forgoing 2.4 billion Omani rial due to lack of active involvement of fishermen in the process of value chain of fishing despite many subsidies. If the country uses its fishing potential, it can create profitable, sustainable fishing sector that contribute significantly for economic diversification and employment generation (Banu Setlur, 2015). Oman recognizes fisheries sector as one of the main pillars for economic growth, contribution to food security and to provide employment opportunities for young graduates.

It is expected that the annual production capacity is expected to reach 34,734 tons at the end of the year 2025. According to (Observer, 2021) 80% of the of Omani fish export are undertaken by foreign specialized companies and Omani individual working in these fields receives only 20% share in the form of transporting, marketing of fish. Most of the revenue goes to some beneficiary companies who harvest Omani sea and export them to other countries. The government should give most modern technologies, tools and equipment to Omanis to join the cadre of this vital sector. In this context researchers are trying to identify what are the real issues faced by fisherman, the constraints for them to move towards the economic growth and development (Lawati, 2021). The study also investigate the limiting factors that are making the fisheries sector in Oman for marching towards ambitious plan vision 2040.

## 2. REVIEW OF LITERATURE

Unemployment problem is one of the primary issues in Oman that has reached to an extent of unmanageable state (QPost 2017). Government has initiated financial and technical advice to non-oil segment that provide huge employment opportunities in fisheries segment in middle east, whilst fishermen presume the fishing activities are not lucrative (Padmalosani Dayalan et al., 2019). Ministry of agricultural and fisheries wealth along with association of world bank, established fishing aquatic vision of 2040 to generate highest revenues from fishing sector that is sustainable and safer to ecology and highest contributor to Oman's economy (Setlur. B., & Arbuckle, M.W 2015).

Damage to the fish instantly embark on catching, until they are transported to different destinations. It is challenging to store, protect and preserve the fish inhabitants when the yield and infrastructure are in inappropriate conditions. Once the amenities in the form of establishing post-harvest facilities by improving storage services, developing ice plants conditions, and facilitating proper distribution channels results in productive monetary revenues (Yadava, Y.S., 2003). Fishing services in Oman has been classified as significant strategic venture on the diversification of Sultanate's economic resources whilst assessing the energy sphere (Food and Agriculture Organization 2016).

Resources in Sultanate are observed as wealthy in Oman (Valinassab, pierce and Johannesson 2007), witnessing lucrative sources in processing and administering activities in fishing sector (Nielsen and Johnson 1983). Fisheries history of Sultanate has gradually enhanced for decades without huge interferences from the ministry. There exists very less association of organized culture by limiting to an individual fisherman by carrying traditional methods of fishing. The government has not acknowledged the actual problems of fisherman due to lack of management units around the country. The ministry has initiated to combine traditional and private fisherman to identify their concern viz., getting permission from the ministry to acquire land for aqua culture which has taken years together in the past. Management units simplified the process of getting approval for aqua cultural establishments (Ministry of Agriculture and Fisheries 2019).

Compound annual growth rate has been projected by Omani fisheries and aqua culture market by 5.2 percent during 2022 to 2027. Even during the covid period Oman has reacted quickly to safeguard Omani's welfare that resulted shutting down the market leading to disturbance for the demand and supply. Ministry of agriculture and fisheries projected 220000 metric tons fishes' worth of 883000 metric us dollars by 2030. It is Oman's pledge to focus in aquacultural segment to establish competitive and sustainable fishing sector in coordination without disturbing social factors, cultural heritage, economic elements, and historic values of the nation (Morder Intelligence 2020).

Food security is essential for the countries depending on aqua culture activities by considering its quality and safety factors (Bose et. al., 2010). Nutritious food consists of fish and seafood products that offer balanced diet providing huge nutrients while comparing other food. Vitamin D, Vitamin B12 and Omega nutrients are available in the fish products, that creates demand in global fish consumption (James et al., 2013). Fast growth in the tourism sector in Sultanate of Oman has forced to establish food control system that would be helpful for fish exports and for the local consumptions. It is Oman's cultural element for most of the population forcing ministry of agriculture and fisheries to enhance contribution of fishing activities to gross domestic product. Government has offered effective management services to lower post-harvest damages by providing quality and safety production methods (Moza Al Busaidi 2018).

Seafood is one of the essential commodities in international business that processes huge revenue sources. Fishing and seafood products generate significant percent growth to the national economy by establishing fishing management units for the growth of future fishing products. There is huge potential for overfishing that offers higher revenues, but international rules were followed by Sultanate (RECOFI 2009). During the last decade the Sultanate of Oman initiated a strategic plan for long term plan of vision 2020 to lower the dependance of oil sources (World Trade Organization 2013).

The strategic plan has brought the focus of social and economic benefit, by contributing major share to gross domestic product, maximum earnings for foreign exchange providing employment opportunities and providing food security for fishing. Ministries of fisheries and technical experts and trainers of world Bank have conducted a sequence of training and seminars on Oman's fishing conditions and performance of certain activities of the committee to plan with the Oman's vision 2040. Committee has proposed a preliminary plan for the Fisheries and aquaculture mission of 2040 by recommending various projects for the investment and execution of model projects in conjunction with the unique training services for stakeholders by advancing regulations and enriching the compliance on associated events. Vision 2040 has proposed prominent pursuits by describing the significance of fisheries by focusing Oman's resources by creating, evaluating, and granting harvesting and other activities of various fisheries management units (World Bank Advisory Agreement 2015).

Fishing actions promote to the prospective efficacy in Sultanate in boosting its social and economic revenues which has seaside edge of more than three thousand kilometer (Aquaculture and fisheries development in Oman 2014). Fishing and its related activities were carried out by most of the population before inventing oil resources in Oman during sixties. Recently, fishing activities are not considered as primary source of revenue for Omani's as they generate less revenue despite huge subsidies offered by the ministries. It is significant that the ministry should improve management advice to the fishermen units to offer sustainable job prospects. World Bank support Sultanate for establishing a plan to attract fishermen with technology that contributes utmost to the Oman's economy (The World Bank 2015).

Oman has four million consumers of fishing, agricultural and its related products and it is one of the worldclass competitive sectors. World Bank has offered extensive range of various policies and regulations along with technical advice in Sultanate by a team of experts of reimbursable advisory services to fishing sector which is Oman's second largest natural resource before exploring oil productivity (World Bank 2017). The governance underlying ocean-related activities lends credence to the conception of the "blue economy," which has gained prominence on both a national and worldwide scale, but lacks sensible management. (Satiz´abal et al., 2020) . The blue economy has a

lot of disagreement over its "triple goal" concept of economic, environmental and social improvements (Voyer et al; 2018).

The blue economy is said to possess the status of a boundary object.  Such are applicable in specific situations and possess versatility that facilitate co-operation between dependent economies (Silver et al., 2015; WWF, 2015; Jolly and Stevens, 2016). Such co-operation is useful in securing a comprehensive fisheries sector. Government, the business world, and individual players must engage together and make an indigenous effort to ensure a robust small-scale fisheries sector (Sumaila, 2019). Such effort encompasses through major challenges in terms of sustainability as well as development. Overfishing, fishing for select high-value species, elitism in the fishing industry, ocean and marine ecosystem rapid degradation are some of the significant challenges that have recently been recognized. These issues are exacerbated by deleterious government subsidies that deceptively slash fishing costs. (Sumaila, 2019; EEA, 2019; Hilborn et al., 2020)

Governments across the globe grant 62% over all subsidies, and this category of detrimental subsidies is culpable for depleting global fish populations, slow management efforts, overfishing, and severely damaged marine ecosystems. (FAO, 2020 and STECF, 2021). The COVID-19 pandemic was sought as the ideal point to restart, revive and rebuilt a sustainable ocean based economies, but the temporary subsidies have dampened the entire cause (UNSDG, 2021). Sustainability cannot be achieved if it does not have policies and plans for unprecedented times. The world is facing a pandemic since Early 2020 and such calls for inclusion of government support as well as contingency plans. The COVID-19 related government support subsidies for fishing sector have been utilized in the same way by major countries for support to powerful companies rather than to help the low impact coastal based communities and support the deteriorating marine ecosystem (Ripol et al., 2020; Machado et al., 2021).

There is an immense need for countries to follow a robust system of governance in precedent and unprecedented times (Sala et al., 2021).  The development of fisheries sector needs a proper description of access and guidelines of sharing of resources , called as fishing access rights which define the responsibilities, rights and privileges about access to resources for individuals and groups in an economy. (FAO, 2016). Such access rights depend upon the inherent culture and existing legal framework in the economy (Scott, 2000). As fishing and fisheries are easily accessible to all participants in an economy, governance and policies relating to such seem a major challenge (Chuenpagdee and Jentof, 2008). Transparency is seen as a crucial element of good governance that can increase the capacity and efficacy of the government to address complicated environmental problems (Kooiman et al., 2003; Lockwood et al., 2012).

Transparency is thought to empower the poor and hold the powerful accountable by balancing information asymmetries between authority and impacted parties. NGOs that serve non-profit public interests are examples of civil society actors that are referred to as crucial political actors for openness. NGOs can act as advocates for transparency by urging governments, businesses, and international organizations to make information available to the public and for public scrutiny of their operations (Gupta and Mason, 2014; Clark et al., 2015). By engaging as watchdogs and policing conformance, NGOs can meet accountability roles. When confronted with challenging concerns, they can offer special knowledge, resources, and competence to judgment call. NGOs can also diversify the range of perspectives that the public is represented by in international organizations and inform the public and media about contemporary geopolitical talks (Hale, 2008; Orsini et al., 2014; Bodin and Osterblom, 2014; Asselt, 2016; Tallberg et al., 2018)

Empirical evidences from (Abbott, 2015;  Colquhoun, 2015;  Kourantidou et al., 2021) suggest the use of economic metrics like the gross value of production, income distribution, expenditure evaluation for the development of the access right guidelines, whilst not ignoring the importance of weighing in the act of resource valuation and ocean conservation(Hassall, 2004). Ecologically sustainable development (ESD) is promoted by (Gray and Kennelly, 2018) for both access rights and fishery management. The ESD is a superior model as a guiding principle as it is more focused on access rights only and does not have an aggregate approach like the ecosystem-based fisheries management (EBFM) and holistically approaches the aim of fishery sector sustainability. The ESD needs to be supported by Spatial Planning. "Spatial planning involves attempts to plan processes of

social, economic, and environmental change to bring about certain ends, together with drawing up plans, maps, or diagrams that indicate where sociospatial activities should take place" (Huxley and Inch, 2020).

Realizing that fisheries do not constitute the only sector that relies on the ocean, spatial planning is essential for the long-term sustainability of the fishing industry. In addition to the oil and gas business, the ocean is also utilized for maritime defense, tourism, cargo shipping, and global trade routes. The ocean is also home to coral reefs and other aquaculture which needs to be conserved. The growing interest of the world towards renewable energy will need the use of the ocean for energy generation in the form of tidal and wind energy. In addition to the above, the world is bracing climate change in the form of growing sea levels which cause significant threat to land loss as well as danger to the very existence of mankind. (Vrees, 2021) advocates the use of spatial planning for making the sea safer as well as more profitable. The study further advocates the need to review the spatial planning process every six years to achieve maximum benefits. The role of spatial planning and government co-ordination amongst the various stakeholders at sea has also been lauded in the empirical study by (tanner et al., 2021).

They emphasized as to how spatial planning schemes helped to support the artisanal farming sector whilst shifting from areas of depleted fish to healthier pelagic stocks. Spatial planning especially the marine spatial planning (MSP) would be disastrous if it did not take into consideration the mounting issue of environmental degradation that poses a threat to fisheries' very existence. (Hoof et al., 2012; Ansong et al., 2017; Sakib et al., 2021). Also, the planning process towards full throttle growth has been deemed to already have taken the guise of MSP, and sustainability has allegedly been abandoned at some levels. (Ehler, 2021).

Sustainability quotient for fisheries cannot undermine the power of behavioral sciences. These also play a very important role in the development of sustainability policies for a sustainable blue economy. The human trait of trust captures a major role. Trust creates and promotes cooperative management, and such is pivotal in the development and sustainability of any industry or sector. The sustainability of any sector depends on co-operation between the stakeholders, sharing of knowledge and technical know-how. The fishing industry suffers from the lack of such trust which has been emphasized in (Symes and Phillipson, 2018; McAngus, 2018). Co-operative schemes develop trust amongst fishers and management and unless such trust can be incorporated amongst all stakeholders, achievement of sustainability in the fisheries sector remains a distant dream (Stewart and Ford, 2021).

(Afroz and Alam, 2013; FAO, 2017; OECD, 2017) showcase that the effect of trust and co-operative schemes can be dampened due to lack of co-ordination and scientific capacity in  economies hence such also needs to be incorporated in order to articulate plans and policies on sustainable management and development of the fisheries sector. The sustainability quotient of fisheries, notably artisanal fishing, has been substantially affected by a lack of coordination among the various government stakeholders (Alam and Ahammad, 2017).

## 3. METHODOLOGY AND SAMPLE

Developing a valid and reliable scale to measure fishermen's attitudes towards the fishery sector is an essential step in understanding the factors that influence their perceptions and behaviors. A well-designed scale can help those involved in fisheries decision making and researchers identify areas for improvement and develop targeted interventions to address issues in the fishery sector.

A structured questionnaire was prepared for collecting the data. The study used an inductive method to generate the items, which reflected the fishermen outlook by asking them what they feel, think and experience. The preliminary questionnaire consisted of 35 questions about the experience and attitude of the fishermen. The study was conducted with the fishermen residing in Muscat area.

As most of the fishermen do not know English language, the questionnaire was translated to Arabic by a professional translator. The researchers met the fishermen in person to explain the questions to them and collected the survey from them. The researchers used convenience sampling to collect the data based on the availability of the fishermen in the villages. The questionnaire statements were measured by using a five point Likert scale ranging from five to one ranging from strongly agree to strongly disagree. 100 responses were recorded and all the

responses were coded and analysed. Exploratory factor analysis was carried out using SPSS 16.0 and to check how well the measured variables portray the number of constructs, and confirmatory factor analysis was done using AMOS software.

## 4. RESULTS AND DISCUSSIONS

### 4.1. Exploratory Factor Analysis and Reliability Estimates

Exploratory factor analysis was performed to check how well the measured factors loaded on each factor.

**Table 2: Exploratory Factor Analysis**

| | Statements | Factor Loadings | Kaiser–Meyer–Olkin (KMO) | Bartlett's test of sphericity | Total variance explained | Cronbach's alpha |
|---|---|---|---|---|---|---|
| **Prospects of fisheries** | Marine fisheries contribute substantially to the wellbeing of people and society (Pros 1) | 0.553 | 0.814 | 302.931*** | 37.937 | 0.829 |
| | Fishing sector helps to reach the goal of food security (Pros 2) | 0.658 | | | | |
| | Fishing sector helps to generate more employment opportunity (Pros 3) | 0.650 | | | | |
| | Fisheries contributes to national income (Pros 4) | 0.595 | | | | |
| | Fishing sector ensures reliable returns (Pros 5) | 0.619 | | | | |
| | Additional income apart from other business income (Pros 6) | 0.522 | | | | |
| | Engagement of women and youth in fishing (Pros 7) | 0.506 | | | | |
| | Huge potential for growth in future (Pros 8) | 0.541 | | | | |
| | Utilization of unutilized fishing resources (Pros 9) | 0.518 | | | | |
| | Increase in fishing output meets the demands of the population (Pros 10) | 0.590 | | | | |
| | Marine fisheries contribute substantially to the wellbeing of people and society (Pros 11) | 0.442 | | | | |
| **Problems of fisheries** | Very less advanced research in fishing sector (Prob1) | 0.552 | 0.745 | 93.864*** | 48.258 | 0.790 |
| | Fishing activities have insufficient institutional support (Prob2) | 0.664 | | | | |
| | Not easy to meet the growing demand of seed, feed and fertilizers (Prob3) | 0.601 | | | | |
| | Difficult to mobilize funds through credit sources (Prob4) | 0.699 | | | | |
| | Inadequate fishing equipment (Prob5) | 0.719 | | | | |
| **Measures to improve fisheries** | Biodiversity of fishes must be preserved by implementing adequate measures (meas1) | 0.591 | 0.770 | 153.815*** | 49.090 | 0.732 |
| | Proper storage, preservation and transportation facilities (meas2) | 0.630 | | | | |
| | Use updated technologies and fishing gears to improve output (meas3) | 0.650 | | | | |
| | Providing subsidies to fishermen to buy modern equipment and tools (meas4) | 0.611 | | | | |
| | Enforce stricter laws to stop exploitation of marine resources and overfishing (meas5) | 0.644 | | | | |
| | Provide loans to ensure adequate capital, specialized staff, infrastructure and technology (meas6) | 0.591 | | | | |

Source: SPSS output

Table 2 displays exploratory factor analysis.  Principal component analysis is done with 35 statements with Eigen values of greater than 1.5 and factor loadings with more than 0.440 are retained. Hence, 22 statements with factor loadings with more than 0.440 and 3 factors were obtained. First 11 statements were named prospects of fisheries, next 5 statements as problems of fisheries and the last six statements were named measures to improve fisheries.

## 4.2. Confirmatory Factor Analysis

Bandalos, & Finney, (2010), suggest that when the relationships among the factors are tested and known, Confirmatory factor analysis can be applied. Therefore, Confirmatory factor Analysis is performed to check whether the statements have a good model fit or not. Confirmatory factor analysis is performed to confirm the survey. Table 2 shows the index category and acceptance levels. The acceptance levels of results are analysed and the results are presented as per the table.

**Table 1. Index category and acceptance levels**

| Category of fit | Index name | Acceptance level | Comments | Source |
|---|---|---|---|---|
| **Absolute fit** | Chi-square (Chisq) | p > 0.05 | Sensitive to sample size >200 | Wheaton et al. (1977) |
| | Root-mean-square error of approximation (RMSEA) | RMSEA < 0.08 | Range 0.05-0.1 is acceptable | Browne and Cudeck (1993) |
| | Goodness-of-fit index (GFI) | GFI ≥ 0.80 | Value greater than 0.80 Suggests a good fit | Forza and Filippini (1998), Greenspoon and Saklofske (1998) |
| **Incremental fit** | Adjusted goodness-of-fit index (AGFI) | AGFI ≥ 0.80 | Value greater than 0.80 Suggests a good fit | Forza and Filippini (1998) |
| | Comparative fit index (CFI) | CFI > 0.90 | Value greater than 0.90 Suggests a good fit | Byrne (1995), Hair et al. (2010) |
| | Tucker–Lewis index (TLI) | TLI > 0.90 | Value greater than 0.90 Suggests a good fit | Vandenberg and Scarpello (1994) |
| **Parsimonious fit** | Chi-square difference ($\chi2/df$) | Chi square/df < 5.0 | The value should be less than 5.0 | Marsh and Hocevar (1985) |

Source: Adopted from Ishiyaku,B. et al., 2017
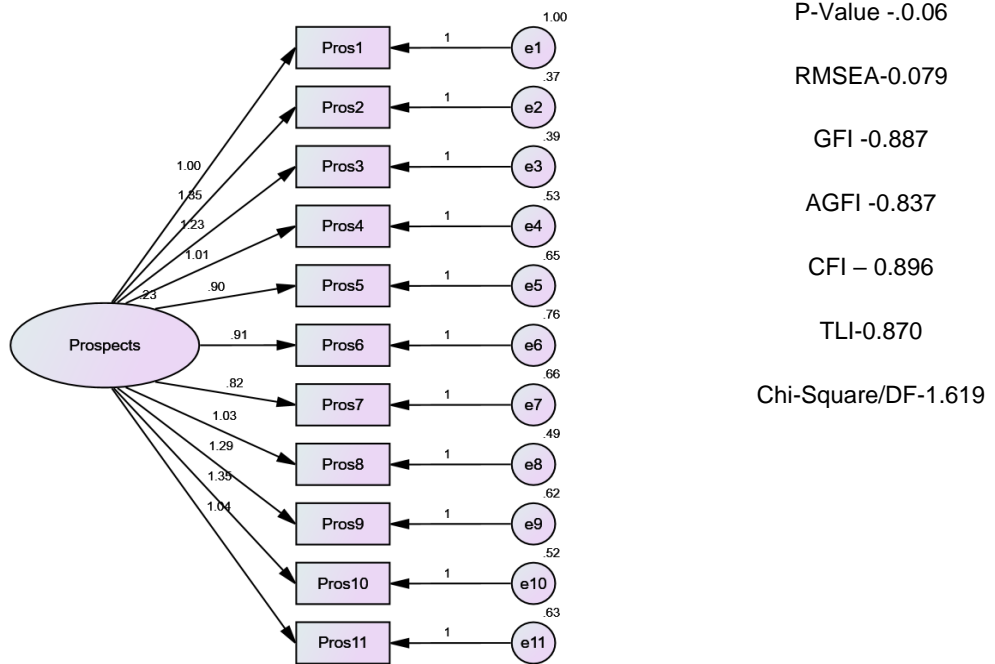
## 4.3. Prospects Of Fisheries



**Figure 1:** Prospects of fisheries

Confirmatory factor analysis was carried out for the prospects of fisheries statements. The values of the results show that all the statements of the prospects of fisheries follow a good model fit based on the values given in table 2. Only CFI and TLI values 0.896 and 0.870 respectively, which must be greater than 0.9 is slightly, less than 0.90.
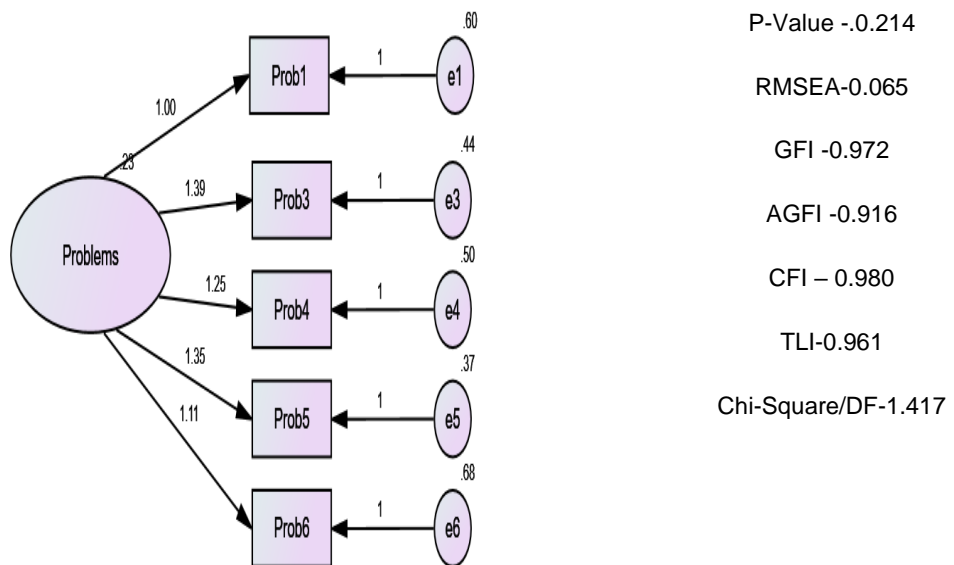
## 4.4. Problems Of Fisheries



**Figure 2:** Problems of fisheries

Confirmatory factor analysis is performed with five problems of fisheries statements. The results showed a good model fit with all the values as mentioned in table 2.
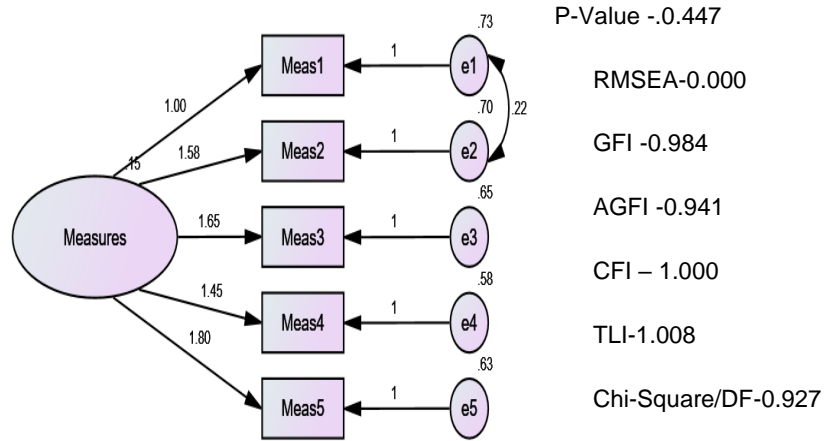
## 4.5. Measures To Improve Fisheries



**Figure 3:** Measures to improve fisheries.

Confirmatory analysis is performed for measures to improve fisheries. Initially, six statements were included, and it did not have a good model fit. Therefore, the statement Inadequate proper storage, preservation and transportation facilities leads to spoilage of fishes with low factor loading was removed after one iteration. Hence, Measures to improve fisheries with five statements showed an improved model fit with all the values confirming to the values as mentioned in table 2.
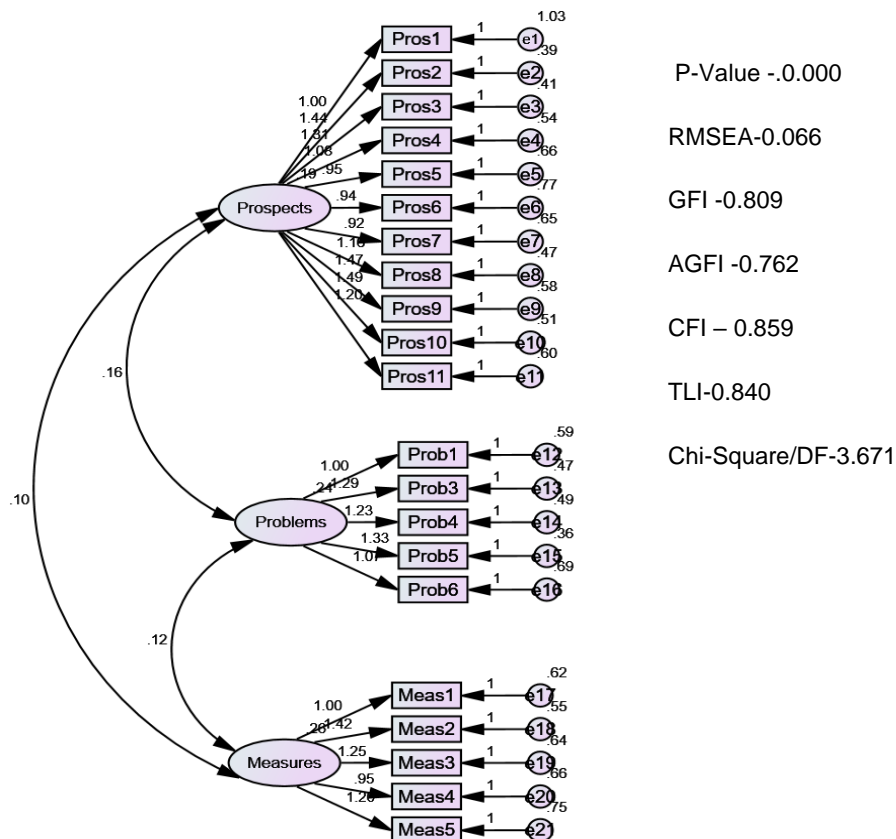
## 4.6. Multiple Regression



Figure 4: Multiple Regression

Pooled model (Figure 4) is performed to assess the fitness indices, factor loadings of every item and correlations between the constructs (Problems, Prospects, and Measures). The result disclosed that the pooled model has attained unit dimensionality with all the factor loadings ≥0.5 except prospect statements 2 and 3.P value is less than 0.05 because the sample size is less than 200. As suggested in table 2, RMSEA value is less than 0.08, GFI and AGFI values are also more than 0.8 which shows a good model fit. However, CFI and TLI which should be greater than 0.90 is slightly lesser with 0.859 and 0.840 respectively. Discriminant validity is attained by removing all the redundant items.

**CONCLUSION**

In conclusion, the development of the questionnaire for fishermen problems, prospects, and measures to improve the fisheries sector has provided valuable insights into the challenges facing fishermen and the fisheries sector. The questionnaire was designed to identify key issues that impact the livelihoods of fishermen, including access to resources, market demand, government regulations, and environmental factors.

The responses obtained from the fishermen provided important information about the challenges they face and the potential measures that can be taken to improve the fisheries sector. The results show that the major problems facing fishermen are related to limited access to finance, inadequate fishing equipment, and declining fish stocks.

Moreover, the prospects for the fisheries sector are largely determined by factors such as government policies, market demand, and environmental factors. The analysis of the responses highlights that the adoption of new technologies, such as fish gathering devices, improved fishing gear, and access to finance, could potentially enhance the productivity and sustainability of the fisheries sector.

Overall, the development of this questionnaire has provided a comprehensive understanding of the challenges facing fishermen and the prospects for the fisheries sector. The results suggest that the adoption of appropriate measures, such as improving access to finance, investing in new technologies, and strengthening government policies, can improve the livelihoods of fishermen and promote sustainable growth in the fisheries sector.

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