www.bircu-journal.com/index.php/birci
Budapest International Research and Critics Institute-Journal (BIRCI-Journal)
Humanities and Social Sciences
ISSN 2615-3076 Online)
ISSN 2615-1715 (Print)

Relationship between Fisherman's Characteristics and Livelihood Assets with Fisherman's Household Livelihood Strategy

Demi Ilavy Maudi[1], Trisna Insan Noor[2], Eliana Wulandari[3]
[1,2,3]Faculty of Agriculture, Universitas Padjadjaran, Indonesia
maudiilavy13@gmail.com, trisna.insan.noor@unpad.ac.id, eliana.wulandari@unpad.ac.id

Abstract

Pangandaran Regency is one of the new autonomous regions that has potential for fisheries resources in the southern part of West Java, however, the contribution of capture fisheries to GRDP in Pangandaran Regency is still relatively low. The majority of fishermen in Pangandaran Regency, especially in Cijulang District, are traditional fishermen and not all fishermen have the facilities and infrastructure that can support them in catching fish, such as equipment and boats. This research formulates a strategy for fishermen's livelihood to remain sustainable, based on the basic capital which is the potential driver and obstacle in the life of fishermen. The methodology used in this research is a survey with sampling withproportionate stratified random sampling technique. Meanwhile, the formulation of the development model was analyzed using the Structural Equation Model (SEM) with PLS analysis tools. The results showed that most of thefishermen are dominated by fishermen of productive age with the status of fishermen who own boats and fishing gear with more than 30 years of experience as fishermen, andformal education level at the elementary level, but always attends counseling, and has a number of family dependents as many as 2-3 people. In general, the average livelihood assets, namely natural capital (56.14 %), human capital (88.25 %), financial capital (72.59 %), social capital (81.26 %), and physical capital (68 ,78 %). Meanwhile, cumulatively, the highest percentage of household mobility/migration strategies is (71.81%), accumulation (68.97%), survival (60.92%), consolidation (39.68%), and diversification (37.13%). Andthere is a relationship between the characteristics of fishermen and livelihood assets on the livelihood strategies of fishermen.

Keywords
livelihood assets; fishermen; livelihood strategies

I. Introduction

Indonesia is a marine country with 17,500 islands and an 81,000-kilometer coastline. The sea and water cover around 62 percent of Indonesia's land area. According to statistics from the 2018 Central Statistics Agency, the total area of the seas is 6.32 million km2. With these conditions, Indonesia is a country that has very rich and abundant marine and fishery resources so that it can support the wheels of the economy that can be utilized for national development.

Marine fisheries business in Indonesia can be divided into two categories, namely capture fisheries business and aquaculture business. Capture fisheries business is a fishery business that relies on fish hunting results in the sea. Its business activities are highly dependent on natural conditions, weather and climate. Therefore, the capture fisheries business has high risks and uncertainties. Based on the development of fishery production data during the period 2013-2018, marine capture fisheries production in Indonesia is

DOI: https://doi.org/10.33258/birci.v5i3.5912

greater than aquaculture production.

The marine fisheries sector is considered to have a strategic role in Indonesia. Fishery business activity is one of the economic sectors that absorbs a lot of labor and produces animal food (protein). Based on data from the United Nations Development Programs (UNDP), marine wealth in Indonesia in 2017 reached US$2.5 trillion per year and only 7 percent was utilized, this was due to the lack of technology (Panjaitan, 2019). Apart from the lack of technology, according to data from BPS, there has been a significant reduction in the number of fishing households (fishermen) from 2000-2016, reaching 50 percent.

Pudjiastuti (2017) conveyed that the factors that caused the number of fishermen to decrease include fishermen having to compete with marine resource users from other countries, both legal and illegal, the fishing equipment used by fishermen is simple so they have to compete with modern fishing gear. Meanwhile, according to the Secretary General of the People's Coalition for Fisheries Justice (KIARA) (2020) the decline in the number of fishermen is due to spatial conflicts that occur on the coast including reclamation, coastal mining and conflicts in tourism areas. This causes many fishermen to switch professions in the hope of increasing their standard of living.

Fishermen as beneficiaries of marine and fishery resources should be able to become a promising profession to build family welfare. However, in reality, the majority of fishermen in Indonesia, from an economic point of view, are in a disadvantaged condition. They are within the threshold of the poverty line, the poverty of this group of fishermen accounts for 25 percent of the national poverty rate. Approximately 14.58 million people or about 90 percent of the 16.2 million fishermen in Indonesia are not economically or politically empowered (Susenas 2017).

West Java is one of the provinces in Indonesia that has such great marine potential, but the fishing profession is a profession that is less desirable in West Java Province because only 0.2 percent of the population of West Java Province works as a fisherman. This amount is still quite low when compared to the area and potential of the oceans.

Fishery resources in the southern part of West Java specifically in Pangandaran Regency have a sea area of 173.4 km2 with a beach that is included in the Fishery Management Area (WPP) zone along a 91 km long coast. Based on the Decree of the Minister of KP Number 50/2017, the utilization rate of WPP Pangandaran Pata Regency in 2016, belongs to the category of the optimum level of utilization. But in reality the fisheries sector, especially the capture fisheries sub-sector, has a low contribution to the GRDP (Gross Regional Domestic Product) of Pangandaran Regency.

The contribution of capture fisheries to GRDP in Pangandaran Regency is still relatively low with an average of 0.97 percent. Besides being quantitatively low, during this period there was a downward trend.

Research conducted by Anwar (2018) shows that in terms of resources, the ability and skills of fishermen in Pangandaran Regency to a new technology are still limited, because fishermen in Pangandaran Regency still use traditional methods in terms of exploiting the potential of existing resources. Fishermen's understanding of the objectives of fishermen's empowerment is still lacking, many activities such as counseling, socialization and others have not been achieved, and the bureaucratic structure and expenditure of program policies from the government are considered to have no elements of sustainability. So that these things can be another cause of the capture fisheries sub-sector in Pangandaran Regency that has not produced optimal results.

Fishermen in Pangandaran Regency are fishermen who are seen from various aspects, including the less profitable category. Their livelihood as fishermen belongs to small fishermen, who are very familiar and are attached to the label of poverty.

II. Research Method

This study's design is a mixed or mixed study mix technique with the survey method. Proportionate stratified random sampling was used in Cijulang District, Pangandaran Regency. Determination of the research location is done intentionally, with the consideration that the construction of the pier is being carried out.

III. Result and Discussion

To see the model of the influence of fishermen's characteristics and livelihood assets on livelihood strategies, Partial Least Square (PLS) analysis was carried out. PLS allows for the modelling of structural equations with relatively small sample numbers and without the need for multivariate normal assumptions. According to Wold (1982:1), PLS is an effective analytical tool since it is not predicated on several assumptions.

3.1 Measurement Model Evaluation

Individual item reliability, internal consistency or composite reliability, average variance extracted, and discriminant validity is all checked as part of the indicator measurement model evaluation. The first three measurements are classified as having convergent validity.

a. Convergent Validity

Convergent validity is comprised of three tests: item reliability (validity of each indicator), composite reliability, and extracted average variance (AVE). Convergent validity is a measure of how well current indicators describes the dimensions. It suggests that the more the indicator's convergent validity, the better its capacity to apply the latent variable:

1. Item Reliability

Item reliability is also known as indicator validity. The loading factor value can be used to test item reliability (standardized loading). The loading factor value indicates the strength of the relationship between each metric and its construct. A loading factor value greater than 0.5 is regarded desirable, meaning that the indication is appropriate for use as a construction indicator. The Chin (1998) model can be omitted if the standardized loading factor value is less than 0.5.

According to the results of the loading factor calculation for fishermen's characteristics, the loading factor is less than 0.5. As a result, it must be placed aside. The image above is the outcome of the improved model after Y13 is removed. As a result, each indicator is appropriate for explaining each latent variable, including the characteristics of fishermen, livelihood assets, and livelihood techniques.

The loading factor not only displays the validity of each indicator but also illustrates the size of each indicator's contribution to the factor/variable.

2. Composite Reliability

Cronbach's alpha and DG rho are the statistics used in composite reliability or reliability constructions (PCA). Cronbach's alpha and DG rho (PCA) values of more than 7.0 imply that the construct is very reliable as a measuring instrument. A limit value of 0.7

or above indicates satisfaction, while 0.8 or higher indicates highly pleasant. Nunnally and Bernstein (Nunnally and Bernstein, 1994; Sofyan Yamin and Heri Kurniawan, 2011: 19).

Table 1. Composite Reliability Results

Variable	**Composite Reliability**
Livelihood strategy	0.916
Livelihood assets	0.907
Characteristics of fishermen	0.868

According to the table above, the composite reliability value of the three latent variables is greater than 0.7, implying that all factors have excellent dependability or reliability as a measuring instrument.

3. Average Variance Extracted (AVE)

The Average Variance Extracted (AVE) represents the variability explained by items in contrast to the variance created by measurement error. If the AVE value is more than 0.5, the concept has strong convergent validity. It implies that the hidden variable may be responsible for more than half of the variation in the indications.

Table 2. Results of Average Variance Extracted (AVE)

Variable	**Average Variance Extracted (AVE)**
Livelihood strategy	0.731
Livelihood assets	0.666
Characteristics of fishermen	0.526

According to the table above, the three latent variables have an AVE of more than 0.5, indicating that the construct has excellent convergent validity, where the latent variable can explain more than half of the variation of the indicators.

4. Discriminant Validity

Cross loading and comparing the AVE value to the square of the association between the components were used to assess the discriminant validity of the reflective measurement model. Cross loading is calculated using the correlation of the indicator with its build and constructions from other blocks. A high level of discriminant validity can explain the indicator variable's variation better than the variance of the other construct indicators. Each indication's discriminant validity value is listed below:

Table 3. Discriminant Validity

	X1	**X2**	**Y1**
X1.1	0.748	0.482	0.452
X1.2	0.528	0.351	0.263
X1.3	0.744	0.451	0.363
X1.4	0.719	0.342	0.338
X1.5	0.837	0.511	0.403
X1.6	0.739	0.620	0.432
X21	0.380	0.771	0.412

X22	0.532	0.913	0.565
X23	0.566	0.587	0.399
X24	0.513	0.925	0.562
X25	0.633	0.838	0.585
Y11	0.400	0.516	0.837
Y12	0.492	0.533	0.872
Y14	0.427	0.457	0855
Y15	0.475	0.623	0855

When compared to other variables, all loading factor values for each indication show a greater connection with the variable. The indications for each variable are the same. It demonstrates that the indicator placement on each variable is right.

3.2 Structural Model Evaluation

A structural model is evaluated at numerous stages. The first stage is to assess the significance of the constructs' interaction. This is demonstrated by the route coefficient, which displays the strength of the relationship between constructs.

a. Path Coefficient

The path coefficient may be used to assess the significance of the interaction between the components. The path coefficient's sign must be compatible with the proposed hypothesis; the t-test (critical ratio) produced from the bootstrapping procedure can be used to determine the relevance of the path coefficient (resampling method). The p-value of the t-test will then be compared to the value of the significance threshold.

I. Fisherman Characteristics Affect Livelihood Strategies

The t-statistic value for the characteristics of fishermen on livelihood strategies is 2.534 with a p-value of 0.012. When compared with the 5% significant level, then the p-value (0.012) < significant level (5%) so Ho is rejected. As a result, it is possible to conclude that the features of fisherman have a substantial impact on livelihood methods. The size of the effect of features of fisherman on livelihood strategies is 0.208. The positive path coefficient implies that the better the fishermen's traits, the better the livelihood strategy.

II. Livelihood Assets Affect Livelihood Strategies

The t-statistic value for livelihood assets against livelihood strategies is 7.610 with a p-value of 0.000. When compared with the 5% significant level, then the p-value (0.000) < significant level (5%) so Ho is rejected. As a result, it is possible to conclude that livelihood assets have a major impact on livelihood strategies. The effect of livelihood assets on livelihood strategies has a magnitude of 0.495. A positive route coefficient suggests that the better the assets, the better the approach.

b. Goodness of Fit

The goodness of fit (GoF) method developed by Tenenhaus et al. (2004) is used to validate the entire model. This GoF index is a single statistic that is used to validate the combined performance of the measurement and structural models. The GoF value is produced by multiplying the model's R2 value by the average communalities index. The goodness of fit model calculation results is shown below:

Table 4. Results of GoF

	Average Variance Extracted (AVE)	**R square**
X1	0.526	
X2	0.666	
Y1	0.731	0.421
Average	0.641	0.421
Y1	0.519	

The results of the r square calculation above show that simultaneously the contribution ofthe characteristics of fishermen and livelihood assets on livelihood strategies are 42.1%, the rest is explained by other variables. According to the table above, the average communality is 0.641. The result is multiplied by R2 and rooted. Chin (1988) defined R Square values of 0.67, 0.33, and 0.19 as strong, moderate, and weak, respectively (Chin, 1998). The calculated GoF value is 0.519, which falls between 0.33 and 0.67. As a result, it is classified as having a substantial GoF, indicating that the model is good (has a reasonably high/moderate capacity) to explain empirical data.

IV. Conclusion

The characteristics of fishermen are dominated by productive age, which is between 15 and 64 years old with the status of fishermen who own boats and fishing gear who have experience as fishermen for more than 30 years, and have a number of family dependents of 2-3 people. The assets owned by fishing households vary. In general, the average livelihood assets are natural capital (56.14 %), human capital (88.25 %), financial capital (72.59 %), social capital (81.26 %), and physical capital (68 ,78 %).

The livelihood strategies of fishermen's households in the research area mostly use a mobility/migration strategy so that there is a significant influence of the characteristics of fishermen and livelihood assets on the livelihood strategies of fishermen.

References

Anton Martopo, GH (2013). Strategy for Sustainable Livelihoods in Dieng Area: (Case in Buntu Village, Kejajar District, Wonosobo Regency). Journal of Ecoscience, 47.

Anwar. (2018). Implementation of Fishermen Empowerment in Pangandaran Village, Pangandaran District, Pangandaran Regency. Scientific Journal of Government Science Vol 4, No. 2 (2018). Galuh University, Ciamis Regency.

Bappeda Pangandaran Regency. (2019). The Contribution of the Secretariat of Agriculture, Forestry and Fisheries to the GRDP of Pangandaran Regency on the basis of the current prices for 2015 – 2018

Central Bureau of Statistics (BPS). (2013). The term Household, accessed from http://www.bps.go.id/. Accessed on May 2, 2021.

Central Bureau of Statistics (BPS). (2018). Statistics of Marine and Coastal Resources BPS Catalog 3312002 accessed fromhttp://www.bps.go.id/. Retrieved April 13, 2021.

Central Bureau of Statistics (BPS). (2020). Fishery Production by Subsector 2013 – 2017 accessed fromhttp://www.bps.go.id/. Retrieved April 13, 2021.

Central Bureau of Statistics of West Java Province. 2018. West Java Province in Figures 2018. Catalog: 1102001.32, West Java

Central Statistics Agency (BPS) of West Java Province. (2019). Total Population by

Regency/City 2015 – 2017 accessed fromhttp://www.jabar.bps.go.id/. Retrieved 23 March 2021.

Chacanchida Tipyan and Farung Mee – Udon. (2014). Dynamic Livelihood Strategies of Fishery Communities in Ban Don Bay, Suratthani, Thailand. International Journal of Asian Social Science, 2014, 4(11): 1126 -1138. SSN€: 2224 – 4441/ISSN(p): 2226 – 5139.

Department of Marine Affairs and Fisheries of West Java. (2020). Number of Fishermen Fishing in the Sea by Regency/City, accessed fromwww.opendata.jabarprov.go.id. Retrieved January 2, 2021

Department of Marine Affairs, Fisheries and Food Security of Pangandaran Regency. (2020). Capture Fisheries Production of Pangandaran Regency 2015 – 2020.

Department of Marine Affairs, Fisheries and Food Security of Pangandaran Regency. (2020). Number of Fishing Vessels in Pangandaran Regency as of 2019.

Department of Marine Affairs, Fisheries and Food Security of Pangandaran Regency. (2020). Number of Fishermen in Pangandaran Regency 2012 – 2019.

Dimas Irham Rabbani and R. Rijanta. (2020). Livelihood Strategy for Salt Farmers on Giliraja Island, Giligenting District, Sumenep Regency. Indonesian Earth Journal Vol. 9 No. 4 (2020).

Dwi Fauzia Putra and Agung Suprianto. (2020). Livelihood Strategy Analysis of Coffee Farmers in Medowo Village Using a Sustainable Livelihood Approach. JPIG (Journal of Education and Geography) Vol. 5 No. 2, September 2020. Pages: 132 – 143.

Eka Rahayu Oktavianti. (2016). The Influence of Physical Capital, Financial Capital, and Intellectual Capital on the Performance of BPRS in East Java Province (Period 2013 – 2015). Faculty of Sharia and Law UIN Syarif Hidayatullah. Jakarta.

Fatmi Anggraini, Muhammad Nurjihadi, and Fahlia. (2020). Household Livelihood Strategies in Facing Poverty in the Coastal Community of Labuhan Ijuk Village. Nusantara Journal of Economics, Vol. 02 No. 01 May 2020, pp. 1 – 6. ISSN: 2714 – 5204.

FKY Amenveku, RK Asravor, and JKM Kowornu. (2019). Determinants of Livelihood Strategies of Fishing Household in The Volta Basin, Ghana. Cogent Economics & Finance. ISSN (print): 2332 – 2039.

John W. Cresswell. (2019). Research Design, Qualitative, Quantitative, and Mixed Methods Approach Fourth Edition. Student Library. Yogyakarta.

Law No. 7 of (2016) concerning the Protection and Empowerment of Fishermen, Fish Cultivators, and Salt Farmers.

Le Thi Hong Phuong, Tran Ngo Thuy Tien, Tran Cao Uy, and Truon Van Tuyen. (2020). Livelihood Strategies of Fishery Household Group to Respond to the Marine Environmental Incident (Formosa): The case study in Hai An Commune, Hai Lang District, Quang Tri Province, Vietnam). International Journal of Innovation and Applied Studies. ISSN: 2028 – 9324, Vol. 03, Sept. 2020, pp. 696 – 705.

Liana Fatma Leslie Pratiwi, Ali Hasyim Al Rosyid, and Maftuh Kafiya. (2020). Sustainable Livelihood Strategies Rural Household in Sanden District Bantul Regency. PROC. INTERNAT. CONF. SCI. ENGINE. Vol. 3, April 2020, Pages: 711 – 714. ISSN: 2597 – 5250. e – ISSN: 2597 – 232X.

M. Syaiful. (2020). Livelihood Strategies of Merchant Fishermen at Fish Auction Places. SIGn Journal of Social Science Vol. 1, No. 1 (November 2020) 001 – 014. e – IISN: 2745 – 374X.

Riesti Triyanti and Maulana Firdaus. (2016). The Welfare Level of Small-Scale Fishermen

With a Sustainable Livelihood Approach in Indramayu Regency.
Rosni. (2017). Analysis of the Welfare Level of the Fisherman Community in Dahari Selebar Village, Talawi District, Batubara Regency. UNIMED Journal. E-ISSN: 2549 – 7057 | P-ISSN: 2085 – 8167.
Shah, M. et al. (2020). The Development Impact of PT. Medco E & P Malaka on Economic Aspects in East Aceh Regency. Budapest International Research and Critics Institute-Journal (BIRCI-Journal). P. 276-286.
Sugiyono. (2017). Quantitative, Qualitative, and R&D Research Methods. Alphabet. Bandung.
Vicky Elsa Puteri and Agustina Setyaningrum. (2019). Livelihood Strategies for Fishermen's Families at Kuwaru Beach, Poncosari Village, Srandakan, Bantul. Commission III: Engineering and Human Geography. ISBN: 978 – 602 – 361 – 243 – 7.