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Determinants of Improving the Welfare of Fishermen's Households in the Coastal Areas of West Sumatera

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ABSTRACT

This study aims to model the welfare of fishermen's households in the coastal area of West Sumatra which is determined by the socio-cultural environment, catches and added value of 373 fishing households with fishing gear by using Partial Least Squares Structural Equation Modeling (PLS-SEM) approach. The contribution of this research lies in the concept of the socio-cultural environment in improving the welfare of fishermen's households through the catch and added value that has been ignored by previous researchers. The results of the study found that the fisherman household welfare model can be achieved through strengthening added value. This study suggests to the government to increase the added value of fishery products through the added value obtained from the difference between the selling price and the cost of materials or other supplies from fishing activities, fish farming, fish handling, fish processing, and distribution in a production process. Furthermore, this study suggests to further researchers to involve the study of the physical environment such as natural conditions as a determinant of the welfare of fishermen's households.

1. INTRODUCTION

The marine and fisheries sector is very important to encourage development in the territory of Indonesia because the water area is larger than the land area with very diverse fishery potential [1]. The region in West Sumatra, which is one of the provinces in Indonesia, also has high fishery potential, especially marine fisheries because it is very abundantly available, so the potential for marine and fisheries in West Sumatra is quite promising as one of the sectors supporting economic growth [2].

The marine fisheries sector in West Sumatra provides strategic potential as a leading sector and the main driver for developing the economy in increasing the expansion of employment opportunities, income distribution and improving people's living standards [3]. This condition is supported by the potential for the marine and fisheries sector which is seen from the indicator of the number of catches in the sea over the last four years which has always increased, which information is summarized in Figure 1.

The information from Figure 1 is the average catch for the volume measured in tons and the value measured in rupiah is always increasing every year. Increased production and production value of marine capture fisheries in West Sumatra is supported by the existence of seven regencies/cities as coastal areas that have great potential for the marine and fisheries sector, including the Mentawai Islands, Pesisir Selatan, Padang Pariaman, Agam, Pasaman Barat, Padang and Pariaman. The entire area is located in a coastal area with a total length of ± 1,973.24 km of beach, 185 islands and a sea area of 186,580 km^2, so that there are various riches of coastal and marine resources such as fishery commodities consisting of skipjack, tuna, and shrimp.

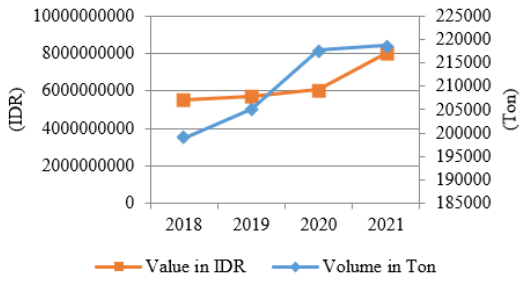

Figure 1. Accumulated production and production value of capture fisheries at sea in coastal areas in West Sumatra [4]

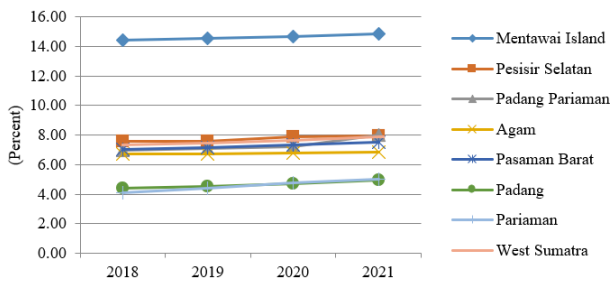

Figure 2. Poverty growth in districts/cities for coastal areas in West Sumatra [4]

The success of the West Sumatra in the marine and fisheries sector, when associated with the welfare conditions of the coastal fishing communities, has not yet contributed to overcoming the problem of poverty, which is summarized in Figure 2.

The information from Figure 2 shows that the growth of the

poor population for coastal areas in West Sumatra, which consists of the Mentawai Islands, Pesisir Selatan, Padang Pariaman, Agam, Pasaman Barat, Padang and Pariaman is overall experiencing a positive trend over the last four years. The phenomenon that occurs is that although the potential of marine resources and capture fisheries in the sea has increased for production and production value, the growth of the poor population has also increased. This condition is not relevant to previous studies that have been carried out in various regions, they found that superior marine potential will contribute to improving the welfare of coastal communities through reducing the number of poor people in coastal areas [5].

The low condition of community welfare as seen from the poverty growth indicators is a multidimensional problem. Poverty is not only defined from the income earned a little, but also related to social, economic and cultural aspects. In general, high poverty in coastal areas is caused by the characteristics of fishermen who are identical with limited assets, weak capital structure, lack of bargaining position to access justice values and economic resources, weakness in market access and low ability to master science and technology [6]. Based on this explanation, poverty alleviation must be carried out through the leading sector in coastal areas in a synergistic and systematic way so that the community is able to improve their standard of living.

A number of literature studies that have discussed the topic of fishermen's household welfare, they were found that the catch and added value are the main determinants to encourage the welfare of fishermen's households [7-12]. First, catches are influenced by knowledge of seasonal fluctuations and conditions. Furthermore, catch rates provide a useful basis for planning fishing activities and infrastructure. Local traditional fishing communities are organized into highly cohesive groups, closely linked with a high level of social control [13]. Fishermen spend a lot of time socializing with each other, during communal activities, on boats and at meeting places, they talk about the state of the sea and fishing activities [14]. Second, added value relates to activities along the supply chain that increase the usefulness, culinary attributes, or economic viability of a food. The high value added proportion of retailers, wholesalers and intermediaries can be explained by the fact that there are higher barriers to entry at this level and therefore less competition [15]. The factor causing the low value added is the difficulty of accessing product creativity, reaching markets, accessing credit, and accessing marketing space in the market [16].

Based on the literature review, our research adds socio-cultural environmental variables as a driver of the welfare of fishermen's households in the coastal areas of West Sumatra, either directly or indirectly, namely through the catch or through the added value of the catch. The socio-cultural environment has a significant influence on people's lifestyles, physical health, quality of life, and psychological well-being [17]. Health consequences are a multifaceted result of the complex interaction of socio-cultural, environmental, economic and psychosocial factors [18]. Both individual and public health are affected by the combined effects of these factors [19]. Moreover, addressing the notion of the potential of the socio-cultural environment seems to be beneficial for a better understanding of their personal and professional development [20]. The socio-cultural environment in a broad sense consists of the social and cultural systems of a nation. Some elements of the socio-cultural environment include beliefs, values, attitudes, habits, lifestyle behavior as a development of cultural, religious, educational, and social conditions, where the socio-cultural environment is described as an environment that includes everything that is not contained in the economic or political system. typical [21].

Based on the previous literature review and the novelty that we propose in the study, the welfare of the fishermen's households that we will analyze is influenced by the socio-cultural environment, catches and added value. The relationship between the variables that we will analyze is that the socio-cultural environment will affect the catch, added value and welfare of fishermen's households. Furthermore, the catch is influenced by the socio-cultural environment, while the catch will affect the added value and welfare of fishermen's households. Then, the added value is influenced by the socio-cultural environment and the catch, while the added value will affect the welfare of fishermen's households.

2. LITERATURE REVIEW

2.1 Welfare

The concept of well-being provides a comprehensive framework for understanding what is important to people, communities and society. In particular, the research group's definition of social welfare on well-being in developing countries takes a three-dimensional view with a focus on the material, relational, and subjective components of well-being. In the elaboration of three dimensions of social welfare, material concerns include practical welfare and living standards; relational aspects including relationships of love and care, networks of support and obligations, social, political and cultural identities, including relations with state organs and formal structures, which determine the scope of personal action and influence in society; and subjective include ideas about self, individual and shared hopes, fears, and aspirations, expressing levels of satisfaction or dissatisfaction and beliefs [22]. According to Hair et al. [23] welfare economics is a systematic study of normative policy recommendations in the economic field. According to Hair et al. [24] to understand the concept of human welfare in general, and poverty in particular, it is necessary to think about the availability of commodities and consider their use. Well-being is the result of a convergence of factors, ranging from good human relations to greater equality and a healthy social and natural environment [25]. Furthermore [26], Amartya Sen mentions function, that is, what a person does to a commodity of certain characteristics that are owned or controlled. The freedom to choose or control one's own life is a central aspect of most understandings of well-being. Improving the welfare of the population can be done if the income is increased enough so that it is able to meet the basic needs of household life. This means that the needs of food, clothing, shelter, health, security, and others are available and easily accessible by every resident so that in turn the number of poor people becomes smaller. This is in line with efforts to increase the standard of living of fishermen's households and increase fish production which is directly or indirectly influenced by factors of production costs, labor, technology used, catches, and selling prices [27].

2.2 Socio-cultural environment

Some elements of the socio-cultural environment include beliefs, values, attitudes, habits, lifestyle behaviors, in which

the socio-cultural environment is described as an environment that includes everything that is not contained in a typical economic or political system. Behavior patterns that are relevant to environmental conditions can then lead to the formation of different cultural values between communities and can affect economic activities [28].

Culture is typically defined by an identifiable group of people with a common language, customs and traditions. The lack of cultural values and qualities of an ethnic group disqualifies people associated with that ethnicity [29]. Today, a person's actions and inactions are influenced by the family, community, social group, government and economic organizations with which they are associated.

2.3 Production

According to Kaya et al. [30] production is the transformation of resources or inputs into goods and services. A fixed input is an input whose quantity cannot be changed as the output changes. A variable input is an input whose quantity can be changed as the output changes. If one of the inputs of a company is a fixed input, it is said to be producing in the short run.

In other words, the short run is the period in which some inputs are fixed. If none of the inputs from the firm are fixed inputs - if all inputs are variable - then the firm is said to be producing in the long run. In other words, the long run is the period in which all inputs can be varied [31]. Thus, the profit for the firm from each unit of labor is the market price multiplied by the marginal product of labor.

2.4 Marginal product

The marginal product of a variable input is the additional output that would be produced by an additional unit of that input if all other inputs were held constant. According to the law of diminishing returns, when an additional unit of a variable input is added to a fixed input, after a certain point, the marginal product of the variable input will decrease [32]. Total product is simply the maximum level of output that can be produced with a given amount of input. Since the production function determines the maximum amount of output that can be produced with a given level of input, if labor is not maximized then the output will be lower. Therefore, the marginal product of capital is the change in total output divided by the change in capital. And the marginal product of labor is the change in total output divided by the change in labor.

3. METHODOLOGY

3.1 Fisherman's household welfare model analysis flowchart

The flowchart analysis of the fisherman's household welfare model is similar to the flowchaert followed by Lein and Setiawina [33]. The analysis of the research model using the PLS-SEM method was carried out in three stages, as shown in Figure 3.

3.2 Research variables

The variables used in this study include: First, Socio-Cultural Environment (X) as exogenous variable is a formative indicator variable. Second, Catch (Y_1) as endogenous variable is a reflexive indicator variable. Third, Value Added (Y_2) as endogenous variable is a reflexive indicator variable. Fourth, Fisherman's Household Welfare (Y_3) as endogenous variable is a reflexive indicator variable (see Table 5 in appendix).

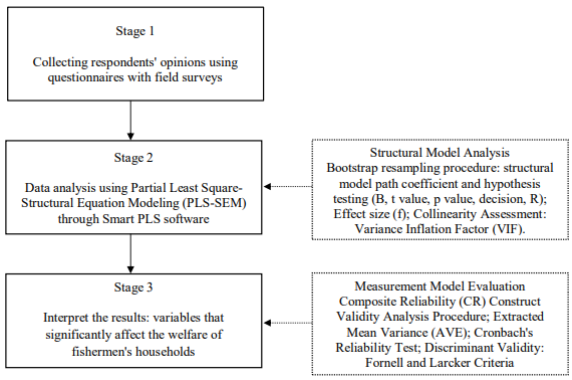

Figure 3. Fisherman's household welfare model analysis flowchart

3.3 Research models and hypotheses

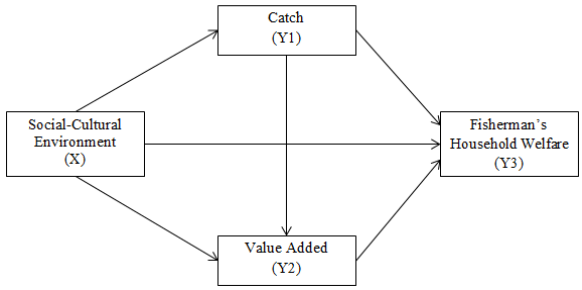

Figure 4. Research model determinants of improving the welfare of fishermen's households in coastal areas of West Sumatra

Table 1. Research hypothesis

	Hypothesis
H_1	The socio-cultural environment has a significant effect on catches in the coastal areas of West Sumatra.
H_2	The socio-cultural environment has a significant effect on value added in the coastal areas of West Sumatra.
H_3	The socio-cultural environment has a significant effect on the welfare of fishermen's households in the coastal areas of West Sumatra.
H_4	The catch has a significant effect on value added in the coastal areas of West Sumatra.
H_5	The catch has a significant effect on the welfare of fishermen's households in the coastal areas of West Sumatra.
H_6	The value added has a significant effect on the welfare of fishermen's households in the coastal areas of West Sumatra.

This research focuses on the Determinants of Improving the Welfare of Fishermen's Households in the Coastal Areas of West Sumatra. For this reason, the scope of this research is directed to determine how much influence: The socio-cultural environment on the catch in the coastal areas of West Sumatra; The socio-cultural environment for value added in the coastal

areas of West Sumatra; The socio-cultural environment on the welfare of fishermen's households in the coastal areas of West Sumatra; The catch on value added in the coastal areas of West Sumatra; The catch on the welfare of fishermen's households in the coastal areas of West Sumatra; Value added to the welfare of fishermen's households in the coastal areas of West Sumatra.

The research model and hypotheses in this study are presented in Figure 4 and Table 1.

3.4 Subject field

This research was conducted by means of a field survey of fishing households that have fishing gear in the coastal areas of West Sumatra, according to the Department of Marine Affairs and Fisheries of West Sumatra in 2017 there were 10,999 fishing households that have fishing gear in the coastal areas of West Sumatra.

3.5 Survey instrument

Researchers produce survey instruments to identify and analyze significant factors that affect the welfare of fishermen's households. The questionnaire in this study was divided into seventeen (17) segments: (1) Respondent Profile; Questionnaire on; (2) Tolerance; (3) Gotong royong; (4) Kinship; (5) Have a good job; (6) Be in good health; (7) Have a happy family; (8) To love and be loved; (9) Achieve the desired goal; (10) Finding the meaning of life; (11) Type of Catch; (12) Characteristics of the catch; (13) Catch Productivity; (14) Value added Main Catch; (15) Value added of Bycatch; (16) Selling Price of Main Catched Fish; and (17) Selling Price of By-catch Fish.

3.6 Measurement scale

All questionnaire items were measured using a five-point Likert scale: (1) strongly disagree/never; (2) disagree/rarely; (3) neutral/sometimes; (4) agree/often; and (5) strongly agree/always.

3.7 Data collection

To obtain the data needed in this study, it was carried out through a questionnaire, which is the method used to obtain primary data, by making a list of questions systematically with the aim of obtaining the desired data. A list of questions was circulated to respondents to be answered.

3.8 Data analysis

The analytical method used in this study is the Structural Equation Model–Partial Least Square (SEM–PLS), consisting of latent variables or constructs and indicators (manifest variables or observed). The SEM–PLS approach used is a formative model because the direction of the arrow starts from the indicator to the latent variable. The latent variables used in this study consisted of exogenous (independent) and endogenous (dependent) variables as well as several indicators (manifest variables). Exogenous variables are socio-cultural environment (X) with formative indicators; endogenous variable is catch (Y_1) with reflexive indicator; added value (Y_2) with reflexive indicators; and the welfare of fishermen's households (Y_3) with reflexive indicators; and several indicators of each exogenous variable and endogenous variable.

4. RESULTS AND DISCUSSION

4.1 Demographic profile of respondents

This study collected data from 373 fishing households that owned fishing gear located in the coastal areas of West Sumatra (i.e., West Pasaman District, Pesisir Selatan District, and Padang City as sample areas in this study). Figure 5 shows the location of respondents in each study sample area.

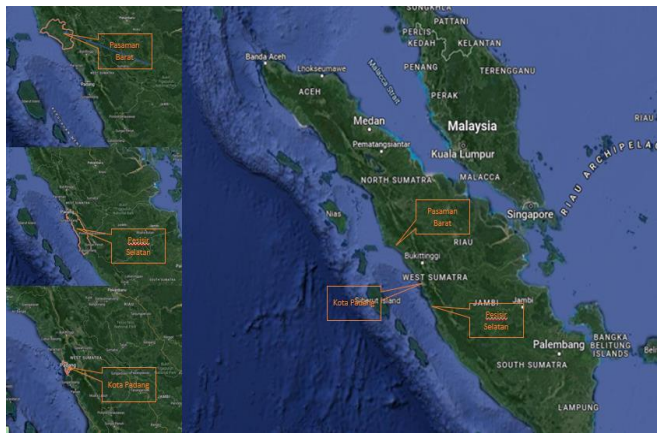

Figure 5. Location of respondents in each research sample area [4]

The majority of respondents were 84.99% male and 15.01% female, at most 16-25 years old as many as 105 people, while with the age of 26-35 years as many as 93 people, 36-45 years old as many as 96 people, and with age >45 years as many as 79 people. Generally, 200 people have formal education, while 99 people have a formal education in elementary school and 74 people in junior high school. The average number of dependents of 0-3 families is 195 people, while the number of dependents of 4-6 families is 154 people and the number of dependents of families > 6 people is 24 people. Most have experience as a fisherman of 5-10 years as many as 136 people while experience as a fisherman < 5 years as many as 79 people, experience as a fisherman 11-15 years as many as 51 people, experience as a fisherman 16-20 years as many as 40 people, and experience as a fisherman > 20 years as many as 67 people. In general, 356 people do not have other jobs, while 17 people have other jobs. Most of the owners of outboard motor fishing gear are 204 people, while the owners of boat fishing gear without motors are 107 people, and the owners of motor boat fishing gear are 62 people.

4.2 Empirical findings on the PLS-SEM model hypothesized via smart PLS

This study uses the PLS-SEM approach to assess the fisherman household welfare model that has been determined based on the research conceptual framework. The analysis in this study consists of two (2) parts, including the assessment of the model and the measurement of the structural model. Furthermore, PLS-SEM analysis was carried out simultaneously for both parts, resulting in more precise results and suitable for this study.

4.2.1 Measurement model assessment

Several statistical tests were used to assess the measurement model. In Table 2, each construct and its indicators are tabulated with the results of the outer loading test, internal consistency, and convergent validity. The discriminant validity test was also carried out using the Fornell-Larcker criteria.

The first procedure involves testing the contribution of items (indicators) for each construction, which is represented by an external load. The software generates values for external loads by calculating the bivariate correlation between the indicators and their respective constructs. In the study of Maya-Jariego et al. [34], the recommended threshold for external loads is 0.70. Any indicator with external loading below the 0.70 threshold will indicate a weak indicator contribution to the construct and should be excluded from the model. In this study, the outer loadings of the 206 indicators of the initial hypothesis model are compared with the threshold value. The revised PLS-SEM model was re-run in the SmartPLS software, and all external loads were above the threshold, as shown in Table 2.

The following procedure is to test the internal consistency of the revised PLS-SEM model. There are two parameters considered: Cronbach's alpha (α) and Composite Reliability (CR). These two parameters are used to determine the similarity of indicator scores per construct. The difference between the two is that Cronbach's alpha assumes equality of loading indicators whereas Composite Reliability does not. Both of these parameters have the same threshold value of 0.70. In this study, all constructs were able to meet the threshold for the internal consistency reliability test, except for the socio-cultural environment construct that did not use Cronbach's alpha (α) and Composite Reliability (CR) measures because it is a formative indicator variable.

Table 3 confirms the convergent validity test, the mean extracted variance (AVE) was calculated. AVE is the amount of variance taken through latent variables regarding measurement errors caused by large variances [35]. Regarding the recommendation, the AVE value below the threshold of 0.5 is still acceptable, only if the composite reliability (CR) is greater than 0.60 [17]. The tolerable AVE range is 0.40-0.50. However, AVE below the lowest tolerance value (0.40) will no longer be accepted. In this study, all items meet the recommended range for Average Variance Extracted (AVE).

Table 4 confirms the discriminant validity of all the remaining constructs. Discriminant validity shows how different each construct is from the others. The square root of AVE per construct was calculated to get the cross-loading of each construct. The cross loading of each construct (represented by the bold underlined number) must be higher than the respective AVE to confirm discriminant validity [36]. This is to verify whether the constructs are appropriate in representing each corresponding construct.

All items must be equal to or greater than the recommended value as per the rule of thumb. Otherwise, these items must be omitted before the next part of the analysis, namely the discriminant validity test. Nevertheless, it is important to check for problematic variables before deleting items [37]. The aforementioned tests confirm that the measurement model is suitable for the next part of the analysis, the assessment of the structural model.

Table 2. Convergent reliability and validity of the final structural model

Construct (Latent Variable)	Indicators Loadings	Outer (α)	Cronbach's Alpha (CR)	Composite Reliability (AVE)	Average Variance Extracted
Socio-Cultural Environment (X)	X_{42}	0.84			
	X_{43}	0.75			
	X_{44}	0.81			
	X_{53}	0.79			
	X_{55}	0.79			
	X_{67}	0.78			
	X_{69}	0.76			
	X_{72}	0.88			
	X_{82}	0.87			
Cathch (Y_1)	Y_{1110}	0.81	0.90	0.92	0.66
	Y_{1113}	0.77			
	Y_{1115}	0.82			
	Y_{1117}	0.85			
	Y_{115}	0.85			
	Y_{122}	0.78			
Value Added (Y_2)	Y_{2112}	0.72	0.89	0.91	0.52
	Y_{2116}	0.71			
	Y_{212}	0.73			
	Y_{214}	0.74			
	Y_{215}	0.71			
	Y_{222}	0.71			
	Y_{223}	0.71			
	Y_{224}	0.75			
	Y_{226}	0.71			
Welfare of Fishermen's Households (Y_3)	Y_{3111}	0.71	0.87	0.90	0.55
	Y_{3112}	0.77			
	Y_{3211}	0.72			
	Y_{323}	0.70			
	Y_{325}	0.78			
	Y_{327}	0.79			
	Y_{329}	0.74			

Table 3. Fornell-Larcker criteria

	AVE	X	Y1	Y2	Y3
X					
Y1	0.66	0.82	**0.81**		
Y2	0.52	0.76	0.67	**0.72**	
Y3	0.55	0.63	0.53	0.84	**0.74**

4.2.2 Structural model assessment

The PLS-SEM approach determines the extent to which the hypothetical model is maintained and supported by empirical data [38]. This follows the assumption of an abnormal distribution. By conducting an assessment of the structural model, the study estimates the relationship between the constructs or latent variables and estimates the accuracy of the model when carried out in practice. Many parameters were observed for the evaluation of the structural model. These include path coefficients, t-statistics, p-values, effect sizes, coefficients of determination, variance inflation factors, and predictive relevance. Table 4 summarizes the results of the structural model assessment.

The first part of the structural model assessment is testing the research hypothesis. The hypothesis was confirmed by calculating the path coefficients, t-statistics, and p-values for each construct. The path coefficient is the partial correlation coefficient between the dependent and independent variables, adjusted for additional independent variables [39]. In addition, it shows the direct influence of one variable that is considered to be the cause of another variable that is considered to be the effect. A t-statistic is an unchanged value generated from sample data [40]. The t-value represents the magnitude of the difference in terms of variation in the sample data. In particular, the higher the t-value, the greater our confidence in the coefficient as a predictor. The p-value, not the rejection point, is used to determine the smallest level of significance at which the null hypothesis is rejected [41]. Performing statistical values helps determine the significance of the results regarding the null hypothesis. A lower p-value indicates that there is more evidence to support the alternative hypothesis.

Using the SmartPLS software, this can be achieved via nonparametric bootstrap. Bootstrapping is a method of calculating statistical features such as sampling variance, standard error, and confidence intervals without relying on certain assumptions about the shape of the distribution around a given statistic [42]. The bootstrap test is a resampling approach in which a number of subsamples (5000 subsamples are usually recommended) are generated [43]. In this study, bootstrap was also carried out with resampling of 500 repeated subsamples.

The results of the analysis show that the Socio-Cultural Environment (X) is a significant predictor of the catch (Y_1) in the coastal area of West Sumatra (t value = 30.925; p-value = 0.000). This has a strong influence and relationship with the catch (Y_1) with = 0.817. Likewise with the Socio-Cultural Environment (X) which is a significant predictor of value added (Y_2) in the coastal area of West Sumatra (t value = 7.465; p-value = 0.000). This has a strong influence and relationship with value added (Y_2) with = 0.633. And so is the value added (Y_2) which is a significant predictor of the Welfare of Fishermen's Households (Y_3) in the coastal area of West Sumatra (t value = 18.615; p-value = 0.000). This has a strong influence and relationship with the Welfare of Fishermen's Households (Y_3) with = 0.867. However, other constructs such as the Socio-Cultural Environment (X) and Catch (Y_1) have a weak influence on the Welfare of Fishermen's Households (Y_3). Likewise, the catch (Y_1) has a weak influence on the value added (Y_2). Therefore, this study supports H_1, H_2, and H_6 and rejects H_3, H_4, and H_5.

The researchers also identified an R^2 model for calculating the quantity of variation in the dependent construct caused by the independent value. R^2 values of 0.75, 0.50, or 0.25 for the dependent variable were considered as substantial, moderate, and weak values, respectively. The R^2 value for the catch is 0.667 which means that 66.7% of the variance can be predicted by the Socio-Cultural Environment. The R^2 value for the value added is 0.558 which means that 55.8% of the variance can be predicted by the Socio-Cultural Environment. The R^2 value for Fisherman's Household Welfare is 0.713 which means that 71.3% of the variance can be predicted by value added.

Next, the effect size (f^2) evaluates how removing certain predictor constructs affects the R^2 value of endogenous constructs [44]. Furthermore, it shows the significance of the relationship between variables or differences between groups [45]. In general, this reveals the practical importance of the study findings. A large effect size indicates that the research findings have a practical application, while a small effect size indicates that the research findings have limited application. Following [46], the large, medium, and small effect predictors have parameters f^2 0.35, 0.35 > f^2 0.15, and 0.15 > f^2 0.02. As a substantial indicator, the socio-cultural environment greatly affects the catch with f^2 of 2,004. Then the value added greatly affects the welfare of fishermen's households with f^2 of 1,081. Socio-Cultural Environment has a moderate influence on the value added (f^2 = 0.324). The catch has a small effect on the value added with f^2 = 0.020. The catch has a small effect on the Welfare of Fishermen's Households f^2 = 0.008. And the Socio-Cultural Environment has a small effect on the Welfare of Fishermen's Households f^2 = 0.002.

Table 4. Hypothesis testing results

Relationship	H	Path Coefficient (β)	t-statistics	p-value	Test result: Hypothesis	Model R^2	f^2	VIF	Q^2
X → Y1	H_1	0.817	30.925	0.000	Supported	0.667	2.004	1.000	0.433
X → Y2	H_2	0.633	7.465	0.000	Supported	0.588	0.324	3.004	0.290
X → Y3	H_3	0.045	0.548	0.584	Unsupported		0.002	3.976	
Y1 →Y2	H_4	0.157	1.767	0.078	Unsupported		0.020	3.004	
Y1 → Y3	H_5	-0.086	1.218	0.224	Unsupported		0.008	3.063	
Y2 → Y3	H_6	0.867	18.615	0.000	Supported	0.713	1.081	2.425	0.387

Multicollinearity test is the first step in model verification and is carried out to test the extent of correlation between Latent Variables. Multicollinearity was verified with the Variance Inflation Factor (VIF) indicator. According to Torell et al. [47], all VIF values were below 5.0 (<5.0) and were considered an acceptable measure. Multicollinearity is present when the VIF coefficient is higher than 5.0. Therefore, it could be considered problematic according to the rule of thumb. In

this study, the results also stated that the VIF values of the significant predictors ($X \rightarrow Y_1$: VIF =1,000; $X \rightarrow Y_2$: VIF=3,004; and $Y_2 \rightarrow Y_3$: VIF=2,425) were still within acceptable limits. Overall, the largest VIF value was 2.743 ($X \rightarrow Y_3$), and the lowest was 1,000 ($X \rightarrow Y_1$). These results indicate that there is no multicollinearity in each construct.

In addition, the blinding process was also included in the examination to predict the validity of the model. This metric eliminates single points in the data matrix, relates the deleted points to the mean, and estimates model parameters [39]. Weeratunge et al. [48] suggest that the value of Q2 should be greater than zero ($Q2 > 0$) to establish the predictive accuracy of the structural model for a particular endogenous construct. Cross-validated redundancy is applied for Q2 measurements, where $Q2 > 0$ is acceptable. Therefore, the value of Q2 indicates that the endogenous construct is within acceptable limits for the predictive relevance test.

The results of this study confirm the application of Partial Least Equation Structural Equation Modeling in the fisherman household welfare model. The results also highlight the importance of value added in improving the welfare of fishermen's households. Yennita et al. [49] found that, in certain employment status, namely self-employed with workers, fishermen are happier than non-fishers. In addition, we found that fishermen are generally more optimistic in life, because being a fisherman is associated with a positive attitude towards changes in future economic status. Hossain et al. [25] found that increasing the resilience of fishermen contributes to poverty prevention and alleviation.

4.3 How does the socio-cultural environment affect the catch in the coastal areas of West Sumatra?

The results of this study found that the socio-cultural environment had a positive and significant effect on catches in the coastal area of West Sumatra, which means that the better the socio-cultural environment, the higher the catch will be. This result is in line with a study conducted by Cahaya [11], in which they found that there is a relationship between the willingness of households to change fishing strategies when facing a hypothetical 50% reduction in fish catch and adaptive capacity scores.

Based on the findings of this study, the assessment of fishermen's households that have fishing gear in the coastal area of West Sumatra which is the sample in this study has assessed that the socio-cultural environment has an effect of 81.7% on fishing with a positive influence. The indicators that drive this effect are: X4 as having a good job, X5 as being in good health, X6 as having a happy family, X7 as loving and being loved and X8 as achieving the desired goal. If this indicator increases, the catch will also increase.

Meanwhile, another study conducted by Guzman et al. [20] found that all the input factors of the three fishing gears had a significant effect on the catch. The catch as a representation of fixed costs and variable costs also has a significant effect on the total cost of fishing. Motorboats are more productive than outboard motors. In addition, motorized exit boats are more productive and efficient than powerless boats. Therefore, this study recommends the fishing community to make changes and development of fishing gear from unpowered boats to motorized outboard boats. Furthermore, the local government is expected to make a credit program for fishing businesses in the form of credit for the purchase of motorized boats or subsidies for the price of motorized exit boats vessels.

4.4 How does the socio-cultural environment affect value added in the coastal areas of West Sumatra?

The results of this study found that the socio-cultural environment had a positive and significant effect on value added in the coastal areas of West Sumatra. This illustrates that the better the socio-cultural environment, the higher the value added. This result is in line with research conducted by Kim [31], which found that resource systems with enforced rules and strong monitoring systems usually have more predictable resource abundance, which can provide economic and social benefits to communities local.

Based on the research findings, it was found that the assessment of fishermen's households that have fishing gear in the coastal area of West Sumatra which was sampled in this study assessed that the socio-cultural environment had an effect of 63.3%, which had a positive impact. The indicators that drive this effect are: X_4 as having a good job, X_5 as being in good health, X_6 as having a happy family, X_7 as loving and being loved and X_8 as achieving desired goals. If the indicator increases, then the value added will also increase.

Meanwhile another study conducted by Hossain et al. [26], in which they found that holothurians require special regulations that consider biology and ecology. Their behavior in groups and forming patches as a strategy for foraging, survival, and breeding, makes them vulnerable to overfishing. The higher the population density, the higher the catchability coefficient, it is clear that the results of this study are novel, that the socio-cultural environment has a positive and significant effect on value added.

4.5 How does socio-cultural environment affect the welfare of fishermen's households in the coastal areas of West Sumatra?

The results of this study found that the socio-cultural environment had no significant effect on the welfare of fishermen's households in the coastal areas of West Sumatra. However, the effect is still there even though it is small, which is 4.5% with a positive influence direction. The driving indicators are: X_4 as having a good job, X_5 as being in good health, X_6 as having a happy family, X_7 as loving and being loved and X_8 as achieving the desired goals.

This result is consistent with research conducted by Anna et al. [5] which found that fishermen are generally more optimistic in life because their work is associated with positive attitudes towards future changes in economic status. Meanwhile, another study conducted by Lein and Setiawina [33] found that the potential of fishery resources can actually be utilized to increase income which is expected to improve the welfare of fishermen's households.

4.6 How does the catch affect the value added in the coastal areas of West Sumatra?

The results of this study found that the catch had no significant effect on value added in the coastal area of West Sumatra. However, the effect is still there although it is small at 15.7%, which is a positive impact. This illustrates that the higher the catch, the higher the value added. These results are in line with research conducted by McCain [35] which explains how this framework supports the development of science-based sourcing criteria and how it differs from the industrial approach that historically and currently forms the

basis for most fish management.

Based on the findings of this study, it can be said that the assessment of fisherman households who own fishing gear in the coastal areas of West Sumatra which is the sample in this study assesses that the catch does not have a significant effect on value added, but the effect is still there even though it is small at 15.7%, which has a positive effect on h. The influencing indicators are: Y_{11} as catch type and Y_{12} as catch characteristics. If these indicators increase, then the value added will also increase even though the effect is small or insignificant.

While, another study conducted by Hair et al. [22], they found that cooperative institutions are the best alternative to accommodate the marketing of fishery products to strengthen the bargaining position of fishermen. Capture fisheries efficiency is still low, which is influenced by simple fishing equipment. Based on this explanation, the results of this study found novelty, in which the catch did not have a significant effect on value added.

4.7 How does the catch affect the welfare of fishermen's households in the coastal areas of West Sumatra?

The results of this study found that the catch had no significant effect on the welfare of fishermen's households in the coastal area of West Sumatra. However, the effect is still there but is small at -8.6%, which is a negative effect. This illustrates that the higher the catch, the lower the welfare of fishermen's households. These results are inconsistent with research conducted by Fornell and Larcker [17], in which they found that the power dynamics built into the design of the West Alaska Community Development Quota program have important consequences for community well-being and that future development programs in fisheries management could benefit from a better understanding of socio-cultural concepts such as welfare. Based on the findings of this study, it can be said that the assessment of fishermen households who own fishing gear in the coastal areas of West Sumatra which is the sample in this study assesses that the catch does not have a significant effect on the welfare of fishermen's households. The influencing indicators are: Y_{11} as catch type and Y_{12} as catch characteristics. If these indicators increase, the welfare of fishermen's households will decrease, although the effect is small or insignificant.

While, another study conducted by Karl et al. [29] found local baseline data on the potential utility of equipment restriction as a management tool. In particular, managers can monitor coral reefs and reduce hand-line when fish-eating fish are low and use spearguns when species diversity is low or algae abundance is high. If it becomes more desirable to apply an ecosystem approach to management that is adaptive to changing ecological and social conditions, this indicator can be used as a starting point along with the local management preferences of fishers.

4.8 How does value added affect the welfare of fishermen's households in the coastal areas of West Sumatra?

The results of this study found that value added has a positive and significant effect on the welfare of fishermen's households in the coastal area of West Sumatra. This illustrates that the higher the value added, the higher the welfare of fishermen's households. This result is in line with research conducted by Muflikhati et al. [40], they found that manufacturing companies with higher employee welfare have better innovation performance, which is measured by three categories of patent applications and this positive relationship reflected in the level of quality of innovation, but not in quantity. Then, various further studies found that alternative measures of innovation performance or employee welfare through different regression methods. In addition, another analysis shows that the positive impact of employee welfare on innovation performance in Chinese manufacturing companies is mainly achieved by retaining outstanding employees, attracting positive media reports, and increasing inventor (R&D) efficiency.

Based on the findings of this study, it is known that the assessment of fishermen's households that have fishing gear in the coastal area of West Sumatra which is the sample in this study assesses that value added has a significant effect of 86.7% on the welfare of fishermen's households, which has a positive effect. The influencing indicators are: Y_{21} as the value added of the main catch and Y_{22} as the value added of the bycatch. If these two indicators increase, the welfare of fishermen's households will also increase. While, another study conducted by Hossain et al. [26], found that bidder defaults can cause social welfare losses in two ways, namely the possibility of no trade and less balanced bidder participation.

5. CONCLUSION

Based on the analysis that has been done, this study has several important conclusions. First, the influence of socio-cultural environment on the catch in the coastal area of West Sumatra has an original sample value of 0.817 and P-Values < 0.05, so there is a direct influence of the socio-cultural environment on the catch of 81.7%. This influence is positive, which means that the better socio-cultural environment will increase of catch.

Second, the influence of socio-cultural environment on value added in the coastal area of West Sumatra has an original sample value of 0.633 and P-Values < 0.05, so there is a direct influence between the socio-cultural environment on value added of 63.3%. This influence is positive, which means that the better of socio-cultural environment will increase of value added.

Third, the effect of value added on welfare of fishermen's households in the coastal area of West Sumatra has an original sample value of 0.867 and P-Values < 0.05, so there is a direct effect of value added on fishermen's household welfare of 86.7%. This influence is positive, which means that the better of value added will increase of welfare of the fishermen's households.

Fourth, the main determining factor for improving the welfare of fishermen's households in the Coastal West Sumatra is value added.

This study provides research recommendations to the government in West Sumatra based on the main determinants that improve the welfare of fishermen's households through added value. The government needs to develop processing technology as an important factor in the implementation of the fisheries-based food industry downstream program. Furthermore, the government needs to increase partnerships with relevant agencies and the business world to build integration between the upstream and downstream sides as an effort to increase the guarantee of the supply of raw materials

as well as guarantee the quality and safety of the fish processing industry products. Then, the government needs to create a conducive business climate through harmonization of import duty rates between upstream and downstream for marine products, as well as increasing the added value of fishery products through the provision of ice factories and cooling units to increase the shelf life of raw materials in fresh form and as buffer stock when production is abundant.

REFERENCES

[1] Adry, M.R., Putri, D.Z. (2019). Socio-economic status of fishermen's household in West Sumatra province. In 2nd Padang International Conference on Education, Economics, Business and Accounting (PICEEBA-2 2018), pp. 1022-1033. https://doi.org/10.2991/piceeba2-18.2019.128

[2] Aldashev, G., Platteau, J.P. (2014). Religion, culture, and development. In Handbook of the Economics of Art and Culture, 2: 587-631. https://doi.org/10.1016/B978-0-444-53776-8.00021-0

[3] Anggadwita, G., Luturlean, B.S., Ramadani, V., Ratten, V. (2017). Socio-cultural environments and emerging economy entrepreneurship: Women entrepreneurs in Indonesia. Journal of Entrepreneurship in Emerging Economies, 9(1): 85-96. https://doi.org/10.1108/JEEE-03-2016-0011

[4] https://sumbar.bps.go.id/, accessed on May 15, 2022.

[5] Anna, Z., Yusuf, A.A., Alisjahbana, A.S., Ghina, A.A. (2019). Are fishermen happier? Evidence from a large-scale subjective well-being survey in a lower-middle-income country. Marine Policy, 106: 103559. https://doi.org/10.1016/j.marpol.2019.103559

[6] Arnold, R.A. (2019). Microeconomics (Thirteenth). Cengage Learning, Inc.

[7] Baye, M.R., Prince, J., Squalli, J. (2006). Managerial Economics and Business Strategy, 5: New York: McGraw-Hill. https://doi.org/10.1080/00137915908965078

[8] Bogomaz, S., Kozlova, N., Atamanova, I. (2015). University students' personal and professional development: The socio-cultural environment effect. Procedia - Social and Behavioral Sciences, 214: 552-558. https://doi.org/10.1016/j.sbspro.2015.11.759

[9] Borjas, G.J. (2016). Does welfare reduce poverty? Research in Economics, 70(1): 143-157. https://doi.org/10.1016/j.rie.2015.11.002

[10] Brauer, M., Behrens, J.W., Christoffersen, M., Hyldig, G., Jacobsen, C., Björnsdottir, K.H., van Deurs, M. (2020). Seasonal patterns in round goby (Neogobius melanostromus) catch rates, catch composition, and dietary quality. Fisheries Research, 222: 105412. https://doi.org/10.1016/j.fishres.2019.105412

[11] Cahaya, A. (2015). Fishermen community in the coastal area: A note from Indonesian poor family. Procedia Economics and Finance, 26: 29-33. https://doi.org/10.1016/S2212-5671(15)00801-1

[12] Çakıt, E., Olak, A.J., Karwowski, W., Marek, T., Hejduk, I., Taiar, R. (2020). Assessing safety at work using an adaptive neuro-fuzzy inference system (ANFIS) approach aided by partial least squares structural equation modeling (PLS-SEM). International Journal of Industrial Ergonomics, 76: 102925. https://doi.org/10.1016/j.ergon.2020.102925

[13] Cerin, E., Sit, C.H., Zhang, C.J., Barnett, A., Cheung, M.M., Lai, P.C., Lee, R.S. (2016). Neighbourhood environment, physical activity, quality of life and depressive symptoms in Hong Kong older adults: A protocol for an observational study. BMJ Open, 6(1): e010384. http://dx.doi.org/10.1136/bmjopen-2015-010384

[14] Cohen, J. (1988). Set correlation and contingency tables. Applied Psychological Measurement, 12(4): 425-434. https://doi.org/10.1177/014662168801200410

[15] Datta, S. (2015). Prospects of value added fish products & it's future in Indian market. Research Gate. https://doi.org/10.13140/RG.2.1.3911.1525

[16] Di Leo, G., Sardanelli, F. (2020). Statistical significance: p value, 0.05 threshold, and applications to radiomics-reasons for a conservative approach. European Radiology Experimental, 4(1): 1-8. https://doi.org/10.1186/s41747-020-0145-y

[17] Fornell, C., Larcker, D.F. (1981). Evaluating structural equation models with unobservable variables and measurement error. Journal of Marketing Research, 18(1): 39-50. https://doi.org/10.1177/002224378101800104

[18] Gallagher, J.E., Wilkie, A.A., Cordner, A., Hudgens, E.E., Ghio, A.J., Birch, R.J., Wade, T.J. (2016). Factors associated with self-reported health: Implications for screening level community-based health and environmental studies. BMC Public Health, 16(1): 1-15. https://doi.org/10.1186/s12889-016-3321-5

[19] Gkargkavouzi, A., Halkos, G., Matsiori, S. (2019). Environmental behavior in a private-sphere context: Integrating theories of planned behavior and value belief norm, self-identity and habit. Resources, Conservation and Recycling, 148: 145-156. https://doi.org/10.1016/j.resconrec.2019.01.039

[20] Guzman, J., Recoco, G.A., Padrones, J.M., Ignacio, J.J. (2022). Evaluating workplace safety in the oil and gas industry during the COVID-19 pandemic using occupational health and safety Vulnerability Measure and partial least square Structural Equation Modelling. Cleaner Engineering and Technology, 6: 100378. https://doi.org/10.1016/j.clet.2021.100378

[21] Hair, J.F., Sarstedt, M., Ringle, C.M., Mena, J.A. (2012). An assessment of the use of partial least squares structural equation modeling in marketing research. Journal of the Academy of Marketing Science, 40(3): 414-433. https://doi.org/10.1007/s11747-011-0261-6

[22] Hair Jr, J.F., Sarstedt, M., Hopkins, L., Kuppelwieser, V.G. (2014). Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research. European Business Review, 26(2): 106-121. https://doi.org/10.1108/EBR-10-2013-0128

[23] Hair, J.F., Risher, J.J., Sarstedt, M., Ringle, C.M. (2019). When to use and how to report the results of PLS-SEM. European Business Review, 31(1): 2-24. https://doi.org/10.1108/ EBR-11-2018-0203

[24] Hair, J.F., Sarstedt, M., Ringle, C.M. (2019). Rethinking some of the rethinking of partial least squares. European Journal of Marketing, 53(4): 566-584. https://doi.org/10.1108/EJM- 10-2018-0665

[25] Hossain, M.S., Johnson, F.A., Dearing, J.A., Eigenbrod, F. (2016). Recent trends of human wellbeing in the Bangladesh delta. Environmental Development, 17: 21-

32. https://doi.org/10.1016/j.envdev.2015.09.008
[26] Hossain, S., Anjum, A., Uddin, M.E., Rahman, M.A., Hossain, M.F. (2019). Impacts of socio-cultural environment and lifestyle factors on the psychological health of university students in Bangladesh: A longitudinal study. Journal of Affective Disorders, 256: 393-403. https://doi.org/10.1016/j.jad.2019.06.001
[27] Ignacio, J.J., Malenab, R.A., Pausta, C.M., Beltran, A., Belo, L., Tanhueco, R.M., Orbecido, A. (2019). A perception study of an integrated water system project in a water scarce community in The Philippines. Water, 11(8): 1593. https://doi.org/10.3390/w11081593
[28] Kant, S., Vertinsky, I., Zheng, B. (2016). Valuation of First Nations peoples' social, cultural, and land use activities using life satisfaction approach. Forest Policy and Economics, 72: 46-55. https://doi.org/10.1016/j.forpol.2016.06.014
[29] Massaquoi, B., Roberts, N.J., Tian, G. (2021). Marine fishing management towards sustainability in Sierra Leone. International Journal of Sustainable Development and Planning, 16(5): 935-944. https://doi.org/10.18280/ijsdp.160514
[30] Kaya, B., Abubakar, A.M., Behravesh, E., Yildiz, H., Mert, I.S. (2020). Antecedents of innovative performance: Findings from PLS-SEM and fuzzy sets (fsQCA). Journal of Business Research, 114: 278-289. https://doi.org/10.1016/j.jbusres.2020.04.016
[31] Kim, T.K. (2015). T test as a parametric statistic. Korean Journal of Anesthesiology, 68(6): 540-546. https://doi.org/10.4097/kjae.2015.68.6.540
[32] Kubiszewski, I. (2018). The genuine progress indicator: A measure of net economic welfare. Encyclopedia of Ecology 2018, 327-35. https://doi.org/10.1016/B978-0-12-409548-9.10609-8
[33] Lein, A.A., Setiawina, N.D. (2018). Factors affecting the fishermen household income and welfare. International research journal of management, IT and social sciences, 5(4): 80-90. https://doi.org/10.21744/IRJMIS.V5N4.266
[34] Maya-Jariego, I., Querevalú-Miñán, J.F., Varela, L.G., Ávila, J. (2017). Escape the lion cage: Social networks by catch zones of small-scale fisheries in the oil settlement of Lobitos (Peru). Marine Policy, 81: 340-349. https://doi.org/10.1016/j.marpol.2017.04.010
[35] McCain, R.A. (2019). Welfare Economics: An Interpretive History. In Davis, J.B. (Ed.), Routledge Advances in Social Economics.
[36] Quynh, C.N.T., Schilizzi, S., Hailu, A., Iftekhar, S. (2018). Fishers' preference heterogeneity and trade-offs between design options for more effective monitoring of fisheries. Ecological Economics, 151: 22-33. https://doi.org/10.1016/j.ecolecon.2018.04.032
[37] Palese, A., Grassetti, L., Bressan, V., Decaro, A., Kasa, T., Longobardi, M., Watson, R. (2019). A path analysis on the direct and indirect effects of the unit environment on eating dependence among cognitively impaired nursing home residents. BMC Health Services Research, 19(1): 1-14. https://doi.org/10.1186/s12913-019-4667-z
[38] Putri, R.A., Eriyanti, F. (2020). Empowerment of fishermen communities in fish processing businesses in pesisir selatan district (study: In nagari pasia pelangai ranah pesisir district). In International Conference on Public Administration, Policy and Governance (ICPAPG 2019), 209-215. https://doi.org/10.2991/aebmr.k.200305.201
[39] Rigdon, E.E. (2014). Rethinking partial least squares path modeling: breaking chains and forging ahead. Long Range Planning, 47(3): 161-167. https://doi.org/10.1016/j. lrp.2014.02.003
[40] Muflikhati, I., Fatchiya, A., Kinseng, R., Oktariza, W., Herawati, T., Purnomo, S., Arifianto, R. (2015). Analisis Kesejahteraan Rumah Tangga Usaha Perikanan. (S. Sutomo & H. Marhaeni, Eds.; BUKU 6). Badan Pusat Statistik.
[41] Stanford, R.J., Wiryawan, B., Bengen, D.G., Febriamansyah, R., Haluan, J. (2017). The fisheries livelihoods resilience check (FLIRES check): A tool for evaluating resilience in fisher communities. Fish and Fisheries, 18(6): 1011-1025. https://doi.org/10.1111/faf.12220
[42] Amar, S., Satrianto, A., Ariusni, Kurniadi, A.P. (2022). Determination of poverty, unemployment, economic growth, and investment in West Sumatra province. International Journal of Sustainable Development and Planning, 17(4): 1237-1246. https://doi.org/10.18280/ijsdp.170422
[43] Sullivan, G.M., Feinn, R. (2012). Using effect size-or why the P value is not enough. Journal of Graduate Medical Education, 4(3): 279-282. https://doi.org/10.4300/JGME-D-12-00156.1
[44] Sun, L., Ji, S., Ye, J. (2018). Partial least squares. In: Multi-Label Dimensionality Reduction. https://doi.org/10.1201/b16017-6
[45] Tanko, M. (2020). Is farming a belief in Northern Ghana? Exploring the dual-system theory for commerce, culture, religion and technology. Technology in Society, 63: 101339. https://doi.org/10.1016/j.techsoc.2020.101339
[46] Todaro, M.P., Smith, S.C. (2020). Economic Development Thirteenth Edition (D. Battista & D. Alexander, Eds.; Twelfth Ed). Pearson Education, Inc. https://books.google.co.id/books?hl=en&lr=&id=UeksEAAAQBAJ&oi=fnd&pg=PT22&dq=Economic+Development+TODARO&ots=kfAepxRG-F&sig=GceuiJda8ASJabfdpKMqOwIUQTQ&redir_esc=y#v=onepage&q=Economic%20Development%20TODARO&f=false.
[47] Torell, E.C., Jamu, D.M., Kanyerere, G.Z., Chiwaula, L., Nagoli, J., Kambewa, P., Freeman, P. (2020). Assessing the economic impacts of post-harvest fisheries losses in Malawi. World Development Perspectives, 19: 100224. https://doi.org/10.1016/j.wdp.2020.100224
[48] Weeratunge, N., Béné, C., Siriwardane, R., Charles, A., Johnson, D., Allison, E.H., Badjeck, M.C. (2014). Small-scale fisheries through the wellbeing lens. Fish and Fisheries, 15(2): 255-279. https://doi.org/10.1111/faf.12016
[49] Yennita, Mardison, E., Kanzu Satrio, M. (2020). Indikator Kesejahteraan Rakyat Provinsi Sumatera Barat (Hefinanur, I. Teguh Raharto, L. Sriyeni, & Deswaty, Eds.). Badan Pusat Statistik Provinsi Sumatera Barat. https://sumbar.bps.go.id/publication/2021/11/30/c586141579b9bc935a9421fe/indikator-kesejahteraan-rakyat-provinsi-sumatera-barat-2021.html.

APPENDIX

Table 5. Variable, item, and statement

Variable	Item	Statement
Socio-Cultural Environment (X)	X_{11}	I appreciate the efforts of friends while at sea.
	X_{12}	I allow my friends to go to sea using the fishing gear I have.
	X_{13}	I respect the opinion of fellow fishermen.
	X_{14}	I gave permission to a friend who could not go to sea.
	X_{15}	I received the division of labor while at sea.
	X_{16}	I believe leaving home, I will be safe when I work.
	X_{17}	I believe that other communities will help people who are in trouble.
	X_{18}	I trust local leaders (village heads, community leaders in the village).
	X_{21}	I get the division of tasks during the fishing process.
	X_{22}	I have a division of labor as a capital owner with fishing workers.
	X_{23}	As a mustard, I have a strong loyalty and bond of solidarity with the courtier.
	X_{24}	I always establish mutually beneficial cooperation to get prosperity and a decent life for myself and the fishing community.
	X_{25}	I always help in repairing broken boats and repairing torn nets.
	X_{26}	I have a very high solidarity in terms of helping each other and helping each other.
	X_{27}	I always maintain trust between friends and courtiers.
	X_{28}	I always respect and respect my fellow fisherman as a fisherman.
	X_{29}	I always get along with my friends as a fisherman.
	X_{210}	I always help and work together in my daily life as a fisherman.
	X_{211}	I am always open with my work relatives as a fisherman.
	X_{212}	I always maintain good relations with fellow fishermen.
	X_{31}	I always try to interact with more experienced fishing communities, so that I can gain knowledge to find more catches.
	X_{32}	I always try to interact well with people outside my home area, so that I have the opportunity to work together in catching fish.
	X_{33}	I followed a group of fishermen so that the price of my catch would be higher.
	X_{34}	I feel my income has increased after joining a fishing group.
	X_{35}	I always get help when I have an accident or need help.
	X_{36}	I have good relationships with fellow fishermen, so I get information about toke that offer higher catch prices.
	X_{37}	My neighbors always help me to look after the children at home while I go fishing in the sea.
	X_{38}	I always visit and stay in touch with friends who are in the location where I live.
	X_{39}	I always give help in various forms, to neighbors, friends or to a family member.
	X_{310}	I feel part of the community around where I live.
	X_{311}	I feel part of a fishing group.
	X_{312}	I have friends outside of my residence who are related to my work as a fisherman.
	X_{41}	I am happy with my job as a fisherman.
	X_{42}	I am not happy with my job as a fisherman.
	X_{43}	I don't like working as a fisherman because it doesn't live up to my own expectations.
	X_{44}	I am not happy with the responsibilities that come with my job as a fisherman.
	X_{45}	I am happy as a fisherman because according to my ability.
	X_{46}	I am happy as a fisherman because it is in accordance with my experience.
	X_{47}	I enjoy working with colleagues who provide me with sufficient support as a fisherman.
	X_{48}	I enjoy working with colleagues who help each other complete the work as a fisherman.
	X_{49}	I enjoy working with colleagues who are responsible for their work as a fisherman.
	X_{410}	I enjoy working with colleagues who have high work motivation as fishermen.
	X_{411}	I enjoy working with colleagues who can provide solutions when there is a problem at sea.
	X_{412}	I enjoy working with colleagues who can create a harmonious working atmosphere with each other while at sea.
	X_{51}	I always carry clean water with me when I go to sea.
	X_{52}	I always carry drinking water with me when I go to sea.
	X_{53}	I don't bring drinking water when I go to sea.
	X_{54}	I wash my hands when I want to eat when I go to sea.
	X_{55}	I don't wash my hands when I want to eat when I go to sea.
	X_{56}	I use the toilet when I go to sea.
	X_{57}	I don't use the toilet when I go to sea.
	X_{58}	I take food with me when I go to sea.
	X_{59}	I don't smoke either when I go to sea or not.
	X_{510}	Smoking is harmful to my health as a fisherman.
	X_{511}	I carry a trash can when I go to sea.
	X_{61}	I as a fisherman remain united to maintain my marriage.
	X_{62}	As a fisherman, I make expectations that are planned before the wedding so that after marriage it becomes a mutual agreement in a reality.
	X_{63}	As a fisherman, I always try to maintain the harmony of my household.
	X_{64}	I as a fisherman try to implement good communication in my household.
	X_{65}	As a fisherman, I properly resolve the misunderstandings that occur in fostering my household.
	X_{66}	I as a fisherman take special time to be with my family.

	X_{67}	As a fisherman, I don't take special time to be with my family.
	X_{68}	As a fisherman, I am able to overcome all the obstacles that occur in my household.
	X_{69}	As a fisherman, I am not able to go through all the obstacles that occur in my household.
	X_{610}	As a fisherman, I always fulfill my family's food needs.
	X_{611}	As a fisherman, my family's health is the main choice.
	X_{71}	As a fisherman, I can understand fellow fishermen.
	X_{72}	As a fisherman, I cannot understand fellow fishermen.
	X_{73}	I as a fisherman must be honest.
	X_{74}	I as a fisherman must be cheerful.
	X_{75}	As a fisherman, I must be able to control myself.
	X_{76}	As a fisherman, I have to adapt easily to the situation.
	X_{77}	I as a fisherman must always try to please.
	X_{78}	I as a fisherman can accept my mistakes without feeling hurt or angry.
	X_{79}	As a fisherman, I have a family who helps me in dealing with any difficulties.
	X_{710}	As a fisherman, I have happy family members.
	X_{711}	I as a fisherman treat my family as it should be.
	X_{712}	As a fisherman, I can understand the family as it should be.
	X_{713}	As a fisherman, I really care about my family.
	X_{714}	I as a fisherman like to make friends.
	X_{715}	As a fisherman, I try to understand the views and opinions of others.
	X_{716}	As a fisherman, I try to see the good in everyone I meet.
	X_{717}	As a fisherman, I easily adapt to other people.
	X_{81}	I produce good quality work as a fisherman.
	X_{82}	I did not produce good quality work as a fisherman.
	X_{83}	I fulfill the work target that has been set as a fisherman.
	X_{84}	I can complete all the work that is my responsibility as a fisherman.
	X_{85}	I often help colleagues in completing work so that they can achieve their desired goals as a fisherman.
	X_{86}	I have always believed in the work I do as a fisherman.
	X_{87}	In any situation, I am sure that I can complete my job as much as possible as a fisherman.
	X_{88}	I feel responsible for my work as a fisherman.
	X_{89}	I feel that the work I produce is maximal and in accordance with my abilities as a fisherman.
	X_{91}	I can't believe that one day I can live happily as a fisherman.
	X_{92}	I like to do introspection on what I do as a fisherman.
	X_{93}	I want to make the people I love happy as fishermen.
	X_{94}	What I aspire to achieve in the future as a fisherman.
	X_{95}	My family motivates me to be successful in achieving what I want as a fisherman.
	X_{96}	I am sure that with maximum effort, my dreams will be achieved as a fisherman.
	X_{97}	I am sure that I will be successful in the future as a fisherman.
	X_{98}	I find out what it takes to achieve a better future as a fisherman.
	X_{99}	I set a target to be achieved in the near future as a fisherman.
	X_{910}	In my opinion, planning is the beginning of success as a fisherman.
	X_{911}	I am satisfied with the efforts I have made as a fisherman.
	X_{912}	I understand the meaning of my life as a fisherman.
	X_{913}	I have beliefs that make my life meaningful as a fisherman.
	X_{914}	I have found a clear purpose in life as a fisherman.
	X_{915}	I feel happy for the position in society that has been achieved as a fisherman.
	X_{916}	I feel happy for what I have gained materially as a fisherman.
	X_{917}	I have a view about the purpose of life to improve the family's economy as a fisherman.
	X_{918}	Feeling valued by the community within the group and outside the group as a fisherman.
Catch (Y_1)	Y_{111}	The type of fish I will catch depends on the type of fishing gear I use.
	Y_{112}	The type of fish I will catch does not match the type of fishing gear I use.
	Y_{113}	I made preparations before leaving for the fishing grounds.
	Y_{114}	I checked my fishing gear before leaving for the fishing area.
	Y_{115}	I did not check the fishing gear before leaving for the fishing area.
	Y_{116}	I checked the condition of the engine before leaving for the fishing area.
	Y_{117}	I prepared fuel before leaving for the fishing grounds.
	Y_{118}	I prepared the catch box before leaving for the fishing area.
	Y_{119}	I prepared supplies before leaving for the fishing grounds.
	Y_{1110}	I did not prepare supplies before leaving for the fishing grounds.
	Y_{1111}	I determine where to fish based on the information I receive.
	Y_{1112}	I determine where to fish based on my previous catch experience.
	Y_{1113}	Fishing operations I do 5 hours a day.
	Y_{1114}	I did a catch split by catch type.
	Y_{1115}	I don't do catch splits.
	Y_{1116}	I did a catch split based on the main catch type.
	Y_{1117}	I threw into the sea my bycatch.
	Y_{121}	My catch really depends on the weather.
	Y_{122}	My catch is very independent of the weather.
	Y_{123}	My catch doesn't go bad.
	Y_{124}	When the weather is bad I don't go to sea.
	Y_{125}	My catch depends on the location of the catch.

	Y_{126}	When I go to sea, I carry a fish storage area.
	Y_{131}	I go to sea using an outboard motor.
	Y_{132}	I go to sea using a motor boat.
	Y_{133}	I pay for fuel every time I go to sea.
	Y_{134}	I pay for supplies every time I go to sea.
	Y_{135}	My catch corresponds to the length of time I used to go to sea.
	Y_{136}	The experience I have, can help me in catching fish.
	Y_{137}	The increase in my knowledge and skills will affect my catch.
	Y_{138}	I have good and comprehensive mastery of work and equipment in catching fish.
	Y_{139}	The income I get is really the result of going to sea.
	Y_{1310}	I always save the excess income from the cost of living for me and my family.
	Y_{1311}	My income increased when I joined the fishing group.
	Y_{1312}	The quality of my catch affects the income I earn.
	Y_{1313}	My income increases when the price of fish in the market increases.
Value Added (Y_2)	Y_{211}	I really understand the equipment that I use/I use to process fish.
	Y_{212}	The business I have for fish processing comes from my own capital.
	Y_{213}	I got a loan from the financing party (bank, cooperative) for fish processing.
	Y_{214}	The business that I own for fish processing comes from joint capital.
	Y_{215}	My business for fish processing comes from other people's capital (friends, family, relatives).
	Y_{216}	The fish processing income I receive is in accordance with the length of time I use.
	Y_{217}	The experience I have, can help me in processing fish.
	Y_{218}	Increased knowledge and work skills will affect work experience in fish processing.
	Y_{219}	I have good and comprehensive mastery of work and equipment in fish processing.
	Y_{2110}	My income from fish processing can meet the daily needs of me and my family.
	Y_{2111}	The income I get is really the result of fish processing.
	Y_{2112}	The income I earn from fish processing can be used to save money and pay for my children's school fees.
	Y_{2113}	If the income from fish processing that I get increases, then part of the proceeds is used to buy an item that can be invested.
	Y_{2114}	I earn more from fish processing, so I will help lend capital to fishermen in need.
	Y_{2115}	My income from fish processing increased when I joined the fish processing group.
	Y_{2116}	The quality of skipjack fish processing results in an effect on the income obtained.
	Y_{2117}	If my income from processing skipjack tuna increases, my family needs will also increase.
	Y_{2118}	My income increases when the price of fish processing in the market increases.
	Y_{221}	I really understand the equipment that I use/I use to process fish.
	Y_{222}	The business I have for fish processing comes from my own capital.
	Y_{223}	The business that I own for fish processing comes from joint capital.
	Y_{224}	My business for fish processing comes from other people's capital (friends, family, relatives).
	Y_{225}	The fish processing income I receive is in accordance with the length of time I use.
	Y_{226}	The experience I have, can help me in processing fish.
	Y_{227}	Increased knowledge and work skills will affect work experience in fish processing.
	Y_{228}	I have good and comprehensive mastery of work and equipment in fish processing.
	Y_{229}	My income from fish processing can meet the daily needs of me and my family.
	Y_{2210}	The income I get is really the result of fish processing.
	Y_{2211}	The income I earn from fish processing can be used to save money and pay for my children's school fees.
	Y_{2212}	If the income from fish processing that I get increases, then part of the proceeds is used to buy an item that can be invested.
	Y_{2213}	I earn more from fish processing, so I will help lend capital to fishermen in need.
	Y_{2214}	My income from fish processing increased when I joined the fish processing group.
	Y_{2215}	The quality of skipjack fish processing results in an effect on the income obtained.
	Y_{2216}	If my income from processing skipjack tuna increases, my family needs will also increase.
	Y_{2217}	My income increases when the price of fish processing in the market increases.
Fisherman's Household Welfare (Y_3)	Y_{311}	The selling price of the fish I determine according to the size and size.
	Y_{312}	I set the selling price of fish according to its quality.
	Y_{313}	The selling price of my fish is determined according to the number of catches.
	Y_{314}	The selling price of fish, I sell varies.
	Y_{315}	The experience that I have, can help me in determining the selling price of fish.
	Y_{316}	I sell fish at an unstable selling price.
	Y_{317}	I sell fish at different prices in each marketing channel.
	Y_{318}	I sell fish at a higher selling price if the catch is small.
	Y_{319}	I sell fish at a higher selling price if the quality is good.
	Y_{3110}	I sell fish at a lower selling price if the quality is not good.
	Y_{3111}	Buyers are happy if the selling price of my fish is set lower.
	Y_{3112}	Buyers are disappointed if the selling price of my fish is set more expensive.
	Y_{3113}	I am happy if the selling price of fish is more expensive.
	Y_{321}	The selling price of the fish I determine according to the size and size.
	Y_{322}	I set the selling price of fish according to its quality.
	Y_{323}	The selling price of my fish is determined according to the number of catches.
	Y_{324}	The selling price of fish, I sell varies.
	Y_{325}	The experience that I have, can help me in determining the selling price of fish.
	Y_{326}	I sell fish at an unstable selling price.

Y_{327}	I sell fish at different prices in each marketing channel.
Y_{328}	I sell fish at a higher selling price if the quality is good.
Y_{329}	I sell fish at a lower selling price if the quality is not good.
Y_{3210}	Buyers are happy if the selling price of my fish is set lower.
Y_{3211}	Buyers are disappointed if the selling price of my fish is set more expensive.
Y_{3212}	I am happy if the selling price of fish is more expensive.