

# The role of trust mediation in the effect of business capital, production factors and government support on the marine fish supply chain performance, in Inhil Riau, Indonesia

Eni Yulinda, Ridar Hendri, Clara Yolandika

Department of Fisheries Socio-economics, Faculty of Fisheries and Marine, Riau University, Pekanbaru, Indonesia. Corresponding author: E. Yulinda, eni.yulinda@lecturer.unri.ac.id

**Abstract.** Indragiri Hilir (Inhil) Regency is one of the most promising capture fisheries production centers in Riau Province, Indonesia, because it is close to the South China Sea. Most of the marine fish production is exported to Singapore and Malaysia. However, the sustainability of exports is heavily reliant on the availability of fish stocks. The majority of Inhil fishermen have small capitals and are dispersed throughout the outer islands, which have limited infrastructure. The continuity of their business is highly dependent on the *tauke* (Indonesian citizen financiers of Chinese descent), and their relationship is established on the basis of trust. The research aimed to analyze the role of trust mediation in the effect of business capital, production factors, and government support on the marine fish supply chain performance, in Indragiri Hilir Riau, Indonesia. Respondents were determined to be 95 out of 5,563 fishers spread across four districts in Indragiri Hilir, each of Tanah Merah, Sei Batang, Kuala Indragiri, and Mandah. Respondents were determined using the Sample Size Calculator method with a 95% confidence level and a 10% margin of error, while the collection of respondents was carried out purposefully and proportionally in the sub-districts. Data collection used a closed questionnaire, containing statements about variables. Respondents' answers were measured with a 5-point Likert scale, consisting of: strongly disagree (1), disagree (2), undecided (3), agree (4), and strongly agree (5). Data analysis was based on the Structural Equation Modelling (SEM) method, using the Smart-PLS software. Business capital has a direct effect on the performance of the fish supply chain (SC) in Inhil, but through the mediation of trust it has an effect. Production factors have a direct effect on the performance of SC fish, but through mediation, trust has no effect. Government support, both directly and through mediation, has a positive and significant effect on fish SCM in Inhil.

**Key Words:** fisherman, fishing industry, supply chain management, traditional fishing

**Introduction.** Business capital determines the success of fishers. The greater the capital, the greater the fishing business' flexibility (Dobroszek 2020). Fishers who dispose of a large capital generally have boats and fishing gear with a higher capacity, generating a higher productivity (Ruswanty et al 2019). But production factors (e.g. number of boats, fishing gear and human resources) also affect the level of fish production (Dirja & Faturrohman 2019). Due to fishers' poverty in Indonesia it is difficult for them to access the capital, which can be overcome through the role of government support. The smooth running of fishers' businesses in Indonesia is also highly dependent on large investors (*tauke*). The *tauke* is an entity in the fishing industry, which acts as a financier, collector, and distributor, at the same time. They are the ones who lend capital and cover the operational costs, without interests and collaterals, to fishers before going to sea (Yulinda et al 2021b). However, fishers are required to sell their fish catch to the *tauke* at the price set by the *tauke*. The *tauke*-fishers relationship is a patron-client relationship built on trust. Previous research demonstrated that production factors, government support and trust can directly affect the performance of the marine fish supply chain (SC) (Hendri et al 2018).

One of the potential fishing areas in Riau Province, Indonesia is Indragiri Hilir (Inhil) Regency. This is because Inhil has a large sea area and faces the South China Sea

(Yulinda et al 2021a). The purpose of this study was to analyze whether the business capital, production factors, government support and trust can directly affect the marine fish SC performance in Inhil, and also if trust can have a mediating role in the effect of business capital, production factors and government support. Based on those reasons, this study will test the following six hypotheses (H):

H<sub>1</sub> : Business capital has a positive and significant effect on the marine fish SC performance;

H<sub>1a</sub> : Business capital through trust has a positive and significant effect on the marine fish SC performance;

H<sub>2</sub> : Production factors have a positive and significant effect on the marine fish SC performance;

H<sub>2a</sub> : Production factors through trust have a positive and significant effect on the marine fish SC performance;

H<sub>3</sub> : Government support has a positive and significant effect on the marine fish SC performance; and

H<sub>3a</sub> : Government support through trust has a positive and significant effect on the marine fish SC performance.

## Material and Method

**Description of the study sites.** This research was conducted in June 2022 in four marine fish production centers in Indragiri Hilir Regency, Riau Province: Tanah Merah, Sungai Batang, Kuala Indragiri, and Mandah (Figure 1). The study used a survey method with a quantitative approach (Hendri 2022).

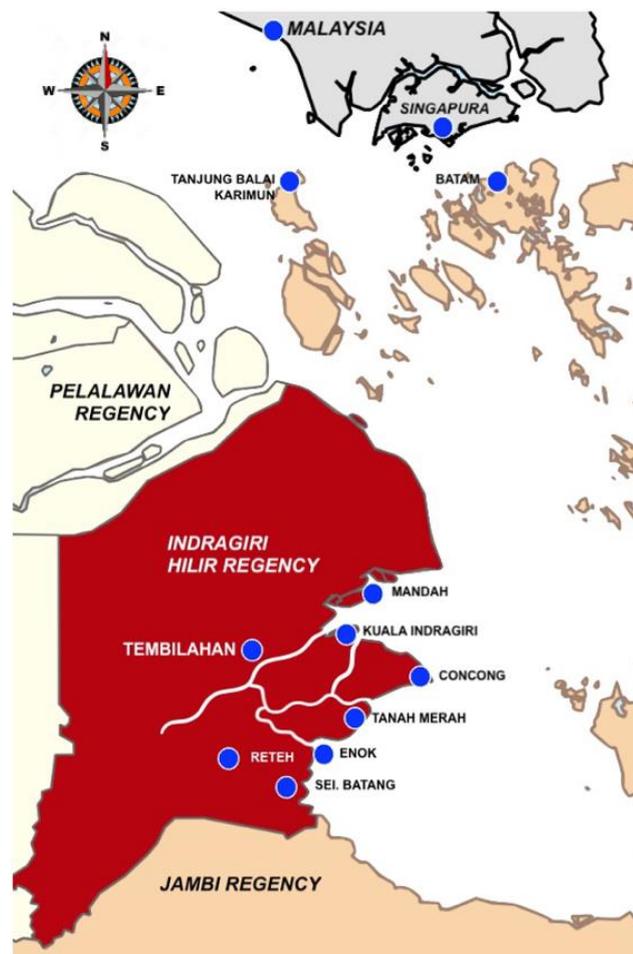


Figure 1. Research sites: Map of Indragiri Hilir Regency, Riau, Indonesia.

### **Population and respondents**

**Data collection.** The data was collected using a closed questionnaire, containing statements related to variables which were measured by a five-point Likert Scale (Yulinda et al 2021). The types of data collected are primary data and secondary data (Akbar 2020; Hendri et al 2021). The primary data covers company capital (X1), production factors (X2), government support (X3), trust (Z), and supply chain performance (Y). Meanwhile, secondary data was obtained from books and other written documentation published by related institutions (Hendri et al 2018; Yolandika et al 2021).

**Statistical analysis.** Hypothesis testing used the Structural Equation Modelling - Partial Least Square (SEM-PLS) method, with the help of Smart PLS software. SEM is an analytical technique that allows you to test a number of relationships at the same time. This relationship is built between one or several independent variables and one or more dependent variables. Each variable can be shaped factors or constructs that are built from several indicators. SEM is an integrated approach between the two analyses, namely factor and path analysis. The Smart PLS software uses the bootstrap method, that is a process for assessing the significance level or probability of direct, indirect, and total effects. Bootstrapping can also assess the significance level of other values, including: r square and adjusted r square, f square, outer loading, and outer weight. The advantages of this software include: data does not have to be normally distributed multivariate, it does not require large sample sizes, and it can analyze data at various scales (categories, ordinal, intervals, and ratios) (Syahrir et al 2020). Partial least squares (PLS) regression analysis is carried out in two stages, namely the evaluation of the measurement model (outer model), and the structural model evaluation (inner model) (Sarwono 2010). The external model is used to obtain the validity and reliability of the research construct, while the inner model is used to answer the hypothesis (Sarstedt et al 2017).

### **Results**

**Outer model.** The other model was carried out to ensure that all indicators on the five variables (constructs) could be used in this study. For this reason, validity tests (Convergent Validity and Discriminant Validity) were conducted, and reliability tests. A Convergent Validity test was conducted to ensure that the AVE (Average Variance Extracted) value of each construct is  $>0.5$ . If the value is  $<0.5$ , then the indicator with the lowest loading factor value is eliminated, before the Convergent Validity test is repeated. Furthermore, the Discriminant Validity test is carried out to ensure that all cross-loading values of all the intended constructs are greater than the cross-loading values of other constructs. Meanwhile, the reliability test was carried out to ensure that the composite reliability (Rho\_A) value was  $>0.7$ , and the Cronbach's Alpha value was  $>0.6$ . The results of the validity and reliability tests can be seen in Table 1.

Table 1

The results of the convergent validity tests

<i>Construct</i>	<i>Cronbach's Alpha</i>	<i>Rho_A</i>	<i>Composite reliability</i>	<i>Average Variance Extracted (AVE)</i>
Business capital	0.779	0.786	0.850	0.532
Production factors	0.935	0.960	0.944	0.575
Government support	0.780	0.784	0.851	0.535
Trust	0.797	0.794	0.867	0.501
Supply chain performance	0.796	0.799	0.867	0.621

Table 1 shows the Average Variance Extracted (AVE) values for all constructs/variables  $>0.5$ . Thus, the constructs are valid enough to be used as research instruments. Furthermore, the results of the discriminant validity test can be seen in Table 2.

Table 2

The results of the discriminant validity test

Indicator	Variable				
	Government support (GS)	Production Factor (PF)	Business capital (BC)	Trust (Tr)	SCM performance (SP)
GS1	0.611–0.758				
PF1		0.583–0.923			
PF2		0.603–0.876			
PF3		0.569–0.923			
BC1			0.657–0.799		
Tr1				0.667–0.809	
Tr2				0.649	
SP1					0.724–0.836

Table 2 shows that the cross-loading value for the intended construct is greater than the cross-loading value for other constructs. In addition, in the Table 1, also be seen that the composite reliability value of all constructs is  $>0.7$ , and the Cronbach's Alpha value of all constructs is  $>0.6$ . It means that the five constructs/variables are reliable enough to be used as research instruments.

**Inner model.** There are two types of tests in the inner model analysis, namely the R-square test and the Hypothesis test. The results of the inner model analysis are illustrated in Figure 2.

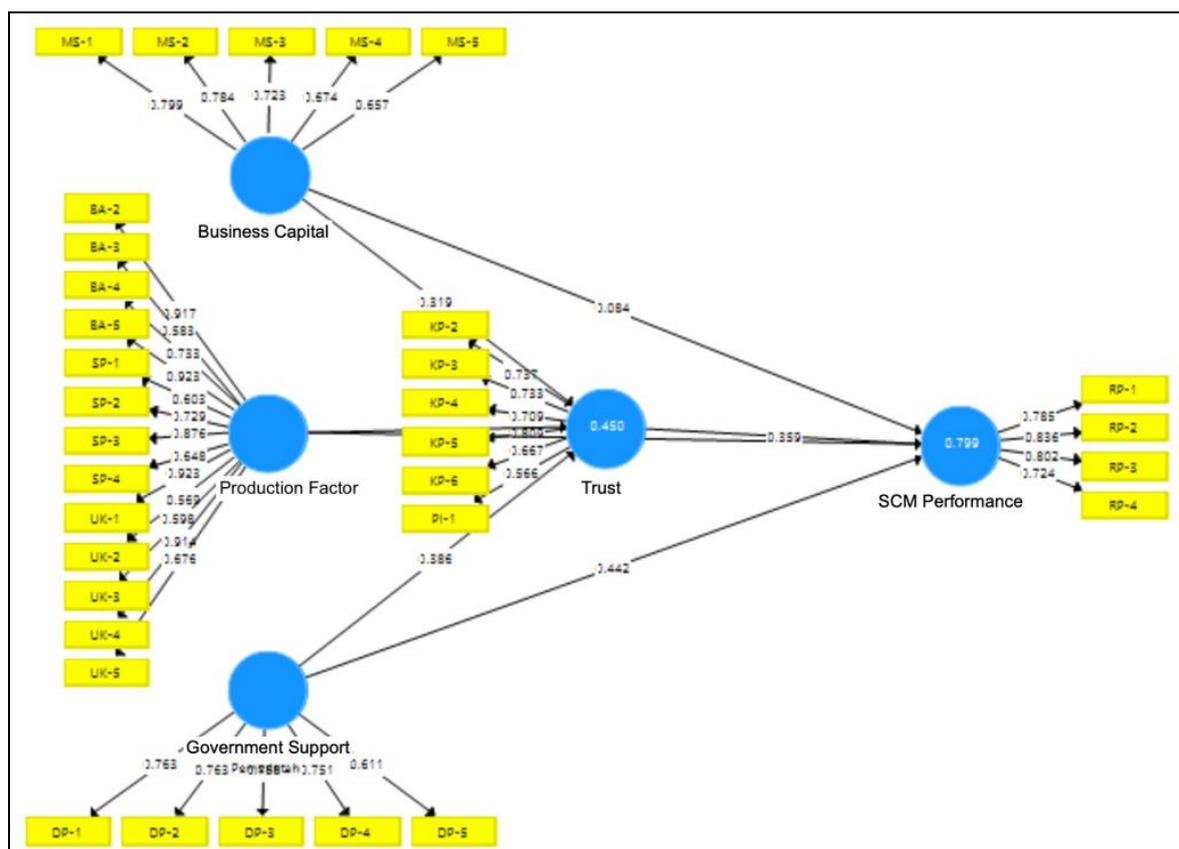


Figure 2. Output of the inner model.

Figure 2 shows the correlation between indicators and research variables. For more details, the correlation can be seen in the results of the R Square test and the following hypothesis testing.

**R Square test results.** The output of the R Square test results is shown in Table 3. Table 5 shows that the R Square value of the trust variable is 0.450. This means that in this model, trust is affected by the variables business capital, production factors, and government support by 45.0%, while 55.0% are affected by other variables that are not included in this study. This table also shows that the R Square value of the supply chain (SC) performance variable is 0.790. This means, the SC performance variable is affected by the variables business capital, production factors, government support, and trust by 79.0%. Meanwhile, 21.0% is affected by other variables that are not included in this study (Putri et al 2020).

Table 3

Output of the R square

	<i>R square</i>	<i>Adjusted R square</i>
Trust	0.450	0.432
Supply chain performance	0.799	0.790

**Hypothesis test results.** Hypothesis testing is done to see the value of t-statistics and p-value. The hypothesis can be accepted if the t-statistic value is  $>1.96$ , and the p-value is  $<0.05$ . There are two purposes for hypothesis testing, namely to see the direct and indirect effects of the independent variable (X) on the dependent variable (Y). The results of the direct effect test are shown in Table 4.

Table 4

Direct effect test results between variables

	<i>Original sample (O)</i>	<i>Sample mean</i>	<i>Standard deviation (STDEV)</i>	<i>T Statistic (O/STDEV)</i>	<i>P-Values</i>
Business Capital → SC performance	0.084	0.084	0.051	1.644	0.101
Production Factor → SC Performance	0.243	0.245	0.067	3.622	0.000
Government Support → SC Performance	0.442	0.444	0.065	6.843	0.000

Table 4 shows that the T statistic value of the correlation of the three independent variables (X), namely the business capital (1.644), the production factor (3.622), and government support (6.843), with the SC performance variable is  $>1.96$ , while the correlation p-values of the three variables are  $<0.05$ , which can be interpreted that the three X variables have a positive and significant effect on SC performance. Thus, hypotheses 2 (H<sub>2</sub>), 3 (H<sub>3</sub>), and 4 (H<sub>4</sub>) are accepted. The T statistic value of the correlation between the business capital variable and the SC performance variable is 1.551 ( $<1.96$ ), and the p-value is 0.122 ( $>0.05$ ). This means that business capital has no positive and significant effect on SC performance, so hypothesis 1 (H<sub>1</sub>) is rejected.

Furthermore, the indirect effect of variable X on variable Y can be seen in Table 5. Table 5 shows that the T statistic value of the correlation of the business capital and government support variables with SC performance through trust is 3.708 and 3.494 (both  $>1.96$ ), respectively, while the p-values of their correlation were  $<0.05$ , namely 0.000 and 0.001, respectively (Syahrir et al 2020). This means that business capital and government support through trust have a positive and significant effect on SC performance. Thus, hypotheses 1a (H<sub>1a</sub>), and 3a (H<sub>3a</sub>) are accepted. On the other hand, the T statistic value of the correlation between production factor and SC performance through trust is 1.651 ( $<1.96$ ), and the p values is 0.099 ( $>0.05$ ). This means that production factor has no positive and significant effect on SC performance, so hypothesis 2a (H<sub>2a</sub>) is rejected.

The results of hypothesis testing are summarized in Table 6.

Table 5

## Indirect effect test results between variables

	Original sample (O)	Sample mean	Standard deviation (STDEV)	T Statistic (O/STDEV)	P-Values
Business Capital → Trust → SC Performance	0.115	0.113	0.032	3.576	0.000
Production Factor → Trust → SC Performance	0.067	0.071	0.042	1.601	0.110
Government Support → Trust → SC Performance	0.139	0.128	0.039	3.527	0.000

Table 6

## Summary of hypothesis test results

Hypothesis	T-statistic	P values	Details
H <sub>1</sub> : Business capital has a positive and significant effect on the marine fish SC performance in Inhil	1.644	0.101	Rejected
H <sub>1a</sub> : Business capital through trust has a positive and significant effect on the marine fish SC performance in Inhil	3.576	0.000	Accepted
H <sub>2</sub> : Production factors has a positive and significant effect on the marine fish SC performance in Inhil	3.622	0.000	Accepted
H <sub>2a</sub> : Production factors through trust has a positive and significant effect on the marine fish SC performance in Inhil	1.601	0.110	Rejected
H <sub>3</sub> : Government support has a positive and significant effect on the marine fish SC performance in Inhil	6.843	0.000	Accepted
H <sub>3a</sub> : Government support trough trust has a positive and significant effect on the marine fish SC performance in Inhil	3.527	0.000	Accepted

**Discussions.** Table 6 shows that production factors and government support, directly, have a positive and significant effect on marine fish SC performance, while business capital has no effect. The production factor has an effect, presumably because it can affect the level of fish production, which in turn affects the number of fish stocks. A stable amount of fish stock ensures smooth SC performance. This is in accordance with the findings of Putra (2019) and Lowing (2020), which states that production factors, including ship size, greatly determine the production of marine fish in the waters of Nusa Penida, Bali, Indonesia. The bigger the boat, the more fish caught. Likewise, the effect of government support enhances the marine fish SC performance. Wibowo et al (2021) found that the assistance of fishing boats by the government of Sinjai Regency (Indonesia) can increase fish production. Similarly, Cahyati et al (2022) suggested that increasing the number of fish ports can facilitate the process of loading and unloading fish. But business capital has no significant effect on marine fish SC performance, because capital usually affects the production factors of the fishing industry, such as the boat size, the fishing gear size, and the number of workers used. This is in in line with the opinion Dirja & Faturrohman (2019) who stated that the production factors are influenced, among others, by business capital. Conversely, the effect of business capital on SC performance through trust is positive and significant. That is, there is a mediating role of trust on the effect of business capital on SC performance. The role of trust as a mediator is also very significant in the effect of government support on SC performance (Hendrik et al 2021). This shows that the role of the trust is very large in the marine fish supply chain system in Inhil. This can happen because the fishing business carried out in Riau Province, including Inhil, is very dependent on the *tauke*. According to El-Amady (2014) and Natalia et al (2022), a *tauke* is someone who acts as an investor, as well as a fish collector and distributor. *Tauke* is adopted by the Chinese, because most of the *tauke*

are Indonesian citizens of Chinese descent. Yulinda (2021) explains that the *tauke* lends capital to fishers and covers their operational costs for catching fish, while fishers are obliged to sell fish to the *tauke* at a price set by the latter. The *tauke* fishers relationship is also called a patron-client relationship that occurs on the basis of the existence of trust between the two parties, that is same with (Yama 2022). However, the role of trust is not significant to the effect of production factors on marine fish SC performance. This proves that the role of production factors is more dominant than trust in effecting the SC performance of marine fish in Inhil. This, is because production factors (such as fishing boats, fishing gear, crew, etc.) have a direct effect on fish production, while SC performance is influenced by production.

**Conclusions.** The current research concludes that: government support, either directly or through trust, has a positive effect on marine fish supply chain in Inhil; business capital also has a positive and significant effect on marine fish supply chain, but through trust it has no effect, and production factors have a significant effect on marine fish supply chain.

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**Conflict of interest.** The authors declare no conflict of interest.

## References

- Akbar Y. R., 2020 [Quantitative analysis: Statistical data processing using SPSS and Google Form/Survey Monkey survey data collection]. CV, Pena Persada, Purwokerto, Indonesia, 168 p. [In Indonesian].
- Bathara L., Nugroho F., Yolandika C., Hamzah G., 2021 Livelihood assets of small-scale fisherman in Tanah Merah District, Indragiri Hilir Regency, Riau Province, Indonesia. IOP Conference Series: Earth and Environmental Science 934(1):012042.
- Cahyati N., Fitriani B. D., Fatih C., 2022 Financial feasibility pepper order in Bukit Kemuning Village North Lampung. Economic Management and Social Sciences Journal (ECOMANS) 1(2):55–59.
- Dirja D., Faturrohman M. I., 2019 [Production factor analysis of catching fish with rampus nets at Bondi Beach Fishing Port, Cirebon Regency, West Java]. Barakuda 45: Jurnal Ilmu Perikanan dan Kelautan 1(2):46–56. [In Indonesian].
- Dobroszek J., 2020 Supply chain and logistics controller – two promising professions for supporting transparency in supply chain management. Supply Chain Management: An International Journal 25(5):505–519.
- El-Amady M. R., 2014 [Tauke and debt culture: Socio-cultural changes in village communities]. AG Litera, Yogyakarta, Indonesia, 238 p. [In Indonesian].
- Hendri R., 2022 Mixed methods for fisheries research. Taman Karya, Pekanbaru, Indonesia, 86 p.
- Hendri R., Nawi H. S. A., Ibrahim A., 2021 The impact of aquaculture cyber extension on fish farmers' attitudes and behavior in Riau, Indonesia. AACL Bioflux 14(4):1965–1973.
- Hendri R., Yulinda E., Hamid H., 2020 Analysis of fish export management in Panipahan, Rokan Hilir, Riau Province. IOP Conference Series: Earth and Environmental Science 430(012018):1-6.
- Hendrik, Hendri R., Elizal, Yulinda E., 2021 Lombada, local wisdom in sharia and sustainable fish catching in Aia Bangih Island, West Sumatra, Indonesia. AACL Bioflux 14(5):2761–2771.
- Lowing T., 2020 [Analysis of skipjack supply chain management at the Tumumpa Fish Auction Place in Manado City]. Jurnal Riset Ekonomi, Manajemen, Bisnis dan

- Akuntansi 8(1):575-585. [In Indonesian].
- Natalia D., Pratiwi E. H., Andika M. G., Nur R. S., Ivana V. W., 2022 Cost analysis of *Ipomoea aquatica* L. cultivation in Lampung State Polytechnic Agricultural Land. *Economic Management and Social Sciences Journal (ECOMANS)* 1(1):21-25.
- Putra G. E. A. B., 2019 [Factors analysis influencing the production and fishermen income in Batununggul Village, Nusa Penida District]. *E-Jurnal EP Unud* 8(5):1092-1121. [In Indonesian].
- Putri A. D., Murniati K., Nugraha A., 2020 [Analysis of supply chain patterns and performance of the Kelanting agro-industry supply chain in Pesawaran and Pringsewu Regencies (Case study: Kelanting agro-industry Darwiyanto, and Robbani)]. *Journal of Food System and Agribusiness (JoFSA)* 1(4):1-8.
- Ruswanty R., Dangnga M. S., Halimah A. S., 2019 [The influence of labor, capital, and sea mileage on fishermen's income in Pangali-ali Village, Banggae District, Majene Regency]. *Jurnal Pendidikan Teknologi Pertanian* 5(1):83-88. [In Indonesian].
- Sarstedt M., Ringle C. M., Hair J. F., 2017 Partial least squares structural equation modeling. Christian A. V. H., Martin K. (eds), pp. 1-40, Springer International Publishing.
- Sarwono J., 2010 [Basic definition of the structural equation modeling (SEM)]. *Jurnal Ilmiah Manajemen Bisnis* 10(3):173-182. [In Indonesian].
- Syahrir D., Yulinda E., Yusuf M., 2020 [Application of the SEM-PLS method in the management of coastal and marine resources]. IPB Press, Bogor, 236 p. [In Indonesian].
- Wibowo B. A., Aiman A. M., Setyawan H. A., 2021 [Strategy for leading capture fisheries commodity development in Pematang Regency]. *Journal of Marine Research* 10(4):481-492. [In Indonesian].
- Yama N. N. S., 2022 Quality control and production targets at the Research Center for Orange and Subtropical Fruit City of Batu, East Java. *Economic Management and Social Sciences Journal (ECOMANS)* 1(1):26-31.
- Yolandika C., Berliana D., Anggraini N., 2021 Efficiency of *Pangasius* sp. supply chain performance in Pringsewu, Lampung. *Journal of Food System & Agribusiness* 5(2):107-115.
- Yulinda E., Supian K., Saad M., 2021 The effect of trust on the fishing industry supply chain performance in Rokan Hilir Regency, Riau Province, Indonesia. *IOP Conference Series: Earth Environmental Science* 934(1):1-6.
- Yulinda E., Supian K., Saad M., 2021a The role of trust as a mediator on the effect of productivity in the fishing-industry supply chain performance in Riau, Indonesia. *AACL Bioflux* 14(4):2317-2326.
- Yulinda E., Supian K., Saad, M., 2021b The supply chain management of the fishing industry in Rokan Hilir Regency, Riau, Indonesia. *Proceeding of the Virtual Asian Conference on Business, Economics and Social Science, Melaka, Malaysia*, pp. 1-13.

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Authors:

Eni Yulinda, University of Riau, Faculty of Marine and Fisheries, Department of Fisheries Socioeconomics, St. HR. Subrantas, KM. 12.5 Panam, 28293 Pekanbaru, Riau, Indonesia, e-mail: eni-yulinda@lecturer.unri.ac.id  
 Ridar Hendri, University of Riau, Faculty of Marine and Fisheries, Department of Fisheries Socioeconomics, St. HR. Subrantas, KM. 12.5 Panam, 28293 Pekanbaru, Riau, Indonesia, e-mail: ridar.hendri@lecturer.unri.ac.id  
 Clara Yolandika, University of Riau, Faculty of Marine and Fisheries, Department of Fisheries Socioeconomics, St. HR. Subrantas, KM. 12.5 Panam, 28293 Pekanbaru, Riau, Indonesia, e-mail: clarayolandika@lecturer.unri.ac.id

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