Sustainability of sucking snail (*Cerithidea obtusa*) in Tanah Merah, Indragiri Hilir Regency, Riau Province based on ecological and economic dimensions

IL Sari *

* University of Riau, Pekanbaru, Indonesia
* indahlsari@gmail.com

Received : 4 August 2022  
Revised : 6 August 2022  
Accepted : 10 August 2022

ABSTRACT: The purpose of this study was to analyze the sustainability status of the sucking snail (*Cerithidea obtusa*) in Tanah Merah District, Indragiri Hilir Regency, Riau Province based on ecological and economic dimensions. This research was carried out in June 2021, located in Tanah Merah District, Indragiri Hilir Regency, Riau Province. The location determination was carried out purposively with the consideration that the Suction Snail (*Cerithidea obtusa*) from Tanah Merah District had been exported. With the export, the economic value of the Sucking Snail (*Cerithidea obtusa*) increases. The method used in this research is to use a survey method, namely by conducting field observations and by conducting interviews with respondents using a descriptive-quantitative approach. Based on the source, the data that can be collected are primary data and secondary data to support the information used in the research. The preparation of the index and sustainability status is carried out by analyzing the score value of each attribute in a multidimensional manner to determine one or several points that reflect the position of sustainability. The conclusion of this study is that the Sustained Snail Sustainability Index in Tanah Merah District on the ecological dimension is 61.90, then its status is quite sustainable. The sustainability index on the economic dimension is 23.20, so the status is unsustainable.

Keywords: ecological, economic, sucking snail, sustainability

INTRODUCTION

Tanah Merah is one of the sub-districts in Indragiri Hilir Regency. The history of Tanah Merah has its own characteristics as the sea village, which is a village where the community is dominated by the Fisherman Tribe and at that time led by the Village Head with another name as Penghulu. From that history, it can be seen that Tanah Merah Subdistrict is synonymous with fisheries. Tanah Merah sub-district is one of the sub-districts that has the largest capture fisheries potential in Indragiri Hilir Regency. This can be seen from the number of capture fisheries production in Tanah Merah District, which is the largest compared to other subdistricts in Indragiri Hilir district. Capture fisheries production in Tanah Merah Subdistrict In 2014 amounted to 12,306.83 tons and in 2015 amounted to 12,738.21 tons, the amount of production is the largest compared to other subdistricts (Purwaningsih, 2012) (Yama, 2022).

One of the fishery resources that have great potential in Tanah Merah District is the Suction Snail (*Cerithidea obtusa*) or what the Tanah Merah community calls Cincinot. The Snail (*Cerithidea obtusa*) has long been an important commercial species in the world. In the Asian region, especially Southeast Asia, the Suction Snail (*Cerithidea obtusa*) is processed into delicious food and as a raw material for medicines. In Indonesia, the sucking snail (*Cerithidea obtusa*) is used as a traditional medicine to treat several diseases including fever, sores and itching (Misnan et al., 2016) (Kamaruddin et al., 2017) (Natalia et al., 2022).

Suction snail (*Cerithidea obtusa*) besides being consumed by the public, it is also sold in the market because it has a fairly high price. At the Muara Angke fish market, the stock of this species is rare and must compete with buyers who send it to Taiwan or Singapore (Purwaningsih, 2012). Likewise in Malaysia, *Cerithidea obtusa*...
has a high market demand and is popular among the local population (Misnan et al., 2016)(Chaterine Yolandika, 2022)(Nuni Anggraini, Yolandika, et al., 2022)(Utoyo et al., 2018)(Clara Yolandika et al., 2021). In Tanah Merah Sub-district, apart from being sold in local or regional markets, in January 2019 the Suction Snail (*Cerithidea obtusa*) was officially exported to Malaysia as much as 12.5 tons. Furthermore, in addition to Malaysia, the snails are also exported to Singapore. With the export, the economic value of the Sucking Snail (*Cerithidea obtusa*) also increases. The price at the level of fishermen in Tanah Merah District by the reservoir is Rp. 10,000 – Rp. 15,000. While the price at the local consumer level in the area is Rp. 23,000 – Rp. 25,000 (Hardiyanti, 2022)(Clara Yolandika et al., 2015)(Utoyo & Yolandika, 2018a).

The market affects the sustainability of a resource. The wider the market (international), the greater the potential for these resources to be degraded or unsustainable. It is feared that this condition will occur in Suction Snails (*Cerithidea obtusa*) in Tanah Merah District because of its increasingly intensive use. In addition, based on information from exporters of sucking snails from Tanah Merah, the trend of catching sucking snails (*Cerithidea obtusa*) in Tanah Merah sub-district has also decreased. This can be seen from the data on the number of sales of Suction Snails in Tanah Merah District which has decreased over the last three years. In 2018 the total sales of Suction Snails amounted to 39,231.4 tons and in 2020 decreased to 24,033 tons (Yama & Unteawati, 2022)(Utoyo & Yolandika, 2018b).

Based on the information above, the authors are interested in conducting research on the sustainability status of the Sustaining Snail (*Cerithidea obtusa*) in Tanah Merah District, Indragiri Hilir Regency, Riau Province based on five aspects, namely ecological, economic, technological, social, and institutional dimensions and recommending strategies to support its sustainability. The purpose of this study was to analyze the sustainability status of the sucking snail (*Cerithidea obtusa*) in Tanah Merah District, Indragiri Hilir Regency, Riau Province based on ecological and economic dimensions (Wulandari & Warningsih, 2022)(Cahyati et al., 2022)(Clara Yolandika et al., 2017b)(Sofyani & Yolandika, 2021).

**METHOD**

This research was carried out in June 2021, located in Tanah Merah District, Indragiri Hilir Regency, Riau Province. The location determination was carried out purposively with the consideration that the Suction Snail (*Cerithidea obtusa*) from Tanah Merah District had been exported. With the export, the economic value of the Sucking Snail (*Cerithidea obtusa*) increases. The method used in this research is to use a survey method, namely by conducting field observations and by conducting interviews with respondents using a descriptive-quantitative approach. Based on the source, the data that can be collected are primary data and secondary data to support the information used in the research (Sutarni et al., 2019)(Handayani et al., 2018).

**Population and Sample**

The population in this study consisted of fisherman figures of sucking snails, the Fisheries Service of Indragiri Hilir Regency, Tanah Merah District office employees, and community leaders. To determine the sample that will be used as respondents, that is based on the relationship with the management of Suction Snails in Tanah Merah District. The figure of the suction snail fisherman in question is a collector and fisherman of the sucking snail that is characterized by the community in Tanah Merah sub-district. From the fisherman figure Snail Hsap in Tanah Merah and Tanjung Pasir villages, the number of respondents taken was 10 people, 5 respondents from Tanah Merah village and 5 respondents from Tanjung Pasir village. The number of employees in the Department of Fisheries is 53 people. Of the total number of employees, 3 respondents were taken, namely from the Division of Processing and Problems of Marine and Fishery Products, the Division of Control and Supervision of Marine and Fishery Resources and the Field of Maritime Affairs and Fisheries Law Enforcement Cooperation. There are 25 employees at the Tanah Merah District Office. Of this number, 3 people were used as respondents in this study, namely from the People’s Welfare Section and the Community Empowerment Section. Community leaders from
Tanah Merah Village and Tanjung Pasir Village, Tanah Merah Subdistrict, as many as 4 people were used as respondents. So that the total number of samples used as respondents in this study amounted to 20 people (C. Yolandika et al., 2021)(Clara Yolandika et al., 2017a)(Hendrik et al., 2021)(Hendri et al., 2022).

Analytical Method

The preparation of the index and sustainability status is carried out by analyzing the score value of each attribute in a multidimensional manner to determine one or several points that reflect the position of sustainability (Bathara et al., 2021)(N Anggraini, Berliana, et al., 2022). The score values which are the sustainability index values for each dimension are presented in the table below:

| Index Value | Category          |
|-------------|-------------------|
| 0.00 – 25.00| Bad (unsustainable)|
| 25.01 – 50.00| Less (less sustainable)|
| 50.01 – 75.00| Enough (sufficiently sustainable)|
| 75.01 – 100.00| Good (very sustainable)|

Through the MDS method, the position of the sustainability point is visualized through the horizontal and vertical axes. The existence of a rotation process causes point positions to be visualized on the horizontal axis with a sustainability index value assigned a score of 0% (bad) and 100% (good) (Hutasoit, 2022)(Anggara et al., 2022)(Nuni Anggraini, Anggara, et al., 2022)(Handayani et al., 2017).

RESULT AND DISCUSSION

Sustainability Analysis of Snails (*Cerithidea obtusa*) in Tanah Merah District, Indragiri Hilir Regency, Riau Province

*Ecological Dimension Sustainability Status*

Based on the results of the MDS analysis using the help of the Rapfish analysis software, it is known that the Sustaining Snail (*Cerithidea obtusa*) sustainability value from the ecological dimension based on the output of the ecological dimension Xscores is 61.90. The score indicates that the sustainability status for the ecological dimension of the Suction Snail (*Cerithidea obtusa*) in Tanah Merah District is in the moderately sustainable category. This is in accordance with the opinion of Thamrin et al., (2007) and Laras et al., (2011) who said that the category index value with a range of 50.01 – 75.00 indicates that the resource is in the fairly sustainable category. The results of the Rapfish analysis can be seen in Figure 1.
The attributes that are estimated to have an influence on sustainability on the ecological dimension consist of eight attributes, including: water pollution; Availability of Final Disposal Sites; Disposal of waste at the bottom of the waters; pH; Water temperature; Trend of catches in the last 3 years; Size of Suction Snails that are often caught; Intensity of water use. The description of these attributes are (Berliana et al., 2018)(Clara Yolandika et al., 2016)(Clara Yolandika, 2016):

1. Water pollution

The measurement of water quality in Tanah Merah waters by the Environment and Hygiene Service (DLHK) was last carried out in November 2020. Basically, water quality standards are classified into five groups, namely categories for tourism, bathing, swimming, and diving; categories for cultivation; categories for conservation; categories for industrial raw materials; and categories for general use or refrigeration in certain industries. Physical and chemical parameters can be used as indicators of water pollution. Therefore, several physical and chemical parameters such as Total Suspended Solid (TSS), dissolved oxygen, BOD, COD, ammonia, and other heavy metal content were used to assess the level of water pollution in Tanah Merah waters by comparing the water quality measurement data in the field (by DLHK) with the quality standard value of each category (class) which has been listed in Government Regulation Number 82 of 2001. In general, it can be said that the pollution level of group I is lower than group II, group II is lower than group III, and so on.

Table 2. Water Quality in Tanah Merah waters

| No | Parameter                                | Unit | Result  | Quality Standard Group |
|----|------------------------------------------|------|---------|------------------------|
|    |                                          |      |         | I | II | III | IV |
| I. | Physical                                 |      |         |   |    |     |    |
|    | Temperature                              | °C   | 29.4    | ±3| ±3| ±3  | ±5 |
|    | Dissolved solid                          | Mg/L | 62      | 1000| 1000| 1000| 2000|
|    | Total suspended solid                    | Mg/L | 43      | 50 | 50| 400 | 400|
| II. | Chemical                                 |      |         |   |    |     |    |
|    | PH                                      |      | 6.1     | 6 – 9| 6 – 9| 6 – 9| 5 – 9|
|    | BOD                                     | Mg/L | 3       | 2 | 3 | 6  | 12 |
|    | COD                                     | Mg/L | 23      | 10 | 25| 50  | 100 |
|    | Dissolved Oxygen (DO)                    | Mg/L | 6.1     | 6 | 4 | 3  | 0  |
|    | Phosphate                               | Mg/L | 0.1     | 0.2 | 0.2| 1  | 5  |
|    | NO₃                                     | Mg/L | 2       | 10 | 10| 20  | 20 |
|    | Cyanide                                 | Mg/L | <0.008  | 0.02 | 0.02| 0.02| -  |
|    | Arsenic                                 | Mg/L | <0.0001 | 0.05 | 1 | 1  | 1  |
|    | Cobalt                                  | Mg/L | <0.11   | 0.2 | 0.2| 0.2 | 0.2 |
|    | Barium                                  | Mg/L | <0.10   | 1 | - | -  | -  |
|    | Boron                                   | Mg/L | <0.0001 | 1 | 1 | 1  | 1  |
|    | Selenium                                | Mg/L | <0.0001 | 0.01 | 0.05| 0.05| 0.05|
|    | Cadmium                                 | Mg/L | <0.005  | 0.01 | 0.01| 0.01| 0.01|
|    | Chrome                                  | Mg/L | <0.008  | 0.05 | 0.05| 0.05| 1  |
|    | Mercury                                 | Mg/L | <0.0001 | 0.001 | 0.002| 0.002| 0.005|
|    | Zinc                                    | Mg/L | <0.01   | 0.05 | 0.05| 0.5 | 2  |
|    | Chloride                                | Mg/L | 11      | 600 | - | -  | -  |
|    | Sulfate                                 | Mg/L | 2       | 400 | - | -  | -  |
|    | Detergent as MBAS                       | Mg/L | <0.05   | 0.2 | 0.2| 0.2 | -  |

Source: Department of Environment and Hygiene (DLHK) of Indragiri Hilir Regency
The data in Table 1 are the results of measurements of several physical and chemical parameters in Tanah Merah waters that have been carried out by the Environmental Service (DLHK). From the table, it can be seen that in general the level of water pollution in Tanah Merah waters falls into group II.

2. Availability of Final Disposal Sites (TPA)
Based on the scoring results of interviews with respondents, it is known that there is only one Final Disposal Site (TPA) in all Tanah Merah Sub-district, which is located in Kuala Enok Village. Because the distance is quite far from the TPA, the people of Tanjung Pasir Village are accustomed to throwing household waste into the waters. Even though many people in Tanah Merah Village are aware of the importance of the disposal and processing of household waste (the PKK group processes plastic waste into various forms of handicrafts), not a few people still throw garbage in the waters.

3. Disposal of waste in waters
Based on the results of interviews with respondents, the majority of people in Tanah Merah and Tanjung Pasir villages are still accustomed to throwing household waste into the waters. Disposal of household waste into the waters is one aspect that is taken into account because it will affect the quality of the waters. Water quality will affect the survival of the Suction Snail. Disposal of household waste in waters by most people is due to the condition of housing built on water, lack of knowledge of the environment and garbage disposal sites that are not owned by all communities in Tanjung Pasir and Tanah Merah villages.

4. Degree of Acidity (PH)
Based on the results of water quality measurements by the Environment and Hygiene Service (DLHK), it can be seen that the degree of acidity (PH) in Tanah Merah waters is 6.1. The pH is still within the tolerance range for the sucking snail's environment, in accordance with Septiana's (2017) statement that the pH that supports the life of mollusks, including the sucking snail, ranges from 5.7 to 8.4.

5. Water temperature
The results of water quality measurements by the Environment and Hygiene Service (DLHK) can be seen that the water temperature in Tanah Merah waters is 29.4°C. According to Septiana (2017) the water temperature suitable for Suction Snails ranges from 25°C-28°C, so the temperature in Tanah Merah waters is not good for the growth of Suction Snails.

6. Trend of catches in the last 3 years
Based on the results of interviews, many respondents said that the trend of the catch of Suck Snails (Cerithidea obtusa) in Tanah Merah Subdistrict for the last 3 years has decreased. In general, sales data can be a reflection of the results of a catch. The decrease in the number of sucking snails (Cerithidea obtusa) in Tanah Merah Subdistrict for 3 years is directly proportional to the sales data of the Suction Snail by the People's Hatchery Unit (UPR) Berkah Kepiting Tanah Merah District and ship data from the Ministry of Transportation (Kemenhub) Directorate General of Sea Transportation. IV Kuala Enok containing Suction Snails to be sent to Batam and Singapore. The People's Hatchery Unit (UPR) of Berkah Crab in Tanah Merah Sub-district is the main collector for Suction Snails in all villages and sub-districts in Tanah Merah District. The decline in 2019 was not too significant but in 2020 there was a very significant decline. According to the source, this was due to the pandemic, which hampered access to the delivery of Suck Snails for export.

Table 2. Total Sales of Snails by People's Hatchery Unit (UPR)

| No | Year | Total Sales (Ton) |
|----|------|------------------|
| 1. | 2018 | 39,231,4         |
| 2. | 2019 | 35,047,5         |
| 3. | 2020 | 24,033           |
7. Size of Suction Snails that are often caught

Suction snails sold from Tanah Merah sub-district are divided into three grades based on their size. And the size will affect the price of the Suction Snails that will be sold. Based on information from the owner of the People's Hatchery Unit (UPR) with the blessing of crabs in Tanah Merah Sub-district as the exporter of sucking snails, grade A sucking snails are >3.5 cm, grade B is 3.5 cm and grade C is <3.5 cm. For the international market, they only accept grade A Suction Snails. Meanwhile, grades B and C are usually sold in the local market or outside the region, such as Batam. The price of Snail grade A is higher than grades B and C, which can reach Rp. 28,000.00 – Rp. 30,000.00 in the international market and Rp. 25,000 in markets outside the region such as Batam and for grades B and C the price is less than Rp. 25,000.00. Therefore, more than 50% of Suction Snail fishermen catch Suction Snails of grade A size.

8. Intensity of water use

Based on the results of interviews, the waters in Tanah Merah Sub-district are used for transportation and fishing. The number of registered fishing boats in the waters of Tanah Merah Subdistrict is 454 vessels consisting of sizes 1 GT to 6 GT. Local people and outside the area generally use speed boats for transportation. In Tanah Merah Subdistrict, sea travel services using speed boats are available at several ports, such as the Port of PT. Pelindo II, Red Port, LKMD Port and Syahbandar Port. The local crossing schedule for one port is usually only up to 8 times. Among them are at 08.00 WIB, 09.00 WIB, 10.00 WIB, 12.00 WIB, 13.30 WIB, 14.30 WIB (except Friday), 16.00 WIB, and 17.00 WIB. Because of the things above, the expert respondents concluded that the use of waters in Tanah Merah District was in the moderate category.

Economic Dimension Sustainability Status

Sustaining snail (Cerithidea obtusa) sustainability value from the economic dimension based on the output result Xscores is 23.20. The score indicates that the sustainability status for the economic dimension of the Suction Snail (Cerithidea obtusa) in Tanah Merah District is in the poor category (unsustainable). This is in accordance with the opinion of Thamrin et al., (2007) and Laras et al., (2011) who said that the category index value in the range of 50.01 – 75.00 indicates that the resource is in the fairly sustainable category. The results of the Rapfish analysis can be seen in Figure 2.

Figure 2. Status of the Economic Dimension of Sustainability
Attributes that are estimated to have an influence on sustainability on the economic dimension consist of seven attributes, including: Suction snail price trends for the last 3 years (Erwina et al, 2016); The contribution of the fisheries sector to GRDP (Erwina et al, 2016); The average relative income of sucking snail fishermen to the UMK (Erwina, 2015); Alternative work (Muliawan, 2016); Marketing distribution (Hartono et al, 2005); Dependent livelihoods (Suryana et al, 2012); Profit transfer (Susilo, 2003). The description of these attributes are:

1. The price trend of Sucking Snails in the last three years
Based on the results of interviews with fishermen and sucking snail collectors (owners of the Berkah Kepiting People's Breeding Unit (UPR) in Tanah Merah Subdistrict) in Kuala Enok and Tanjumg Pasir villages, it is known that there is a difference in the price of sucking snails at the fisherman’s level and at the collector's level. Likewise, the price for each grade is also different, both at the fisherman's level and at the collector's level. The differences in the price of sucking snails at the level of fishermen and collectors can be seen in Tables 3 and 4.

Table 3. Prices of Suction Snails at Fisherman Level

| No | Year | A          | B          | C          |
|----|------|------------|------------|------------|
| 1. | 2018 | Rp 12.000,00 | Rp 10.000,00 | Rp 8.000,00 |
| 2. | 2019 | Rp 12.000,00 | Rp 10.000,00 | Rp 8.000,00 - Rp 9.000,00 |
| 3. | 2020 | Rp 15.000,00 | Rp 12.000,00 | Rp 10.000,00 |

Source: People's Breeding Unit (UPR) Berkah Crab, Tanah Merah District

Table 4. Prices of Suction Snails at the Collecting Level

| No | Year | A          | B          | C          |
|----|------|------------|------------|------------|
| 1. | 2018 | Rp 22.000,00 | Rp 20.000,00 | Rp 15.000,00 |
| 2. | 2019 | Rp 25.000,00 | Rp 21.000,00 | Rp 18.000,00 |
| 3. | 2020 | Rp 25.000,00 | Rp 22.000,00 | Rp 18.000,00 |

Source: People's Breeding Unit (UPR) Berkah Crab, Tanah Merah District

From the table above, it can be seen that the price of Suction Snails both at the fisherman's level and at the collector's level tends to increase.

2. The contribution of the fisheries sector to GRDP
The largest role in the formation of the GRDP of Indragiri Hilir Regency in 2020 was generated by the Agriculture, Forestry and Fisheries business fields, which reached 46.78 percent (this figure increased from 44.68 percent in 2019), which encouraged an increase in the production of the Processing Industry business by as much as 46.78 percent. 24.05 percent (this figure increased from 23.63 percent in 2019) but experienced a decrease in the Wholesale and Retail Trade, Car Repair, and Motorcycle business fields by 16.14 percent.

The fisheries sector is one of the priorities for developing superior commodities in Tanah Merah District (Vaulina, 2016). In addition, the agricultural and fishery sectors are the majority of business fields for residents in Indragiri Hilir Regency, which is 75.87%. Tanah Merah District contributed the largest fishery contribution to Indragiri Hilir Regency, amounting to 12,738.21 tons. So it can be said that the contribution of the fisheries sector in Tanah Merah District to GRDP is in the high category.

3. The average relative income of sucking snail fishermen to the UMK
The Regency/City Minimum Wage (UMK) for the downstream Indragiri Regency has been set at IDR 2,984,695.00. This figure has not changed from the previous year. The average fishing time for Suction Snails by fishermen in Tanah Merah District is only 4 days a week from morning to evening. The catch in one catch usually gets 8 kg. Based on the results of interviews, the capital for fuel is usually Rp. 10,000 for a single catch, and food supplies are Rp. 10,000. So, the net income of Suction Snail fishermen every month
is estimated at Rp. 1,600,000 on average (assuming the size of the Snail caught is grade A). So when compared with the value of the Indragiri Regency/City Minimum Wage (UMK) downstream, the income of the Suction Snail fishermen is still very far away.

4. Alternative jobs
Of the 10 Suction Snail fishermen who were respondents from Tanah Merah and Tanjung Pasir villages, 6 of them did not have any alternative work other than being a Suction Snail fisherman. While the rest have many other alternative jobs, including trading, gardening, mangrove loggers and nipah shoot craftsmen, fishermen looking for fish (not sucking snails).

5. Marketing spread
As previously mentioned, the marketing of the Snail Suction from Tanah Merah District has already reached foreign markets such as Singapore and Malaysia. Snail collectors will usually choose to sell sucked snails abroad because the price will be more expensive.

6. Dependent livelihood
Of the 10 sucker snail fishermen from Tanah Merah and Tanjung Pasir villages, 6 of them make the work of sucking snail fishing as their main livelihood while the other 4 only make it as an additional livelihood. Fishermen who look for sucking snails as an additional livelihood have alternative jobs as traders, mangrove loggers and nipah shoots craftsmen.

7. Profit transfer
Most of the profit transfers from the sucking snail catching business in Tanah Merah sub-district are at the collector and exporter level. Snail collectors in Tanah Merah Subdistrict are local people or people who come from Tanah Merah with a margin rate of Rp. 10,000.00 – Rp. 15,000.00 per kilogram.

CONCLUSION

The conclusion of this study is that the Sustained Snail Sustainability Index in Tanah Merah District on the ecological dimension is 61.90, then its status is quite sustainable. The sustainability index on the economic dimension is 23.20, so the status is unsustainable.

REFERENCE

Anggara, R. W., Anggraini, N., Lurrohman, K., Sitanggang, R., & Fransiska, W. F. (2022). Marketing and financial aspects of balado banado chips processing business in Bandar Lampung city. *Economic Management and Social Sciences Journal (ECOMANS)*, 1(1), 1–7. https://doi.org/10.56787/ecomans.v1i1.4

Anggraini, N., Berliana, D., & Yolandika, C. (2022). The Strength of Motives in Food Choosing Behaviour in Fishermen Based on Social Layers in the Coastal area of Bandar Lampung, Indonesia. *IOP Conference Series: Earth and Environmental Science*, 1012(1), 012007. https://doi.org/10.1088/1755-1315/1012/1/012007

Anggraini, Nuni, Anggara, R. W., Lurrohman, K., Sitanggang, R., & Fransiska, W. F. (2022). Production Management of Balado Banado Chips Processing Business in Bandar Lampung City. *Economic Management and Social Sciences Journal (ECOMANS)*, 1(2), 45–49. https://doi.org/10.56787/ecomans.v1i2.3

Anggraini, Nuni, Yolandika, C., Utoyo, B., & Irawati, L. (2022). PROSES PENGAMBILAN KEPUTUSAN KONSUMEN DALAM PEMBELIAN PRODUK LADA DI PROVINSI LAMPUNG. *Jurnal Agrisep*, 23(1), 43–51.

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. https://doi.org/10.1088/1755-1315/934/1/012042
Sustainability of sucking snail (Cerithidea obtusa) in Tanah Merah, Indragiri Hilir Regency, Riau Province based on ecological and economic dimensions

II. Sari

Berliana, D., Yolandika, C., & Anggraini, N. (2018). Supply Chain Performance of Banana Chip Industry in Bandar Lampung. *International Journal of Sustainable Biomass and Bioenergy, 2*(1), 1–6.

Cahyati, N., Fitriani, Berliana, D., & Fatih, C. (2022). Financial Feasibility Pepper Oxter in Bukit Kemuning Village North Lampung. *Economic Management and Social Sciences Journal (ECOMANS), 1*(2), 55–59. https://doi.org/10.56787/ecomans.v1i2.6

Handayani, S., Anggraini, N., & Yolandika, C. (2018). *Efisiensi Usahatani Padi Organik di Kecamatan Candipuro Efficiency of Organic Rice Farming in Candipuro Districts*. 19–24.

Handayani, S., Fitriani, & Yolandika, C. (2017). *Pengantar Koperasi untuk Perguruan Tinggi* (Edisi ke 1). UB Press.

Hardiyanti, F. (2022). Management and procurement of sweet orange production input research center for orange plants and subtropical fruit (Balitjestro), Batu city, East Java. *Economic Management and Social Sciences Journal (ECOMANS), 1*(1), 8–14. https://doi.org/10.56787/ecomans.v1i1.1

Hendri, R., Yulinda, E., & Yolandika, C. (2022). Halal Practices on the Shrimp Paste Processing Industries for Business Development in Rokan Hilir, Riau Indonesia. *International Journal of Halal Research, 4*(1), 14–18.

Hendrik, H., Hendri, R., & Yolandika, C. (2021). Impact of the Covid-19 Pandemic on Activities Socio-Economic Floating Net Cages (FNC) Business in the Koto Panjang Hydropower Reservoir, Riau Province IOP Conf. Ser. Earth Environ. Sci. 934 012037 Impact of the. *IOP Conference Series: Earth and Environmental Science, 934*(1), 012037. https://doi.org/10.1088/1755-1315/934/1/012037

Hutasoit, M. F. (2022). Human Resource Management of Pt. Nestle Indonesia Panjang Factory Lampung, Indonesia. *Economic Management and Social Sciences Journal (ECOMANS), 1*(2), 36–44. https://doi.org/10.56787/ecomans.v1i2.2

Kamaruddin, E., Adriman, & Sihotang, C. (2017). Morphometric Variations and Long Weight Relationships Red Eye Snail (Cerithidea obtusa). *Journal of Coastal Zone Management, 20*(4). https://doi.org/10.4172/2473-3350.1000450

Misnan, R., Salahudin, N., Abd Aziza, Z. H., Yadzirb, M., Abdullahb, N., Bakhtiarb, F., & Muradb, S. (2016). Comparison Of Allergenic Proteins Of Sea Snail (Cerithidea Obtusa) And Freshwater Snail (Pomacea Canaliculata). *Journal Teknologi, 11*, 113–119.

Natalia, D., Pratiwi, E. H., Andika, M. G., Nur Rahmah, S., & Ivana, V. W. (2022). Cost analysis of semi organic spinach (Ipomoea aquatica L) cultivation in Lampung State Polytechnic Agricultural Land. *Economic Management and Social Sciences Journal (ECOMANS), 1*(1), 21–25. https://doi.org/10.56787/ecomans.v1i1.10

Purwaningsih, S. (2012). Aktivitas Antioksidan dan Komposisi Kimia Keong Matah Merah. *Ilmu Kelantan, 17*(1), 39–48.

Sofyani, T., & Yolandika, C. (2021). Tingkat Kesejahteraan Rumah Tangga Generasi Ketiga Pemukim Kembali di Desa Koto Mesjid Kecamatan Kampar Provinsi Riau. 2(April), 1–6.

Sutarni, S., Irawati, I., Unteawati, B., & Yolandika, C. (2019). Proses Pengambilan Keputusan Pembelian Sayuran Hidroponik Di Kota Bandar Lampung. *Journal of Food System & Agribusiness, 2*(1), 17–24. https://doi.org/10.25181/jofsa.v2i1.1107

Utoyo, B., & Yolandika, C. (2018a). Farmers’ decision analysis to select certified palm oil seedlings in Lampung, Indonesia. *IOP Conference Series: Earth and Environmental Science, 147*(1). https://doi.org/10.1088/1755-1315/147/1/012034

Utoyo, B., & Yolandika, C. (2018b). Technical Efficiency of Palm Oil Plantation in Lampung, Indonesia. *International Journal of Sustainable Biomass and Bioenergy, 1–5.*

Utoyo, B., Yolandika, C., & Anggraini, N. (2018). Strategi Bauran Pemasaran Bibit Kelapa Sawit BERSERTIFAT
Sustainability of sucking snail (*Cerithidea obtusa*) in Tanah Merah, Indragiri Hilir Regency, Riau Province based on ecological and economic dimensions

IL Sari

**Resource Allocation: Economic, Management, and Social Sciences Journal (ECOMANS)**

*Prosiding Seminar Nasional Pengembangan Teknologi Pertanian, 2015, 266–272.*

Wulandari, F., & Warningsih, T. (2022). Marketing Management of Catch Fish in Cold Storage At the Bungus Padang Ocean Fishing Port (Pps) West Sumatra Province. *Economic Management and Social Sciences Journal (ECOMANS)*, 1(2), 50–54. https://doi.org/10.56787/comans.v1l2.5

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. https://doi.org/10.56787/comans.v1l1.9

Yama, N. N. S., & Unteavati, B. (2022). Production Activities and Procurement of Input Research Center for Orange and Subtropical Fruit City of Batu, East Java. *Economic Management and Social Sciences Journal (ECOMANS)*, 1(2), 32–35. https://doi.org/10.56787/comans.v1l2.1

Yolandika, C, Anggraini, N., & Berliana, D. (2021). Food Security Level of Fisherman Household in Bandar Lampung, Indonesia. *IOP Conference Series: Earth and Environmental Science, 934*(1), 012047. https://doi.org/10.1088/1755-1315/934/1/012047

Yolandika, Chaterine. (2022). Social Concepts of Traditional Justice and Methods of Settlement of Traditional Law in Aceh, Indonesia. *Economic Management and Social Sciences Journal (ECOMANS)*, 1(1), 15–20. https://doi.org/10.56787/comans.v1l1.8

Yolandika, Clara. (2016). *Analisis Supply Chain Management Brokoli CV. Yan’s Fruits and Vegetable di Kabupaten Bandung Barat*. IPB University.

Yolandika, Clara, Berliana, D., & Anggraini, N. (2021). Efisiensi Kinerja Rantai Pasok Ikan Patin di Pringsewu, Lampung Pangasius Supply Chain Perfomance Efficiency in Pringsewu, Lampung. *Journal of Food System & Agribusiness, 5*(2), 107–115.

Yolandika, Clara, Lestari, D. A. H., & Situmorang, S. (2015). Keberhasilan Koperasi Unit Desa (KUD) Mina Jaya Kota Bandar Lampung Berdasarkan Pendekatan Tripartite. *Jurnal Ilmu-Ilimu Agribisnis, 3*(4), 385–392.

Yolandika, Clara, Nurmalina, R., & Suharno. (2016). Marketing Analysis of Broccoli in Lembang West Java Indonesia (Case Study: CV. Yan’s Fruits and Vegetables, Lembang, West Java). In A. Rifin, M. P. van Dijk, D. P. de Boer, H. Mudde, J. van Rooyen, & S. Jahroh (Eds.), *Strengthening Indonesian Agribusiness: Rural Development and Global Market Linkages* (pp. 241–250). IPB University. http://agribisnis.ipb.ac.id/wp-content/uploads/2017/04/Husnul-Khotimah-Stefan-Von-Cramon-Taubadel-dkk-VERTICAL-MARKET-INTEGRATION-PERFORMANCE-OF-INDONESIAN-RICE-MARKET-CHAIN.pdf

Yolandika, Clara, Nurmalina, R., & Suharno, S. (2017a). Analisis Nilai Tambah Brokoli Kemasan Cv. Yan’S Fruits and Vegetable Di Kecamatan Lembang Bandung Barat. *Journal of Food System & Agribusiness, 1*(1), 30–37. https://doi.org/10.25181/jofsa.v1l1.84

Yolandika, Clara, Nurmalina, R., & Suharno, S. (2017b). Rantai Pasok Brokoli di Kecamatan Lembang Kabupaten Bandung Barat dengan Pendekatan Food Supply Chain Networks. *Jurnal Penelitian Pertanian Terapan, 16*(3), 155–162. https://doi.org/10.25181/jipt.v16i3.93