

MARKET INTEGRATION OF TILAPIA FISH (OREOCHROMIS NILOTICUS) FROM FRESHWATER CULTIVATION IN SOUTH KALIMANTAN PROVINCE OF INDONESIA

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MARKET INTEGRATION OF TILAPIA FISH (*OREOCHROMIS NILOTICUS*) FROM FRESHWATER CULTIVATION IN SOUTH KALIMANTAN PROVINCE OF INDONESIA

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¹⁶ STRACT

This study aims to determine the market integration of tilapia fish (*Oreochromis niloticus*) from freshwater cultivation in South Kalimantan Province. The data used are primary data and secondary data, while the data collection uses the methods of observation, interviews and documentation. The sampling method of cultivators uses simple random sampling method, while the sample of marketing institutions uses the snowball sampling method. The data analysis used is (a) marketing channel analysis and (b) market integration analysis. The results of the analysis show that (a) marketing channels of tilapia fish consist of 4 patterns, which are (1) one of fish farmer (3%) sold the fish out to the consumer, (2) twenty five of fish farmers (78%) sold the fish out to the middleman and then sold again to retailers and finally sold to the final consumers, (3) four of fish farmers (13%) sold the fish out to the retailers and distributed to consumers and (4) two of fish farmers sold the fish out to the institutional market for distributed to consumers and (b) the value of the regression coefficient (β) is 0.55. The value of < 1 explains that the market is not perfectly integrated, while the market structure is an oligopsony market.

KEY WORDS

Fish cultivation, tilapia fish, fish farmer, middlemen, retailers, marketing channel.

Fish cultivation is a process made to increase the production of fishery products without harming the sustainability of aquatic resources, improve fish stocks in nature through efforts to enhancement fish stocks by restocking in waters that experience overfishing and provide fish continuously regardless of the season (Wonginyoo K, Piewthongngam K, Chatavithree P and Vorasay J., 2018). Freshwater fish farming business opportunities are now increasingly being looked at as a promising business opportunity along with the increasing market demand for fishery products (Saugat K, Sushil K and Saurav K., 2020). One type of freshwater fish that has been favored by cultivators is tilapia, known for its delicious and savory meat taste, fast growth with 4 to 6 months for enlargement to meet standard sizes for consumption (Dampin N, Maleewong M, 2012). Tilapia is also quite strong against disease disorders so the maintenance is easy and the cost is cheap, but the results are relatively profitable (Kapute F, Valeta J, Jeremy L and Jeremiah K., 2016). Tilapia is one of the leading commodities of freshwater aquaculture in South Kalimantan with the amount of production as shown in Table 1.

Table 1 – Total production of tilapia from freshwater aquaculture in 2011-2020

No.	Year	Tilapia fish (ton/year)
1.	2011	32.443,0
2.	2012	32.673,5
3.	2013	29.883,3
4.	2014	30.764,5
5.	2015	36.625,8
6.	2016	50.358,9
7.	2017	49.289,8
8.	2018	49.440,8
9.	2019	49.488,2
10.	2020	49.560,3

Source: Dinas Perikanan and Kelautan, 2021.



Throughout 2011-2020, tilapia production increased due to the relatively easy way of cultivation with not too large capital, has fast growth with a shorter harvest period and has a promising selling value at a high enough price (Ariadi H, Meilissa M.C, Elyah F and Mardiana, 2021). The high price of tilapia is the main attraction for producers and traders to sell fish to main markets in several areas in South Kalimantan, thus enabling the movement of tilapia from production areas to consumption areas relatively quickly (Lilimantik, 2013). Tilapia prices in South Kalimantan in 2020 shown in Table 2.

Table 2 – Price of tilapia fish in South Kalimantan Province in 2020

No.	District/City	Price (IDR/kg)
1.	Tanah Laut	37.000
2.	Kotabaru	40.000
3.	Banjar	30.000
4.	Barito Kuala	36.000
5.	Tapin	38.000
6.	Hulu Sungai Selatan	40.000
7.	Hulu Sungai Tengah	39.000
8.	Hulu Sungai Utara	39.000
9.	Tabalong	35.000
10.	Tanah Bumbu	38.000
11.	Balangan	35.000
12.	Banjarmasin	34.000
13.	Banjarbaru	32.000

Source: Dinas Perikanan and Kelautan, 2021.

The high price at the producer level will have a positive impact, this is because the profits obtained will be greater and will stimulate producers to increase the amount of production, and vice versa (Ngo T., et al, 2019). Information about market prices between regions must be disseminated to all relevant parties such as producers, marketing institutions and consumers so that they are able to support the formation of strong price ties (Kemisola, O.A and Anifat, O.B., 2010). Understanding the level of market integration will facilitate monitoring of price changes, and can also be used as a basis for improving policies that are more relevant to the development of fisheries markets in an area (Eltholth M, Fornace K, Grace D, Rushton J and Hasle B., 2015). Price closeness can be determined based on the formation of the price of a commodity at the level of certain marketing institutions which is apparently influenced by prices at the level of other marketing institutions (Mafimisebi T.E., 2008). Price closeness will occur if the price conditions at the next level are the same as the price at the current level plus marketing costs (Heytens, 1986). Strong market integration indicates that the marketing process of a commodity becomes efficient, because the price will be transformed appropriately to other markets both vertically and horizontally (Ravallion, 1986).

Anindita and Baladina (2017) explain that in an efficient market structure, the slightest price changes that occur in a market will cause prices to fluctuate. Prices at the retail level will be the basis for determining prices to be paid to intermediary traders and ultimately to producers and vice versa (Kartikasari D, 2010). Furthermore, the price received by farmers will determine how large the volume of production produced by producers is to be sold to middlemen or retailers (Lilimantik E, Ahmadi., 2020). If the price received is satisfactory, the production offered to the market will also increase, and vice versa (Hanafiah and Saefuddin, 1996).

MATERIALS AND METHODS OF RESEARCH

This research conducted in South Kalimantan Province, where the research was determined intentionally (purposive sampling) with the consideration that Kalimantan Province has several areas that cultivate tilapia, with the largest area being in Banjar Regency and then moved into local fish markets located in Martapura, Banjarbaru, Banjarmasin, Barabai and Pelaihari of South Kalimantan Province.



A total of 51 respondents who directly involved in marketing channels were selected comprising 32 fish farmers, 7 wholesalers and 12 retailers. The age of respondents varied between 33-52 years old with the duration of business experience range of 2-6 years.

The data was collected use observation, interview and documentation method. Observation method is a method that collects data directly from the field for the success and accuracy of research results (Ciesielska M, Bostrom K.W and Ohlander M., 2008). The interview method is an event or a process of interaction between the interviewer and interviewee through direct communication (Gubrium J.F and Holstein J.A., 2013). In the interview techniques, there are two known approach methods, namely structured interviews in which the interviewer prepares to conduct interviews with respondents, while the other one is the unstructured interviews, where the interviewer does not prepare a list of questions and the question is carried out spontaneously (Rabin J, Morse JM., 2003). While the documentation method is used to obtain data through facts stored in the form of letters, diaries, photo archives, meeting results, souvenirs, activity journals and so on (Bowen, G.A., 2009).

The data used are primary and secondary data. Generally, these two data are combined to complement each other and assist researchers in observing any existing phenomena. (Rabinovich, E. & Cheon, S., 2011). Primary data is data obtained directly from the first source by using measurement tools or data collection tools directly on the subject as the source of information sought (Kabir SMS, 2016), while secondary data is data that is not obtained directly by researchers, for example research must go through others or searching through documents (Johnston, MP, 2014). Secondary data is obtained through books, government publications, internal organization records, reports, journals, to various sites related to the information being sought (Martins, F., Cunha, J., & Serra, F., 2018).

The sampling method for tilapia cultivations is the simple random sampling method system, a sampling technique which is a method of drawing random members of the population regardless of the strata in the population (Singh S, 2003) so that each member of the population has an equal chance of being selected. Equally to be elected (Castle JE, 2003). This method is carried out if the members of the population are considered homogeneous (West, P., 2016).

Then the sampling of marketing agencies (i.e. middlemen, retailers) uses the snowball sampling method, which is a method for identifying, selecting and taking samples in a continuous network or chain of relationships (Blanken P, 1992), or sampling techniques that are initially small in number, then this sample selects its peers to be sampled and so on until the number of samples collected increase (Atkinson, R. and Flint, J., 2001).

The pattern of marketing channels for tilapia cultivation in South Kalimantan Province was analyzed by descriptive method, by analyzing each of the marketing institutions involved and the marketing channels they went through from the producer level (fish cultivators) to the consumer level (Parmar G, Leua A and Vanza J., 2018).

Market integration analysis can be searched using standard static models such as simple regression which aims to test the law of one price with the assumption that if the prices of other factors remain constant, then prices at the producer level and prices at the consumer level are linear (Unget D, Mahreda E, Lilimantik E., 2020) . The simple linear regression equation model can be seen in equation 1.

$$P_f = \alpha + \beta P_r + \mu_t \quad (1)$$

Where: P_r - Price of retailer; P_f - Price of farm; α - Constant; β - regression coefficient; μ_t - error terms.

The value of α and β can be searched by the formula:

$$\beta = \frac{n \sum P_r P_f - \sum P_r \sum P_f}{\sqrt{n \sum P_r^2 - (\sum P_r)^2}} \quad (2)$$

$$\alpha = P_f - \beta P_r \quad (3)$$



Regression analysis of the prices of the two markets can show the degree of closeness of the relationship between the two markets. The regression coefficient aims to estimate how much price formation at the market level is influenced by the price of the commodity at other market levels (Haji J, 2014). The value of the regression coefficient (β) is an indicator of marketing efficiency (Hodrea R, 2015), while the interpretation of the regression coefficient is the magnitude of price changes at the consumer level with the following criteria (Monke and Petzel (1984; Azzaino, 1982):

If $\beta < 1$, then the market is not integrated. The market structure is monopsony or oligopsony because an increase in the price of one unit at the consumer level is followed by a price increase that is smaller than one unit at the producer level;

If $\beta = 1$, then the market is perfectly integrated. The market structure is perfect competition, which means price formation between markets is more integrated with an increase in the price of one unit at the consumer level followed by an increase in the price of one unit at the producer level;

If $\beta > 1$, then the market is not integrated. The market structure is monopoly or oligopoly because an increase in the price of one unit at the consumer level is followed by a price increase that is greater than one unit at the producer level.

RESULTS AND DISCUSSION

The way fish farmers' market tilapia is usually different, causing different marketing channels and the shape of the channel can be very simple, or it can be complex. The marketing channel of tilapia fish in South Kalimantan Province consists of 4 patterns which can be seen in Figure 1.

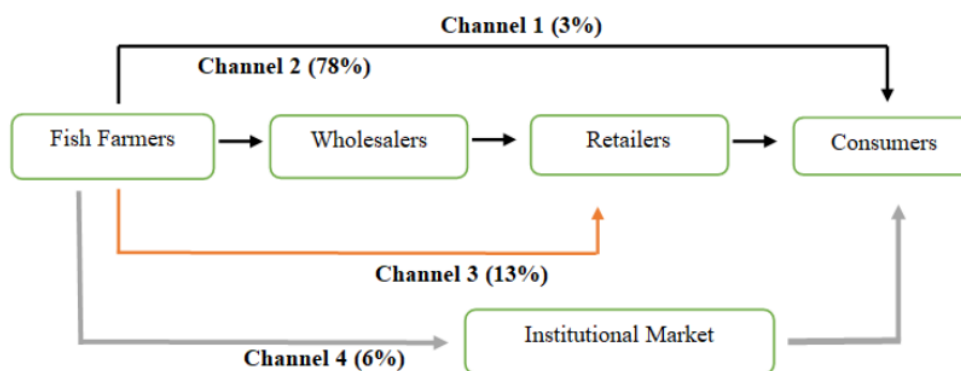


Figure 1 – Marketing channel of cultivated tilapia in South Kalimantan Province

Figure 1 explains that the marketing channel for cultivated tilapia in Banjar Regency, South Kalimantan Province consists of 4 patterns. The first channel, one of fish farmer (3%) sold out fish to the consumer. The second channel, twenty five of fish farmers (78%) sold out fish to the middleman and then sold again to retailers and finally sold to the consumers. Third channel, four of fish farmers (13%) sold out to the retailers and distributed to consumers and the four channels, two of fish farmers sold fish to institutional market for distribution to consumers.

The most used pattern is channel two. Fish farmers carry out the sales process directly to collectors because traders usually come to the cultivation site to buy and immediately transport fish to be redistributed to the next buyer (Rokeya, JA, Ahmed, SS, Bhuiyan, AS, Alam, MS, 1997), in addition to Therefore, most of the cultivators strongly believe in the middleman (Rahman, Ahmadi, Mahreda, ES, 2019). Usually the collectors will pay to the farmers after the fish they have brought have been sold out (Sathiadhas, R., Kanagam, A.



2000). Wholesalers already have their own subscriptions, namely retailers in several market areas so that they will directly distribute the fish purchased from the cultivators to the retailers (Lilimantik, E. 2013). Retailers usually make payments in cash or depending on the agreement that has been agreed with the collecting traders (Flowra, F.A., Bashar, A.H.M., Jahan, K.S.N., Samad, M.A., Islam, M.M. 2012).

Regression analysis of the prices of the two markets can show the degree of closeness of the relationship between the two markets. The regression coefficient aims to see the market structure of cultivated tilapia. The results of the regression analysis of prices at the farmer level and prices at the retail level are presented in Table 4, while the regression analysis equation model between prices at the farmer level and prices at the retail level is presented in equation 4.

$$P_f = 28,054 + 0,55 P_r \quad (4)$$

Table 4 – Price regression analysis at producer level and price at retail level

No.	Description	Value
1.	α	28,05
2.	β	0,55
3.	R	0,85
4.	R^2	0,71

Source: Processed Primary Data, 2021.

Table 4 explains that from the results of the price regression analysis at the producer level and the price at the retail level, the regression coefficient value is not equal to one ($\beta < 1$), which is 0.55. This means that every price increase of IDR 1, - at the retail level is followed by a price increase of IDR 0.55 at the cultivator level or an increase in the price of one unit at the consumer level followed by a price increase that is smaller than one unit at the cultivator level. The value of < 1 explains that the market is not perfectly integrated and the structure of the fish market that is formed is an oligopsony market. In this market cultivators get lower prices, this is because cultivators have no choice and are very dependent on collectors in selling their products (Lilimantik E, 2020), marketing institutions as buyers usually dominate the market (Rapsomanikis G, Hallam D and Conforti P., 2004) and they have a big role in determining prices (Joskow P, 2005). Imperfect market conditions will cause the price information obtained by market participants to be imperfect (information disintegration occurs) (Sexton, RJ, Kling, CL and Carman, HF, 1991), this also causes a slow response to price adjustments so that the market becomes unstable (Ravallion M, 1986).

CONCLUSION

The marketing channel of cultivated tilapia in South Kalimantan Province consists of 4 patterns, which are (1) one of fish farmer (3%) sold out fish to the consumer, (2) twenty five of fish farmers (78%) sold out fish to the middleman and then sold again to retailers and finally sold to the consumers, (3) four of fish farmers (13%) sold out to the retailers and distributed to consumers and (4) two of fish farmers sold fish to institutional market for distribution to consumers. The market structure of aquacultured tilapia is an oligopsony market, where in this form of market buyers, namely marketing agencies, usually dominate the market as recipients of goods.

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