

A Marketing and Financial Analysis of Milkfish (*Chanos chanos*) and Giant Tiger Prawn (*Penaeus monodon*) Farming in East Kalimantan

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The aims of this current research were (1) to find out the marketing system of milkfish and giant tiger prawn (marketing channel, margin and marketing farmer's share) as well as (2) to analyse the financial aspects of the milkfish and prawn farming business. The field research was conducted in two months (August- September 2016). Moreover, in order to investigate the marketing system, the sampling technique employed was snowball sampling, whereas for the financial analysis, the sample was selected by using purposive sampling. Data in this research were obtained by using interviews with guidelines, which afterwards were analysed quantitatively and qualitatively. The research findings indicated that: (1) the marketing system of milkfish and giant tiger prawns used the Level 2 Marketing Channel, with efficient marketing margin and farmer's share; meanwhile (2) the financial analysis indicated that the Net Present Value (NPV) > 0, Internal Rate of Return (IRR) > Opportunity Cost of Capital (OCC), Net Benefit Cost Ratio (Net B/C Ratio) > 1, therefore it could be concluded that the milkfish and giant tiger prawn farming business in Babulu Laut Village was profitable.

Key words: *Marketing, Financial Analysis, Milkfish, Giant Tiger Prawn, Babulu laut.*

Introduction

East Kalimantan Province has 10 regencies/ municipalities, one of which is Penajam Paser Utara (PPU) Regency. The regency covers the areas of 3,333.06 Km² (3,060.82 Km² of land and 272.2 Km² of sea). It comprises of four sub-districts, namely: Babulu, Waru, Penajam and Sepaku, as well as 47 villages/ urban communities (23 villages and 24 urban communities), with the marine fisheries production amounting to 4,628.5 tonnes, and the fish farming production amounting to 3,590.3 tonnes. The highest number of fish farmed is found in Babulu Sub-District, especially in Babulu Laut Village, which is amounting to 2,032.6 tonnes, with a production value of IDR 43,479,550,000,-. (BPS Penajam Paser Utara, 2016).

Furthermore, the Profile of Babulu Laut Village (2016) mentions that this village has a thousand hectares of land which is used for fish farming. This area has also been well known as the center of fish products, especially the ones from fish farming. Since 2010, the Babulu Laut area has been designated as a Minapolitan area by the Minister of Marine and Fisheries.

The commodities cultivated in this farming are milkfish (*Chanos chanos*) and giant tiger prawns (*Penaeus monodon*). The cultivating systems are monoculture (only milkfish) and polyculture, which is the combination of cultivating milkfish and prawns at the same time. Previous studies carried out by Murachman (2010), in Tanjung Sari Hamlet, Kupang Village, Jabon Sub-District, Sidoarjo Regency as well as Mangampa dan Burhanuddin (2014) at the Farm of Borimasunggu Village, Maros Regency, stated that the polycultural cultivation system would be more financially beneficial than the monoculture system. Murachman argued further that the polycultural system with three commodities would even be more profitable.

The fish cultivation in Babulu Laut Village is mostly carried out by using a two-commodity polycultural system, in which milkfish and tiger prawns are cultivated together at the same time in a farm. The reason why these two commodities are the most cultivated ones is firstly due to the all-season demand for milkfish, it being favoured by people both from the villages and the cities, the relatively affordable price, the possibility of producing it into particular food products such as high-pressure cooked milkfish and milkfish floss. Murachman (2010) added that milkfish, including the species of *Chanos chanos* Forks (Garcia, 1990), also has a wide range marketing area. In addition, tiger prawns, including the species of *Penaeus monodon* (Sutarno, 2001), are mostly cultivated due to their current status as the fisheries commodity of Indonesia, the increasing global demand caused by the change in consumers' taste and preferences as well as the relatively wide marketing opportunities, their rather high and relatively stable prices and their being favoured by the consumers (Ghee-Thean et al, 2016).

Meanwhile, the financial accountability, according to Gray (1994) and Kadariah (2001) could be obtained by analysing the following values: *Net Present Value* (NPV); *Internal Rate of Return* (IRR) and *Net Benefit Cost Ratio* (Net B/C Ratio).

Moreover, the research concerning marketing channels needs to be conducted, because no matter how good and high the production is, if the marketing is not done properly, the products will not be received maximally by the markets. Marketing itself (Hanafiah and Saefuddin, 1986; Mubyarto, 1989; Downey, 1992 and Soekartawi, 1993) is an action related to the movement of products/ items from the producers to the consumers, through marketing institutions. Marketing channels refers to the path from the marketing institution which has an activity to distribute products from producers to consumers, in a simple or complicated form, in a long or short route (Hanafiah and Saefuddin, 1986; Stanton, 1993 and Soekartawi, 1993).

Kotler (1990) classified the marketing channels as follows:

1. Zero Level Channel

Producers → Consumers

2. One Level Channel

Producers → Agents → Consumers

3. Two Level Channel

Producers → Agents → Retailers → Consumers

4. Three Level Channel

Producers → Agents → Wholesalers → Retailers → Consumers

The polycultural cultivation business in Babulu Laut Village has been carried out for some years already. However, the fish farmers there did not have certain data and financial information concerning the profits they had been making, as well as whether the marketing channels of their products were good enough or not. Therefore, this current research entitled “The Marketing and Financial Analysis of Milkfish (*Chanos chanos*) and Giant Tiger Prawn (*Penaeus monodon*) Farming in Babulu Laut Village, Babulu Subdistrict, North Penajam Paser Regency, East Kalimantan Province” was conducted.

The aims of this research were to investigate the marketing of milkfish and tiger prawns, which included the following aspects: channels, margin and marketing efficiency, as well as to analyse financially the milkfish and prawn farming business.

Materials and Methods

The primary data collection was conducted in two months (from August to September 2016), at the research site located in Babulu Laut Village, Babulu Sub-District, Penajam Paser Utara Regency. The data was collected by observation and interviews (to obtain primary data) and

library study (to obtain secondary data). The sample for the farming product marketing was selected by using the snowball sampling technique with 20 respondents (fish farmers, wholesalers and retailers). Moreover, to know the fish farming business accountability, the sample was taken by using the purposive sampling technique, by selecting participants using specific considerations as follows: active polycultural fish farmers, having worked in the fish farming business for a minimum of 15 years, the minimum age was 30 years old, and being able to provide data and information concerning their fish farm business. Based on the above mentioned criteria, 9 respondents were selected.

The data analysis method was qualitative and quantitative. The qualitative method was employed to describe characteristics of important variables of a situation/ describe the aspects relevant to the phenomenon being researched. On the other hand, the quantitative method was a method which placed more emphasis on the objective measurement of social phenomena (Sumanto, 1995).

Marketing Margin

According to Dahl dan Hammond (1977); Hanafiah and Saefuddin (1986), Masyrofi, 1994 and Sudiyono (2002), marketing margin is the difference in the price received by the fish farmers from the price paid by the consumers. The obtained marketing margin value is calculated by using the following formula:

$$MR = Pr - Pf$$

Notes:

MP = Marketing Margin (IDR/Kg)

Pr = Consumer Price (IDR/Kg)

Pf = Producer Price (IDR/Kg)

Efficiency

Marketing efficiency can be seen from *farmer's share*. Marketing is efficient if it is able to distribute products/services to the consumers at a lower cost and is able to hold a fair share of the total paid by the consumers to all parties who are involved in marketing activities (Rahardi, 1994). Farmer's Share's formula is as follows:

$$FS = \frac{Pf}{Pr} \times 100\%$$

Notes:

FS = *Farmer's share* in the consumer price expressed as percentage (%)

Pf = Price received by the farmer (Rp/kg)

Pr = Retail Price (Rp/kg)

Criteria of Decision according to Downey and Erickson (1992):

FS \geq 40% = efficient

FS < 40% = inefficient

Financial Analysis

The financial feasibility of a pond business can be analysed by using (Kadariah, 2001) :

Net Present Value (NPV)

NPV is the difference between *Present value of benefit* and *present value of cost* during the project at a given interest rate.

1. Net Present Value (NPV)

NPV is the difference between benefits and costs used as present value.

$$NPV = \sum_{t=1}^n \frac{Bt - Ct}{(1+i)^t}$$

Notes:

Bt = Gross Benefit in Year t (Rp)

Ct = Cost of Project in Year t (Rp)

n = Project Life Technis (Year)

i = Opportunity Cost of Capital (%)

t = Year

These Investment Criteria Mean that:

If NPV > 0, pond business is feasible to continue

If NPV \leq 0, pond business is not feasible to continue

Internal Rate of Return (IRR)

Internal Rate of Return (IRR) is the interest rate that makes the Net Present Value (NPV) equal to zero.

$$IRR = i' \frac{NPV'}{NPV' - NPV''} (i'' - i')$$

Notes:

NPV' = Net Present Value Positive (Rp)

NPV'' = Net Present Value Negative (Rp)

i' = Discount Rate Giving a Positive NPV Value (%)

i'' = Discount Rate Giving a Negative NPV Value (%)

These Investment Criteria Mean that:

If IRR > OCC, pond business is feasible to continue

If IRR < OCC, pond business is not feasible to continue

Net Benefit Cost Ratio (Net BCR)

Net BCR is a comparison between net benefit and net cost, and considered as present value in which the numerator is positive and the denominator is negative. The net value of BCR is derived from:

$$Net\ B/C = \frac{\sum_{t=1}^n \frac{Bt - Ct}{(1+i)^t}}{\sum_{t=1}^n \frac{Ct - Bt}{(1+i)^t}}$$

Notes:

Bt : *Benefit* (Gross Benefit in Year (Rp))

Ct : *Cost* (Gross Cost in Year (Rp))

n : Period

i : Interest Rate (%)

t : Number of Time Period

These Investment Criteria Mean that:

If $Net\ BCR > 1$, pond business is feasible to continue

If $Net\ BCR < 1$, pond business is not feasible to continue

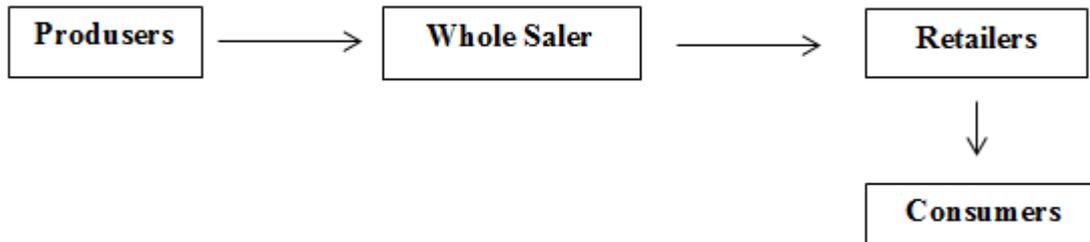
Findings and Discussion

North Penajam Paser Regency (PPU Regency) is divided into four sub-districts, one of which is Babulu sub-district. Located in Babulu sub-district, Babulu Laut village has a population of 4.134 people, and is the highest production centre of pond cultivation; that is 2.036,2 tons with value Rp. 43.479.550.000. In this area, most of the people cultivate the pond as their main livelihood, the pond system is divided into two types; they are monoculture and polyculture. However, most of the people tend to practice the polyculture system, where milkfish and prawn are bred simultaneously by using the traditional business pattern. This system is practiced by most people in Babulu Laut village because the farming system is not complicated, the water management is not too dependent on technical ducts and in one year it can be harvested three times, and moreover it gives added value to the result compared to the monoculture system. The area of respondents' pond is from 5 to 10 Ha. The milkfish yield is around 2000 – 4000 kg / season. While the tiger prawn is around 5 – 150 kg / season. When the research was conducted, the price of the milkfish from the farmers was Rp. 16.000 and the tiger prawn was Rp. 150.0000 (size 30) and Rp. 240.000 (size 20). The polyculture pond system is mostly practiced by the people in Babulu Laut village because it can reduce the prospect of business failure, both are mutually beneficial (symbiosis mutualism) i.e. when the prawn crop experiences failure due to the virus attack (*White Spot Syndrome Virus*), then milkfish can be harvested, yet if the milkfish's price is low in the market, then the prawn's price can reduce the loss and (Riesti Triyanti dan Hikmah, 2015).

Milkfish and Tiger Prawn Marketing System

Milkfish (*Chanos chanos*) and tiger prawn (*Penaeus monodon*) using the polyculture system is sold through the level two (2) marketing system. This is done because if it is sold directly to the consumers, the marketing cost is relatively higher. The Level 2 marketing system involves two middlemen; they are big agents and small retailers, the description is in Diagram 1 as follows:

Diagram 1. Milkfish (*Chanos chanos*) and Tiger Prawn (*Penaeus monodon*) Marketing System



Marketing Margin and Farmer's Share

Marketing margin is the price difference between the farmers' selling price and the consumer's buying price. With the level 2 marketing pattern, each margin of milkfish and tiger prawn's marketing, as well as their farmer's share can be seen in Tables 1 and 2 as follows:

Table 1: Marketing Margin and Farmer's Share of Milkfish Marketing

Level 2 Marketing System	Selling Price (Rp/Kg)	Buying Price (Rp/Kg)	Marketing Margin (Rp)	Farmer's Share (%)
Farmers	16.000	-	-	-
Wholesale Agents	25.000	16.000	9.000	64,00
Retailers	30.000	25.000	5.000	83,00
Consumers	35.000	30.000		

Table 2: Marketing Margin and Farmer's Share of Giant Tiger Prawn Marketing

Level 2 Marketing System	Selling Price (Rp/Kg)	Buying Price (Rp/Kg)	Marketing Margin (Rp)	Farmer's Share (%)
Farmers	195.000	-	-	-
Wholesale Agents	225.000	195.000	40.000	86,00
Retailers	240.000	225.000	15.000	93,00
Consumers	290.000	240.000		

Tables 1 and 2 above show that the total margin of milkfish marketing is Rp. 19.000 with Farmer's Share 45,71% and the marketing margin of giant tiger prawn is Rp. 95.000 with Farmer's Share 67,24%. Farmer's Share of milkfish and tiger prawn is categorised as efficient, because more than 40% of the buying price is in consumers' level. This is in line with Downey and Erickson's point of view (1992) that the marketing of agricultural products when viewed from the parts received by producers / farmers can be deemed efficient if the selling price of the farmers is more than or equal to 40% of the purchase price at the



consumer level. The marketing margin in every marketing agency involved is also relatively and evenly distributed.

Financial Analysis

The result of milkfish and tiger prawn's financial analysis in Babulu Laut Village is based on the calculation of NPV, IRR, and Net B/C Ratio with a Discount Rate 15 % obtained value is as follows: NPV Rp. 411.802.785, the value of NPV shows that the net benefit obtained in five years is Rp. 411.802.785, and because the NPV value > 0 , then milkfish and tiger prawn farming is feasible and profitable; IRR 15% of 17,56%, the IRR value indicates that the rate value of milkfish and tiger prawn pond to the investment is 17,56%, and because the IRR value obtained from the calculation is higher compared to the determined OCC level which is 15%, then the milkfish and tiger prawn business is financially feasible (profitable); the Net B/C ratio has a discount rate of 15% is 75,56, which means that any additional cost of Rp. 1,00 will result in the additional benefit of Rp 75,56 of milkfish and tiger prawn pond business, therefore it is financially feasible (profitable).

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