

DISTRIBUTION CHANNELS METHODS: SOME EVIDENCES FROM THE MALAYSIAN TILAPIA INDUSTRY

Zuraimi Abdul Aziz, Rosmaizura Mohd Zain, Mohd Rosli Mohamad, Nora'Aini Mustapha,Shahril Nizam M.

R^{1*},Suria Baba , Wan Mohd Yusuff Wan Ibrahim, Siti Nabila Rosdi

¹Faculty of Entrepreneurship & Business University Malaysia Kelantan

*For correspondence; Tel. + (60) 09-7717256 E-mail: zuraimi@umk.edu.my

ABSTRACT: *The supply chain for aquaculture products involves a large number of stakeholders, right from fish farmers to final consumers. This relates to a proper handling of transportation and distribution for fish products, as it would be essential complementary functions of all food production systems. An efficient organization of the transportation and distribution system requires the performance of some key transportation and distribution functions. In other words, lack of knowledge in proper handling and transportation among fish farmers, or re-sellers towards distribution strategy could affect the supply of fish product from the rural to the urban areas. Since Tilapia fish products are perishable, intensive transportation and distribution systems are required in this modern business environment. Therefore, this study intends to investigate methods of transportation and distribution for Tilapia fish. This study deals with the relevant agencies that have involved in managing the transportation and distribution of aquaculture products. Data are collected through focus group discussions. The study discovers that there were several types of transportation and distribution methods accordingly.*

Keywords: Transportation, distribution, aquaculture, focus group discussion, logistics

1. INTRODUCTION

In Malaysia, the aquaculture industry is growing rapidly, especially the production of freshwater aquaculture fish. The Department of Fisheries Malaysia reported the production of farming aquaculture products in 2007 was about 635,000 tonnes compared to 269,000 tonnes in 2007. The increase is about 58% within 5 years and the average production increase per year from 2003 to 2012 (10 years) was about 13.4% [2]. Based on the gradually increased on the production, it seem that consumers in Malaysia have begun to accept aquaculture fish as an alternative to sea fish since the production of sea fish was depleted. Freshwater fish are the main aquaculture products in Malaysia beside brackish water fish [3]. Red Tilapia (*Oreochromis* sp. red hybrids), keli (*Clarias* spp.) and patin (*Pangasiussutchii*) are among the most popular aquaculture fish produced by farmers. Major fish species cultured include Red Tilapia, Black Tilapia and eel. Particularly, red Tilapia showed very high of total Tilapia production in Malaysia.

For many years, farmers in Malaysia have cultured freshwater fish in earthen ponds, floating net cages in rivers and ex-mining pools [3]. After harvesting, the fresh fish normally will be sold at local markets and cooked aquaculture fish are among popular dishes on food premises in Malaysia.

Many studies have been done on transportation and distribution system [1, 9, 14]. However, [12] focused on fishery industry of India; [7] on fish products in Nigeria, but little was studied in the aquaculture and especially Tilapia industries in Malaysia. This paper provides the insight of distribution channel systems with special focus on transportation and distribution methods. This study is focusing on Tilapia fish, as it is very versatile and is tolerant of a variety of aquaculture environments; it can be farmed in brackish or salt water and also in pond or cage systems.

2. LITERATURE REVIEW

In Asia, many countries are experiencing fast economic transformation [6]. Improving the performance of

aquaculture-based industries has achieved more interest from practitioners and academicians similarly for the past decade. This is due to continuous economic expansion and population growth in Asia, especially China and India. Logistics is one of the practices to improve the business competition. Truly, a good management practice in logistics could provide better movement of products, high quality of service, the optimization of resources and facilities, as well as operational costs can be minimized. In the industrial or manufacturing sector, logistics aims to enhance the productivity and distribution processes by practicing management techniques to provide the benefits to a maximum level and to ensure the customer satisfaction. It is believed that, the efficiency of product delivery is totally depends on the transportation. This is mainly due to the transportation plays a crucial role in the functions of logistics and supply chain management.

Moreover, numerous studies deal with logistics or supply chain practice in fishing industry, for example, [8] proposed a model of fishing supply chain management for enhancing production and distribution of fishes in Bangladesh. [5] developed the model of the supply chain network in the German fish industry. To date, there is little attention or no recorded research on the state of logistical management practices of Tilapia fish (in Malaysia) has appeared in the literature. This paper therefore seeks to promote a greater understanding of logistics management development in Malaysia connected to transportation and distribution of Tilapia production. For this reason, Focus Group Discussion (FGD) was conducted to investigate the method of transportation and physical distribution of Tilapia.

The fisheries sector is part of a sub-sector in Malaysia and plays a significant role in the national economy. The need for fishery-related product in Malaysia has increased in recent years. The upper, middle and downstream operations of the local fish farming industry have striven to meet this increased need. In 2014, FAO reported that world fishery production of Tilapia and cichlids were 728,227 tonnes, and this number is comparatively small as compared to carps, barbels and other

cyprinids (amounted to 1.55 million tonnes). In fact, Tilapia has become the most profitable business and popular food in most countries such as India, China, Thailand, Philippines, Taiwan and followed by Malaysia. In spite of the importance of aquaculture to world food supplies, transportation occupies one-third of the amount in the logistics costs in the economic activity whereas it can influence the performance of logistics system hugely [15]. The physical distribution aspect of logistics is still viewed as highly cost oriented, and hence the perception to improve delivery accuracy and handling, turnaround time and reduce delivery costs.

3. METHODOLOGY

Focus groups discussion (FGD) is one of the most common tools in the social sciences and health research for collecting qualitative data [13, 10, 4]. This approach is suitable for researchers to explore different ideas, perspectives and important information on a related topic. Therefore, this study considers the use of FGD as the aim was to gain in-depth understanding and experiences in dealing with Tilapia fish distribution systems in Malaysia.

The group discussions were organized to generate exhaustive discussions on opinions based on experiences of the respondents on related issues. Twelve (12) respondents were selected by consideration of their knowledge, the length of experience in aquaculture, tilapia, and logistics. This rich and thick information is vital as main source of data [17] also to support the validity of data. The planning of FGD has started several weeks before the actual session, and FGD was conducted at the research location. The selection of specific respondents was based on the following criteria to provide sampling units appropriate to this study: a) Respondents who have been in this industry more than five years of experience in managing the transportation and distribution of the industry; b) Respondents were selected from different types of organization involved in the management fisheries, such as Customs (PK1 and PK2), Fisheries Association (PENEKA) (PK3), Federal Agricultural Marketing Authority (FAMA) (PK4 and PK5), Fisheries Development Authority (LKIM) (PK6, PK7 and PK8), Logistics Service Providers firm (PK9 and PK10), and Fisheries Department (JP) (PK11 and PK12); and c) Acceptance from these respondents are very important because of their nature of work in this area and also customizing multi source of information [19].

The session of FGD was led by a trained moderator (Logistics senior lecturer from Universiti Malaysia Kelantan) and the protocol was designed [10] to guide FGD session. Inclusion general criteria or theme: an overview of Tilapia farming practices (raw materials, operational procedures and products). Followed by the specific themes including the types of distribution channels or marketing systems; methods of distribution with respects to handling, transportation, storage, fish management support services provided by governmental or non-governmental organizations and other institutions, as well as constraints of managing the Tilapia products. Focus groups usually last approximately 2–3 hours and data were recorded by digital recording. NVivo 10 was used for analysis to identify several major themes based on perceptions and reactions of respondents to Tilapia management.

4. FINDINGS AND DISCUSSION

The FGD main discussion was on the aquaculture industry in general, the tilapia industry in specific and logistics. Based on the discussion, this study identified that there were four types of Tilapia products, namely raw material (holding or main fish), semi-product (fish fry), by-product, and finished product to offer in the market. However, most of the respondents agreed that there were still lacking for handling tilapia products from the upstream to the downstream level as compared to marine fish landings, which was regulated by LKIM since 2010. What transpired from the discussion was that the level of mortality rate among holding fish is high. However, in order to ensure the longevity of holding fish, there is a guideline provided by FAMA for its transportation. It was recommended that the lorry or truck should be equipped with the oxygen and the size of fish container within 4' x 3'; and the quantity of Tilapia should not exceed a quarter of the water level of the fish container as illustrated by PK4 as follows:

Usually, fish farmers are using normal truck, normal truck with the oxygen, for tilapia, for live tilapia would require fish container of 4' x 3', [...] quantity not exceeded a quarter of the water [.....] means out of 4 metric tonnes fish container, only 1 metric tonnes tilapia will be in fish container. [.....] quantity of tilapia can be up to 50% of fish container size but the mortality will be higher.

Should this recommendation is met, the longevity of holding fish would increase up to 50 per cent of holding fish transported.

In the case of fish fry, FAMA also recommended the use of plastic bags filled with oxygen to transport the fry. It is highly recommended that the fish fry delivered and distributed at night to avoid high temperature. It was explained by PK12 that:

Talks about fish fry, if comes from our centre, we provide a plastic bag, which filled with the oxygen. No restriction to transport with any mode of transportation. [.....]. Own transportation, department vehicles, truck, or other type of vehicle, can be accepted. [.....] but we recommended that fish fry should deliver at night, more cool [.....] but sometimes fish farmers are not follow our recommendation, but they put it in ice cube before release into their cages.

This study also identified, that there were three types of distribution channels for Tilapia products as follows:

1) Distribution channel to end customers

Sales to end customers required fish farmers to do all marketing by themselves. Thus, Tilapia need to be, either transported to customer's locations; or held in cages or tanks on the farm. Adequate facilities and proper handling would make a big difference in the delivery of Tilapia products. For example, to supply holding fish, it is important that the fish is readily available and in good conditions. Dead fish will turn customers away. In the case of location of the farm is not enough to attract for direct sales, fish farmer has to be transported the Tilapia products to where the customer are. The Tilapia products can be delivered to farmer's market, restaurant or grocery stores. This result is consistent with previous study such as [11] whose found that most fish sell directly to individual consumer, fish retailer as well as

restaurants. It can be delivered using the hauling tanks such as box made of marine plywood, aluminium and fiberglass tanks with some ice added to reduce temperature of the water during transport.

2) Distribution channels to the intermediaries

It was found that FAMA is an authorised agency, acting as an intermediary for marketing and distribution of aquaculture products. In this context, FAMA purchased Tilapia from fish farmers and re-sell to the distributor or directly to the retailers. This alternative creates opportunity for fish farmers to sell Tilapia to the intermediaries, either a company or an individual, who own large transport vehicles to transport and distribute the Tilapia to other distributors, or to retail outlets. The respondents admitted that there was a direct sale and delivery by fish farmers to retail outlet rather than via FAMA. As highlighted by the respondents, by doing this type of delivery, the Tilapia product from fish farmers would be placed in the rear of the rack or it may be placed out of buyer view. However, if the fish farmers distribute their product to the hypermarket via FAMA, there is a high opportunity for the Tilapia product will be placed at the edge or the middle of the shelf. The finding supports the study by [8] and [18] who found that market communication is mainly made by the middlemen and the wholesaler, which involve lots of intermediaries in the supply chain.

It was also informed that fish farmers had alternative intermediaries such as Consolidation Centre (CC) and Distribution Centre (DC). As to date, there were three CCs and DCs now in Malaysia, which located in Klang Valley and East Coast Region of Peninsular Malaysia. The main purpose of these two establishments is to reduce the cost and time for distribution channels. It acts as a One-Stop Centre for the stakeholders. All Tilapia products were gathered at the place to facilitate stakeholders transporting and distributing the Tilapia products. For example, when a processor requires a big volume of Tilapia, they could obtain from CC or DC. According to the respondents this exercise would reduce the transportation cost and delivery time. PK8 stated:

[.....] CC and DC were established in three location, Klang Valley, East Coast, Besut near to Kelantan. Main purpose of cost reduction. [.....] buyer able to collect a goods from one place. If one-stop centre, they could get all type of goods related to tilapia [.....] that our main purpose to establish CC and DC.

This is because transportation of live fish to remote markets is a more complex handling operation and requires investment in trucks with fish holding cages, pumping systems to circulate the water, and aeration devices in the tanks. Long distance transport of fresh fish further requires ice, or trucks with cooling devices. It may not be economically feasible to transport fresh or live fish to rural markets unless economies of scale can be achieved through high-volume transport. Transport is expensive and may be unreliable or unavailable along bad roads during certain seasons. Therefore, CC or DC improves the transportation and distribution systems in Tilapia and other aquaculture products. This argument is consistent with studies by [16] who emphasized that proper distribution network gives all parties involved benefit especially for the smaller partners,

they are able to offset the distribution cost by literally sharing transport.

3) Distribution channels to processors

Respondents also highlighted that some aquaculture products are sold by fish farmers to processing firms. The same goes to the Tilapia fish. However, the respondents reminded that fish farmers need to ensure the distribution of Tilapia fish is in order. Processing firms will schedule delivery of loads of Tilapia fish depending upon their current and anticipated orders. Fish farms have able to regularly supply the volume and size of Tilapia fish desired by the processors. Thus, as a producer of Tilapia fish, fish farmer have a clear idea of what the plan's specifications are for size tolerances, delivery volumes, timing of deliveries, and quality control checks. The respondents also stressed that processing firms normally purchase a large volume of product per order and they are more particular about transportation and distribution method, compared to other potential customers. They required a proper transport and distribution management in order to avoid unnecessary problem that affect to their production. It includes timing, volume of products, and packaging. The larger seafood markets are those with higher income consumers who have little interest in cleaning fish for consumption at home will find the alternative of seafood. In this case, fillet and other byproducts from Tilapia fish is the primary product sold in the seafood market.

5. CONCLUSION

This study is conducted to investigate the transportation and distribution system for Tilapia fish in Malaysia that could influence the performance of local and international trade. The results demonstrated that the distribution or marketing channel consists of three alternatives to selling process for Tilapia fish. Distribution system plays the connecting chain between the fish farmer and the last stage customers, intermediaries and processors (manufacturers). Moreover, existing of consolidation centre, distribution centre, and authorised agency (FAMA) have created opportunities for fish farmers to quickly sell their Tilapia product. The government or authorised agency, fish farmers, third parties and other channel distributors should have a better procedure to ensure the selling process of Tilapia fish is entirely managed at each stage. Therefore, an efficient transport, material handling and distribution system is very important for achieving maximum benefit or profit for the farmers and other stakeholders' those are involved in the fishing industry. Hopefully, the findings of this study can provide the practitioners and academicians with real information of day-to-day operating experience of Tilapia fish management.

6. ACKNOWLEDGEMENT

Authors are very thankful to the Malaysia Ministry of Higher Education for the financial support through the Niche Research Grant Scheme to carry out this study.

7. REFERENCES

- [1] Adnan, K. M. M., Rahman, M., Sarker, S. A. (2014), Marketing channels and post harvest practices of onion: a case of Bogra and Joypurhat District in

- Bangladesh. *Universal Journal of Agricultural Research*, 2(2), 61–66.
- [2] Department of Fisheries, M. (2014a), Perangkaan Perikanan Tahunan. Available from: <http://www.dof.gov.my/fishery-statistics>.
- [3] Department of Fisheries, M. (2014b), Skim Persijilan Ladang Akuakultur Malaysia. Available from: <http://www.moa.gov.my/web/guest/splam>.
- [4] Dilshad, R.M., Latif, M.I. (2013), Focus group interview as a tool for qualitative research: an analysis. *Pakistan Journal of Social Sciences*, 33(1), 191-198.
- [5] Gagalyuk, T., Hanf, J.H., Steinbauer,W. (2009), Managing supply chains successfully: an empirical testing of success of supply chain networks in the German fish sector. 113th EAAE Seminar: A resilient, European food industry and food chain in a challenging world, Greece.
- [6] Goh, M., Pinaikul, P. (1998), Research paper: logistics management practices and Thailand. *Logistics Information Management*, 11(6), 359–369.
- [7] Hamilton, H.O. (2016), Distributional strategy of fish product in Asari-Toru local government area of Rivers State. *International Journal of Business Administration*, 7(1), 33-49.
- [8] Islam, S. B., Habib, M. (2013), Supply chain management in fishing industry: a case study. *International Journal of Supply Chain Management*, 2(2), 40–50.
- [9] Madugu, A., Edward, A. (2011), Marketing and distribution channel of processed fish in Adamawa State, Nigeria. *Global Journal Of Management and Business Research*, 11(4), 21–25.
- [10] Merriam, S.M. (2009), *Qualitative research and case study applications in education. Revised and expanded from case study research in education. 3rd edition.* San Francisco: Jossey-bass Publisher
- [11] Obiero, K. O., Opiyo, M. A., Munguti, J. M., Orina, P. S., Kyule, D., yongo, E., Githukia, C. M., Charo-Karisa, H. (2014), Consumer preference and marketing of farmed Nile Tilapia (*Oreochromis niloticus*) and African Catfish (*Clarias gariepinus*) in Kenya: Case study of Krinyaga and Vihiga Counties. *International Journal of Fisheries and Aquatic Studies*, 1(5), 67-76.
- [12] Phukan, S. C., Studies, M. (2013), Selection of distribution channels by small and marginal fish farmers in rural India and its impact on fish prices and fish farmers' income level: a survey of available literature. *International Journal of Management and Social Sciences Research*, 2(11), 1-5.
- [13] Rabiee, F. (2004), Focus-group interview and data analysis. *The Proceedings of the Nutrition Society*, 63(4), 655–660.
- [14] Saremi, H., Zadeh, S.M.M. (2014), Management of distribution channels. *Indian Journal of Scientific Research*, 5(3): 452-456.
- [15] Tseng, Y., Yue, W. L., Taylor, M. A. P. (2005), The role of transportation in logistics chain. *Eastern Asia Society for Transportation Studies*, (5), 1657–1672.
- [16] Wagner, B. A., Alderdice, A. D. G. (2006), Managing the distribution channel: the case of Scot Trout and Salmon. *Supply Chain Management: An International Journal*, 11(2), 104-107.
- [17] Wolcott, H.F. (2009), *Writing Up Qualitative Research.* Thousand Oaks: SAGE Publications.
- [18] Wongprawmas, R., Canavari, M., Waisarayutt, C. (2015), A multi-stakeholder perspective on the adoption of good agricultural practices in the Thai fresh produce industry. *British Food Journal*, 117(9), 2234-2249.
- [19] Yin, R. K. (2009), *Case Study Research: Design and Methods.* 4th edition. Thousand Oaks: SAGE Publications.

*For correspondence; Tel. + (60) 09-7717256,
email:zuraimi@umk.edu.my