Accessibility of Aquaculture Products in Thailand

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Abstract The paper first reviews the aquaculture sector in Thailand and focuses on the development of freshwater fish. The government has promoted freshwater fish culture mainly to supply domestically. The development policies that influence markets and access have been stated. It then highlights fish consumption by region. As a result of increased demand for freshwater fish, marketing plays an increasing vital role and is left in the hand of private sector. Marketing practices including market structure, marketing channel and marketing margins are analyzed and discussed. It is found that the private assembly markets as well as the retail outlets have been developed significantly to serve the increase in both the supply and the demand of cultured freshwater fish. Marketing margin varies among species. Obstacles to market access is not observed apparently. The shift in production centers close to the big consuming center with high purchasing power in the past two decades may benefit some group of consumer. However, the consumer in other regions can access to freshwater fish through the effective and efficient marketing system. The paper concludes with the discussion and analyzes of future domestic market potential in view of existing and evolving consumption pattern and marketing development, and measures required to realize the potential.

Key words marketing structure, marketing channel, marketing margin

1. Sector overview

1.1 Production

Fisheries production in Thailand demonstrated a remarkable growth over the last three decades. The total production exceeded two million tons for the first time in 1977 but it was followed by a set back and then has recovered to over two million tons again since 1982. In 1996, a record of nearly 3.5 million tons was obtained, of which 79.3 percent came from marine captured fisheries. The rest was contributed by coastal aquaculture, freshwater aquaculture and inland captured fisheries at 10 percent, 5.9 percent and 5,8 percent, respectively.

Considering the country' s total aquaculture production , which is divided into coastal and freshwater, production from freshwater aquaculture was predominant in earlier days. However, coastal aquaculture has played important role since 1988 onwards due to the rapid development of intensive marine shrimp culture. In 1996, of total aquaculture production, freshwater aquaculture shared 41.3 percent and 13.9 percent in quantity and value , respectively.

As far as freshwater aquaculture is concerned, its actual operation has been started long time ago, but culture practice adopted initially on few species such as common carp (*Cyprinus carpio*), sepat siam (*Trichogaster pectoralis*) and striped catfish (*Pangasius sutchi*). Such culture were operated only on a small scale and were confined around Bangkok area. Until the mid of 1951, other species i.e. chinese carp (*Ctenopharyngodon idellus*) walking catfish (*Clarias batrachus*) and striped snake-head (*Ophicephalus striatus*) were introduced and extensive fish culture extension scheme had been implemented. Within a short period, a large number of ponds had either been constructed or converted from the old ones for fish farming. Several idle swamps had been converted and operated by the farmers. From 1963 onwards, fish culture has been rapidly developed, partially from the breakthrough in artificial breeding by hormone injection of many valuable species.

At present, more than 15 species of fish and invertebrates are cultured. In 1996, catch from freshwater culture amounted to 228,656 tons, valued at 6,785.6 million baht. During the past two decades, production from this sub-sector had increased with an average annual growth of 11.9 percent and 17.1 percent in quantity and value, respectively.

1.2 Production system and species cultured

Fish farming practice is classified into four types; pond culture, paddy field culture, ditch culture, and cage culture. The pattern of culture, either monoculture or polyculture varies according to species cultured. The former is commonly found in raising carnivorous species. The latter is generally found in raising omnivorous species. Nevertheless, it is observed that in some farms especially in the

North, tilapia is raised together with walking catfish in order to reduce the tilapia fries, otherwise tilapia's growth rate is low due to its high fecundity.

Fish culture development scheme in Thailand has been designed to fit into the socio-economic condition of the rural populace. Wherever possible, people are encouraged to culture fish in addition to pig or poultry raising, vegetable and fruit cultivation and rice planting. Therefore, integrated fish culture with animal husbandary and/or cropping are commonly practiced in Thailand.

The main species cultured that contributed about 90 percent in quantity and 78 percent in value [1] in 1996 are Nile tilapia , Walking catfish , Thai silver barb, Sepat Siam , Striped catfish and Striped snake-head. Nile Tilapia which accounted over 35 percent of total freshwater fish cultured increasingly become more popular in every regions because of its easy raising and fast growing. The consumers are fond of its taste, texture and its price which had not much fluctuated during the past two decades.

1.3 Production by region

In 1996, production from inland culture was produced from 153,993 farms with the total culture area of 72,114 hectares. The area cultured are divided into six regions; the North, the Northeast, the Central plain, the East, the West and the South. Main species cultured are slightly different among the regions. Nile tilapia is number one cultured in every regions except in the South and the Central that Walking catfish is the most popular species cultured. The average farm size of inland fish culture in Thailand is rather small about 0.44 hectare per farm.

In fish culture operation, a large number of farms in Thailand use traditional method without additional fish feed. Some may feed occasionally or may use by-product from poultry raising. In some cases, fertilizer is used to generate natural fish feed. Fish farmers in rural areas particularly in the Northern and North-eastern part engage in fish farming with the purpose for household consumption and for earn supplementary income, and most of them earns living on subsistence basis.

The intensive culture with high investment especially construction, fish feed and fingerings together with controlling the water and raising period is found mostly in operating walking catfish, snake-head fish farms in the Central Plain.

[1] If not include freshwater prawn, frog and soft shell turtle, they contributed about 94 percent in quantity and 93 percent in value.

2. Development policies

2.1 Fisheries development plan

The macro policy pertaining to aquaculture is to increase fisheries production from aquaculture at the rate of five percent per year. Freshwater aquaculture is aimed mainly for domestic consumption whereas coastal aquaculture is aimed for both domestic consumption as well as for export. The policy is to be achieved through;

- increase production efficiency by improving management and cultured technic.
- improve the environmental compatibility of aquaculture production system.
- develop and rehabilitate infrastructure needed for the expansion of production and trade.

2.2 Other policies related to aqaculture development

2.2.1 The Office of Land Reform under Ministry of Agriculture and Cooperatives is concerned with the policy and planning on accelerating land distribution and promoting land tenure to agriculturist. Based on the Land Reform Act of 1975, the land ownership promotion has been pursued with a view to fully utilize the available idle land and to solve the problem of limited land resources and hence high rent faced by the poor agriculturists. To assign the ownership to those in Agriculture sector, it will also alleviate the problem of lack access to credit since land is used as collateral.

2.2.2 The Ministry of Commerce is concerned with broad aspect in relation with trade both domestically and internationally. One of its policies is to promote and support free economic system through market mechanism, together with controlling and monitoring fair trade to prevent monopoly regime both directly and indirectly.

1 Consumption

According to the estimated per capita consumption of animal protein source, namely pork, beef, chicken and fish[2] during 1980-1997, fish ranked the first among all followed by chicken, pork and beef. The per capita fish consumption in 1997 was about 27 kg., compared to 8.5 kg., 2.1 kg., and 11.5 kg. of pork, beef and chicken, respectively.

[2] Including all groups of marine and freshwater production.

Focusing on fish consumption by region, the survey result[3] reveals that per capita fish consumption is highest in the Northeast, followed by the North, the East, the West and the Central, despite the fact that per capita income in the Northeast is lowest, followed by the North. Over 80 percent of fish consumed by those in low income group is freshwater fish which command low relative prices. However, freshwater fish accounts for over 50 percent of total quantity of fish consumption in all region, suggesting that the Thai people are easily access to freshwater fish both from natural and cultured sources (figure 1, table 1 and figure 2).

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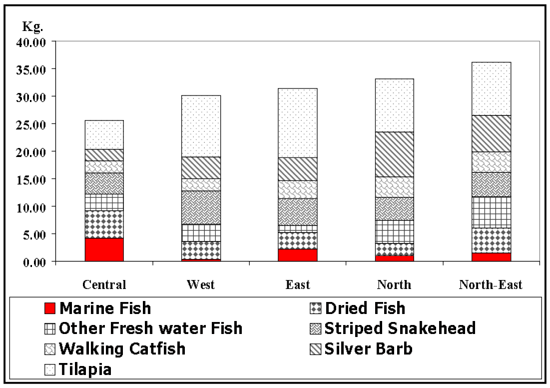

Figure 1: Per Capita Consumption by Species and Region (1999 Survey)

Region and Area	Average Annual Income		Average Annual Expenditure	
				Unit : Baht/Kg
	Per Household	Per Capita	Per Household	Per Capita
Whole Kingdom	129,348	35,206	110,280	30,016
Greater Bangkok 1/	263,364	82,767	20,901	65,687
Central Region 2/	130,884	36,007	114,120	31,395
Northern Region	99,972	29,070	84,515	24,576
Northeastern Region	88,656	22,214	79,932	20,028
Southern Region	118,152	30,397	105,516	27,146

1/ Bangkok Metropolis, Nonthaburi,Pathum Thani and Samut Prakan.
2/ Exclude Bangkok Metropolis, Nonthaburi,Prtum Thani and Samut Prakan.
Source : Report of The 1996 Household Socio-Economic Survey

Table 1: Average Annual Income and Expenditure by Region and Area

[3] Preliminary result of fish consumption survey conducted in 1999 by the Fisheries Economics Division, Department of Fisheries (unpublished).

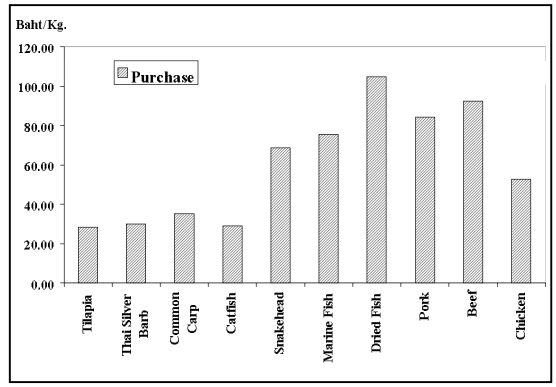

Figure 2: Average Retail Prices of Fish and other Products

4 Marketing

As far as cultured freshwater fish is concerned, its domestic marketing is complex involving many types of markets and a large number of parties. Fish is sold in fresh as well as processed. Fresh fish is sold both alive and death. Walking catfish, snake-head fish and sand goby are commonly sold alive. Fish sold alive are transported by trucks (pick up, six-wheels trucks and ten wheels truck) contained in water-filled metal box. Poor transportation may cause fish died and price is reduced by as much as 40-50 percent. Other species are sold in death with same mode of transportation, In moving freshwater fish as a commodity from fish farmers to consumers, there are many types of traders concerned. **.**In general, some peculiar species is served to up-market, tourist trade such as sand goby. The species like Nile tilapia, Sepat siam,Thai silvser barb, Walking catfish, Striped snake-head, Striped catfish and Chinese and Indian Major carps are for selling to city markets. Most of herbivorous species, normally with small sizes are sold to low income market or in rural areas.

4.1 Market structure

Cultured freshwater fish market may be classified into three levels; primary market, intermediate market and terminal market.

4.1.1 Primary market, is the point where fish marketing starts for the first time. Fish is collected and sold at the farm gate and redistribute to other market levels. However, it is observed that fish farmers may choose to carry their fish to sell at other markets by themselves if the transportation is done easily and they get higher price after deducting marketing cost i.e. transportation ,and labor cost, etc.

4.1.2 Intermediate market; is the point where fish is transit before redirecting or reconsigning to the terminal market. In Thailand, this market level composed of two market types; the central assembly markets and the wholesale markets.

4.1.2.1 The central assembly markets could be divided into State assembly market and private assembly markets.

a. State assembly market is managed by the Fish Marketing Organization (FMO) [4] located in central Bangkok. The market handles both marine fish and freshwater fish. Fish is sold through registered fish agents. In this market, presently, there are 14 marine fish agents and two freshwater fish agents. Mostly, selling and buying fish is conducted through auctioning system. However, it is observed that the system is gradually replaced by price negotiation. Fish is transported into the market mostly by pick up which can carry fish about 1-2 tons. Ninety percent of the fish sold is brought in by the fish farmers themselves from the Central Plain and the East. The rest is brought by collectors and by the fish agents themselves that buy from the fish farmers at the farm and transport fish into the market. Lived fish sold by freshwater fish agent starts as early as 2.00 am. But those sold by the marine fish agents start at 9.00 am. Dead fish which is sold only by marine fish agents start at 11.30 am. The cultured freshwater fish entered into this market were amounted at 47,010 tons in 1998 and showed increasing trend during 1984 –1998.

b. private assembly markets are run by the private who normally owns the land in the suitable location. Recently, the number of the private assembly market as well as trade volume is expanded rapidly to serve the increase in the supply and demand of the freshwater fish. The emergence of these new assembly markets are in vicinity of 50-100 km. from Bangkok. Selling and buying is through bargaining.

4.1.2.2 Wholesale market

Wholesale markets are mostly located in the big city and in good location. Many of them incorporated together with retail or final consuming market. Normally, the wholesale market include selling other consuming products and fish is a sector in the market. Here, fish is transported from fish farms or from the assembly markets by the wholesalers and distribute to the retailers in very early morning. However, in some markets, fish may be distributed in the afternoon. Many wholesale markets are long established and wholesalers have very good relationship with the retailers. It is observed that the retailers do business permanently with the selected wholesalers. Only few wholesale markets that retailers buy fish from any wholesalers who bring in the fish.

4.1.3 Terminal market, is final consuming market. Fish is distributed to the consumers through retail outlets including retail markets, supermarkets, restaurants and hotels.

Retail markets are scattered in urban and peri- urban which consumer can access easily. They are not special market sold only fish but they sell all kinds of food stuff. Generally, the appearance of the market is traditional open hall with one big roof above concrete floor, and inside there are a number of stalls for retailers with no wall around them. The retailers pay the rent and other expenses usually the electricity and clean water. The retailers place the fish on the open slab but lived fish is displayed in the crates.

In the big retail markets, normally incorporate wholesale market as well, all forms of freshwater fish is found, in lived, dead in whole or in pieces, and processed fish i.e. salt and dried, minced fish, fish ball, and fermented fish ,etc. Mostly, retailers inform the fish prices on the board above the stall. The markets are opened everyday. At present, there amount to 16 big retail/wholesale markets in Greater Bangkok.

In the small retail markets, it could hardly find the processed fish and species is limited. The fish price is not shown to the consumer. In some local retail markets, fish is carried out in open public ground which are not run on daily basis.

Nowadays, it is common to find freshwater fish sold in the supermarkets which emerge throughout Greater Bangkok. They may be sold in whole gutted or in pieces. Varieties of processed fish is sold in small portion. Open freezers are used for storage and display. The price is higher than that sold in traditional retail market about 40-50 percent on average.

Another retail outlet that is developed rapidly is the shed built in front of the fish processors' house along the main road from Bangkok to other provinces. Freshwater fish sold in this location is to serve the travelers and mostly are salt and dried fish.

Recently, franchise trade is increasingly popular. Fish is promoted as fast food and delivery becomes another service that change the consumer's habit from eating outside to stay home, particular in the big city like Bangkok.

[4] FMO is State enterprise under Ministry of Agriculture and Cooperatives.

4.2 Participants

Fish trading are conducted by various fish traders including,

4.2.1 Fish farmers

Fish farmers participate in both primary market and intermediate market. For those who have high catch volume prefer to bring their catch to the assembly market and most of them are regular customers of the specific fish agent. This practice, however, is confined especially in the cultured area in the vicinity of assembly market outlet. In the areas far from these markets, fish farmers may sell their product at the farm or bring their catch and sell to local wholesalers/retailers in their provinces or other provinces nearby. Fish farmers may engage business as fish collectors and fish agents as well.

4.2.2 Fish collectors or fish assemblers

Fish collectors also supply fish in the assembly markets. They could perform as a by-pass between the fish farmers and the fish agents, or they themselves could conduct selling fish in the assembly markets. By gathering fish from several farms, they contact in advance with the fish farmers who are ready for harvesting. Prices are set by negotiation based on species and size. In some farms, the size of certain species may vary and then price is appraised on average price basis. In such a case, fish collectors benefit through the price differentiation in the assembly market after fish is graded by their sizes.

4.2.3 Fish agents

Fish agents operate their business in the assembler markets and are classified into the FMO's fish agents and the private fish agents. Fish agents' function is selling fish on behalf of fish farmers and collectors. Unlike the fish collectors, the fish agents do not own the fish. Their earnings is from commission fee. At FMO assembly market, according to the Royal Decree on fish agents, the commission fee charged by the fish agents must not exceed six percent of gross sale value. In some private assembly markets, the fish agents may deduct commission by each kg sold . To perform their business sucessfully, fish agents must have good relationship with both sellers and buyers. It is common practicethat fish agents pay the fish farmers/collectors in cash when give credit to the buyers without interest charge. Some fish agents may supply necessary inputs or provide credit to the fish farmers.

4.2.4 Fish wholesalers

Fish wholesalers usually procure fish from the assembly markets and some may buy directly from the fish farmers. The volume of their business vary case by case. Fish wholesalers could be classified into the first wholesalers and the second wholesalers. The former may have very big volume of fish traded when they distribute fish to the latter who usually resided in other provinces and to the retailers, processors, and bulk consumers. The second wholesalers buy fish only from the first wholesalers and sell directly to retailers.

4.2.5 Fish processors

Fish processors become increasingly important as demand for processed fish increase. Traditional processed freshwater fish is in simple various forms to make consumer have alternative choices. Fish processors procure fresh fish from several sources. They may buy directly from the fish farmers, or from the assembly markets, wholesalers and also from the other processors. Small processors normally sell their product directly to the consumer. In many provinces, processed fish mostly in dried and salted form, are sold along the highway to serve the domestic travelers. Processors who carry large volume usually sell their product in the specific wholesale market in Bangkok, which trading involves only salted and dried fish.

Several processors operate cold storage, either owned or rent , for the purpose of exporting frozen fish. They may be hired by the broker and process fish by order, or they may export by themselves. These type of processors have large trade volume and buy fish directly from fish farmers and assemble markets.

4.2.6 Fish retailers

Fish retailers buy fish from various sources and sell directly to the consumer.

4.3 Marketing channel

Chart 1 illustrates marketing channel which shows trading route of cultured freshwater fish. The product volume traded by different levels of traders are approximated , based on observation in the field visit to fish farms, main assembly markets, wholesale markets, and retail markets including personal interviews (some with formal questionnaire) to those concern and participate in the freshwater fish markets. The Department of Fisheries 'Annual statistics of freshwater fish production' is also employed in this calculation.

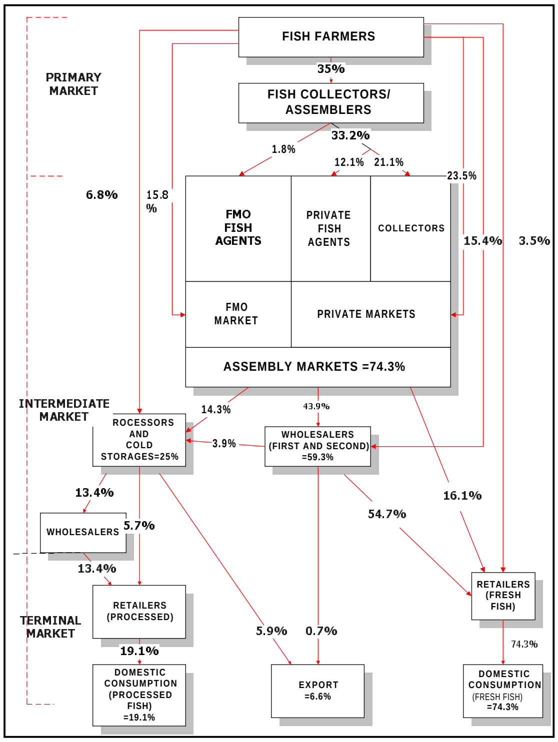

Chart 1: Marketing channel of cultured freshwater fish in Thailand (From survey, 1999)

a. Fish farmers distribute fish to every types of traders. About 35 percent of the total production are sold to fish collectors. Most of small scale fish farmers rely on the fish collectors who have experience and more information on the fish market outlets and it may not be worthwhile for those fish farmers to transport a small fish volume. Another 23.5 percent of total production are self transported to sell in private assembly markets where they may sell through private fish agents, except in Angthong assembly market that fish farmers sell fish by themselves. The wholesalers, the processors/cold storage and the retailers buy fish at the farm gate at the quantity of 15.4 percent, 6.8 percent and 3.5 percent of total production, respectively.

In rural production area, the small scale wholesalers and retailers usually buy fish directly at the fish farms nearby. Species of fish traded in rural areas are low-priced species and small size that consumer are able to afford.

b. Fish collectors, after buying fish from the fish farmers will transport their catch to sell in the assembly markets. Out of 35 percent (see a), 1.8 percent is sold through fish agents in FMO market and 33.2 percent is sold in private assembly markets , of which 21.1 percent is sold by themselves and 12.1 percent is sold through private fish agents. Therefore, the freshwater fish is sold in assembly markets are accounted about 74.3 percent of the total production.

c. Fish agents, both FMO agents and private agents, as well as fish collectors in the assembly markets distribute most fish to wholesalers at 43.9 percent of total fish volume. Next is retailers and fish processors/cold storage, which accounted for 16.1 percent and 14.3 percent, respectively.

d. Wholesalers distribute most fish directly to retailers about 54.7 percent of total fish volume, while 3.9 percent is sold to processors/cold storage and 0.7 percent is exported. Fish exported by wholesalers are mostly catfish (*Pangasius sutchi*) and to nearby neighbouring country like Burma.

e. Processors/cold storage have another route of processed fish distribution. 13.4 percent of total fish production is distributed to wholesalers whereas 5.7 percent is sold directly to retailers[5]and 5.9 percent is exported. Most of fish exported are chilled and frozen. Many species are exported with fluctuated volume during the past years. Walking catfish, Snakehead-fish are exported to the United States, Japan and Europe. Thai silver barb, Tilapia , Rohu, and Mrigala etc. are mostly exported to the Middle East. Striped catfish is sold mostly to Europe and Asia.

f. Retailers is the last channel before the fish reach the consumer. From the marketing channel and percentage of freshwater fish distribution, it is revealed that 93.4 percent of total cultured freshwater fish is consumed domestically, of which 74.3 percent is bought in fresh/alive and 19.1 percent is taken in several processed forms.

The export is accounted for 6.6 percent of the total freshwater fish production, mostly in chilled/frozen.

4.4 Marketing margin

Marketing margin refers to the differences between the price paid by the consumer and the prices received by the producers. Therefore, the margin in this study is the differences between the retail prices and the farm gate prices. According to marketing channel mentioned previously, many traders involve in moving fish from the farms to the final consumers and hence marketing margin occurs at each level where fish is passed through. The price setting varies from one species to another at producers' level, from one fish trader to another even though they are in the

[5] Wholesalers and retailers of processed fish are different groups from those sell fresh fish.

same category of fish trading operations, and from one market to another at the retail level. To simplify this complication and to be able to give some idea of the relative scale of traders at each level, one marketing route is selected from the field survey and field observation. Marketing margin is considered in two parts which are marketing cost and marketing profit.

The selected marketing channel start from the fish collectors who buy selected freshwater species ; Nile tilapia, Silver barb, Walking catfish, Snake-head, and Striped catfish from the fish farmers in the Central Plain and sell their fish in one private assembly market, 105 km. north of Bangkok. The wholesaler buy those fish in this assembly market and deliver to the retailers in the wholesale/retail market in the province located about 70 km. from the assembly market and 35 km. from Bangkok. Marketing margin is illustrated in chart 2.

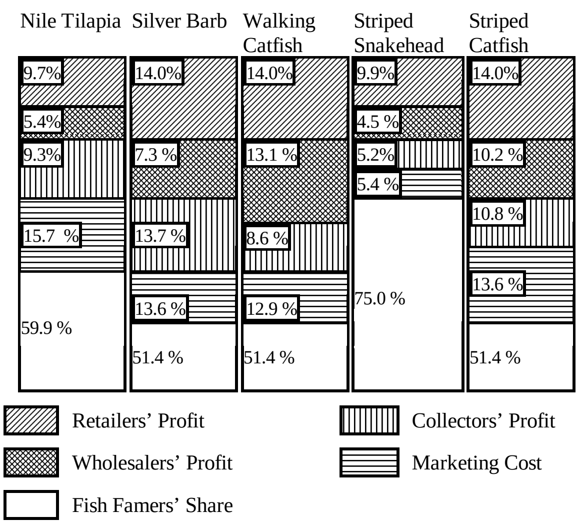

Chart 2 : Illustration of percentage of marketing margin,by species

a. It is found that the fish farmers' share of stripped snakehead is 75 percent which is the highest among all selected species. Its marketing margin is 25 percent of the retail price of which 5.4 percent is marketing cost and the remaining 19.6 percent is profit margin for the traders. Of the total profit margin, the retailers receive the highest share which account for 9.9 percent. The fish collectors and the fish wholesalers receive 5.2 percent and 4.5 percent of the retail price, respectively.

b. The fish farmers' share of tilapia is 59.9 percent . Its marketing margin is 40.1 percent of the retail price of which 15.7 percent is marketing cost and the remaining 24.4 percent is profit margin for the traders. Of the total profit margin, the retailers receive the highest share which account for 9.7 percent. The fish collectors and the fish wholesalers receive 5.4 percent and 9.3 percent of the retail price, respectively.

c. The marketing margin of the remaining three species, silver barb, walking catfish and striped catfish as the percentage of retail prices is the same at 48.6 percent and hence the fish farmers' share at 51.4 percent. The total marketing cost and profit margin are accounted for about 13 percent and 35 percent of the retail prices, respectively.

Of their retail prices, the retailers' profit, the collectors' profit and the wholesalers' profit are about 14 percent, 11-13 percent and 7-10 percent, respectively.

According to the model in this study, the retailers earn the highest profit margin among all traders. Their marketing cost is also relatively high. The labor cost is the main component since fish is cleaned, gutted and chopped etc. at this level. The high profit margin may compensate if the fish has to be kept and sell on another day which in normal practice its price would decrease at least 1-2 baht per kg.

5 Conclusion and recommendation

Production of cultured freshwater fish in Thailand has increased steadily in the past two decades. Over 15 species are cultured mostly in pond. Small scale with traditional rearing method and integrated farming are common and widely practiced. Commercial scale with intensive culture method is employed for species of relatively high value in some regions. The government has promoted freshwater fish culture mainly to supply domestically. As a result of increased demand for freshwater fish, the marketing system play an increasing vital role. Marketing is left in the hand of private sector. The Fish Marketing Organization is only one State enterprise that deals with fish marketing and provide assembly fish market located in Bangkok. Recently, many private assembly markets have been established nearby production centers as well as a big consuming center like Bangkok and surrounding provinces in order to serve consumer needs. Most of the existing markets have been meeting with good response from traders and consumer. Price is very competitive since there are a large number of sellers and buyers trading in these assembly markets. In the provinces far from the production center, fish is delivered conveniently because roads are linked between all big cities and nearby districts. Since freshwater fish is cultured in every regions, the local consumers in those regions are supplied by local production and the remaining excess demand is supplied by the fish from production center. However, urban dwellers are easily access to a more consistent supply and more varieties of fish product than those in the areas far from fish farms and markets. Moreover, consumer in different regions have different taste, preference and purchasing power which affect their decision making on choosing both species and quality.

Presently, it may intuitively state that there have no appearance of collusion among the certain trader groups that will influence the markets. Some traders may perform many functions in the markets. Some large scale fish farmers expand their business to cover marketing. Whether those practices would have adverse impact to small scale fish farmers and small traders in the future, is an issue that the government should pay attention and monitor closely.

Generally, freshwater fish distribution and marketing has been efficiently developed to some extent. In the near future, priority should be given on fish handling. Even though there are some improvement in fish handling but applied knowledge of maintaining quality of fish is still lacking. Hygiene handling from the farm gate until it reach consumer should be focus on. Market condition with hygiene environment and other proper market facilities are needed. Weight loss and fish contamination could be reduced through good handling. Consumer attitude on change in handling practices has to be encouraged. It is therefore necessary to improve marketing education for farmers, processors and consumers related to characteristics and handling of aquaculture product, including home processing preparation and nutrition quality.

Campaigns to build awareness of nutritional value of freshwater fish and promote consuming fish as regular diet are important aspect to achieve greater development of fish farming and marketing.

On production side, the government should develop new species and increase new domestic markets such as specialty markets, and international markets. Additionally, this should be coupled with the development of technology for high valued species through improving high yielding strain species and environmental management technology.

In the future, dual culture practices is obviously prevailed in Thailand. While the development of large scale commercial farming is needed, the small scale farming must not be worse off. The comparative study of these two sub sector is to be carried out. Marketing may be used as the effective tool to segregate the production from both sources and be sold in different market segment to serve different group of consumers.

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