



## Market Channel and Trade of Fermented Small-Sized Fish Paste in Cambodia

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**Abstract** Fermented small-sized fish paste is considered to be one of the main food sources for Cambodians, especially for the poor. However, most small-sized fish are used as direct feed for aquaculture or dried for animal feed. This study was conducted in order to identify market channel and trade of fermented small-sized fish paste. Phnom Penh city, Kendal, Kampong Chhnang, Battambang, and Siem Reap Provinces were selected as the study areas. The study revealed that there were three main sources of product which should be considered when analyzing total volume of annual production. The total production of the fermented fish paste in 2007-2008 was around 6,659 tons, of which 50.18% was domestically consumed and 49.82% exported to Thailand and Vietnam. Marketing and trading differed according to trading sites, stakeholder characteristics, and fish species containing in the fermented fish paste.

**Keywords:** Market channel, trade, small-sized fish, fermented small-sized fish paste, Cambodia

### INTRODUCTION

Fish has played an important role in ensuring food security in Cambodia. Fermented fish paste (or Prahoc in Khmer), a processed fish product, is a concentrated form of fermented fish which is typically made from small freshwater fish in which the fermentation has digested the fish to the point where the form of the fish is no longer clearly visible (Hortle, 2007). Fermented fish paste is desirable and is kept in houses all year round. It contributes to food availability, especially in the period when fresh fish is in short supply. There are two kinds of fermented fish paste - boneless and bony fish paste - which are bought and used by different classes of people. Some boneless fish paste is processed from small-sized fish species, but it is sold at a higher price compared to that of bony fish paste. Normally bony fish paste, also processed from small-sized fish, is consumed by the poor who have limited income.

Nearly all small-sized fish - around 92% - are used as direct feed for cage and pond aquaculture (So et al., 2005). These competing uses are a challenge to human consumption, especially to the poor. Based on the rapid decrease of small-sized fish numbers in the river, the Royal Government of Cambodia placed a ban on snakehead fish farming. As a result more fish is

available and an opportunity exists for the poor, and for small-sized fish paste stakeholders, to access more fish for their living and businesses. In addition around 50% of small-sized fish is processed into small-sized dried fish and salted fish or converted into small-sized fish paste or fish sauce (Asian Development Bank (ADB), 2006).

Information about fermented small-sized fish paste market and trade in Cambodia has not previously been investigated and understood. This study was conducted to identify the market channel and trade of fermented small-sized fish paste in Cambodia.

## **METHODOLOGY**

Phnom Penh City and Kandal Province, in the Mekong-Bassac River zone, and Kampong Chhnang, Battambang and Siem Reap Provinces, in the Great Lake and Tonle Sap River zone, were selected as study areas. Samples for interviews were categorized into six groups, processors, middlemen, exporters, wholesalers, retailers, and end consumers, based on their characteristics in the trade and markets. The total sample size in the study was 150. Two kinds of data, primary and secondary, were required for the study. Primary data comprised information from interviews. Structural interviews using six different design questionnaires were conducted with survey respondents who were purposively selected. Key informants, such as officers at Fisheries Administration Cantonment and local authorities in each city/province, were also semi-structurally interviewed, and observations conducted. Secondary data were taken from technical papers, books, journals, and other publications. The collected primary data were installed and analyzed in SPSS version 12.

## **RESULTS AND DISCUSSION**

There are three main actors in the fermented fish paste market channel:

**Processors:** Among the five study areas Kampong Chhnang has the largest amount of fermented small-sized fish paste processing. Fermented small-sized fish paste production rose from 1124 tons in 2000-2001 to 1,448 tons in 2007-2008, but declines occurred in the years 2002-2003 and 2005-2007 because of shortages and an increasing price of small-sized fish.

**Exporting Companies:** There were three exporting companies - Trey Meas and Marchhar Steoung Sangkae, located in Battambang Province and Marchhar Meas Angkor, based in Siem Reap Province. The total amount of salted small-sized fish bought, processed, and traded by these three exporting companies in 2001-2002 was 800 tons and rose to 4,139 tons in 2007-2008.

**Wholesalers and Retailers:** It was estimated that the total amount of fermented small-sized fish paste which went through wholesalers and retailers, and did not go through processors or exporters, was 1,071 tons in 2007-2008.

Thus, the total amount of the fermented fish paste produced in 2007-2008 was about 6,659 tons. Of this 3,341 tons (50.18%) was domestically consumed, 3,268 tons (49.07%) was exported to Thailand, and 50 tons (0.75%) was exported to Vietnam.

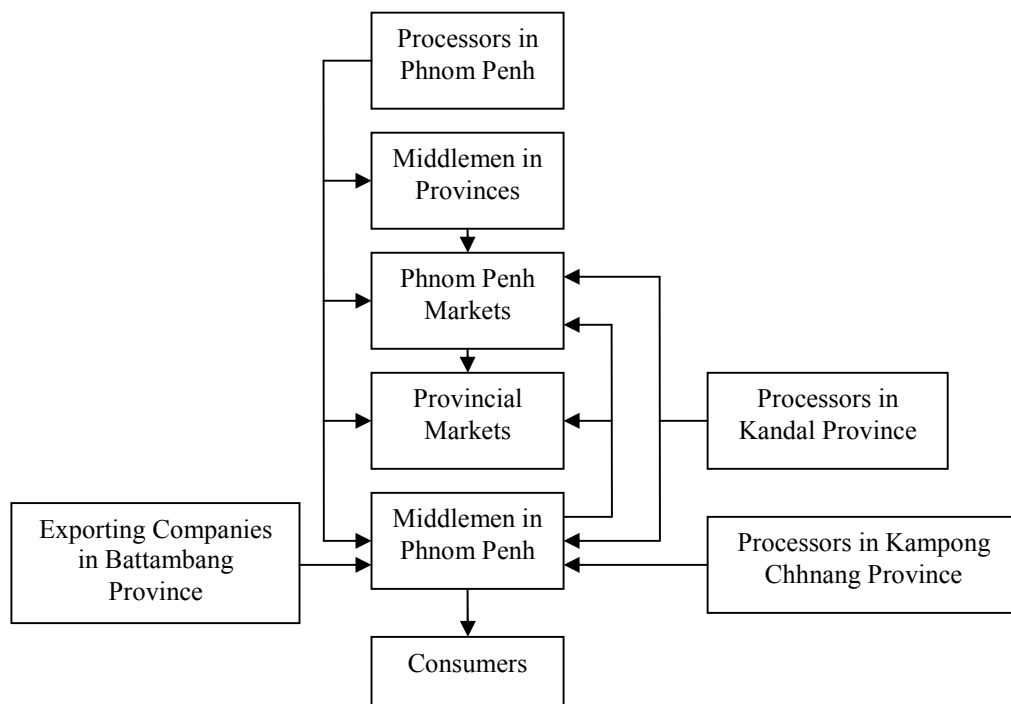
In 2000, the total amount of fermented fish paste produced by family-scale processors was between 17,500 and 25,000 tons. Commercial-scale processors produced 12,681 tons (Touch, 2001), of which 7,187 tons (56.68%) were domestically consumed and 5,494 tons (43.32%) were exported (Department of Fisheries, 2001). However, (Nao et al., 2001) state that the actual amount of fish paste exported was much higher.

About 58.82% of salted small-sized fish which was bought by middlemen came from fishermen; 92.75% bought by exporters came from middlemen; 73.50% bought by wholesalers was from middlemen; 43.13% bought by retailers was from processors. When sold, 63.83% was sold from processors to middlemen; 65.14% from middlemen to exporters; 88.74% from exporters to middlemen; 33.97% from wholesalers to provincial wholesalers/retailers. The fermented fish paste was mostly not classified when traded in markets.

This study also showed that the average price of fresh fish was 1,497 Riel/kg in 2007-2008 (processors) and of (final) fermented small-sized fish paste was 3,141 Riel/kg in 2000-2001, 3,594 Riel/kg in 2001-2002, 3,783 Riel/kg in 2002-2003, 4,014 Riel/kg in 2003-2004, 4,541 Riel/kg in

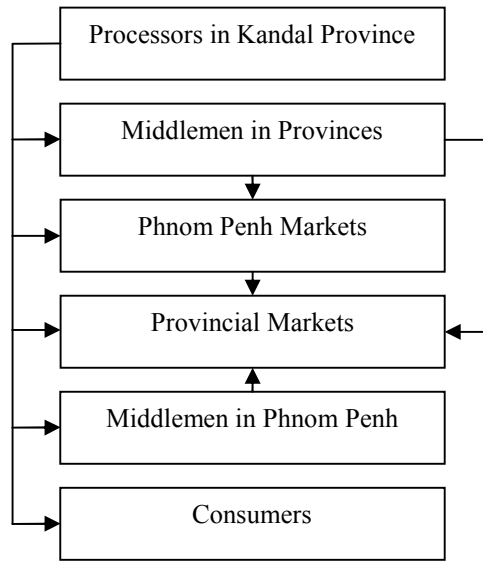
2004-2005, 5,026 Riel/kg in 2005-2006, 5,707 Riel/kg in 2006-2007, and 6,789 Riel/kg in 2007-2008, compared to the study of Touch in 2001 which showed that the price of bony fish paste per kilogram in 2000 was about 1,500 Riel and 5,000 Riel for boneless fish paste. Note that the exchange rate used is 4,000 Riel to 1 US Dollar.

Market channels of fermented small-sized fish paste differed in the five study areas. In Phnom Penh, the total amount of fermented small-sized fish paste which was marketed and distributed to other provinces was about 421 tons (6.34% of total amount of fermented small-sized fish paste (6,659 tons) being annually traded in Cambodia). In Fig. 1, processors in Phnom Penh played an important role to supply (final or finished) fermented small-sized fish paste to stakeholders in markets; they sold the product to provincial middlemen and markets, and to Phnom Penh middlemen and markets. Moreover, processors in Kandal Province also sold their (final) fermented small-sized fish paste to some markets and to middlemen in Phnom Penh. And middlemen in Phnom Penh also bought fermented small-sized fish paste in semi-final form (or called salted small-sized fish) from processors in Kampong Chhnang Province and from exporting companies in Battambang Province. After being processed and stocked in cement reservoirs or earthenware pots this fermented fish paste was sold to either Phnom Penh and provincial markets or consumers.



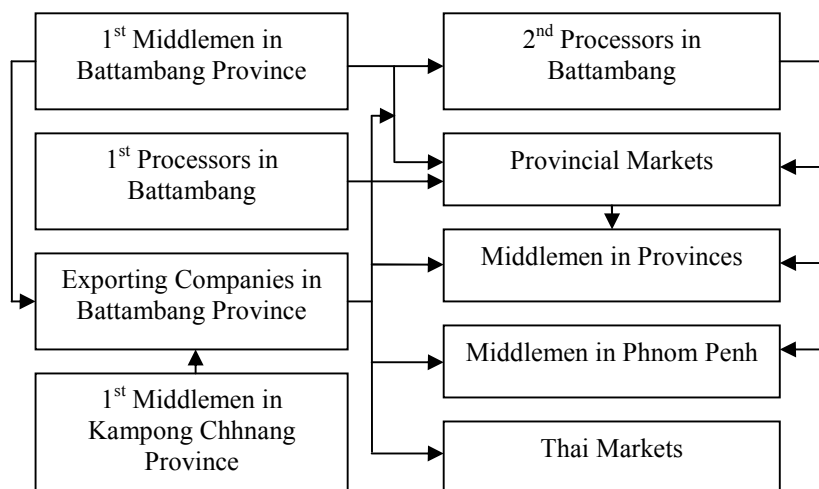
**Fig. 1 Market channel of fermented small-sized fish paste in Phnom Penh City**

In Kandal Province, the total amount of fermented small-sized fish paste which was either marketed within the province or distributed to other provinces was 445 tons (6.70% of the total amount being traded in Cambodia every year). As shown in Fig. 2, processors supplied fermented small-sized fish paste to middlemen in the province and to other provinces, to Phnom Penh and provincial markets, to middlemen in Phnom Penh, and to consumers. Middlemen both inside and outside the province sold the product to Phnom Penh market which it was then distributed from Phnom Penh markets to some markets in other provinces. Furthermore, middlemen in Kandal and other provinces, and those in Phnom Penh sold their products to markets in Kandal Province and to other provinces as well.



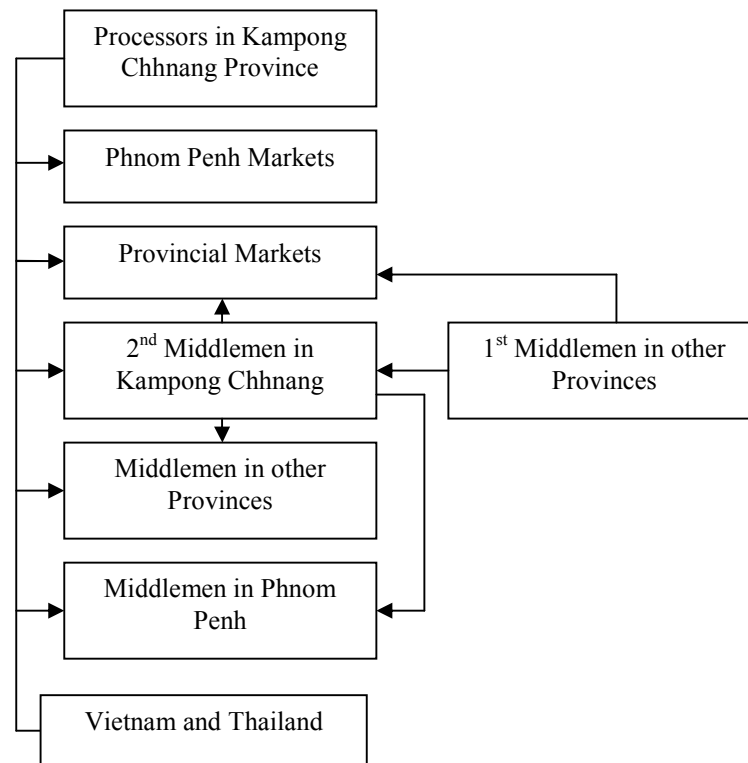
**Fig. 2 Market channel of fermented small-sized fish paste in Kandal Province**

The total amount of fermented small-sized fish paste which was being either marketed in Battambang or distributed to other provinces and to Thailand was 3,730 tons (56% of the total amount being traded annually in Cambodia). In Fig. 3, second processors in Battambang bought salted small-sized fish from first middlemen living near the Tonle Sap river. After being processed (through adding more salt or making into final products), the fermented fish paste was sold to wholesalers/retailers in markets, to middlemen both inside and outside the province and to Phnom Penh middlemen. Moreover, first processors in Battambang sold salted small-sized fish directly to some markets in Battambang and in other provinces. First middlemen in Battambang also supplied the salted fish to sellers in markets of Battambang and other provinces and exporting companies in Battambang. These companies bought salted small-sized fish from first middlemen in Kampong Chhnang. After being salted and stocked, it was sold out to second processors in Battambang, to provincial markets, to provincial middlemen, to Phnom Penh middlemen, and to Thai markets.



**Fig. 3 Market channel of fermented small-sized fish paste in Battambang Province**

The total amount of fermented small-sized fish paste which was being marketed in Kampong Chhnang and distributed to other provinces was 960 tons (14.43% of the total amount being traded in Cambodia). In Kampong Chhnang the product which was sold by processors was salted small-sized fish, called fermented small-sized fish paste by local people in the province. As shown in Fig. 4, the salted fish was sold from processors to Phnom Penh markets, to provincial markets, to second middlemen in the provinces, to middlemen in Phnom Penh, and to other middlemen from other provinces. Some of the salted fish was taken to Vietnam by Vietnamese processors when the processing season was finished. Moreover, some of the salted fish was also exported to Thai markets by the processors. Additionally, first middlemen from other provinces also sold salted small-sized fish to second middlemen in the province and to some wholesalers and retailers either in the province or in other provinces. After being stocked (or sometimes not), the fermented fish paste was distributed to provincial markets, to middlemen in other provinces as well as in Phnom Penh city.



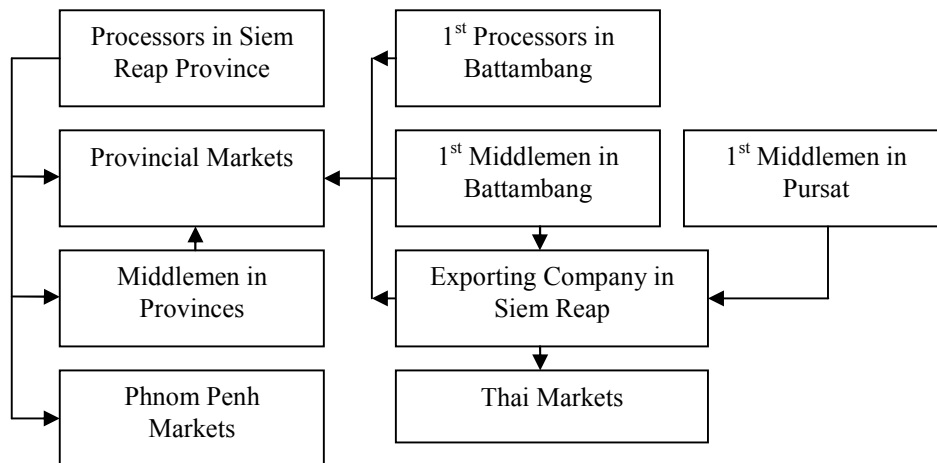
**Fig. 4 Market channel of fermented small-sized fish paste in Kampong Chhnang Province**

The total amount of fermented small-sized fish paste which was being marketed in Siem Reap, distributed to other Provinces and to Thailand was 1,100 tons (16.53% of the total amount being traded in Cambodia). Unlike the other four Provinces in Siem Reap both bony and boneless small-sized fish paste were marketed. Fig. 5 shows that processors sold fermented fish paste as finished products to markets and middlemen in the province, and to markets in Phnom Penh. Middlemen in the province also sold the fermented fish paste to markets in the province. In addition first middlemen in Pursat and Battambang Provinces brought salted fish from fishermen and sold to exporting companies in Siem Reap. After being salted and stocked (or sometimes not), the salted fish was exported to Thai markets. Furthermore, an exporting company in Siem Reap and first middlemen and first processors in Battambang sold salted fish and final fermented fish paste (mostly from exporting company) to wholesalers and retailers in some markets in Siem Reap Province. This would later be processed into finished products before sale to consumers.

Generally the market channels for fermented fish paste are affected by seasons, which determine the availability of fish for fermented small-sized fish paste processing. Seasonal factors influence the presence of the product in markets from month to month and business outcomes.

Overall, fermented small-sized fish paste is locally marketed and traded in both finished and unfinished form depending on the business purposes of stakeholders. The product was ultimately sold to domestic consumers as finished products or exported to neighboring countries as unfinished product which could later be processed into finished products to meet export market needs.

The market channel of fermented small-sized fish paste in the five study areas differed in terms of condition (finished or unfinished) and type (bony or boneless) of fermented small-sized fish paste being marketed, and means of transport (car, cart or boat).



**Fig. 5 Market channel of fermented small-sized fish paste in Siem Reap Province**

## CONCLUSION

Fermented small-sized fish paste was traded differently according to trading sites, stakeholder characteristics, and fish species. Moreover the fermented fish paste market and trade was complicated because not only was finished fermented small-sized fish paste marketed and traded but also salted small-sized fish. Although there seemed to be complications in the market channel and trade, the fermented fish paste was sufficiently processed for domestic needs and nearly half of the total production was exported to neighboring countries. Most of the product which was exported to neighboring countries was in semi-final form which could reduce some of the added value. Hence, more value adding could be obtained if the product could be processed locally into finished products to meet the demands of consumers in other countries.

## ACKNOWLEDGEMENT

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