



THE COMMERCIALIZATION OF JAVA SEA PELAGIC FISHERY PRODUCTS

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Introduction

Trade and processing jobs of pelagic fishes of Java north coast are taking a growing place in the economic and social activity of Indonesia:

- The volume of activities has considerably increased during the last years, with a purchase amount at auction places of approximately **250 000 tons in 1995**, corresponding to a value of **175 billions rupiah**¹. Knowing that the price will have doubled before arriving in the consumer plate, the turnover would be of the order of 350 billions *rupiah*.

- These firms create a lot of **direct jobs**, because they are "labor intensive", and employ unskilled people from the area, particularly women originating from the fishing milieu.

- **Indirect jobs** are also numerous, as well upstream as downstream of the activity (supplying of ice, salt, heating wood, packaging material; services of transport, brokers and agents,...).

- Generally speaking, **growth perspectives** of the Indonesian market remain very good. The strong rise of the gross domestic product, which is higher than 6 % a year, has been translated into an enlargement of the access to fish, with many new consumers. Otherwise, the local consumption remains weak (16,3 kilos per capita and per year in 1995) and it appears that an increase of the income would lead to a rise of the fish part in the food intake for 60% of the population².

- The pelagic fishery production of the Java Sea is processed and then distributed to Java and Sumatra, it provides **60 % of the animal protein supplying** of the population. After processing, this cheap fish allow the poorest population from the interior of the country to enjoy an affordable animal protein source.

This question has never been studied, despite the priority attached to the sector by the Indonesian government. That's why the research program "**Java sea pelagic fishery assessment project**" (**PELFISH**) has ranked the study of the commercialization of the pelagic fishery products among its priorities.

PELFISH is a pluridisciplinary program carried out by France (French Institute of Scientific Research for Development through Cooperation, ORSTOM) through a partnership with Indonesia (Research Institute for Marine Fisheries, RIMF). PELFISH has been studying the Javanese pelagic fishery through three main activity fields : resources and exploitation, technical innovation, and economics. Indonesian scientists play a major role in PELFISH works, one fishery economist and one informatician are directly implied in the study.

¹ On the base of 700 *rupiah* per kilo

² Source: inquiries of the service of the statistics on the buying of fish by Indonesian households, according to the income brackets.





1 Population studied

1.1. Central Java fishery : a dominating part for Indonesian population

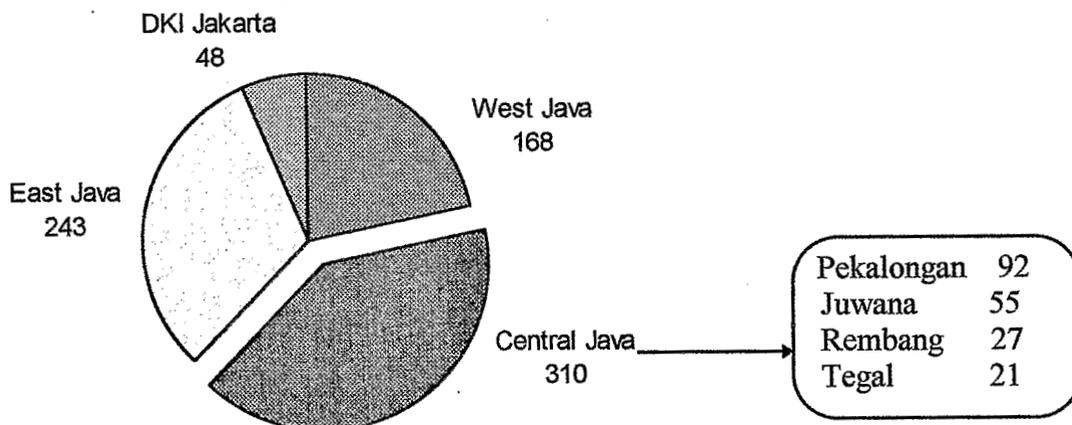
According to the last available statistics³, 4 millions tons of fish have been landed in Indonesia in 1994, marine fisheries accounting for 3,1 millions tons, fish culture for 0.6 millions tons and open water for the rest. Concerning marine fisheries, the supplying of Indonesia depends mainly on Sumatra, 872 403 tons landed, and **Java, 770 174 tons**.

Central Java dominates other provinces of Java, particularly through 4 major landings places : **Pekalongan, Juwana, Rembang et Tegal** receive almost **200 000 tons** a year. This quantity include pelagic fishes (living in) and demersal fishes (living near the bottom of the sea). The study concern the pelagic fishery, the main part of the raw material used by firms is constituted by pelagic species but we have also to take into consideration the part of demersal fish in the activity of firms studied.

Quantity of Fish production by Province and Fishery Sub Sector, 1994

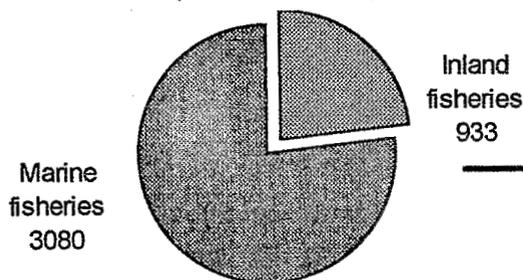
Marine Fish production in Java

(thousands tons)



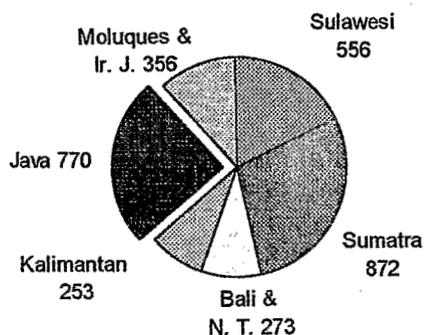
Fisheries in Indonesia

(thousands tons)



Marine Fish Production in Indonesia

(thousands tons)



³ Biro Pusat Statistik, "Statistik Indonesia 1995", data 1994, except for Central Java : data 1995.



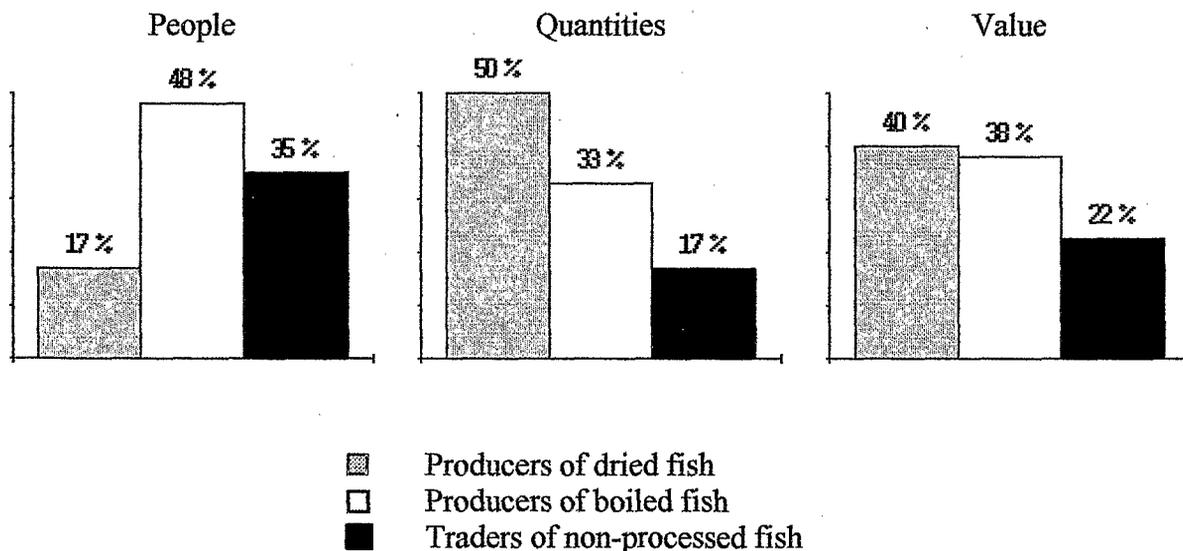
These places belong to the Java Sea Fishery : six fish species (*Decapterus spp*, *Rastrelliger kanagurta*, *Sardinella longiceps*, *Sardinella gibbosa*, *Selar crumenopthalmus*, *Euthynnus affinis*) constitute the bulk of landings. This homogeneity characterizes also the type of fish processing : dried salted or boiled, fish is always processed in a traditional way and methods are similar in every places.

1.2. Fish Traders And Processors from Central Java

At the beginning of the study, we have been surprised by the **lack of information** about buyers on these major auction places : in Pekalongan and Tegal, no list was available. Then we chose to get a complete census in Pekalongan and Tegal from the auction daily registering book : we have added purchases for each name of buyers, during 4 days in October in Pekalongan. in November in Tegal. We have constructed a list describing average purchases and type of activity for each buyer⁴.

We have distinguished **three types of buyers**, even though it would have been better to slice the "Traders of non-processed fish" category in two (between traders who send fish outside and the ones who trade fish on the auction place only) in order to get an homogeneous presentation of this population.

Graph 1 : Relative weight for each category of buyers in Pekalongan auction place



Source : census of all buyers of more than 100 kilo in average during October 1995 (4 days of census).

⁴ During our census, we have taken names of all buyers into account, whereas many firms use to employ more than one buyer, since it was impossible to know who was the employer of each buyer. Nevertheless, consequences of this overestimation seem to remain limited, and number of firms approach number of buyers since most of small-scale firms have only one buyer, the owner.



In **Pekalongan**, producers of **dried fish** buy the largest quantities (150 tons a day) of fish, but at the smallest price (560 Rp/kilo in average) because they use to process salted onboard fish, the worst quality⁵ of landings.

Producers of **boiled fish** prefer to buy iced onboard fish at 780 Rp/kilo in average, that's why value of their purchases (78 millions Rp) approach the producers of dried fish one, whereas quantities bought (100 tons a day) are inferior.

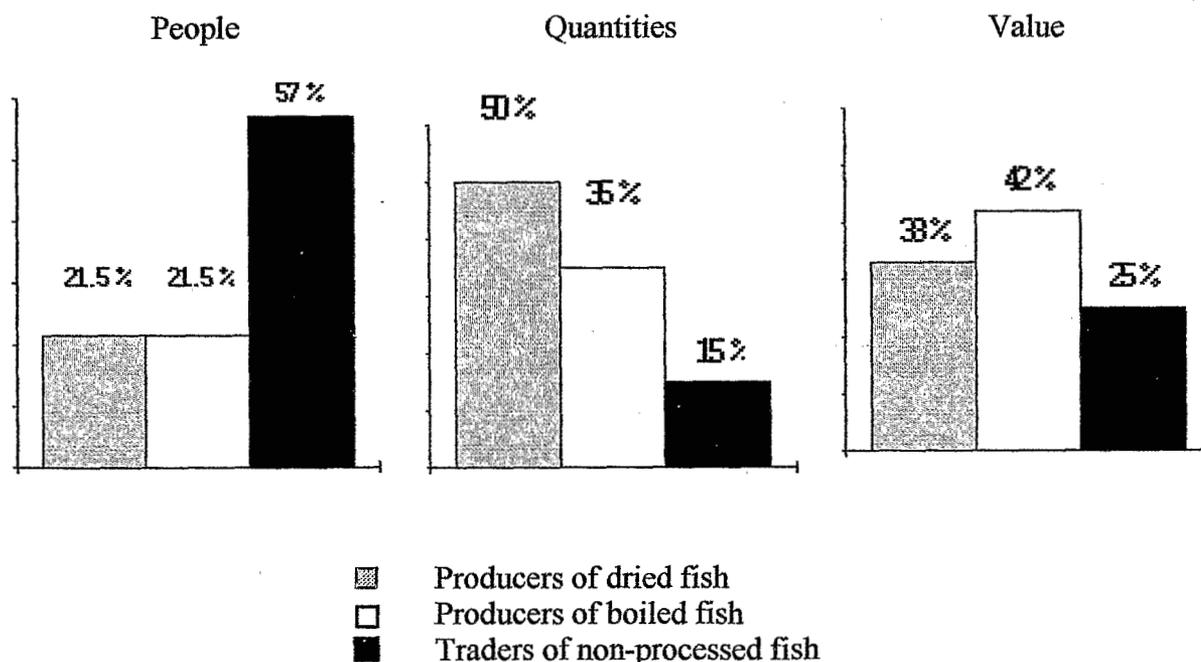
Traders of **non-processed fish** enjoy the smallest volume of daily purchases (50 tons a day), at the best price (940 Rp/kilo in average) : most of them trade good quality fish, but some buy salted fish destined to processors who prefer to get fish through a middleman.

The total volume of daily purchases (300 tons) described by the census is relatively high compared to average daily landings (255 tons) of Pekalongan, since October⁶ is one of the best months in the year.

Buyers in **Juwana** originate not only from Juwana but also from Rembang, Jepara, Demak... Information given in the second table are based on the census published by the Fisheries service of Pati. According to suggestions of auction place employees, we have slightly modified the original list in order to take into account last evolution of buyers population.

This table concerns only buyers of more than 100 kilos a day, in average, but a total of 212 tons a day corresponds to quantities of fish landed during the fish season, and after verification, this census seems to be sound enough to be taken as a basis for our sample.

Graph 2 : Relative weight for each category of buyers in Juwana auction place



Source : census given by the Dinas Perikanan and field survey

⁵ Fish has already spent too much time in holes to be used by producers of boiled fish or fresh fish traders

⁶ We chose this month in order to get an exhaustive census, even though some buyers present in October stop their activity during more than three months a year. The most regular buyers have also to endure a tremendous fall in the volume of their activity when landings reach their bottom level (after the Ramadan, during the west wind season).

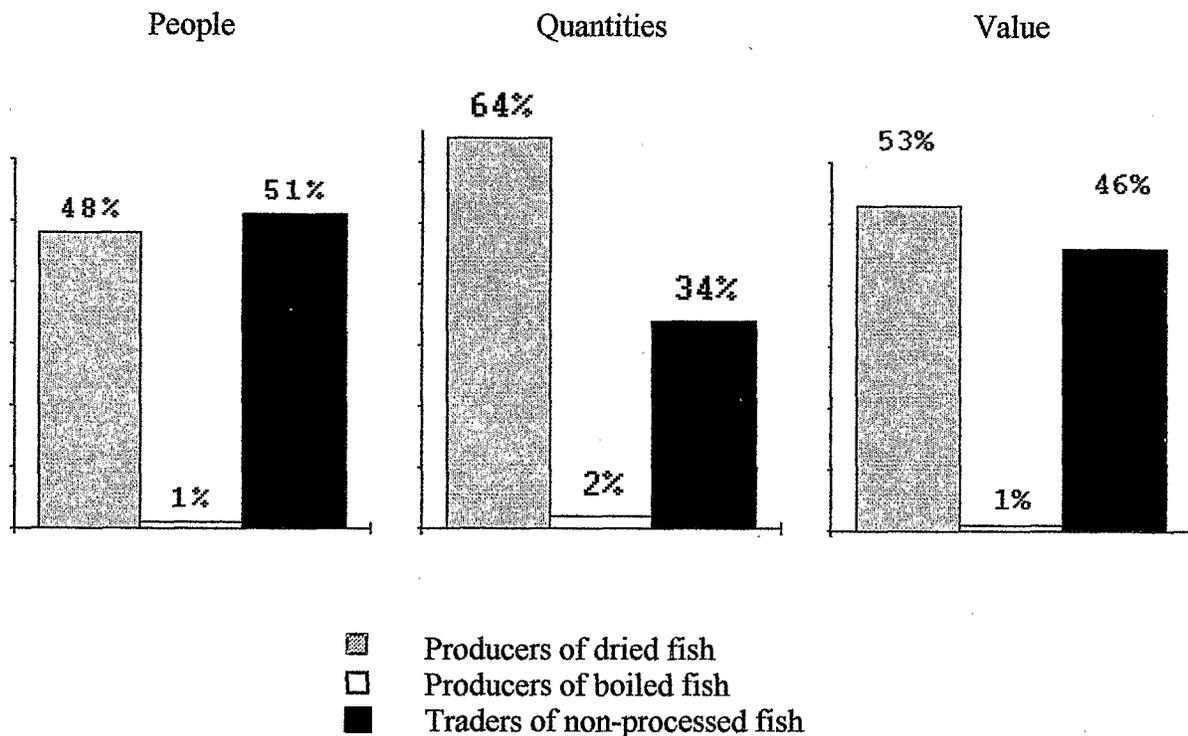


Producers of **boiled fish** work on a larger scale (75 tons a day with only 27 people) than in Pekalongan, their purchases (60 millions Rp) are superior in value to the producers of **dried fish** ones (47 millions Rp), but they do not reach the dried fish producers capacities in volume (106 tons a day).

Traders of **non-processed** fish are numerous in Juwana (72 people), but most of them work on a small scale, with approximately 500 kilo bought/day, and total quantities of fish traded are not so high (31 tons a day).

Tegal is the smallest auction place we have chosen to study, with landings reaching 100 tons a day during best months and 81 regular buyers of more than 100 kilos a day. We have used the same method as in Pekalongan, with 4 days of census during November 1995.

Graph 3 : Relative weight for each category of buyers in Tegal auction place



Source : census of all buyers of more than 100 kilo in average during November 1995 (average from 4 days of census).

Tegal is characterized by the quasi-absence of producers of **boiled fish**, only one people, whereas producers of **dried fish** are relatively numerous, 39 people, and use to manage small-scale firms (they buy a total of 64 tons a day). Traders of **non-processed** fish (41 people) are not so numerous, but with a total of purchases reaching 34 tons a day, they are more powerful than their colleagues of Juwana : the value of their purchases, 40 millions Rp a day surpass the Juwana one, 36 millions Rp a day.



2 The survey

2.1. The population studied

About **160 firms**, representing a purchasing capacity of **600 tons a day** in average along the year have been regularly followed.

This capacity have to be compared not only with landings on auction places where the survey has been launched, but also with the marine fish production of Central Java.

The four auction places we study received nearly 200 000 tons a year, it means that the capacity of our sample is equivalent to the whole landings, but we have to keep in mind that first, we work with **estimation** of the sample capacities, second, firms use to complete their supplying with fish landed on other places.

If we consider a wider frame, our sample is still representative since landings on all Central Java auction places represent, on a 360 days a year basis, 860 tons a day which means that the **population studied trade 70 % of Central Java Marine fish production**.

- A population of 115 firms have been followed during one year (mid-1996-mid-1997), in order to take into account the full cycle of the activities, characterized by very strong marked seasonal evolution.

- We have added 44 firms to this population, 12 from Pekalongan (regular buyers not established in Pekalongan) and 32 in Rembang (they play a significant part in the Juwana auction place). This additional part has been followed during six months, with a lighter type of quizz.

This population is distributed in 4 types of activity

- **Producers of dried fish** (50 people) use to process salted on board fish or iced fish of bad quality⁷ (especially in Juwana), the duration of the process is 2 days in average with possibility of storage of the production. Women represent the major part of employees.

- **Producers of boiled fish** (38 people), use to process iced fish of medium quality, they have to send rapidly their production, during the same day as the purchase, employees can also be numerous but they use to stop working at the beginning of the afternoon. Women represent the major part of employees.

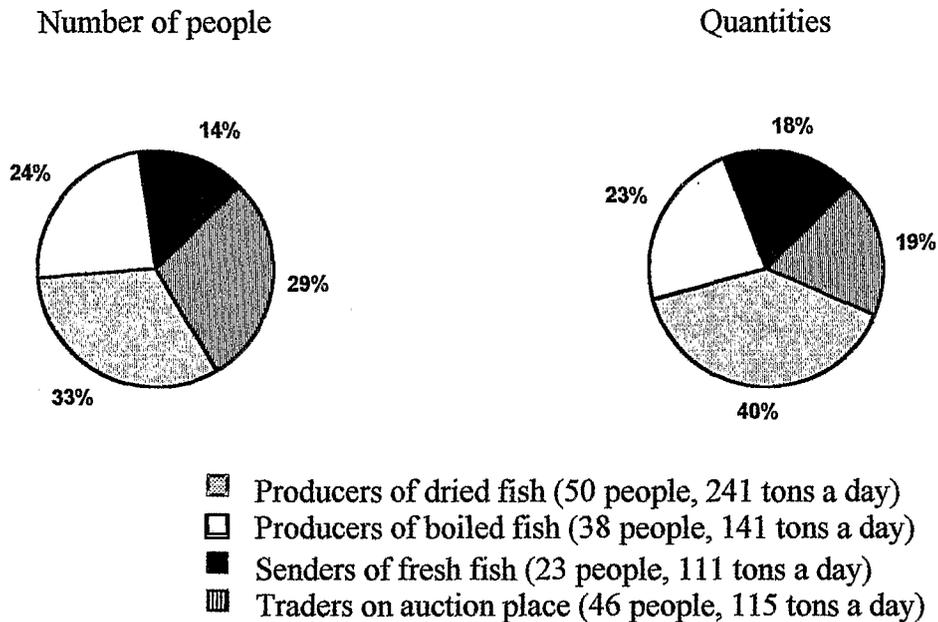
- **Senders of fresh fish** (23 people) use to add ice to the fish they buy and send immediately trucks to Java towns. Employees, male only, are not so numerous than the former categories, they work on a half day basis.

- **Traders on the auction place** (46 people) buy and retail fish on the auction place, without any operation modifying the fish. They use to work alone, the scale of their activities depends on their financing capacities, one of the main justifications of their job is to provide credit to other fish traders who reimburse money as soon as they have been paid by their own customers.

⁷Fish has already spent to much time in holes to be used by producers of boiled fish or fresh fish traders.



Distribution of the sample



2.2. Methods and results of the survey

2.2.1 Methods of questioning

The goal of this survey is to gather a set of information on Central Java major auction places buyers. These information have to be accurate enough to allow a sound analysis of efficiency determinants of firms. Compare "efficiency" of firms means that we intend to class each firm according to its use of inputs : a firm will be more efficient than another if, from a same inputs set, it's output is superior.

We have mixed **three types of survey** to achieve this objective.

- A one year survey, with 115 firms, is intended to get information about purchases and production of firms. Investigators use to meet every firm twice a month and collect a description of nature, quantities and values of purchases and sales with indication of products destination.

- A six month survey, 44 firms, complete the preceding by recapitulating volume and price of purchases and sales for 2 weeks a month.

- All along the year of the survey, during 1 week per month, we carry on interviews with firms managers and employees in order to gather a homogeneous set of information about origins, functioning, constraints for the development of each firm.

Remark

Traders on auction places need a specific treatment : we can not study with same indicators their activity and the processing and expedition of fish one. Means mobilized are limited to a solid running capital, allowing them to support long delays of payment but the



quality of relations with fishermen, administration employees, colleagues and customers play a crucial part in the developing of such a business. In this case, we focus our quizz on the risk they have to support. It depends on the volume of sales, the payment mode, the regularity of relations with each customer and the distance until customers home.

2.2.2. Expected results of the survey

- **Supplying of firms.**

Thanks to the survey, we describe, for each category of firm, what are their choices in terms of **species, conditioning on board, quality, quantity and price**. We also know what are auction places they prefer, do they get fish through a middleman, what is the pace of their activity.

Such a set of information allow a wider comparison between habits on each auction place : we analyze **specificity of each auction place**, by comparing price elasticity, average price of each species, average level of quality, distribution between fresh and salted onboard fish.

- **Functioning of each firm**

This part concern more specifically producers of processed fish and senders of non-processed fish. The **work force management** plays an important part in the functioning of such firms; we focus first on the calculation of the wage distributed to each employee, the number of determinants we have to take in account⁸ prove that this variable is a key one.

We study also the weight of the manpower in the running costs, the sharing of work and benefits, the articulation between male and female tasks, the degree of autonomy given to each team and each worker. But despite the complexity and the weight of the human resource management other costs are far to be negligible, as **transport, conditioning, and packaging costs**.

The objective is to get an estimation of **overall processing and sending costs per kilo of fish** with indication of their variability inter and infra firm. In order to get a reliable estimation of these costs, we have to take in consideration not only the distribution of the production between destinations, species and size of the fish, but also the variability of the volume of fish sent. We are gathering information about other costs endured by firms : for example, producers of dried fish support maintenance costs of drying equipment which are not negligible.

- **Channels of distribution**

Surveys are also intended to provide a **description of sales of each type of firm**, by gathering statistics about status of customers, place of final commercialization, selling price according to species, type of processing and quality. By the presentation of **maps** describing the distribution of Java sea fishery products, we can compare importance of each destination

⁸ For many firms, we need to know 35 variables just to approximate the average yearly wage per capita



for each type of product. Such a document give indication on consumption habits, purchasing power of towns and we can easily estimate the part played by other fisheries.

This completion of the production cycle study will allow us to lead research concerning **margins, profitability and viability of each firm** with the hope to dress a typology of main determinants of the success in this sector.

That's why we don't forget to take into account **the origin of each firm**, the quality of its suppliers and customers network, keeping in mind that in many cases, the family origin of the employer, his educational level and the quality of his business relations paved the way to prosperity.

Conclusion

The Java sea pelagic fishery has enjoyed a tremendous increase in landings during recent years, the commercialization sector creates a lot of direct and indirect job thanks to its use of traditional mode of fish processing and it is providing 60 % of the animal protein supplying of the population.

By undertaking this study, PELFISH has targeted a major sector which plays a key part not only in the food supplying of Indonesian population but also in economic development of a whole region. Thanks to a study, based on a regular and deep implication on the field, with many interviews with major actors of this sector, PELFISH benefits from reliable information on an unknown sector endowed with a promising development.

The food distribution sector is dramatically changing : supermarkets, commercial centers are luring more and more customers. Concerning fish products, the trend is definitely directed to a significant improvement in quality and packaging following the rocketing of the large scale distribution.

Fish processing and trade sector will directly face consequences of these changes in distribution, a growing part of traders will be asked to supply supermarkets with good quality fresh fish, whereas a bigger proportion of processing products like dried salted or boiled fish will be commercialized in supermarkets, with a modern packaging.

At the dawn of such a radical modification of the fish distribution, information is necessary to foresee what will be social and economic consequences of this move, and PELFISH is eager to share benefits of its work. We do think that it is an opportunity to be caught by all people interested in the development of fisheries activities.