Network of Aquaculture Centres in Asia-Pacific

Shrimp Price Study, Phase III

Case studies in Vietnam, Indonesia and Bangladesh

November 2011

Prepared by the Network of Aquaculture Centres in Asia-Pacific (NACA)

Acknowledgement

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Executive Summary

This study is a continuation of "Evaluation of the impact of the Indian Ocean tsunami and US anti-dumping duties on the shrimp farming sector of South and South-East Asia", a study conducted by Network of Aquaculture Centres in Asia-Pacific (NACA) in 2006, with the aim of assessing the impact of the 2004 Indian Ocean tsunami and of the introduction of anti-dumping duties on the shrimp farming sectors of countries in the Asian region, with special focus on the effect that these unforeseen events had on shrimp prices and livelihoods of the stakeholders. The project was conducted in three countries selected as representatives for countries affected by the anti-dumping duties, the tsunami, and neither event respectively.

The first-round study, while giving an insight on the impact of the Indian Ocean tsunami and US anti-dumping, also highlighted the need for continuous collection of price data from a wider range of stakeholders in the supply chain in order to do a thorough evaluation of the health of the industry and to identify the interventions to be made to increase the sustainability of the sector. Phase II (January 2008 to June 2009) and Phase III (Current study) are follow-up studies based on the recommendations derived from the initial study. The present study is the 3rd phase of this extended study and aims to update the social and economic trends in the shrimp farming sector investigated during the previous phases.

This report is based on the data collected from the 3 representative countries, Vietnam, Indonesia and Bangladesh from July 2009 - November 2010. The sampling locations and methods were kept identical as far as possible to those adopted in the previous studies, enabling valid data comparisons and analysis.

Investment levels of the Vietnamese farmers were either stable or slightly increasing over the study period due to improvement of technical skills and management tools. Consequently, both the total production of shrimp harvested per year and shrimp yield per crop remained stable. The price of the shrimps was determined by the size and seasonal crop, and has tended to increase rapidly between 2008 and 2009, especially for bigger size for both *P. monodon* and *P. vannamei*. About 85% of the respondents were aware of US anti-dumping in 2004, and it was this was thought to be the reason for decreased shrimp prices. However, in general shrimp farmers, traders and processors/exporters who were impacted by the US antidumping duties have tried to find strategies to mitigate these negative impacts by finding ways to reduce production and marketing costs, improve shrimp quality, and increase the proportion of value added products for export.

A number of significant changes in shrimp farming industry were apparent in Indonesia over the past few years. The yield of the first crop showed a 35% increase in 2010 compared with 2009. Although tiger shrimp remained the most important traded commodity, the traded amounts of both this species and white shrimp other than *P. vannamei* decreased over time, while *P. vannamei* trading appeared to be still on top. In contrast with the rapid increase evident in Vietnam, Indonesian shrimp prices for most count sizes of *P. monodon* and for most stakeholder groups were slightly fluctuating over the study period. Sales prices by farmers also have randomly fluctuated overtime whilst procurement prices by traders tended to increase toward end of the year with highest price recorded in January 2010. A majority of farmers and traders were aware of the occurrence of the tsunami in December 2004, but

only of them were conscious about its impact on their business. Most processors said that their business mainly affected by scarcity of shrimp volume from aquaculture and government ban of shrimp trans-shipment. Other difficulties associated with Indonesian shrimp industry were endemic disease outbreaks and increasing pressure from international markets requesting quality products.

In Bagladesh*, P. monodon* remained the major common traded commodity ranging from 77- 98% during 2010. Volume of *P. monodon* trade showed a slight increase from 2009 to 2010. Trends of both procurement as well as resale prices of all the concerned stakeholders were positive indicating that over time both increased. 100% percent of the traders and the majority of the depot owners, agents and processors replied that the price of shrimp was higher in 2010 than in 2009 and the price increase helped expand the businesses of many stakeholders. Majority of the farmers were unaware of the tsunami however the rest in the chain, from traders to processors were. Farmers, traders and depots claimed that the tsunami did not affect their livelihood but Sidr (2007) and *Aila* (2009). Agents and processors claimed that imposing of non-tariff barriers had adverse effects on shrimp exports in 2008. Most of the stakeholders are also concerned about the climate change effects. Only the processors were aware of the US anti-dumping and have identified some indirect effects of it on the industry. In general, livelihoods were not directly affected by the tsunami and US anti-dumping.

In conclusion, shrimp farming sector has influenced by many factors over the past few years such as unforeseen natural events, international trade barriers and increasing consumer demand for good quality products. Mitigatory and recovery methods identified and implemented by some counties have been effective in remaining stable amid such difficulties. However, the results of the study made clear the importance of having sound mitigatory and recovery strategies and good marketing strategies while taking steps to improve the quality of the products by introducing better management practices to ensure sustainability of the trade.

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1. Introduction

This study is a continuation of “Evaluation of the impact of the Indian Ocean tsunami and US anti-dumping duties on the shrimp farming sector of South and South-East Asia”, a study conducted by Network of Aquaculture Centres in Asia-Pacific (NACA) in 2006, with the aim of assessing the impact of the 2004 Indian Ocean tsunami and of the introduction of anti-dumping duties on the shrimp farming sectors of countries in the Asian region, with special focus on the effect that these unforeseen events had on shrimp prices and livelihoods of the stakeholders. The project was conducted in three countries selected as representatives for countries affected by the anti-dumping duties, the tsunami, and neither event respectively.

The first-round study, while giving an insight on the impact of the Indian Ocean tsunami and US anti-dumping, also highlighted the need for continuous collection of price data from a wider range of stakeholders in the supply chain in order to do a thorough evaluation of the health of the industry and to identify the interventions to be made to increase the sustainability of the sector. Phase II (January 2008 to June 2009) and Phase III (Current study) are follow-up studies based on the recommendations derived from the initial study.

2. Objective of the current study

To update NACA's March 2010 study titled "Shrimp Price Study, Phase II Case Studies in Vietnam, Indonesia and Bangladesh" (which updated the October 2006 study titled "Evaluation of the impact of the Indian Ocean Tsunami and US anti-dumping duties on the shrimp farming sector of South and South-East Asia"). As explained there, both the studies "highlighted the need for continuous collection of price data, not only from processors and concerning exported commodities, but also from traders and farmers so that a thorough evaluation of the health of the industry could be conducted and interventions to increase the sustainability of the sector implemented." The objective of the current study was to update the shrimp price trends of the selected countries, from July 2009 to November 2010.

3. General Methodology

Lead and Partner Organisations

The study was led by NACA under the supervision of Dr. C.V. Mohan (mohan@enaca.org) and was implemented in partnership with institutions in Vietnam (Mr. *Phan Thanh Lam & Tran Quoc Chuong),* Indonesia (Mr. Pamudi) and Bangladesh (Mr.Humayun Kabir).

Study Period

The data for this study was collected from July 2009 to November 2010.

Sample Sites

Study sites for the current study were chosen to overlap with the study sites of the first 2 phases of the study to the extent possible. Country specific basis of site selection and site details are given under the methodologies of each country.

Data Collection and Analysis

Primary Data was collected mainly from 3 stakeholder groups, namely farmers, traders and processors (also agents and depots in Bangladesh) using pre-tested questionnaires and where possible the original shrimp transaction records. The questionnaires were specially designed for each category of stakeholders. Uniformity of the questionnaires of the 3 counties was maintained to do valid comparisons. Secondary data was obtained from published literature.

Keeping with the analytical methods used in the previous studies, regression analysis was performed to elucidate shrimp price trends.

4. Vietnam Case Study

4.1 Summary

The aim of this study is to give a thorough evaluation of the health of the shrimp industry and interventions to increase the sustainability of the sector implemented. The survey included a total of 150 shrimp (*Penaeus monodon*) farmers and 30 shrimp (*Penaeus vannamei*) farmers, 30 shrimp traders and 30 processors/exporters from the 4 provinces with the largest shrimp production in the Mekong Delta. Primary data is collected using questionnaires which were pre-tested before being used. Data on prices and quantity traded for the period from July 2008-to Nov 2010 were taken from actual records maintained by the stakeholders.

There was a trend among farmers to keep stable or increase slightly their investment level, especially through improvement of technical skills and management tools. Consequently, both the total production of shrimp harvested per year and shrimp yield per crop tended to be stable over the period examined (2009-2010). The results also showed that the shrimp price depends on the size and seasonal crop, and has tended to increase rapidly between 2008 and 2009, especially for bigger size for both PMF and PVF. About 85% of the respondents knew about US anti-dumping in 2004, this was blamed for decreased shrimp prices and was said to have had impacts even before the official application of antidumping duties. However, the industry appeared to have recovered from those initial negative effects, perhaps as a consequence of the market expansion to other countries. In general, all the shrimp farmers, traders and processors/exporters who were impacted by the US antidumping duties have tried to find strategies to mitigate these negative impacts. The most important solutions were: (1) reduce production and marketing costs, (2) improve shrimp quality, and (3) increase the proportion of value added products for export.

Key words: P.monodon, P.vannamei, shrimp price, famers, traders and processors

4.2 Introduction

The fishery sector plays an important role in the economy of Vietnam. For many years the development of the sector has depended on capture fisheries, although the contribution of aquaculture to the sector has become increasingly important (NACA, 2006). In 2010, the total fishery production was 5.157 million tonnes, of which aquaculture contributed 53% of total fishery production (Figure 1), and aquaculture gradually play an important role in the fishery sector of Vietnam (DoF, 2008), which reached the average annual growth rate of 16.46% in the period 2000-2010, which the rate of 590,000 tonnes in 2000 increased to 2.706 million tonnes in 2010. Recently, aquaculture becomes a significant source of income contributing to national economy as well as a considerable source of protein for local provinces and Vietnam (Vu & Phan, 2008; Phan *et al.*, 2008). Aquaculture products are not only provided for domestic market but also for international market.

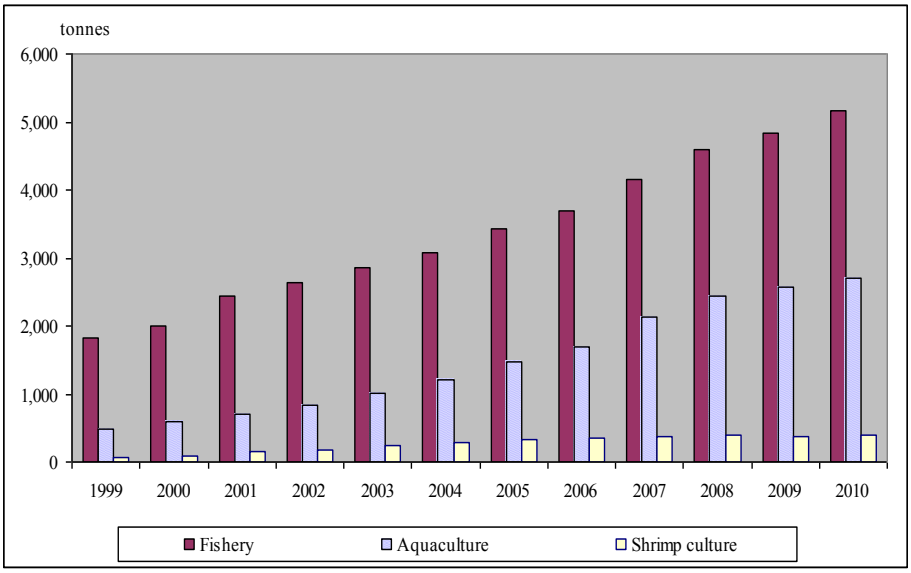
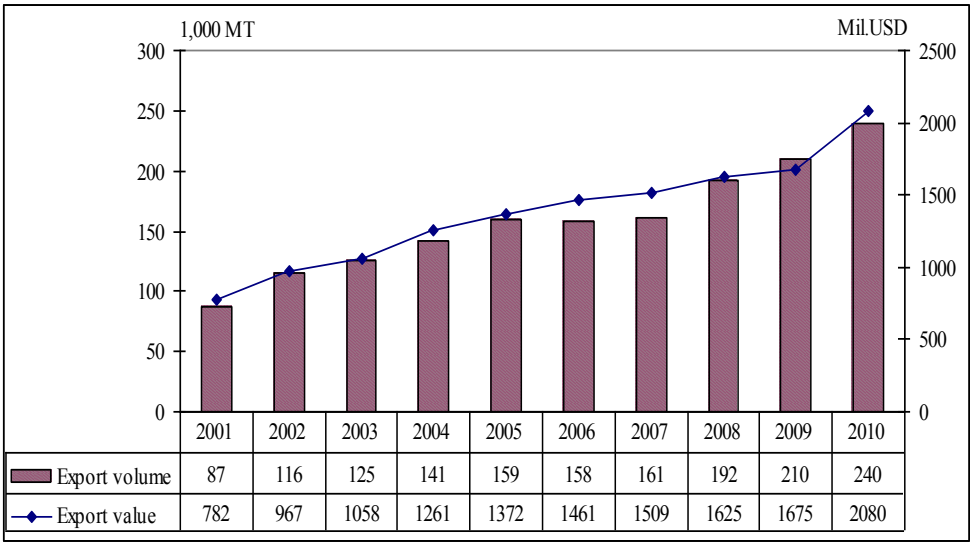


Figure 1. Aquaculture/and shrimp culture production vs. fishery production, Vietnam

(Sources: General Statistics Office of Vietnam, 2009; MARD, 2009 & 2010)

The shrimp industry has primarily developed during the last decade, especially following Government resolution no. 09/NQ-CP which permitted the transfer of ineffective agriculture land for use in aquaculture development from the year 2000. This change was a primary factor leading to increased aquaculture areas and production during this the period of time. Shrimp culture is believed to be the most economically important sector of Vietnamese aquaculture. In 2010, Vietnam had approximately 645 ha of shrimp culture area and produced 394 tonnes of shrimp, contributing more than USD2.08 billion dollars out of the total USD4.945 billion dollar value of aquatic species exported from the country (Figure 2).



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Export volume	87	116	125	141	159	158	161	192	210	240
Export value	782	967	1058	1261	1372	1461	1509	1625	1675	2080

Figure 2. Shrimp export volume and value 1999-2008, Vietnam

(Sources: VASEP, 2008 & 2009 & 2010)

The Mekong Delta is by far the largest shrimp producing area in Vietnam, with eight coastal provinces constituting 560,000 ha of shrimp farms that produce 292,000 tonnes of shrimp in 2010, the Mekong Delta accounted for 86% and 74% of the total shrimp industry in Vietnam, respectively (Figure 3). Because more than 80% of the total shrimp production is exported, international markets have become increasingly important to the Vietnamese shrimp industry. However, a number of issues/challenges have limited the development of the shrimp industry in Vietnam, including: 1) elevated food safety requirements, 2) anti-dumping and trade remedies, 3) labeling and trade fraud, 4) international competition, 5) the declining trend for price of farmed seafood, and 6) more stringent environmental protections and increased social responsibility in importing countries. (Nguyen et al., 2008).

The trend of shrimp farming in Vietnam and the Mekong Delta since 2000 is shown in Figure 3 (GSO, 2008; VIFEP, 2008 & 2009, MARD, 2009 & 2010). It is important to note that the area used for intensive and semi-intensive (SI) shrimp farming in 2010 was about 10% of the total cultured area in the Mekong Delta, as most of the production was conducted in improved extensive (IE) systems.

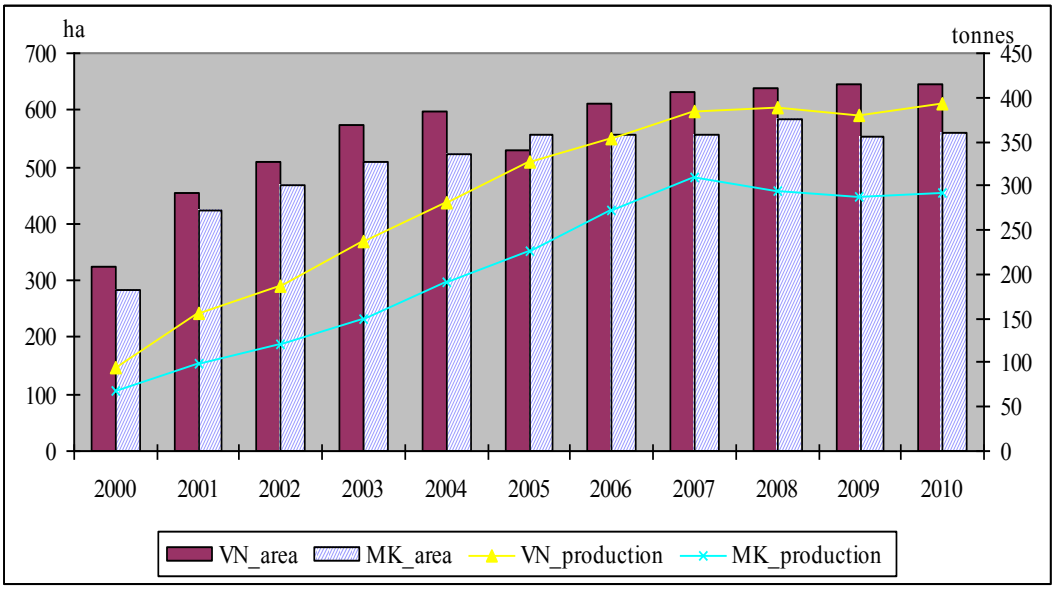


Figure 3. Culture area & production of coastal shrimp in Viet Nam & the Mekong Delta
(Sources: GSO, 2008; VIFEP, 2008 & 2009; MARD, 2009 & 2010)

After 10 years (2000 - 2010), in response to the change in use of agricultural land by resolution no. 09/2000/NQ-CP, brackish shrimp culture moved to a key position. The Resolution not only generated changes in business scale and usefulness of land/water/labor resources but also facilitated the mobilization of material resources to develop the culture/process/service of brackish shrimp (Phi et al., 2007). Yet, there were some limitations to these achievements such as: (1) the Development of brackish shrimp culture is not sustainable long-term and poses a high rate of risk, (2) Brackish shrimp culture has been a main cause of the environmental pollution of soil and water; (3) Increases in

productivity, yield, quality and export return are still low, and this does not correspond with potential and advantages; (4) The yield of brackish shrimp in the same model (intensive, semi-intensive, extensive) varies greatly between households, farms, and areas in an ecologically zone; (5) The solutions, which increase yield, quality and effect, are still limited; (6) The co-operation between the 4 steps of the shrimp industry: production - buying - process - consumption do not correspond to the reduction of competition of products in the market; and (7) The standards of food safety for brackish shrimp are insufficient.

The aim of this study is to give a thorough evaluation of the health of the shrimp industry and to provide improvements that would increase the sustainability of this sector.

4.3 Methodology

Because of the overwhelming importance of the Mekong Delta which contributes more than 70% of total shrimp production and about 80% of the total shrimp production for export (DoF, 2008; Nguyen, 2008), the survey was focused on the 4 biggest shrimp (*P.monodon*) farming provinces in the Mekong Delta, namely: Ca Mau, Soc Trang, Bac Lieu and Ben Tre. To make the comparison between *P.monodon* and *P.vannamei* shrimp, the shrimp (*P.vannamei*) farmers' survey also included the Ca Mau and Ben Tre provinces (Figure 4).

Primary data was collected from 3 groups of respondents in these provinces. The total sample size for the study was 240, including 30 processors/exporters, 30 shrimp traders, and 180 shrimp farmers (150 P.monodon, and 20 P.vannamei farmers). The farmers were selected through the use of stratified random sampling based on culture systems and areas. Because of differences in the farming practices between semi-intensive or intensive farmers when compared with improved extensive farmers, and in spite of the sector being overwhelmingly dominated by small scale producers, both groups were sampled in approximately equal proportions to obtain representative samples from both groups. The details of the interviews are provided in Annex 1 to Annex 4.

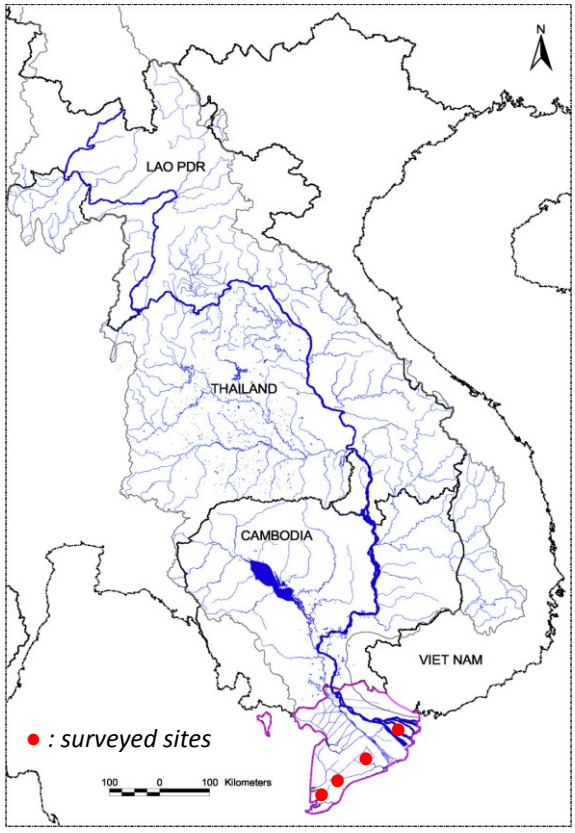


Figure 4: Map of study areas in Vietnam

Data was collected using questionnaires developed for each of the 3 stakeholder groups (Annex 17, 18, 19). Questionnaires were pre-tested before being used for data collection. Data on prices and

quantity traded for the period 2009-2010 (July 1, 2009 to Nov 30, 2010) was taken from actual records maintained by the stakeholders, with the exception of farmers, who provided responses on socio-economic characteristics, incentive mechanisms, shrimp price trends and their effects, and their opinions on the effects of the anti-dumping and other business information mainly based on their memory. The data were processed using MS Excel and SPSS for statistical analysis. Raw price data for every link in the supply chain was summarized using simple linear regression. Linear regression was also used to analyze price trends and to calculate the most likely prices at any point in time. Analyses were conducted only when the number of observations for a specific size and species allowed the analysis of that information to be done in a meaningful manner.

4.4 Results and discussion

Socio-economic characteristics of the shrimp farmers

On average, households consisted of 4.48 persons in *P.monodon* farming (PMF) areas and 4.67 persons in *P.vannamei* farming (PVF) areas. The age of shrimp farmers varied from 25 to 75 years with an average age of 46.46 years in the PMF and 45.70 years in the PVF. More than 98% of the owner of shrimp farmers were male. On average, the PMF farmers had over 11 years and PVM famers is around 7 years of shrimp farming experience (Annex 5). Educational levels were relatively low with roughly 70% of the shrimp farmers having stopped formal education at elementary school level and 25% having obtained high school or higher degrees. The educational level of famers in the PMF is lower than that in the PVF, because PVF have developed for 8 years and most farmers are younger and have higher educational degrees.

Farmers' aquaculture technical knowledge was derived mainly from two sources: self-learning (100% of farmers in both PMF and PVF), and short training courses offered by different types of institutions (94% and 100% respectively). Only a small proportion of PMF farmers (0.67%) attended professional programs from vocational schools and/or universities, whereas this rate in the PVF is 0% (Annex 5). Shrimp farming was the occupation ranking first among the surveyed farmers in both PMF and PVF. Agriculture was the second important income of famers in the PVF, while livestock was ranked second in the PMF.

In the PMF, the average total land area for farms was 1.90 ha, ranging from 0.20 ha to 15 ha. Within the total land area, the area of shrimp culture were 1.35 ha with an average of 3.5 ponds/farm and 0.38ha/ponds. Whereas, in the PVF total farm area was 0.98 ha (0.25 to 1.8 ha), in which surface water for shrimp pond accounted for around 62% with an average of 1.9 ponds/ farm and 0.33ha/pond. The majority of farmers (100%) were single owners of their farm.

The most common cropping practice was a single annual crop in both PMF farmers and PVF farmers adopting this strategy. This probably reflects the effect that environmental conditions and disease has had on shrimp culture and that has translated into the "one-crop-per-year" policy recommended by the Government of Vietnam. The average stocking density in the PMF and PVF farms was 17.14 and 70.99 postlarvae/m^2/crop respectively, and most of shrimp seed originated from hatcheries. The crop is harvested 4-5 months after stocking; most of the stocked shrimp are harvested from June to October in PMF famers and from April to August in PVF famers resulting in a very clear seasonal supply

of both farming inputs and raw materials for trading and processing activities.

Volume changes of commodities traded

The shrimp industry has increased quickly between 2005 and 2007, and reached stable development in 2008 and in 2009, and continued to increase dramatically in the year 2010 in both volume and value of shrimp exported. Most shrimp products were exported to international markets; the shrimp export has contributed over 42% of the total value of fishery export and became a target commodity of export for Vietnam.

Table 1. Volume and value of shrimp exported traded of Vietnam: 2005-2010

Year	Shrimp production from culture *(1,000 tonnes)*	Shrimp export	
		Volume *(1,000 tonnes)*	Value *(million USD)*
2005	327.20	159.19	1372.00
2006	354.50	158.45	1461.00
2007	384.50	161.27	1509.00
2008	388.40	191.55	1625.00
2009	380.00	209.57	1675.14
2010	394.00	240.00	2080.00

Sources: GOS 2008; VASEP 2008,2009, 2010; MARD 2009, 2010

Changes taking place between 2009 and 2010

a. Overall changes

In general, the farmers in both PMF and PVF areas have tended to keep stable their investment level (Annex 8). The unstable markets, fluctuation and un-predicted harvested shrimp price and the quickly increasing price of input costs (i.e. feed cost, chemical/drug used etc.) were the main reasons leading to farmers' no change in shrimp culture planning.

Most of the farmers in the both PMF and PVF did not change the total area used for shrimp farming, but about 47.33% and 56.67% of the farmers made their activities more diversified respectively, whereas 21.33% and 50.00% of total famers respectively have increased their stocking density. Most farmers have tended to reduce production costs such as cost for feed and chemicals used by improvement of their technical skills and management tools. The farmers also changed the number of days from stocking to harvesting; the reasons given for changing the length of the crop cycle were to get the higher shrimp price period in the year 2010 which the price have tended to be increasing gradually.

b. Description and evaluation of the 1st production cycles in 2009 and 2010

There were minimal changes in farmed species or farm management between 20098 and 2010. Most of the farmers stocked the first crop from February to April. There was not much change in time of stocking

for each farmer in 2009 and 2010.

A total of 78% of farmers reported a stable average stocking density in the 1st crop while 22% of them said that stocking density had been increased in the PMF farmers, while these rates were 50% and 50% respectively in the PVF farmers. Hatcheries were the only source of shrimp PL for the shrimp farmers in both years examined. In the PMF, 38% of the shrimp farmers reported that the yield of tiger shrimp harvested from crop 1 in 2010 was increased and slightly higher than that in 2009, while 14% said that they had lower harvest in 2010 compared to 2009, and the remainder reporting no difference between the two years. Whereas, 17% of the PVF farmers stated that the yield of white leg shrimp in 2010 was lower than that of 2009, and 27% of farmers reported that higher yield in 2010.

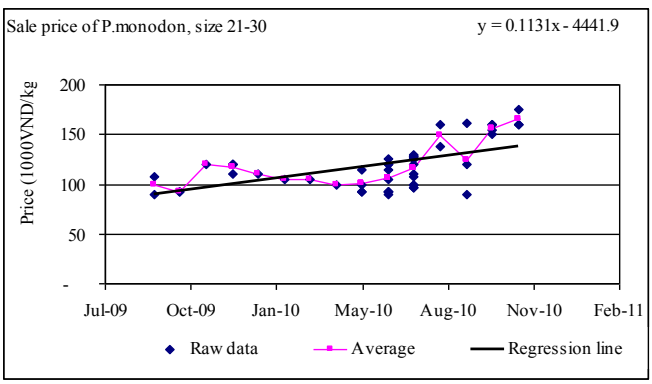
Harvesting took place during April through August for most of the PVF farmers and from June to October for PMF famers, although some of them harvested in other months depending on the stocking time, weather, shrimp health and situation of shrimp price at the market. Most farmers harvested their crop once a year. The survey clearly indicates a increasing in the production cost/crop in 2010 compared with 2009, around 38% of PMF famers reported that production cost was higher than that of 2009 (PMF) and 27% for PVF. However, there was a high degree of variability (SD) in the amounts spent- the details of variable costs can be observed in Annex 9. As a result of increasing in the production cost/crop from shrimp farming between 2009 and 2010, however the total net return generated in 2010 was not negatively influenced because shrimp price have been increasing quickly at the harvesting season and the end of this year.

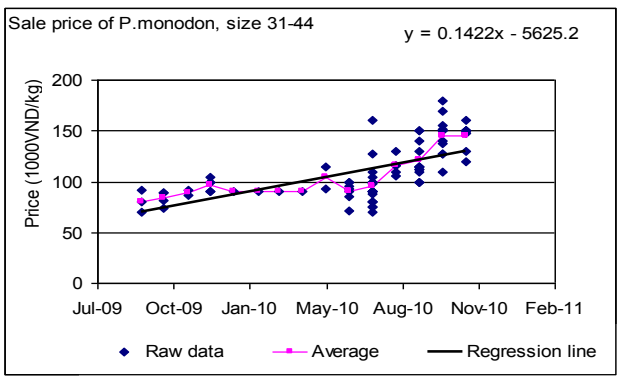
Shrimp price trend analysis

The monthly price of all sizes of shrimp fluctuated over time; the price depends on harvested size and seasonal crop. Generally, the selling price in 2010 has tended to increase and is higher than that in 2008, and 2009. The economic crisis in 2008's effect on the shrimp industry was the primary reason leading to a price reduction in 2008 and 2009, but the lack of raw-material shrimp sources is the main reason of price increasing in 2010.

Farmers

In general, the prices obtained by farmers have tended to be increasing from the year 2009 to 2010, with a rapidly increasing trend for bigger harvested shrimp size (i.e. the 21-30 size and 31-44 size), and gradually rising trend of the small size (Figure 5). The price of *P.vannamei* was also tended to be rising rapidly from 2009 to 2010.





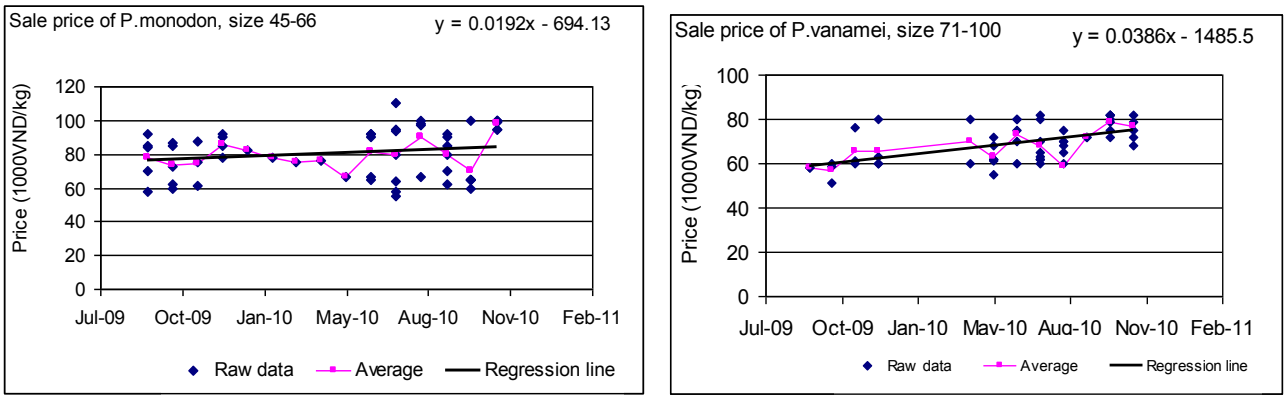


Figure 5. Scatters of actual sale prices of harvested shrimp for farmers

Traders

The trend in selling prices by traders for the 3 most typical sizes (21-30 pieces/kg, 31-44 pieces/kg and 45-66 pieces/kg) can be observed in Figure 6. The price for all sizes of shrimp tended to be increasing rapidly over time between the year 2009 and 2010. The price in 2010 was higher than that in 2009, especially for size 21-30 and 31-44 shrimp/kg. The selling price of while leg-shrimp has been also increased gradually during 2009 and 2010.

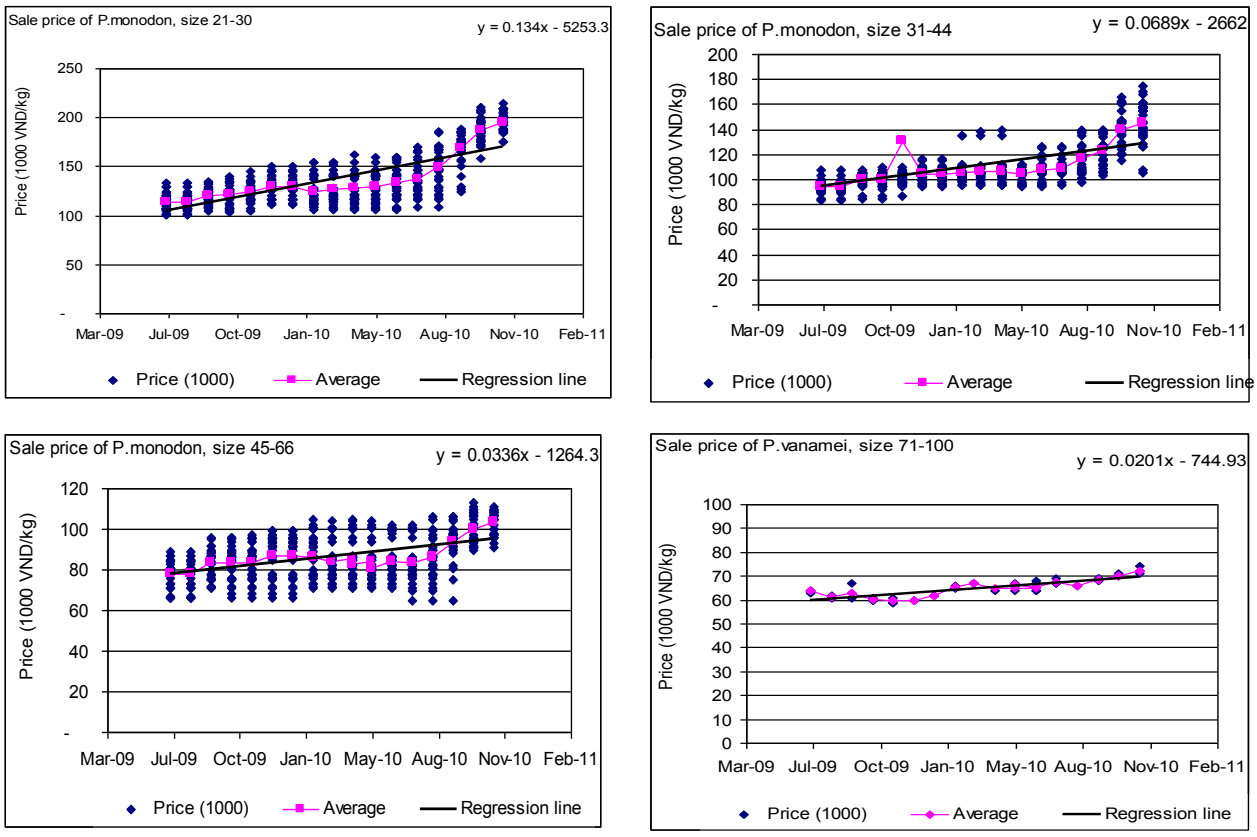


Figure 6. Scatters of selling prices of shrimp for traders

Processors

The selling prices reported by the processors show a rapidly increasing trend for most sizes from 2009 to 2010 (Figure 7). The selling price of while leg-shrimp has been also risen slightly since 2009.

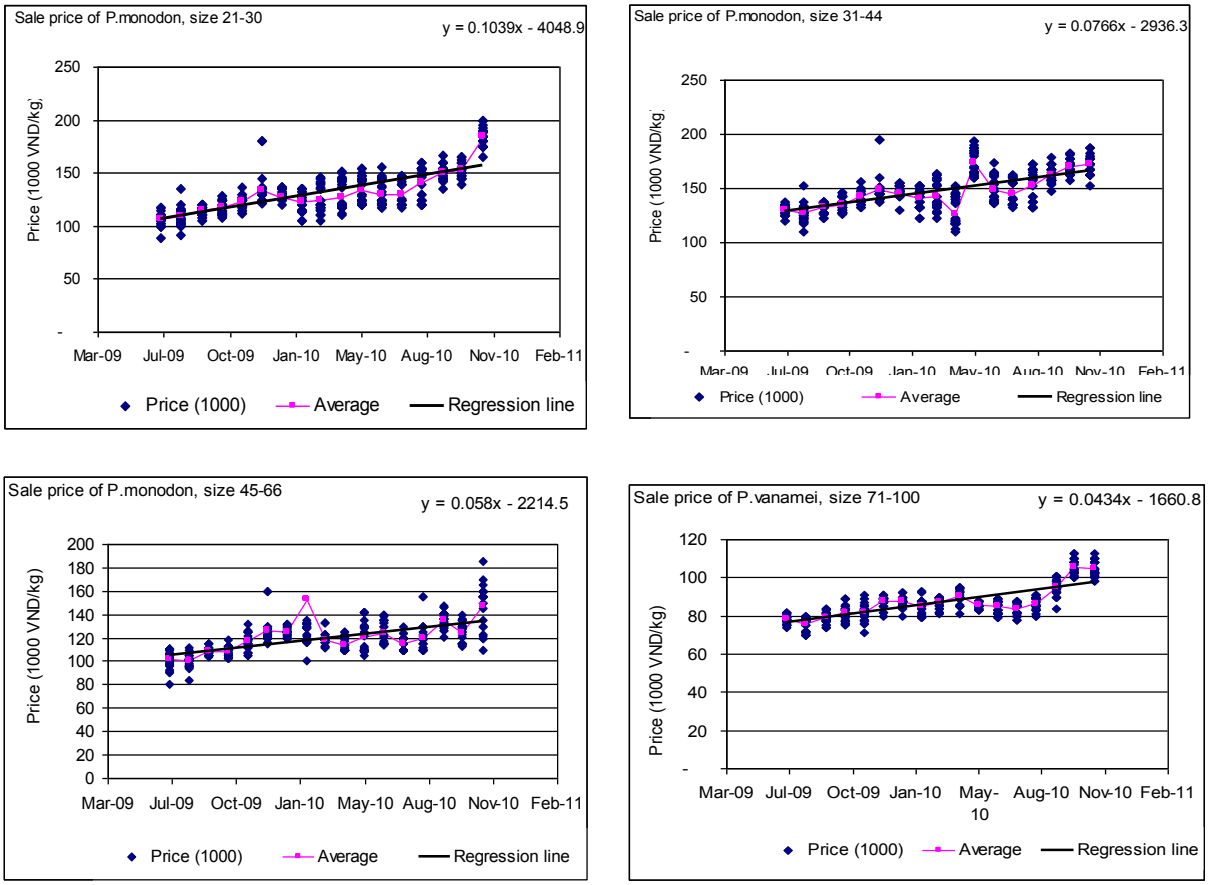


Figure 7. Scatters of selling prices of shrimp for processors

Table 2 and 3 summarize the trends of prices for the stakeholders in Vietnam. For more information on monthly average prices, see Annexes 10 through 12.

Table 2. The price trends of stakeholders, black tiger shrimp (*P.monodon*)

Stakeholders	Size	Slope	Intercept	Jul- 2009[1]	Nov-2010[1]
Farmers	21-30	0.113	-4441.90	99.00	165.00
	31-44	0.142	-5625.20	80.67	145.11
	45-66	0.019	-694.13	77.80	98.17
Traders	0-20	0.155	- 6095.80	146.73	238.37
	21-30	0.134	- 5253.30	114.27	195.50
	31-44	0.068	- 2662.00	94.92	144.87
	45-66	0.033	- 1264.30	77.97	103.30
	67-100	0.019	- 736.56	54.53	68.97
Processors	0-20	0.084	- 3210.50	171.23	243.73
	21-30	0.103	- 4048.90	157.00	185.00
	31-44	0.0766	- 2936.30	130.00	173.00
	45-66	-	-	-	-
	67-100	-	-	-	-

(1) 1000 VND/kg

Table 3. The price trends of stakeholders, white leg shrimp (*P.vannamei*)

Stakeholders	Size	Slope	Intercept	Jul- 2009[1]	Nov-2010[1]
Farmers	71-100	0.038	- 1485.5	58.00	77.00
Traders	45-70	-	-	-	-
	71-100	0.020	- 744.93	63.67	88.33
Processors	45-70	0.048	- 1840.3	81.93	112.97
	71-100	0.043	- 1660.8	78.17	104.67

(1) 1000 VND/kg

Perceived reasons of price trends

About 86% of farmers who reported changes in shrimp prices in the last 6 years since 2005 said that the price of shrimp was increasing. The lack of raw-material of shrimp sources and shrimp disease outbreak were considered to be the main reasons for the changes in shrimp price during this period of time. In 2010, the shrimp price have tended to be increasing rapidly with 72% of farmers reported, the main reasons were high demand of market and the increasing of input cost leading to shrimp price rising (Table 4 and annex 16).

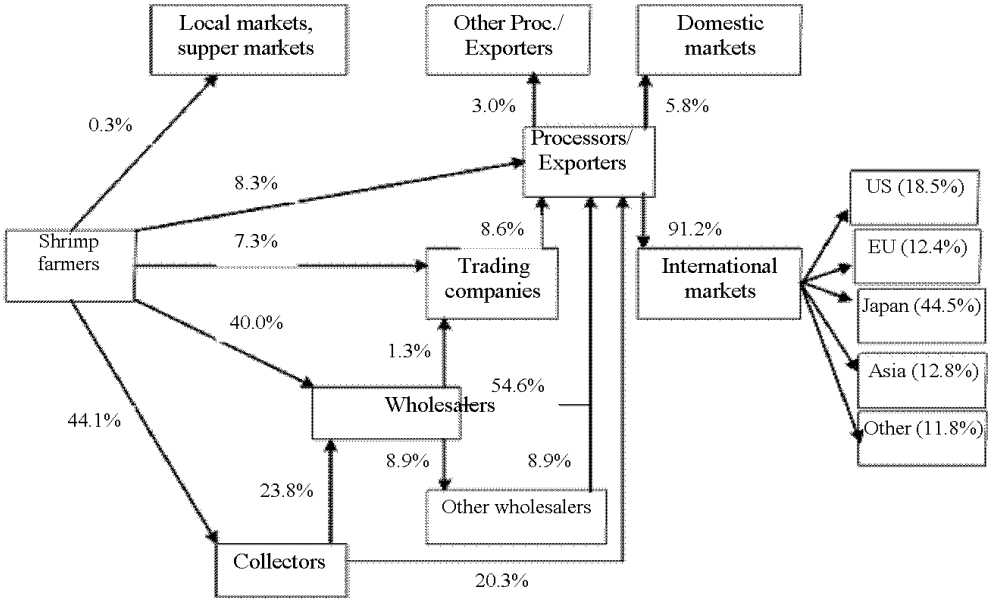
Table 4. The perceived reasons of price trends

	N	%
Price changed/trends 2005-2010		
Decreased	-	
Increased	*154*	*85.56*
Fluctuated	-	-
No change	*26*	*14.44*
The reasons:		
Lack of raw-material shrimp sources	*136*	*75.56*
Shrimp disease outbreak	*125*	*69.44*
Impacts of climate change	*19*	*10.56*
Price changed/trends in 2010:		
Decreased	-	-
Increased	130	72.22
Fluctuated	-	-
No change	50	27.78
The reasons:		
High market demand	*125*	*69.44*
Input cost increasing	*130*	*72.22*
Impacts of climate change	*20*	*11.11*

Supply chain analysis

The survey did not collect data related to this section, especially the "supply chain" issue. According to NACA (2006), the harvested shrimp were sold by the farmers involved in the survey as follows: 44.1% to the collectors; 40.0% to the wholesalers; 7.3% to the private trading companies; 8.3% to the processors/exporters; and the remaining 0.3% to the local markets or super markets (Figure 8).

It is clear that most of the raw shrimp production for processors/exporters in the Mekong Delta was supplied via the network of wholesalers (62.5% of the total volume of raw shrimp). Raw shrimp was also bought and resold between wholesalers. About 1.0% of the total amount of raw shrimp traded via the wholesalers was lost, while the proportion of shrimp lost by private trading companies was 1.3%. Raw materials might have been lost because of quality degradation and for the grading of shrimp during the transportation and pre-processing procedures. Due to the seasonality of the supply of raw shrimp and seasonal participation in shrimp processing of some fish/clam-based processors/exporters, about 3% of the total volume of raw shrimp was traded between processors. Finally, 95.7% of the total amount of traded raw tiger shrimp were processed and exported to the international markets, especially to Japan, the US, and European nations (Figures 8 and 9). Since the anti-dumping duties were introduced, a significant market expansion to European and Asian countries was observed while the share to the US was reduced in 2005 and 2006, but this market has been gradually restored since 2007.



(1.3% lost by trading companies and 1.0% lost by the wholesalers)

Figure 8. Marketing channels of shrimp production in the Mekong Delta

(Source: NACA, 2006)

The Vietnamese incentive system was rather complex. There were shrimp farmers, shrimp traders and processors/exporters receiving incentives from the other stakeholders. The incentives received consisted mainly of: administrative support, loans, technical advice/training, food safety knowledge, market information, shrimp seed, feed, and chemicals/medicines. The processors were major players in this incentive system. The incentives included: loans or capital (77.8%), technical advices (55.6%), ice and transportation (33.3%), shrimp seed (22.2%), feed (22.2%), chemicals/medicines (11.1%), and training on food safety (11.1%). The incentives encouraged the supply of shrimp from both wholesaler and farmers. Wholesalers benefited not only from processors' support, but also from farmers in terms of information of shrimp harvest, of shrimp quality and quantity, and priority in shrimp procurement. The proportion of stakeholders who provided and received incentives is presented in Figure 10.

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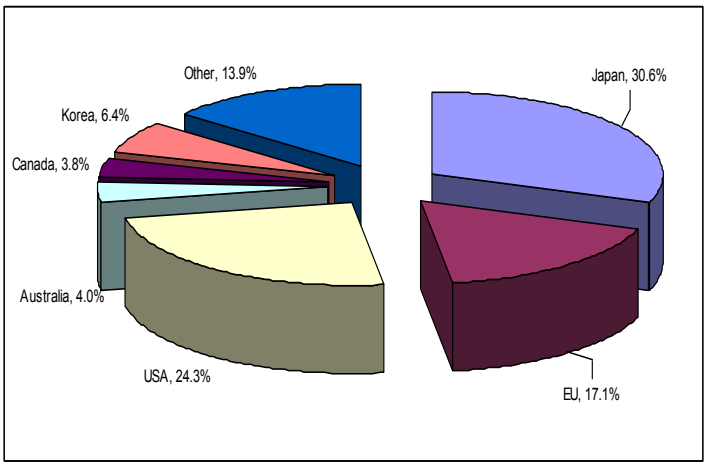

Figure 9. Export market structure of shrimp products in 2008 (by volume), *(Source: VASEP, 2009)*

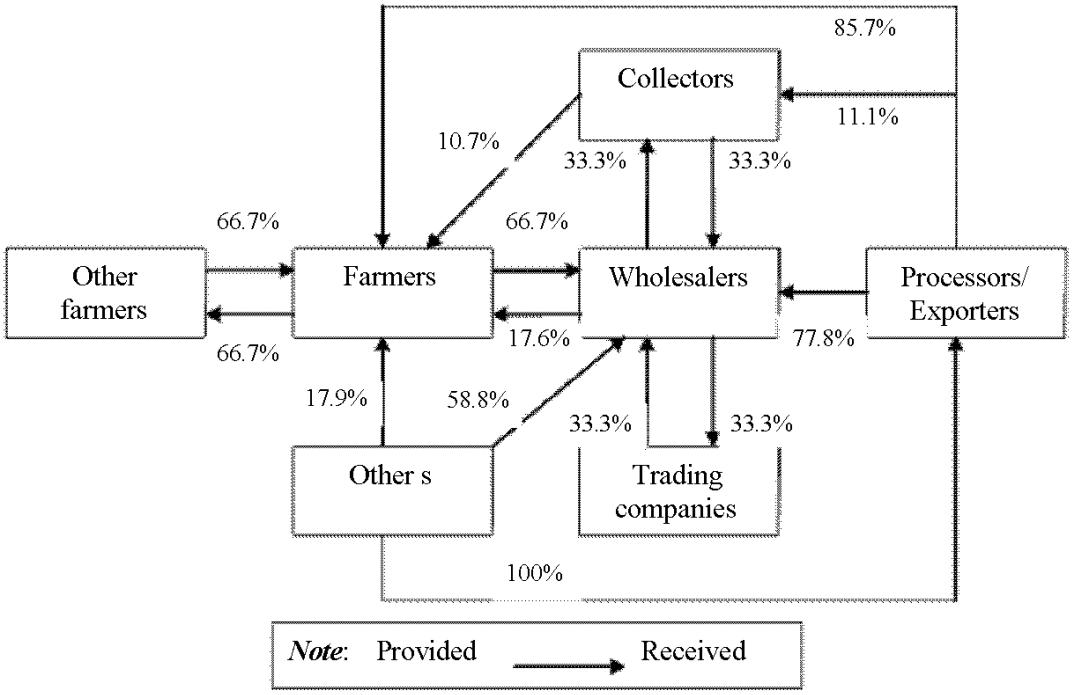

Figure 10. Proportion of the number of stakeholders who provided and received the incentives from the others, Vietnam *(Source: NACA, 2006)*

The 'chain map's outline the actors and processes of the current value chain of shrimp systems in the Mekong Delta is described in figure 11 including primary and support activities for domestic and export markets. Primary actors who are directly involved in the transformation of inputs into outputs include seed producers/operators/suppliers (hatcheries, nurseries, seed and brood-stock traders); grow-out farmers (individual-, contracted-, and company's farmers); export agents; local traders; and processing/export firms. The supporting actors who facilitate the activities of the primary actors include feed/chemical and drug providers/suppliers; service providers; input suppliers; and support institutions/facilitators.

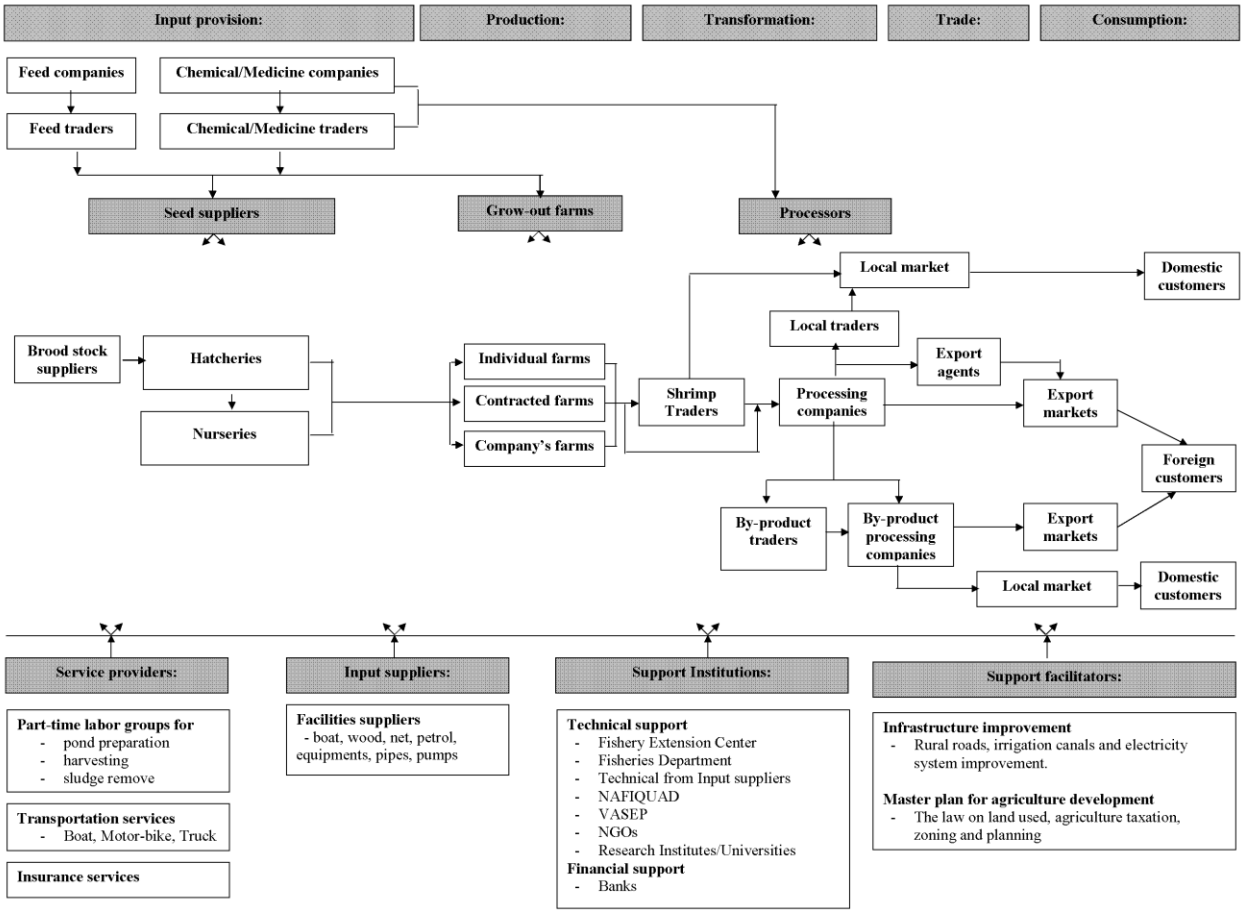

Figure 11. The value chain of shrimp system in the Mekong Delta

Impact of tsunami and US anti-dumping or other events

The survey did not collect data related to this section, because most of famers, traders and processors did not forget these events. Therefore, we used the results from the survey in 2008 and 2009 by NACA (2006 & 2010) to describe this section as follows:

a) Tsunami

There were around 80% of the surveyed farmers who knew about the Indian Ocean tsunami. However, the impacts of the tsunami on the Vietnamese stakeholders appeared minimal as only 20% farmers perceived themselves as having been affected (Annex 13).

b) US anti-dumping duties

Around 80% of the surveyed farmers were aware of the US anti-dumping case in 2004 (Annex 13). In general, as a result of US anti-dumping duties, all respondents were concerned with a decrease in shrimp prices, an increase in trade barriers, greater competition for international markets and more intense price fluctuations. Anti-dumping duties were said to have an impact on 80% of shrimp farmers who

participated in the survey.

Almost all the affected farmers (80%) emphasized the decrease in household income and shrimp prices. Besides, farmers reported that US-anti-dumping led to a decreased cultured area and lost markets (Annex 14). According to NACA (2006), the most important impact reported by traders was a decrease in shrimp prices (71.4%), a strong reduction in profits which led farmers to reduce production, resulting in insufficient supplies of raw shrimp (21.5%) and a fear of greater competition in shrimp trading (4.3%). Following the imposition of US anti-dumping duties, 3.3% of interviewed processors/exporters had to stop exporting their shrimp products to the US market for about half a year. A total of 58.3% of the processors/exporters said that greater competition in the market for shrimp products was their most significant concern. They also considered other important impacts of the US anti-dumping duties including requests for payment of bonds since the middle of 2005, which led to higher transaction costs (33.3%), a decrease of shrimp prices internationally (25.0%), an increase in international trade barriers (16.7%), and more difficult payment and liquidation (16.7%). They also mentioned a need to improve their knowledge on international trade (25.0%), When asked to rank potential solutions to mitigate the impacts of the US anti-dumping duties, farmers identified improvements in government supports (i.e. stable prices, expansion of markets, final support, and management) and self-improvement of practices to help them to stabilize shrimp farming activities. Whereas, the 2006 NACA report stated that around 20% of the traders identified 3 potential solutions, including a reduction in trading costs, improving the quality of shrimp traded, and waiting for an increase in shrimp prices. To face impact of US anti-dumping, about 50% of the processors emphasized the importance of a higher capability to compete in the market, and 40% said that they needed to focus on market penetration and expansion. Upgrading processing techniques and improvements in management quality were also cited as potential solutions (30%).

4.5 Conclusions and Recommendations

The Vietnamese shrimp industry has been developing very rapidly over the past decade, especially in the Mekong Delta. This growth has, however, led to a number of constraints that have threatened the sustainability of the sector. In addition to environmental pollution, disease and quality issues, economic factors such as fluctuating shrimp prices are playing an increasing role. At the present, the linkage between farmers and processors has more commonly been verbal agreements than enforceable contracts. Therefore, the farmers have faced problems in meeting the demand of potential customers and finding buyers for their production in the first place. The demand in terms of quantity and quality are determined by the processors, which places them in a powerful position in their relationship with the fish farmers.

The results also showed that the shrimp price depends on the size and seasonal crop, and has tended to increase rapidly in both PMF and PVM species between 2009 and 2010. The tsunami at the end of 2004 was known by most of the respondents. This unusual event, however, was said to have little direct influence on the shrimp industry in the Mekong Delta and Vietnam.

As expected, many surveyed farmers, shrimp traders and processors/exporters knew about the US anti-dumping case in 2004. This was blamed for decreased shrimp prices and was said to have had an impact even before the official application of antidumping duties. However, the industry appeared to have recovered from those initial negative effects, perhaps as a consequence of market expansion to other countries. Stakeholders have been trying to determine ways that will help them to mitigate the impact of the anti-dumping duties. The most important solutions identified are: (1) reducing production and marketing costs, (2) improving the quality of shrimp, and (3) increasing the proportion of value added products for export.

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5. Indonesia Case Study

5.1 Summary

This goal of the study is aiming to examining the shrimp farming sector in Indonesia over the past 5 years, focusing particularly on the potential effect of the unusual events occurring between 2009 and 2010, such as the Indian Ocean tsunami and the US anti-dumping duties.

A total of 155 stakeholders comprising 132 farmers, 19 traders and 4 processors from 5 districts at 3 provinces in Indonesia were interviewed**.** Primary data were collected using questionnaires and, where possible, actual records of sales of shrimp transactions.

The average age of the farmer groups ranged from 24 to 80 years old, whilst processor groups ranged from 45 to 66 years old and trader groups were 31 to 60 years old. The traders were the youngest group followed by the farmers and the processors. Therefore, the processors were the most experienced. The average experience in the shrimp business ranged between 16.3 and 18 years (monodon and vannamei farmers respectively), 15.4 years (traders) and 26.3 years (processors). The monodon farmers were also of lowest educational level (36.8% primary school graduated) whilst 50% processors were university/college graduated, although 26.7% vannamei owners were also university graduate. The traders and farmers had involvement with other occupations but the processors just paid attention to their processing/exporting business.

Tiger shrimp was the main species produced by the surveyed farmers (117 out of 132). Most of the surveyed farmers stocked shrimp in polyculture with milkfish or tilapia. Harvesting of shrimp took place throughout the year. Almost all of the monodon and vannamei farmers sold their products to collectors and, to a limited extent, to wholesalers. Hard season (disease) in production had caused production volume is largely reduced thus farmers could no longer sell shrimp directly to processors.

Over the past few years, a number of significant changes could be detected. The yield of the first crop increased 35% in 2010 compared with 2009. Although tiger shrimp remained the most important traded commodity, the traded amounts of both this species and white shrimp other than *P*. *vannamei* decreased over time, while *P. vannamei* trading appeared to be still on top.Shrimp prices for most count sizes of *P. monodon* and for most stakeholder groups were slightly fluctuating over the study period. The main reasons reported for fluctuated prices were due to limited volume of production and market in shrimp industries. Sale prices by farmers were randomly fluctuated overtime whilst procurement prices by traders tended to increase toward end of the year with highest price recorded in January 2010. On the other side, procurement prices by processors were also randomly fluctuated over study period, although for some size the trends were slightly similar to traders.

As expected, the overwhelming majority of farmers and traders knew about the occurrence of the tsunami on December 2004 particularly those in North Sumatra, but only few numbers of farmers, traders, and processors said that the event impacted their business, since the event occurred for quite

some time. Most processors said that their business mainly affected by scarcity of shrimp volume from aquaculture and government ban of shrimp transshipment. The situation has made some processors to close their business due to lack of raw material supply.
In general, the Indonesian shrimp appeared to be facing several problems, not only associated with the occurrence of unusual events but also because of endemic disease outbreaks and increasing pressure from international markets requesting quality products (certification).

5.2 Introduction

Indonesian shrimp farming is dominated by traditional, extensive system. From more than 600,000 hectares of brackish water ponds, nearly 80% of them are dominated by traditional ponds. However, to meet Indonesian goal in improving fisheries production up to 353% by 2015, the country is planning to reactivate and intensify idle and available resources with new ambitious program called *minapolitan*. Minapolitan is a term used as a marine and fisheries based economic management to boost economic growth to improve people livelihood and income. The approaches of minapolitan concept would apply integration, efficiency, quality, and acceleration principals. Integration in the concept also means to cover trade and services issues within minapolitan area thus strongly related with other ministry such as public works, energy and mineral resources, health, education, industry and trade, local government, banking and private sectors. Minapolitan program would integrate the whole fisheries business process from production to marketing. The government will start its minapolitan program by 2011 covering 24 minapolitan development areas as pilot projects of the program. The program is aimed to meet its aforementioned overall goal of increased aquaculture production in Indonesia (Table 1).

Table 1. Projection of Indonesian Aquaculture and Shrimp Production 2010-2014

No	Description	2010	2011	2012	2013	2014	2010-2014 (%/annum)
1	Total Volume	5,376,200	5,376,200	6,847,500	9,415,699	16,891,000	107.09
2	Black tiger shrimp	109,140	115,720	128,700	148,500	188,000	18.06
3	Vannamei shrimp	291,160	344,280	400,300	459,500	511,000	18.88

Source: MMAF (2009)

In general, for the last two years, Indonesian shrimp production has been declining. Although a decline is recorded during 2008-2009 (Table 2), Indonesian shrimp export has still slightly increased in average during 2005-2009 (2.02%). Most importantly, shrimp export in Indonesia is still dominating value of fisheries export (around 43.2% in 2008). Other commodities such as tuna, other fishes, crab and others contributed remaining 56.8% of the export.

During first quarter of 2010, Indonesian shrimp production has reached 136,175 mt. MMAF has calculated that, although total fisheries export volume and value had increased 3.7% during first quarter of 2010 compared with first quarter of 2009, shrimp export volume and value during first quarter of 2010 were declining. The situation was caused by persistent disease outbreaks, particularly WSSV and

IMNV virus, in many places in Indonesia. As a result of the situation, many processors in North Sumatra and Java region were closed due to lack of raw material supplies.

Massive drops (40%) in shrimp production were experienced by farmers in Lampung, the largest vannamei shrimp producer, during 2010. It was noted that shrimp export volume from the province was only 14,207 mt (valued at USD 107.31 million) during January until August 2010. The volume was recorded as the lowest volume ever achieved for the last five years. During similar period in 2009, the province shrimp export was reaching 36,467 mt valued at USD 211.60 million.

Similar situation occurred in North Sumatra as production decreased 30% from target volume of 10,000-12,000 mt during 2009. The situation had caused many shrimp processors in Medan closed their business since farmers in Aceh preferred to sell shrimps to local market due to better price offer. On the other side, farmers in West Java and East Java are now farming milkfish and other salinity tolerant fish such as tilapia, or catfish as alternative to shrimp. East Java has proved to be the most persistent farmers where most of them still raised shrimp, although with lower density.

Table 2. Volume and Value of Indonesian Shrimp Production and Export 2005-2009

No	Description	2005	2006	2007	2008	2009*	2005-2009 (%/annum)
1	Prod. aquaculture (mt)	280,629	327,610	358,925	409,590	348,100	6.01
2	Prod. capture (mt)	208,539	227,164	258,976	236,922	240,000	4.81
3	Exported (mt)	153,906	169,329	157,545	170,583	165,000	2.02
4	Export (%)	54.8	51.7	43.9	41.6	47.4	47.9

Source: MMAF (2010)

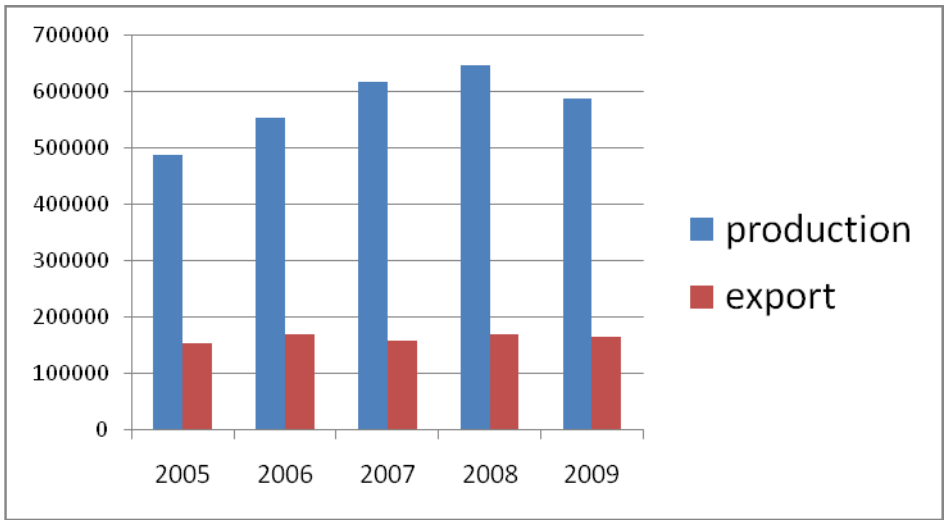

Figure 1. Comparison of Indonesian shrimp production (both culture and capture) and export

Shrimp production from aquaculture in Indonesia was obtained from more than 600,000 ha brackishwater ponds operated in major islands such as Java, Sumatra, and Sulawesi. If compared with total shrimp production in 2009 which around 340,000 mt, it can be seen that average productivity of brackishwater ponds in Indonesia was low or around 570 kg per ha per annum. If farmers stock twice a year, then average productivity will be around 285 kg per ha per crop/cycle. Its low productivity is due to traditional system applied by 80% of brackishwater ponds in Indonesia. Indonesian traditional system productivity is around 50-100 kg per ha per crop in average, whilst intensive system average production can reach up to 2,500 kg per ha per crop.

Low shrimp production and quality in Indonesia is mainly due to several reasons, particularly failure associated with poor management, environmental quality deterioration, economic and social constraints, and legal aspects. Poor management practices applied by traditional farmers have been the most issues discussed in shrimp aquaculture dialogue. Traditional mindset applied for years was proofed to be the main reason of poor aquaculture practices. Although massive efforts have been conducted by the government and its partners (donors) to educate/train shrimp farmers to adopt better management practices with special attention to environmentally safe practices, as well as trials and demos for enhancing learning process, however, more efforts are still needed to improve their entrepreneurship skills to enhance their business performance in aquaculture (not for subsistence only).

On a larger basis, the government is also planning to develop responsible shrimp farming and environmental recovery to improve carrying capacity of coastal environment, such as through mangrove conservation and replanting. There has been very limited research of aquaculture practices in mangrove areas to provide essential information on carrying capacity of mangrove habitats, fate of effluents from shrimp farm in mangrove habitats, assimilative capacity of mangrove habitats, criteria and bio indicators used, etc. Development of organic shrimp in conserved areas will also be developed, whilst constraints on legal aspect will need to cover establishment of coastal zoning for many purposes to prevent resource competition and environmental degradation.

5.3 Methodology

To ensure proper update on the annual study, similar study locations were selected, i.e. North Sumatra, West Java and East Java regions. The three provinces were famous as monodon producers in Indonesia for the last 2 decades. However since environmental quality started to degrade and diseases were widespread in most regions in Indonesia, South Sulawesi and East Kalimantan had defeated them in monodon production since 1990s.

Figure 2. Map of studied areas in Indonesia. From left to right these are North Sumatra, West Java and East Java (blue circles)

To get a true representation of the Indonesian shrimp supply chain, data were collected from 3 groups of stakeholders namely farmers, traders (both collectors and wholesalers) and processors/exporters. The number of people selected in each stakeholder group was based on the size of each group in the selected site. Data were collected from a total of 132 farmers, 19 traders and 4 processors.

Questionnaires were developed for each stakeholder group to collect information on socio-economical status, occurrence and impact of any major changes, management practices in 2009 and 2010, quantity of shrimp produced or traded over the previous few years (2 for farmers and processors, and 5 for traders), procurement and resell prices for different shrimp sizes and over the period between July 2009 to September 2010. Particular attention was paid to collect information on changes related to the occurrence of the Indian Ocean tsunami and the introduction to several Asian countries of anti-dumping duties by the US. Questionnaires were pre-tested before being delivered to the selected stakeholders.

Although price trends were considered important indicators of impact in the present study, several difficulties were encountered while collecting this information. In fact, farmers and traders did not keep written records of shrimp sales. On the contrary, processors were not prepared to share this information with the research team due to data sensitivity.

Primary data were compiled and analyzed using Microsoft Excel. Data were analysed using graphs and descriptive statistics. Trends in shrimp prices for different sizes were analysed for all the stakeholder groups (i.e. farmers, traders and processors) as described in the General Methodology.

The sizes used in analysis were U20, 21-30, 31-44, 45-66 and 67-100 pieces/kg for monodon farmers, size 30-40, 41-50, 51-60, 61-100 for vannamei farmers, size 30, 40, 50, and 60 for monodon traders and size 50, 60, 70, and 80 for vannamei traders, and U20, 21-30, 31-44, 45-66 and 67-100 pieces/kg for processors.

Samples were taken from 3 (three) major shrimp producer provinces in Indonesia namely North Sumatra, West Java and East Java. Total sample size for the study was 155 respondents, including 132 farmers, 19 traders and 4 processors. The farmers were selected from areas where last studies were conducted. However, minor changes were applied to adjust recent trends in shrimp farming areas due to disease outbreaks. Each province has equal proportions in numbers of samples to maintain data accuracy.

5.4 Results and Discussion

General Description of the stakeholders

a. Farmers

All vannamei farmers interviewed were male (100%) whilst monodon farmers were 98% male, with an average age of 48.2 years (monodon) and 45.7 years (vannamei), varying from 24-80 years (monodon) and 29-62 years (vannamei). Monodon farmers' experience in shrimp culture was 16.3 years, varying from 2-40 years, whilst vannamei farmers experience was 18 years, varying from 3-42 years. On average, households were composed of 4.4 people (monodon) and 4.0 people (vannamei), of which 1.3 people on average were involved in the family's labour force. All of them were male labourers. Besides the family members, the farmers also hired 1.5 workers (monodon) and 6.1 workers (vannamei) in average to work on their farms. The educational level of monodon farmers was mostly up to primary school (36.8%) with no illiterate. Some farmers only attended secondary school (26.5%). Fewer of them attended high school (23.1%). Only 1.7% of the farmers obtained a diploma and 12% graduated from colleges or universities, which usually also act as traders. Vannamei farmers had slightly better education level of which 20% attended primary school and secondary school respectively, and 33.3% attended high school, and 26.7% graduated from colleges or universities. The compositions reflected that vanamei farmers were dominated by people with high capital. Monodon farming was the first occupation or livelihood for the farmers. However, some of them were also involved in other businesses like trading (13.7%), agriculture (35.9%) and employee to a company (10.3%). On the other side, vannamei farmers were also involved in trading (6.7%), agriculture (13.3%) and employee to a company (6.7%). Most of the monodon farmers conducted shrimp farming based on their own experiences (88%) with only 10.3% received training in shrimp farming. On the other side, 53.3% vannamei farmers conducted shrimp farming based on their own experiences with 26.7% received training. Detail of the social and economic background of shrimp farmers can be found in Annex 1.

b. Traders

The traders were the youngest stakeholder group interviewed (43.6 years). Their average experience in trading shrimp was 15.4 years. All of the traders were male (100%) with households were composed of 4.5 people. Around 1.4 male and 0.3 female working as family labourers. Most traders were also working as farmers (57.9%). Shrimp traders were also better educated than farmers. Most traders attended high school (47.4%) and college/university (21.1%). Although traders' educational level was

relatively high, their business was operated using personal experience (84.2%). Further details on the socio-economic characteristics of traders can be found in Annex 2.

c. Processors

The processor group was 100% male. The average age of processors was the oldest amongst other groups. Their average age was 53.5 years. Their experience in processing/exporting was also the highest and averaged at 26.3 years. Processors' educational level was the highest, and 50% of them were university/college graduates. Technical knowledge was derived mainly 50% through training and 25% from vocational school. The processors seemed very satisfied with their business as they chose this as the sole occupation (100%). None of the interviewees had other occupations. The further details can be found in Annex 3.

Volume changes of commodities traded

The quantities of *P. monodon* and *P. vannamei* production and trade in Indonesia during period 2005-2009 can be seen in Table 3. Generally, the volume of shrimp production has been slightly increasing over time, but was declining in 2009 due to endemic disease outbreaks. Nevertheless, shrimp volume traded was slightly declining in 2007 but increased back in 2008. Downtrend in production and export will likely to continue in 2010 where shrimp farmers have not yet fully recovered from disease outbreaks.

Table 3. Comparison of Indonesian shrimp production from aquaculture and its export volume/value

Year	Shrimp Production from Aquaculture (tonnes)	Shrimp Export Volume (tonnes)	Shrimp Export Value (USD 1,000)
2005	280,629	153,906	948,130
2006	327,610	169,329	1,115,963
2007	358,925	157,545	1,029,935
2008	409,590	170,583	1,165,293
2009	348,100	165,000	974,000

Source: MMAF (2010)

During first quarter of 2010, Indonesian shrimp export volume to Japan has reached 7,462 mt, and was declining 12.4% in compare to first quarter of 2009 (8,515 mt). However, Indonesia is the second largest shrimp exporting country to Japan after Thailand (9,032 mt). For US market, Indonesia shrimp export in the first quarter of 2010 reached 14,582 mt compared with 20,614 mt during first quarter of 2009, means declining 29.3%. For European market, Indonesian shrimp export has reached 864 mt and has declined 48.9% compared with first quarter of 2009 (1,688 mt). The government is now targeting new market destinations for shrimp, i.e. Russia, Saudi Arabia, and Canada. Unlike other two market destinations, European market was weakening due to crisis in European countries particularly in Greek.

Indonesian shrimp export has been, and will likely to continue, targeting Japan, the US, and EU. Since 2005, Japan and the US have been the major destinations for Indonesian shrimp export. During 2005-2009, Japan has imported 29.9% (2005), 29.9% (2006), 25.6% (2007), 23.2% (2008), and 28.5% (2009) respectively. The US has shared 32.9% (2005), 36.2% (2006), 38.3% (2007), 47.2% (2008), and 37.7% (2009) respectively, whilst EU countries have shared 17.7% (2005), 20.8% (2006), 18.3% (2007), 15.7% (2008) and 12.0% (2009) respectively, and remaining small portion went to other countries (see Figure 3).

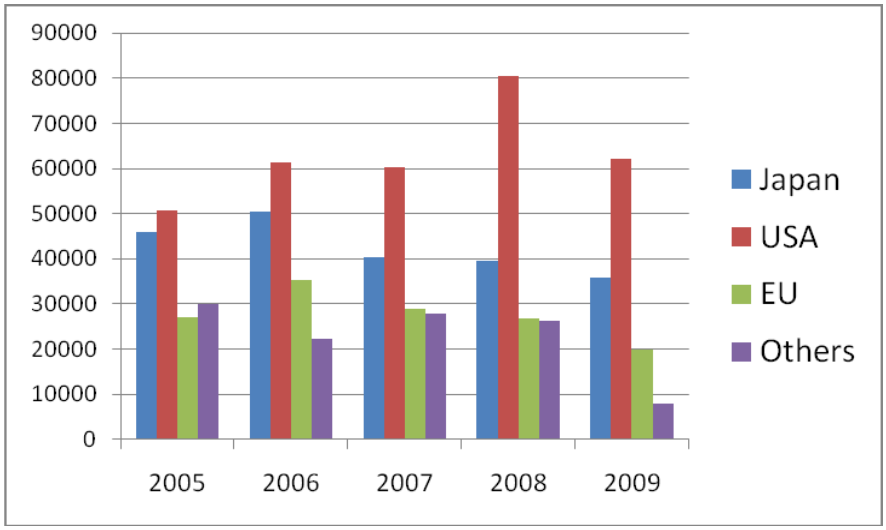

Figure 3. Destination countries of shrimp export from Indonesia

Changes taking place between 2009 and 2010

a. Overall changes

In general, both monodon and vannamei farmers in Indonesia did not change their culture practices, but there was a slight increase in investment recorded, particularly to vannamei farmers. The increase was particularly used for feed to increase productivity. The increase in investment was recorded around 9.4% for monodon and 40% for vannamei farmers. The increase in feed investment has also increased 35-40% of both monodon and vannamei productivity. However, although costs were increasing more than 50%, the increase in productivity only increased 13.3% profit in vannamei production, compared to 35% profit increase in monodon production. Other factors remained un-changed (more than 86% respondents) such as total area of pond, ownership status, and numbers of labors. The perception of the changes in shrimp farming is described in detail in Annex 4.

b. Description and evaluation of the production costs during 2009 and 2010

In general, there have been limited changes in shrimp production costs during 2009 and 2010. When comparing production costs of monodon production during 2009-2010, there has been a slight increase recorded for fish seed, chemical and drug use, lime, fertilizer, and home made feed. Monodon farmers seemed to reduce shrimp stock in 2010 and switched to low-risk fish such as milkfish and tilapia. More lime were also used for pond preparation, whilst shrimp feed was reduced to reduce costs. Stocking of low-risk fish was believed by farmers to be less-dependant to feed. Electricity and fuel costs were also reduced as a result of reduced pumping and water exchange.

On the other side, vannamei farmers experienced increased costs of shrimp fry, commercial feed, lime and fuels. Although percentage from total cost of shrimp fry in 2010 was lower, the cost was actually increasing compared with 2009. Drastic increase in vannamei farming cost was recorded for lime, commercial feed and fuel costs. It can be seen that increased stocking during 2010 has also increased all aforementioned variable costs. On the other side, other variables remained un-changed (less than 2% change) as they were not considered as major inputs in production. Variable costs associated with production can be found in Annex 5.

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Shrimp price trend analysis

Monodon Farmers

In terms of larger size count (U20), the study could not get complete series data due to limited data collection for such size. In general it can be said that compared with last year (2009) U20 size shrimp has increased slightly (around 16%) in 2010. Meanwhile, compete series of size 21-30, 31-44, 45-66, and 67-100 were recorded.

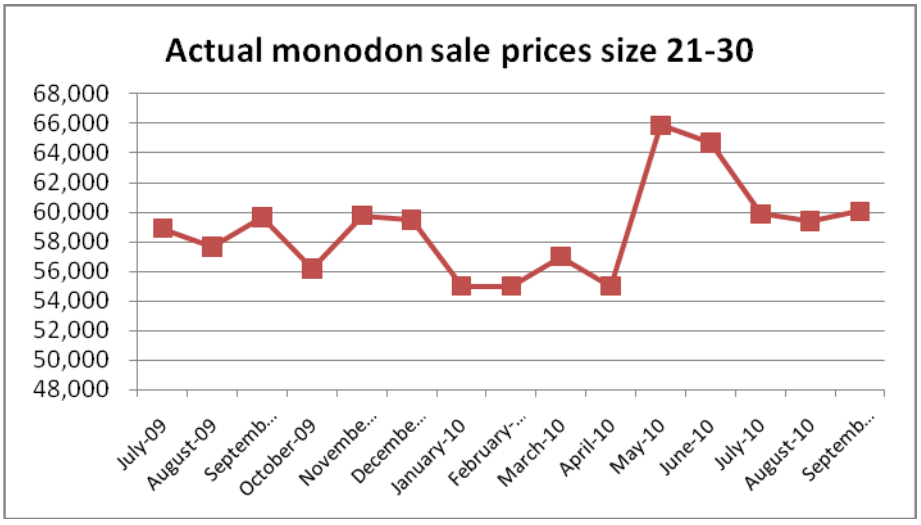


Figure 4. Trends of actual shrimp sale (size 21-30) by monodon farmers

From Figure 4 above it can be seen that trends of monodon prices were fluctuating during period of April-June 2010. Average monodon prices for size 21-30 were ranging from Rp. 55,000/kg to Rp. 65,870 with average sale price of Rp. 58,903/kg. Higher price was recorded in May 2010 whilst the lowest was recorded in January-February 2010 and April 2010. Lower prices were generally collected from respondents in Karawang, whereas higher prices were collected from respondents in Langkat. Consolidated stocking and harvests have made data were not well distributed throughout the year. Thus, trends/changes in prices from this size did not reflect price fluctuations overtime but relatively more to site-specific price.

On the other side, for size 31-44, it can be seen in Figure 5 below that slight fluctuation was recorded during study period, with highest price was recorded in March 2010. The actual monodon sale prices by farmers were ranging from Rp. 47,667/kg to Rp. 55,750/kg, with average price of Rp. 50,934/kg. As with size 21-30, the sale price of size 31-44 was highly influenced by site-specific situation since farmers in North Sumatra stocked and harvested at the same time, thus fluctuations in prices were influenced by (limited) samples in West Java.

Figure 5. Trends of actual shrimp sale (size 31-44) by monodon farmers

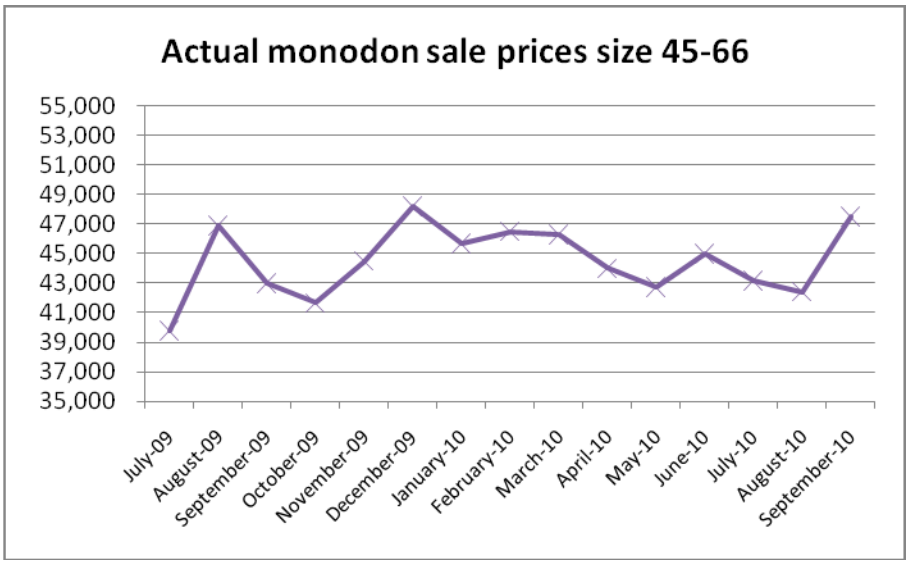


Figure 6. Trends of actual shrimp sale size 45-66 by monodon farmers

For size 45-66, average sale price of monodon was slightly fluctuating overtime. From Figure 6 above, the highest price was reached during December 2009 whilst the lowest was reached during July 2009. Average shrimp price for this size during study period was Rp. 44,488/kg. For this size, the prices were also influenced by study locations where samples from East Java had slightly higher price offer than North Sumatra. Again, prices were influenced by site/area of production.

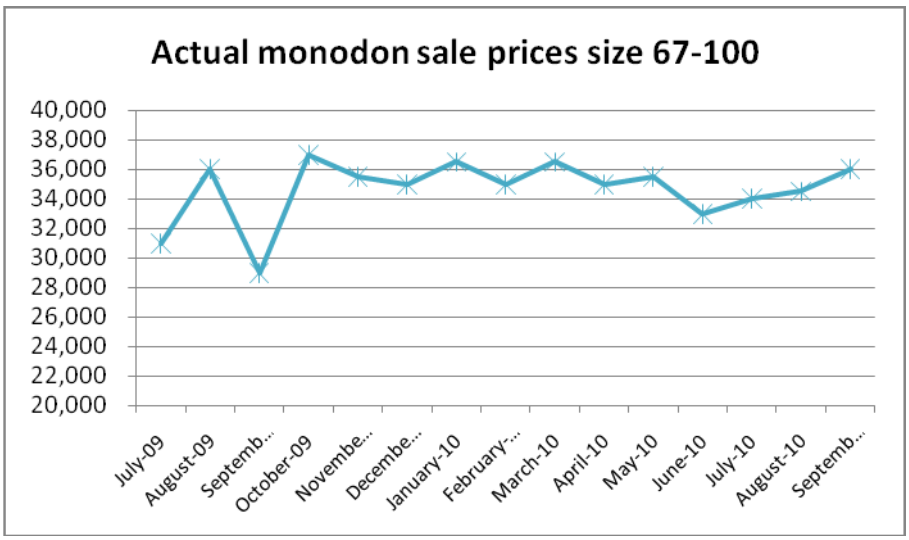


Figure 7. Trends of actual shrimp size 67-100 by monodon farmers

Figure 7 above states that the fluctuations in monodon price size 67-100 occurred only during August-October 2009 over study period. The highest price was recorded in October 2009 (Rp. 37,000/kg) whilst the lowest was in September 2009 (Rp. 29,000/kg). Average monodon price size 67-100 during study period was Rp. 34,633/kg. Limited samples of size 67-100 amongst study locations have caused data to be slightly more stable overtime.

In general, it can be concluded that prices of monodon in Indonesia tended to slightly fluctuate overtime. Nevertheless, to some extent, prices were more stable in North Sumatra, compared with West Java and East Java. Unlike North Sumatra, harvests in West Java and East Java were also well distributed overtime thus could represent price fluctuations during study period. Consolidated harvests in North Sumatra had influenced averaged certain monthly prices, which usually offering higher prices than West Java and East Java. Thus price fluctuations over study period were highly influenced by samples from West Java and East Java, of which highly influenced by volume available (supply) and demand as well as monodon trader's generosity. On the other side, data from North Sumatra were more consolidated and only available at certain months of the year thus highly dominating average prices in those months (Annex 6).

Vannamei farmers

Data set for vannamei shrimp were mainly dominated by size 61-100, whereas other data were less available during study period. From Figure 8 below, it can be seen that prices were tend to be stable overtime. Low production volume due to disease outbreaks during study period has also affected price stability.

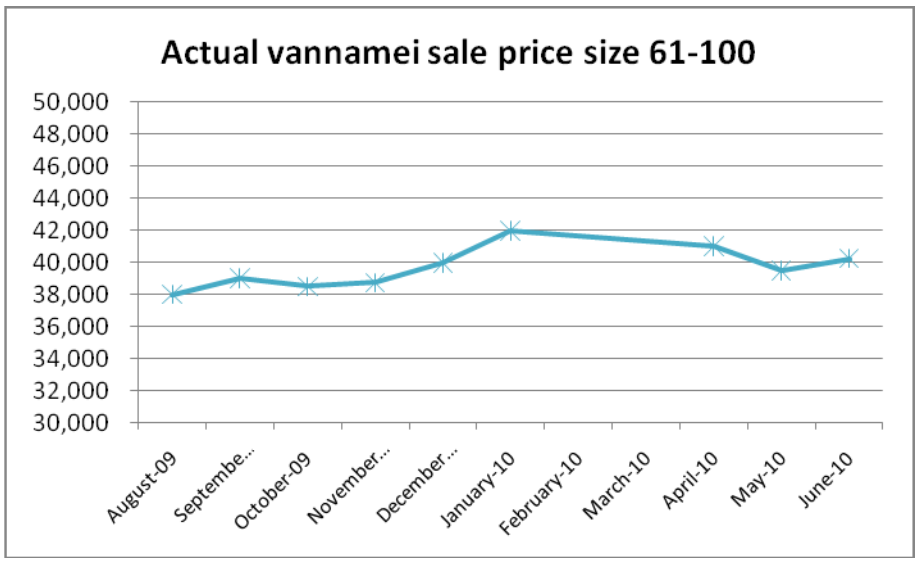


Figure 8. Trends of actual shrimp price size 61-100 by vannamei farmers

The average vannamei price during study period was Rp. 39,667/kg for size 61-100. The highest price was reached in January 2010 (Rp. 42,000/kg) whilst the lowest was in August 2009 (Rp. 38,000/kg) (Annex 7).

Traders

Shrimp traders are the key players in the dynamics of shrimp prices in Indonesia. The position of traders in shrimp business is so strong thus farmers are fully relying on their courtesy and kindness. This is probably also as a result of financial dependency within the aquaculture economic system where most traders supply farmers with farming inputs on loan basis. However, in areas where competitions are tough, scarcity of shrimp supply and pressure from processors could sometime strengthen farmer's position in negotiating the prices.

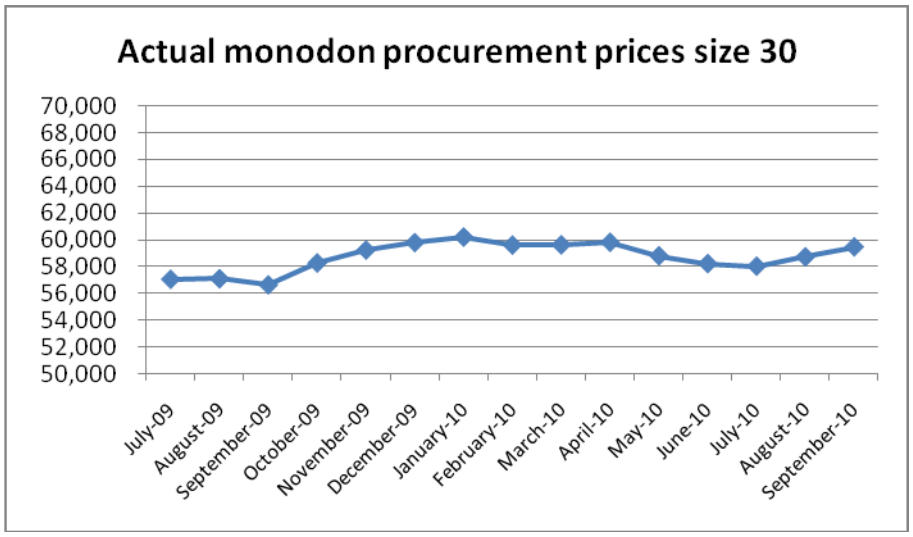


Figure 9. Trends of actual procurement price size 30 by monodon traders

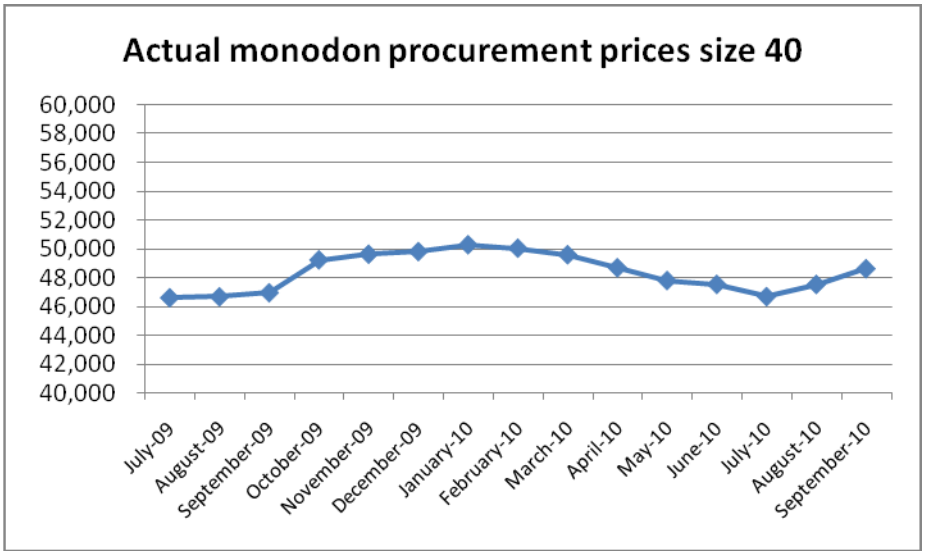


Figure 10. Trends of actual procurement price size 40 by monodon traders

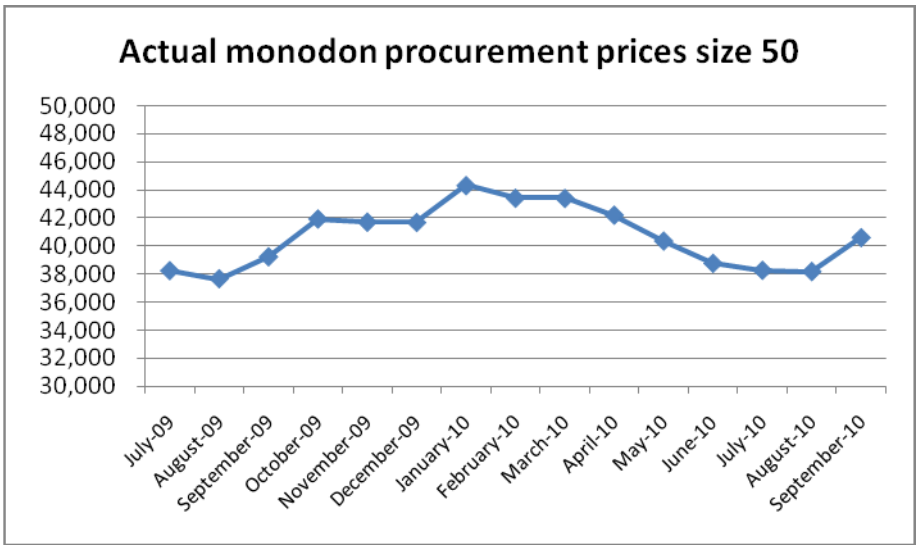


Figure 11. Trends of actual procurement size 50 by monodon traders

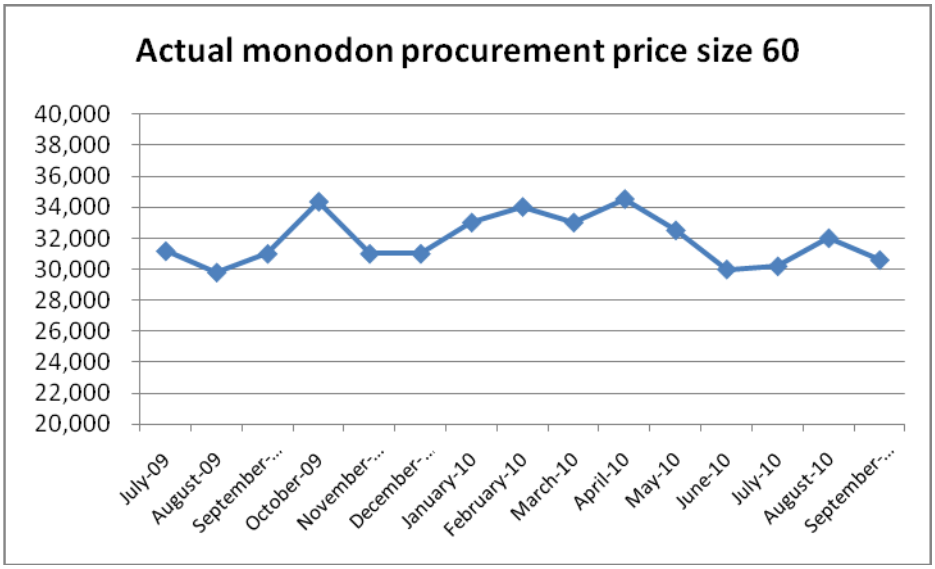


Figure 12. Trends of actual procurement size 60 by monodon traders

From Figure 9-12 it can be seen that procurement prices of monodon size 30, 40 and 50 were nearly stable amongst study period (Annex 8). The trends are similar as prices tended to slightly go up toward end of the year and declined until mid year before it went up again. These were surprisingly not matched with farmer's sale during the same period. This is however possible since farmers also sold their shrimps to local market other than to traders. For those who sold shrimps to traders, data from traders were considered more accurate since traders tended to keep records on their shrimp procurement and sale than farmers did.

On the other side, vannamei procurement prices for size 60 were slightly more stable. But it can be seen that prices in 2010 were higher than 2009. Similar to monodon trends, prices tended to increase toward the end of the year and declined until mid year before it went up again (Annex 9).

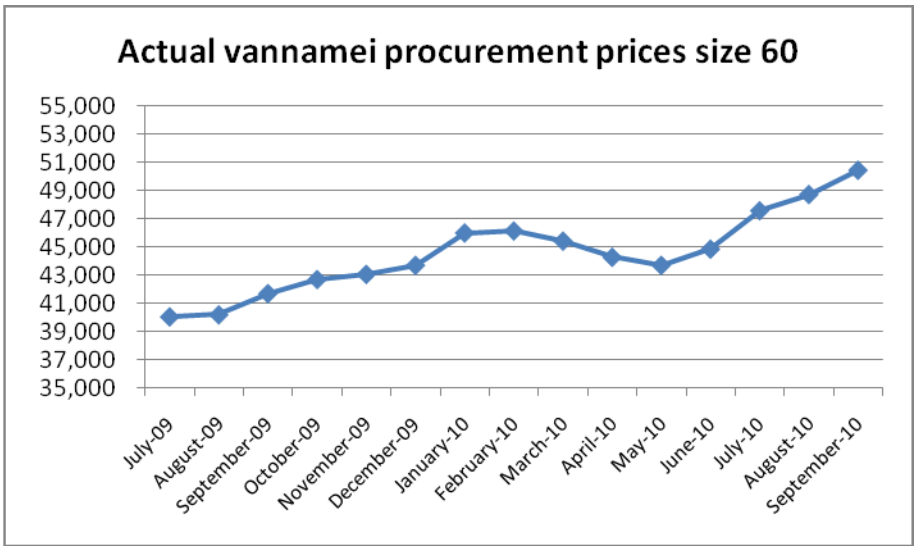


Figure 13. Trends of actual procurement price size 60 by vannamei traders

The trends of 2010 seemed to be influenced by scarcity of shrimp supply during 2009 thus traders had increased their price offers to farmers in 2010.

Processor

Processor procurement prices for most size were fluctuating over study period (Annex 10). The fluctuations were mainly affected by fluctuated supply of raw material. However, it is apparent that for some size, shrimp prices increased in January 2010 as with procurement prices of traders. Limited samples of processors had made data to be highly fluctuating over study periods.

Occurrence of BP oil spill in Gulf of Mexico during mid 2010 which, as paper said, would increase shrimp prices was not affecting shrimp prices in Indonesia. Lack of shrimp production was probably the main reason of fluctuated shrimp prices recorded throughout study periods.

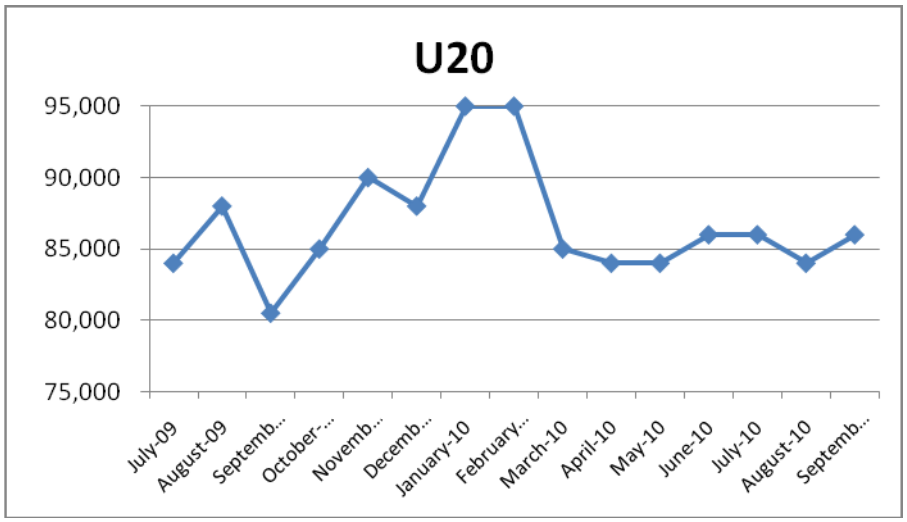


Figure 14. Trends of actual monodon procurement price size U20 by processor

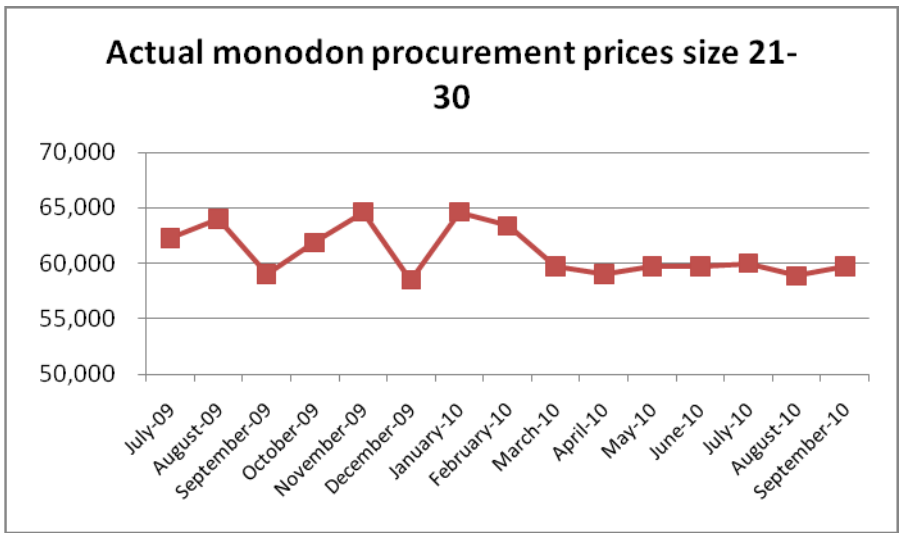


Figure 15. Trends of actual monodon procurement price size 21-30 by processor

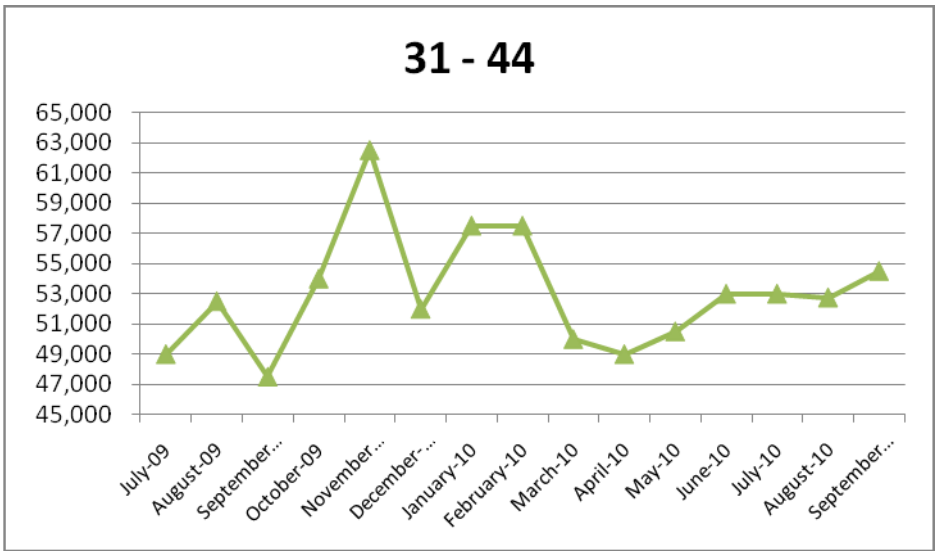


Figure 16. Trends of actual monodon procurement price size 31-44 by processor

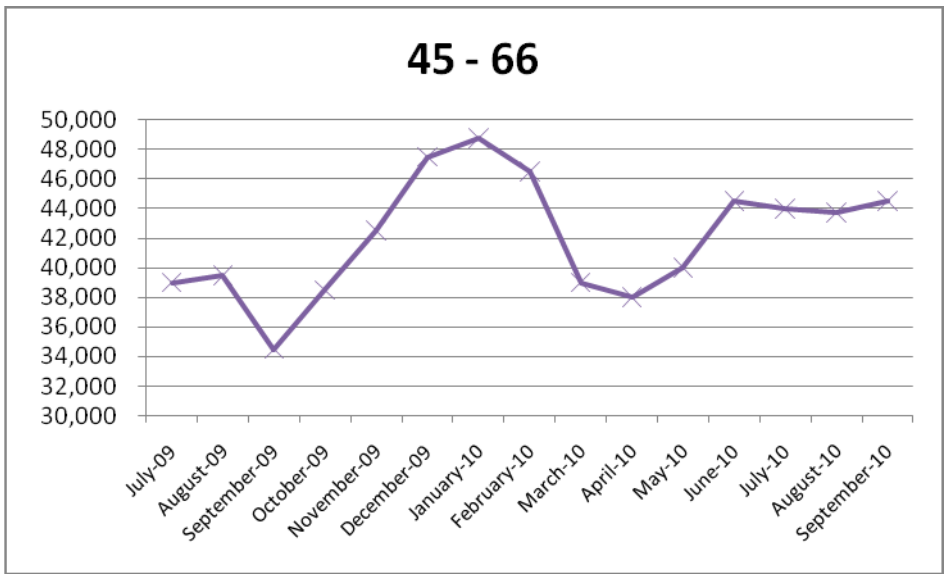


Figure 17. Trends of actual monodon procurement price size 45-66

The association with the unusual events occurring at the end of 2004 could not be assessed since the event did not affect production and prices by stakeholders. Fluctuations in prices were mainly affected by fluctuations in shrimp supplies and trends in global economy.

Perceived reasons and impact of price trends

According to all of the farmers, shrimp prices have been fluctuating over the past 5 years. Most of the farmers did not know exactly when the prices began changing. Some farmers also recognized the fact that prices tend to increase toward end of the year, where pond production decreased due to bad season and processors usually requested for more shrimp supplies. Most farmers paid little attention to prices changes. Similar to results from last years, the main reasons stated were over-exploitation of farmers by traders and processors, who were free to set the prices leaving limited options to farmers; the lack of government control to ensure that farmers get a fair price for their shrimp; the occurrence of shrimp importation and re-exportation (although this practice has been made illegal); poor shrimp quality because of chemical use; as well as recent global economic crisis. All the traders reported that shrimp prices were changing, either decreasing (21.1%), increasing (10.5%), or fluctuating (68.4%). Among the reasons given were unstable supplies, sometimes because of disease outbreaks; loan system between traders and wholesalers; demand fluctuations; the illegal importation and re-export of shrimp from countries affected by the US antidumping measures; poor shrimp quality; and unstable exchange rates. All processors recognized that prices have been fluctuating (100%) over the past few years. One of the main reasons for these price changes was unstable supplies and unstable exchange rates, as well as difficulties faced by the processors to keep viable businesses, due to unstable market demand and antibiotic issues. Exporters also recognized that Indonesian shrimp face lower market prices because of allegedly poorer quality. Trade barrier was also blamed. All stakeholder groups agreed that decreasing and fluctuating prices led to a negative impact throughout the supply chain because of lower margins,

which often leads to bankruptcy. Most farmers believe that there are few or no benefits in farming shrimp because of the rising production costs over the years and the decreasing prices.

Supply Chain Analysis

Shrimp supply chain in Indonesia, particularly for smallholder farmers, is fully dependent to traders who have strong positions in farming business. Smallholder farmers (both farm owner and operator) in most areas usually received farm inputs on loan basis to traders, on precondition that shrimps would be sold to respective traders as capital investors. Processors also chose to deal with traders instead of farmers. In some area in Indonesia, traders are the key for quality shrimp thus when traders do not have knowledge on maintaining shrimp quality (or conducting practices that lead to deteriorated shrimp quality such as keeping in ices for days to gain weight), shrimp prices will go down as quality declines.

During study period, most farmers (71.2%) sold their harvests to collectors whilst small proportion (28%) sold the harvests to wholesalers. Farmers who sold vannamei shrimp were more likely to sell directly to wholesalers compared with farmers who sold monodon. Incentives are rarely applied in Indonesian shrimp business thus were not recorded in all shrimp stakeholders.

As it can be seen in Table 4, most of the exported shrimp were sold to the US, Japan and EU markets. During 2005-2009, Japan has imported 29.9% (2005), 29.9% (2006), 25.6% (2007), 23.2% (2008), and 28.5% (2009) respectively from total Indonesian shrimp export. The US shared 32.9% (2005), 36.2% (2006), 38.3% (2007), 47.2% (2008), and 37.7% (2009) of total Indonesian shrimp export, whilst EU countries shared 17.7% (2005), 20.8% (2006), 18.3% (2007), 15.7% (2008) and 12.0% (2009) respectively, and remaining small portion went to other countries. During year 2009-2010, processors did not experience any changes in terms of market destinations, type of products and packaging.

Table 4 Trends of Indonesian shrimp exports to some major destination countries

Years	USA	Japan	EU	Others	Total
2005	50,698	46,051	27,179	29,978	153,906
2006	61,235	50,581	35,232	22,281	169,329
2007	60,399	40,334	28,845	27,967	157,545
2008	80,479	39,582	26,825	26,397	170,583
2009	62,173	35,875	19,786	8,001	125,835

None of the respondents mentioned selling products to local markets, although it is believed that a small proportion of shrimp would also consumed domestically.

Impact of Tsunami and US Anti- Dumping or other events

a. Tsunami

All of the surveyed farmers, shrimp traders and processors/exporters knew about the occurrence of the tsunami in December 2004, particularly those in North Sumatra. However, the impacts of the tsunami appeared to be limited among the respondents since the event occurred quite a long time ago. During study period, farmers have not had experienced any impact from tsunami, which possibly affected by location and time specific. Most processors also believed that the tsunami did not affect their business. Processors also declared that factors such as shrimp under supply and low quality were those which affected their business.

b. US anti-dumping duties

There were limited numbers (less than 5%) of respondents who were aware of the US anti-dumping affecting some other Asian countries. Those who got affected were only processors who believed that US anti dumping duties had forced them to improve shrimp quality. However the event also stimulates positive effect in gaining greater access to the US market.

5.5 Conclusions and recommendations

The Indonesia shrimp industry has experienced an increasing number of difficulties over the past few years. This study identified that the decline in shrimp production as well as the profit (compare with increased cost) in shrimp sector in Indonesia. Major factors influenced the above situation were poor quality products as a result of disease outbreaks, environmental degradation and poor management practices. Among others, linked factors affecting the sector were unfair prices paid by the traders and processors; increased competition among traders; the suspected occurrence of shrimp importation and re-exportation; poor shrimp quality because of antibiotic use; and the unstable political environment of the country. Although the US anti-dumping duties were not introduced in Indonesia, they were said to have impacted also Indonesia shrimp prices, mainly because of stricter control of shrimp exported to the US.

The introduction of better planning for the sector, and improvement in management practices and shrimp quality and in the overall image appeared to be potential solutions to revive the Indonesian shrimp industry. These issues need to be given consideration and should be targeted through the commitment of both government and stakeholders throughout the supply chain.

6. Bangladesh Case Study

6.1 Summary

This study has been undertaken mainly to update NACA's 2006 October study titled Evaluation of the Impact of the Indian Ocean Tsunami and US Anti-dumping Duties on the Shrimp Farming Sector of South and South-Asia. The 2010 study has emphasized more on the analysis of prices of shrimps of the concerned stakeholders namely, traders, depots, agents and processors. The price of *Penius monodon* has been intensively analyzed as common trading species among the study countries. This study has gone beyond the 2006 study and analyzed price spreads (gross marketing margins) of the concerned stakeholders. Besides, important socioeconomic characteristics of stakeholders, business characteristics of the other stakeholders, and the supply-demand situation of shrimp along with reasons for inadequacy/adequacy of shrimp supply etc. have been analyzed. As demanded by the ToR, the same set of stakeholders included in the 2006 study have been revisited and included in the 2010 study.

A total of 189 stakeholders comprising 137 farmers, 24 traders/faria[1], 8 depots, 8 agents sand 8 processors from 9 Upazillas[2] of 5 major shrimp producing districts of Bangladesh were selected, from whom primary data were collected by administering pre-designed questionnaires. Time frame for the present study is 15-months starting from July 2009 to September 2010.

The selected stakeholder's average age ranged from 40 to 55 years. Traders and depots were the junior most stakeholders while the processors were more aged. The shrimp farming /trading experience were 16 to 26years. Most farmers were illiterate while the processor's educational level was much higher, up to the University level. Although shrimp farming/ trading remained the main occupation of the stakeholders, overwhelming majority had involvement with other occupations. Couple of processors had also involvement with shrimp farming. The average number of shrimp pond of the farmers was 1.4 with pond water area of 14.14 ha (35 acre). Seventy eight percent of the shrimp farms were singly owned and 11 percent each had 2-4 and more than 4 owners respectively.

Bagda[3] remained the major common traded commodity ranging from 77 to 98 percent during 2010. Volume of *Bagda* trade in general increased slightly from 2009 to 2010. Farmers' average production has gone up from 78 kg during 2009 to 98 kg during 2010, total being 5,10,778 kg and 546,845 kg respectively. For traders too, average volume of *Bagda* transaction has raised from 2948 kg during 2009 to 2758 kg during 2010. Average trading of bagda made by the depots during 2009 was 30,6373 kg during 2010. Agents also traded from 34498 kg to 42590 kg in average. Processor's average HLSO and HOSO *Bagda* trade during 2009 were 11,739,875 kg and 8,804,910 kg while these were 4,922,025 and 3,543,865 kg respectively during 2010.

Trader's price differentials (gross marketing margins) ranged between Tk[4] 5.89 to Tk 11.21 per kg for bagda. The same for depots ranged from Tk 6.90 to Tk 12.60 per kg for bagda. Agents earned gross

[1] Faria: Traders who trade in between farmers and depot/agents
[2] Upazilla: Sub district
[3] Bagda: *Penius monodon*
[4] Tk: BDT

margins of Tk 5.87 to Tk 11.00 for *Bagda*. Average gross marketing margins of the processors were the highest of all the stakeholders. For *Bagda*, the minimum per kg margin enjoyed by the processors was Tk 83.00 (US$1.28) and the maximum was Tk 100.50 (US$1.55) per kg.

Staffing situation of the traders, depots, agents and processor did not have any noticeable change over the previous study period. The industry is heavily dominated by male particularly for the farmers, traders, depots and agents as was the case observed in the earlier study. However, this is other way around for the processors. Female has a very good stake in the processing activities of processor's factory.

Receiving cash advance is a common phenomenon of incentive in shrimp marketing of Bangladsh. This is mainly to ensure the supply continuity and business relations. All but the processor did receive advance cash incentives.

Trends of both procurement as well as resale prices of all the concerned stakeholders were positive indicating that over time both increased. Tradres position themselves in the second link in the marketing channel. They buy shrimp directly from the farmers. Procurement prices of all the different sizes of shrimp of the traders increased over the 15-month period starting from July 2009 to September 2010 as evident from the positive slopes of the trend line. Slopes of the resale price trend of the traders were also positive. The procurement price trends of depots were also positive for all the sizes of shrimp. This holds for resale prices as well. Average monthly growth rates ranged from 0.704% to 0.940% for procurements prices and from 0.251% to 0.951% for the sale prices. For agents, average monthly growth rates ranged from 0.704% to 0.940% for procurement prices and 0.715% to 0.940% for sale prices. Processor's procurement prices growth ranged from 0.719% to 0.924% on the other hand their sale prices growth ranged from 0.251% to 0.768%. Monthly average growth rates in procurement price did not reach nearly to 1% but it exceeded in terms of sale price, which happened in case of all stakeholders.

Cent percent of the traders replied that price of shrimp was lower during 2009 while it was higher during 2010. They indicated that during 2009 shrimp price started declining from January and increasing from March onward for the rest of year. The general impression of the depot owners, agents and processors is also that price was lower during 2009 and higher during 2010. Processors indicated the same. Most of the stakeholders were affected positively while price remained lower during first two months of 2009. However, they were benefited due to existence of higher price during the study period. The price increase helped expand the businesses of many stakeholders favorably.

6.2 Introduction

Bangladesh fisheries

Fisheries contribute 3.74% to GDP and 2.7% to Foreign Exchange Earning. Fish provides about 60% of national animal protein consumption. The Fisheries Sector also plays an important role in generating rural employment and poverty reduction. There are major four sources of fisheries production that include (i) Inland Open waters, (ii) Inland closed waters, (iii) Brackish waters and (iv) Marine waters. On the other hand, according to the types of water, Bangladesh fisheries are broadly classified into two categories, namely, (i) inland fisheries and (ii) Marine fisheries. Inland fisheries comprise inland capture fisheries and inland culture fisheries.

Inland capture fisheries comprise rivers and estuaries (10,31,563 ha) including Sundarban, *beels*[5] (11,461ha), Kaptai Lake (68,800 ha) and floodland (28,32,792 ha) totaling 4047,316 ha. It contributed 10,29937 metric tons (35.52%) to total fish production of the country during 2009-10. The inland closed water bodies contributed and Marine contribution was 517,282 MT (17.84%) (DoF 2010). The inland culture fisheries comprise ponds and ditches (305,025 ha), *baors*[6] (5,488 ha) and coastal shrimp farms (217,877 ha) totaling 528,390 ha. The inland water areas suitable for fish capture and culture together is 4575,706 ha where fish capture and culture takes place. Inland culture fisheries contributed 1351,979 MT (46.63%) to the total fish production.

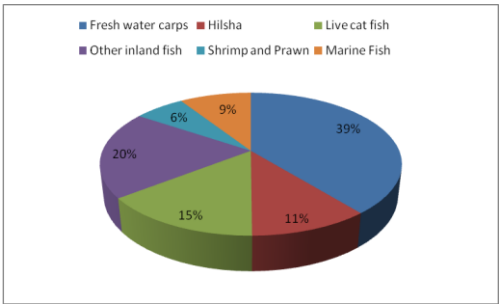


Fig-1: Contribution of different fish to total fish production

The country has a coastal area of 2.30 million ha and a coastline of 710 km along the Bay of Bengal. Marine fisheries constitute a total area of 16.6 million ha (Mazid, 2002). Marine fisheries production during the same period was 497,573 metric tons comprising 34,159 metric tons (1.33%) from industrial trawling and 463,414 metric tons (18.07%) from artisanal fisheries (DoF, 2010). In addition, the coastal aquaculture comprises 217,877 ha of shrimp/prawn farms. The shrimp/prawn farms provide 5.25% to the total fish production in the country. The country has a total fish production of 2,563,296 tons during the 2009-10 comprising 41.36% from inland capture, 39.23% from inland culture, and 19.41% from marine waters (Annex- 1).

Shrimp production trend of Bangladesh

The Bangladesh shrimp sector has undergone a dramatic change both in terms of area, production, improvement of quality and marketing. The area under shrimp production was 108,280 ha (DoF, 1992) in 1990-91 which increased to 217,988 ha (DoF, 2010) in 2009-10 showing almost two times increased. On the other hand, the yield of shrimp for the same period increased from 263 kg to 687kg/ha presenting

[5] Beels : Inland closed water bodies that may be linked with river or cananl by a small channel
[6] Baors: Oxbow lake

2.61 fold increased. Two areas in the south, the Chittagong-Cox's Bazar region and Khulna, Satkhira-Bagerhat regions represent for over 95% of the total area of shrimp culture in the country (Bhattacharya *et. al.* 1999). Total shrimp production takes place from three sources namely, inland capture, inland culture and marine fisheries. In 1990-91 Total shrimp production of the country was 80,384 metric ton in which cultured shrimp used to contribute 24 percent. In 2009-10, the total shrimp production has increased to 244,972 metric tons in which cultured shrimp contributed 43.80 percent. That means, the shrimp production come from the culture sources got increased by about 20 percentage point as compared to 1990-91 (Figure-2).

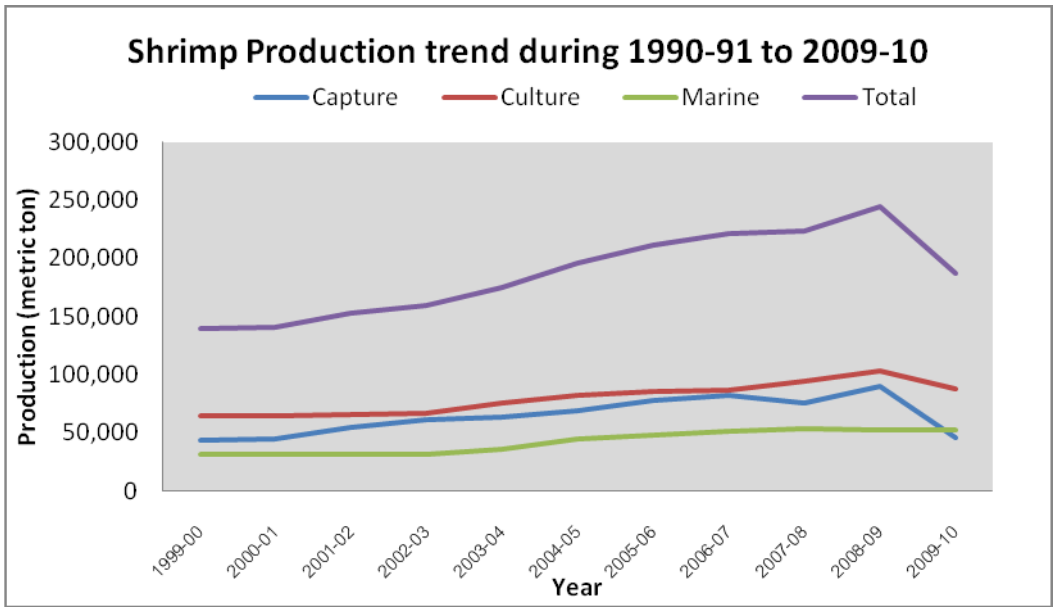


Figure 2: Shrimp production trend of Bangladesh, 1990-91 to 2009-10

Total of 31.86 million fish and shrimp/prawn farmers were in 2009-10 comprising 11.50 million shrimp/prawn farmers and 20.36 million fish farmers in the country (DoF, 2010). Number of licensed fish processing plant was 162 where approved by EU was 74 (BFFEA, 2010). Quantity of frozen food exported in 2009-10 was 77,584 mt. where quantity of shrimp was 38.37 million kg. Export earning from frozen foods in 2009-10 was US$ 492 million. Number of shrimp hatchery was 60 in 2009-10 (DoF, 2010) where post larvae produced 475-575 crore[7] during the same period. The major markets of the Bangladesh shrimp had been USA, EU (UK, German & Belgium) and Japan. During 2002-03 to 2009-10 the quantity exported to USA was on increase. Quantity of shrimp exported to USA was 26% of the total export in 2002-03 which increased to 39% in 2009-10. It was only the USA where export quantity continuously increased. The quantity of shrimp export made to UK got decreased from 29 to 18 percent during the period. Belgium also shows similar downward trend (Table 1).

[7] 1 Crore = 10 million

Table 1: Volume of shrimp exported to different countries (%)

Countries where exported	2002-03	2003-04	2004-05	2007-08	2008-09	2009-2010
USA	26	36	40	43	41	39
UK	29	22	21	23	24	18
Belgium	25	26	23	12	15	8
Germany	8	6	5	3	5	4
Japan	5	5	5	4	4	15
Others	7	5	6	15	11	16

Source: BFFEA, 2010. Shrimp and Fish News

6.3 Methodology

The shrimp price study is the follow-up study of a pervious one conducted in 2006, to examine the nature and extent of changes in the price situation of the different stakeholders involved in the marketing channel of shrimp mainly Bagda (*Penius monodon*) as the common traded shrimp in the countries under this study. The Golda (*Macrobrachium rogenbergii*) and Horina (*Metapenius monocerus)* are considered in
this study as they are not the common traded shrimps.

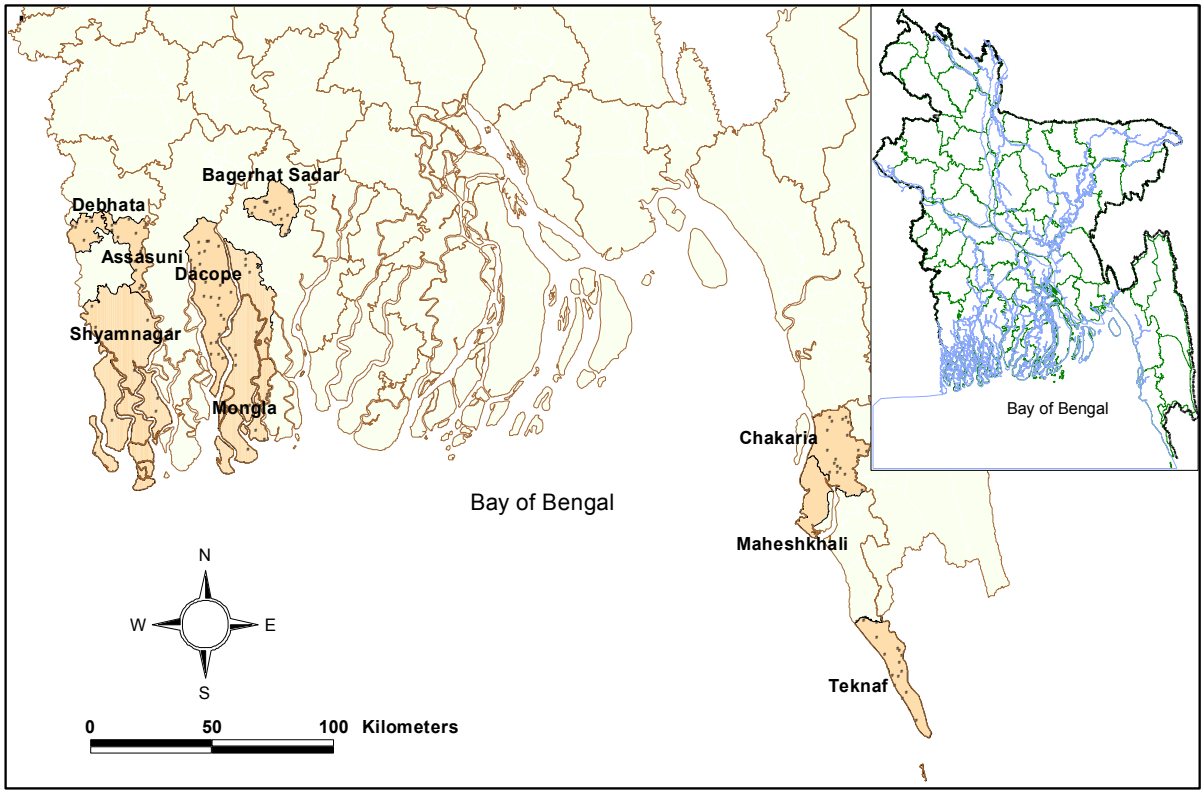
The selection of study location was purposive in the sense that not all areas in Bangladesh are shrimp cultured areas. Accordingly only five districts namely Khulna, Satkhira, Bagerhat, Cox's Bazar and Chittagong were selected (Fig-3).

The total sample size for the study was 189 comprising 8 processors, 8 agents, 12 depots, 24 traders and 137 farmers. Data from the different stakeholders were collected from 9 upazillas of the selected five districts (Table 2).

Table 2: Samples and locations for the study

District	Upazillas	Proce-ssors	Agents	Depots	Traders	Farmers	
						Sell to Depot	Sell to Traders
Khulna	Dakup	4	4	2	4	2	16
	Batiaghata			2	4	2	16
Bagerhat	Bagerhat	1	1	2	4	2	16
	Mongla			2	4	2	16
Satkhira	Sayamnagar			1	2		16
	Asasuni			2	4		16
	Debhata			1	2		
Cox's Bazar	Cox's Bazar	1	1				16
	Chakaria	1	1		4		19
Chittagong		1	1				
Total		8	8	12	24	8	129

Source: Field Investigation (2010): Bangladesh



The same questionnaires (used in 2006) for 5 different stakeholders were used to collect the data. Survey method was followed to collect the data from the field and checking their business record. In addition, different key persons were also consulted to generate meaningful information. The average price of each size were calculated from the written records of the stakeholders and entered into the questionnaire as prices of each size were different for different transaction taken place during the month. For many other information such as prices (for farmers in particular), responses on socioeconomic characteristics of the stakeholders, incentives mechanisms, shrimp price trends and their effects, and to some extent some business information, the enumerators had to rely on stakeholder's memory.

The fisheries officers, DoF of the area held generate the data for this revisit. Not much difficulty was faced as this is the fourth visit to them. However, some difficulties relating to the information on incentives and its kind were faced. The stakeholders had the tendency to hide this aspect. But the enumerators were to some extent familiar with the incentive system of the area; it was possible to elicit the authentic information. All possible efforts were given to verify the consistency of the collected data to make sure that these are error free. The data were processed in the computer using MS Access, Excel and SPSS. For studying the price trend, simple regression method was followed. Regression equations were fitted using time and price as the independent dependent variables. A linear functional specification was given as:

$$P = a + bt$$

where, P and t stand for price (monthly per kg) and time respectively, and a and b are constants to be estimated.

In addition, attempt was also made to estimate linear monthly growth rate from the estimated price trend lines. Since, the prices for about past 15 months were of interest and since examining price trend was an important issue in the terms of reference, the regression method was chosen. The different sizes of shrimp were: size U20 = 1-20 pieces per kg; Size 30 = 21-30 pieces per kg; Size 44= 31-44 pieces per kg; Size 66 = 45-66 pieces per kg; Size 100 = 67-100 pieces per kg; Size PUD = miscellaneous and broken shrimp. The same sets of stakeholders were interviewed as in 2006 survey.

6. 4 Results and Discussion

Socio-economic Characteristics of Shrimp Stakeholders

Most of the stakeholders were male except one female. The average age of the respondents varied from 39 to 53 years. Traders and depots were the most junior while processors were more aged. They had an average shrimp farming/trading experience of about 15 to 25 years. The household sizes of the farmers were 5.6 which were almost similar with the national average household size (national family size was 5.56: BBS 2005).

Farmers were the most illiterate followed by traders. All other stakeholders, namely, depots and agents were literate with educational attainment ranging from primary to secondary schooling. It was the processors who had the highest level of education i.e., up to university level. Shrimp farming/trading remains the main occupation of all the traders. But many of them had additional involvement with other economic activity like crop farming, business, livestock farming, shrimp farming and ice making. There were two processors (25%) who had involvement with shrimp farming, and another one (12.5%) dealt additionally with ice plant. The above makes it clear that traders, agents and processors prefered to have involvement with shrimp farming although they were directly involved with shrimp trading (Table 3).

Table 3: Socioeconomic indicators of the sampled stakeholders

Socioeconomic characteristics	Farmer	Trader	Depots	Agents	Processor
Average Age (years)	46.00	36.00	43.00	41.87	50.50
Shrimp farming experience (years)	13.00	12.00	14.00	19.00	22.00
Household size (no.)	5.62				
Illiterate farmer (%)	40	16.60	-	-	-
Literate farmer (%)	60	83.40	100	100	100.00
College/University. attended	3	-	-	-	100.00
High school attended	32	-		-	
Primary attended	24	58.40	58.40	62.50	
Secondary school attended	1	25.00	41.60	12.50	
Vocational education	-	-	-	25.00	
Shrimp farming/trading as major occupation (%)	100	100	100.00	100.00	100.00
Involvement of shrimp farmers with other occupation (%)	100	100	75.00	12.50	25.00
Agriculture	52.00	47.00	44.45		
Business	0.70	9.50	11.10		
Livestock	40		44.45		
Service	7.30	4.70			
Shrimp farming		28.50		12.50	12.50
Ice plant					12.50
Aquaculture technical knowledge (%):					
Own initiative	45.00	91.60	33.33	-	
Training	29.00	8.40	8.34	-	87.50
Own initiative and training	28.00	_	33.33	100.00	12.50

Source: Field Investigation (2010): Bangladesh

Shrimp Farming Characteristics of the farmers

The average farm size of the shrimp farmers was found 43.32 acre (17.33 ha) ranging from 0.50 acre (0.20 ha) to a maximum of 400 acres (161.9 ha). Average number of pond of the selected shrimp farmers was 1.47 with a minimum of 1 and a maximum of 8. The average size the ponds was 41.48 acre (16.75 ha) (Table 4).

Table 4: Description of Shrimp Farm:

Farm characteristics	Average	Std Dev	Min	Max
Total Farm Area (Hectare)	17.36	27.36	0.20	161.9
Number of pond/farm	1.47	1.02	1.00	8
Pond Area in (Hectare)	16.75	27.17	0.20	161.9

Production and trading of shrimp by the stakeholders during 2009-10

Average shrimp production of the farmers has been reported to have increased significantly from 90 kg in 2009 to 112 kg in 2010, totaling 512,883 kg for the previous year and 169,154 kg for the current year. Traders transacted Bagda, Golda[8] and Horina during the reference period. Forty eight percent of the traders/faria traded Bagda while 34 and 18 percent traded Golda and Horina respectively. Volume of shrimp transacted by traders during 2010 was higher than that of the year 2009.

All the depots traded Bagda. In addition to Bagda trade, 58% and 83% of them simultaneously traded Golda and Horina. Total volumes of Bagda, Golda and Horina traded by the depots were 342,775kg, 49,983kg and 56,885kg respectively. Average trading per depot was 28,563 kg for Bagda, 7,077 kg for Golda and 57,884 kg for Horina. Of these total volumes, 74% of Bagda, 70% of Golda and 96% of Horina shrimp were traded during 2008, making it clear that quantity traded during 2009 was much lower.

Unlike other stakeholders of the lower links of the marketing channel, agents traded both shrimp and fish. Cent percent of the agents traded *Bagda*, *Horina*, and other fish species, but 63 percent of the agents traded all the species of shrimp and fish species. Total volume of shrimp traded by them was 2,575,080 kg of Bagda, 995,490 kg of Golda, 482,600 kg of *Horina* and 39,230 kg of fish. These constituted 89% for *Bagda*, 82% for *Golda*, 78% of *Horina* and 70% of fish species.

Processors traded all the different types of fish and shrimp such as *Bagda, Golda* and *Horina* and fish. However, about 37% of the processors did not trade *Golda*. Total quantity of HOSO (Head On Shell On) shrimp traded by the processors for the reference period of 15 months was 22,823,085 kg, constituting 73% *Bagda*, 9% *Golda*, 4% Horina and 14% fish. As far as HLSO (Head Less Shell On) shrimp trade is concerned, the compositions of trade were 87% for *Bagda*, 9% for *Golda* and 4% for fish. Average HOSO and HLSO trades were 393,501 kg and 3,39,745 kg.

[8] Golda: Macrobrachium rogenbergii

Traded volume of the processors during 2009 was also much higher than 2010. *Bagda* HOSO and HLSO trade made were 70% and 71% during 2009 and 67% and 56% during 2010 respectively. Average quantities of Bagda, HOSO and HLSO traded by the processors were 1,467,484 kg and 1,100,614 kg during 2009. In case of *Golda*, percentages of total trade during 2009 were 80% for HOSO and 81% for HLSO. For fish (HOSO) also, the volume of trade was higher during 2009, which was 70% as compared to 53% during 2010. Like other stakeholder, cent percent processors indicated that the supply of shrimp and fish was higher during 2009 as opposed to the year 2010. In general, trade was much higher for 2009 as compared to the year 2010 as the year 2010 was not cover the full 12 months.

Factors affecting shrimp production during 2009 and 2010

It reveals that farmers, traders and depots dealt with different kinds of shrimps, while the agents and processors dealt with shrimp and fish simultaneously. Production and trading during the year 2009 was reported to be very good by all the stakeholders under consideration, but it was quite frustrating during 2010. Three factors came out to be the most important reasons for the inadequate supply and high prices during 2010. These are less supply due to production declined for draught and impact of Cyclone Aila. Further, it was also reported that the higher completion due to intenational market demand was high. No problem was identified as a constraint to sell the shrimp.

Price differentials (Gross marketing margins) of shrimp of the stakeholders

Price differential here refers approximately to gross marketing margins, which is defined as the difference between the sale price minus the procurement price. The purpose of this analysis is to examine how this differs across traders, depots, agents and processors.

Farmers

Almost farmers sold their bagda shrimp estimating four grades (20/kg, 30/kg, 44/kg and 66/kg) to the traders. The Farmers received average per kg monthly prices of bagda were Tk 507 for size-20, Tk 454 for size-30, Tk 388 for size-44 and Tk 325 for size-66 during the study period. Size-20 presented the least price variation across the 15-month period. The CVs of bagda prices were 10.1% (size-20), 11% (size-30), 19% (size-44) and 29.4% (size-66). One thing pretty clear is that the price variation gets higher as the grade size (number per kg) increases. For example, size-66 shrimp had the highest coefficient of variation of 29.4% while it was only 10.1% with the size-20.

Traders

The average bagda procurement price of size-20 shrimp enjoyed the highest per kg price (Tk 548.23). The same for size-30, size-44, size-66 and size-100 were Tk 472.77, Tk 403.85, Tk 229.00 and Tk 161.62 per kg respectively. On the other hand the average sale prices were Tk 558.77 for size-20, Tk 482.38 for size-30, Tk 408.85 for size-44, Tk 335.92 for size-66 and Tk 167.69 for size-100. These pattern of the procurement and sale prices of shrimp generated per kg gross marketing (price differential) margins of Tk11.21 for size-20, Tk 13.88 for size-30, Tk 5.89 for size-44, Tk 6.17 for size-66 and Tk 6.00 per kg for size-100 (Table 5).

Bagda procurement price of size-44 had the highest dispersion as evident from the coefficient of variation. Size-100 had the second highest price variation across months Bigger size of shrimps had relatively lower price variation than the smaller sizes. Similar variations were also observed for the sale price of shrimp for the traders. Gross marketing margins also presented similar variation as the procurement and sale price.

Table 5. Bagda price differential per kg by Count size-wise (traders)

Statistics	20	30	44	66	100
Procurement Price per kg					
Standard deviation	50.84	53.10	79.28	95.07	25.30
Mean	548.23	472.77	403.85	229.00	161.62
Coefficient of variation	9.3	11.2	19.6	28.9	15.7
Sale Price per kg					
Standard deviation	49.56	53.35	81.62	95.73	24.49
Mean	558.77	482.38	408.85	335.92	167.69
Coefficient of variation	8.9	4.50	5.89	4.40	5.01
Price Differentials/Gross Marketing Margin per kg					
Standard deviation	2.70	4.95	2.15	2.99	3.34
Mean	11.21	13.88	5.89	6.17	6.00
Coefficient of variation	24.10	35.60	36.60	48.50	55.60

Depots

Depot traded HOSO (Head On Shell On) type of shrimp only as indicated by cent percent of the depot owners. Average per kg bagda procurement price for size-20, size-30, size-44, size-66 and size-100 over the 15-month period were Tk 559.23, Tk 481.00, Tk 410.46, Tk 334.08 and Tk 167.92 respectively. The sale prices were respectively Tk 570.38, Tk 490.00, Tk 418.69, Tk 340.54 and Tk 173.23. Procurement prices of bagda had the highest variation for the size-66 followed by size-44. As for its sale price, the structure of price variation was similar, being the highest with size-66 and lowest with size-20. With these procurement and resale prices of bagda, the per kg gross marketing margin (sale price minus procurement price) became Tk 12.6 for size-20, Tk 10.8 for size-30, Tk 9.5 for size-44, Tk 10.3 for size-66 and Tk 6.9 for size-100 (Table 6).

Table 6. *Bagda* price differential per kg by Count size-wise (depots)

Statistics	20	30	44	66	100
Procurement Price per kg					
Standard deviation	48.18	53.63	79.12	94.99	24.79
Mean	559.23	481.00	410.46	334.08	167.92
Coefficient of variation	8.6	11.1	19.3	28.4	14.8
Sale Price per kg					

Standard deviation	49.39	54.03	80.75	94.96	26.04
Mean	570.38	490.00	418.69	340.54	173.23
Coefficient of variation	8.9	12.6	19.7	27.8	13.9
Price Differentials/Gross Marketing Margin per kg					
Standard deviation	4.1	4.4	5.6	5.5	3.0
Mean	12.6	10.8	9.5	10.3	6.9
Coefficient of variation	32.9	41.1	59.5	53.9	42.9

Agent

Average price differentials of *Bagda* for the agents were Tk 11.00 (size-20), Tk 8.75 (size 3-30), Tk 9.37 (size 44), Tk 8.63 (size 66) and Tk 5.87 (size 100). Here also, it is observed that larger size shrimp provided grosser margin than the smaller ones (Table 7).

Table 7. *Bagda* price differential per kg by Count size-wise (agents)

Statistics	20	30	44	66	100
Procurement Price per kg					
Standard deviation	47.37	50.48	75.66	92.32	21.49
Mean	565.07	482.08	409.00	328.53	168.07
Coefficient of variation	8.4	10.5	18.5	28.1	12.8
Sale Price per kg					
Standard deviation	46.65	50.08	76.67	93.03	23.52
Mean	575.87	491.07	416.53	335.40	174.00
Coefficient of variation	8.1	10.2	18.4	27.7	13.5
Price Differentials/Gross Marketing Margin per kg					
Standard deviation	2.98	3.54	3.20	3.02	2.64
Mean	11.00	8.75	9.37	8.63	5.87
Coefficient of variation	27.1	40.4	34.2	35.00	45.00

Processors

The mean procurment prices of *Bagda* per kg were Tk 575.80 for size-20, Tk 490.87 for size 30, Tk 416.20 for size 44, Tk 334.87 for size 66 and Tk 174.07 for size 100. The coefficient of variation was the highest for the size-66, followed by size-44, size-100, size-30 and so on. The sale prices per kg were US$ 12.67, 10.93, 9.93, 8.87 and 7.60 respectively for sizes, 20, 30, 44, 66 and 100. The sale prices show lesser variation as compared with the procurement prices (Table 8).

Table 8. *Bagda* price differential per kg by Count size-wise (processor)

Statistics	20	30	44	66	100
Procurement Price per kg					
Standard deviation	46.67	50.21	76.92	93.35	23.46

Mean	575.80	490.87	416.20	334.87	174.07
Coefficient of variation	8.1	10.2	18.5	27.9	13.5
Sale Price per kg					
Standard deviation	.961	.640	.737	.352	1.05
Mean	12.67	10.93	9.93	8.87	7.60
Coefficient of variation	7.6	5.7	4.2	5.4	4.8
Price Differentials/Gross Marketing Margin per kg					
Standard deviation	6.61	3.78	2.14	4.79	5.25
Mean	83.00	94.50	100.50	72.87	89.88
Coefficient of variation	8.00	4.00	2.10	6.60	5.80

Average gross marketing margins of the processors were the highest of all the stakeholders. For Bagda, the minimum per kg margin enjoyed by the processors was Tk 83.0 (US$1.22) and the maximum was Tk 243.99 (US$1.48) per kg.

Business information for the Stakeholders

Number of regular and seasonal staff of the traders was 32 and 58. All of the staffs were male. The average number of regular staff per trader was 1.33, while it was 2.42 for the seasonal staff. Cent percent of the traders purchased shrimp from the farmers. On an average a single trader made shrimp purchase from 14 farmers. All of the staff (both regular and seasonal) of the depots was male too. Average regular staff per depot is 1.28 while seasonal staff average 2.75. All depots received supply from trader/faria while 22% of them simultaneously received supply directly from farmers. Sources of procuring shrimp and fish for the agents were mainly farmers, depots, and landing/service centers. However, agent's most important source of procurement was the depots followed by landing/service centers. Processor's average numbers of regular and seasonal staff were 42 and 298 respectively. One important characteristic for the processor was that about 12% of the regular staff is female and over 75% seasonal staffs were also female.

Incentive mechanism to and from different stakeholders

Incentive in the form of receiving cash advance is a common phenomenon in the shrimp marketing in Bangladesh. This is mainly to ensure the supply continuity and business relations.

Farmers received cash advance from the traders/farias. Most of the traders opined that they needed to provide incentives to ascertain that supply comes from farmers and its continuity is maintained. Cash advance was the kind of incentive given to the farmers. A trader advanced on an average, Tk 4500 per farmer. Farmers get cash advance from the agents in Chittagong and Cox's Bazar region as there are absent of depot and traders.

Cent percent of traders supplied shrimp to depots. Often the traders receive cash incentives too from the depots. Seventy percent of the traders indicated that they received cash advance from the depots. On an average they received cash advance of Tk 75,500 from depots.

Sixty percent of the depots gave incentive to the traders, and the remaining 40% did not give any incentive for receiving supply. Average number of traders receiving cash from the depots was 8, and average cash advance amounted to Tk 17,50,000 each. As a supplier of shrimp to their next link, depots also received cash advance from higher stakeholders (agent). Average cash advance depots received from agent was Tk 11,75,000 per depot. However, not everybody received cash advance as incentive from the agent. Cent percent depots sold shrimp to agents. Average numbers of farmers and depots receiving incentives per agent were 75 and 11 respectively who were given cash advance averaging Tk 2000 to each farmers and Tk 10,12,857 to each depot.

Like providers of incentive for procuring shrimp and fish, agents do receive incentives too from their buyers, i.e., processors. Each and every agent received cash advance from their buyer counterpart in 2009 and 2010. On average, each agent received a cash advance of Tk 15,75,00 as incentives from the processors and big agents. All the agents sold shrimp to processors.

The processor also required to provide cash incentive to agents to ensure the supply continuity. Amount of cash advance given to agent averaged Tk 75,50,000. Processor did not receive any incentive from the exporters. Processors sold most of shrimp to the international market. However some also sold to local market (very insignificant quantity) and international market both.

Opinion of stakeholders on price situation during 2009 and 2010

Cent percent of the traders stated that price of shrimp was slightly lower during 2009 while it was higher during 2010. They indicated that during 2009 shrimp price started up from April and continued onward for the rest of year. From March 2010 onward, it started contimual rising**.** The general impression of the depot owners, agents and processors is also that price was lower during 2009 and higher during 2010. Processors indicated that prices of shrimp increased from April 2009 and March onward in 2010. Most of the stakeholders were affected positively as price remained higher during 2009 and 2010 as their earning were higher that affecting their livelihood positively. However, they were also benefited due to existence of higher price during 2010. The price increase helped expand the businesses of many stakeholders favorably.

Price trend Analysis

Shrimp price trend analysis:

Table 9 and 10 summarizes the results of the trend line fitted to the data on procurement and resale price of the selected traders, depots, agents and processors. It is to be mentioned that in case of the resale price of the processor, the prices per kg are in US dollar. In examining the price trend, graphical analysis showing the scatters of prices, average prices and trend prices have additionally been made. These are presented in graphs (Fig-4 to Fig-43).

Table 9: Results of the estimates of bagda procurement price trend of different stakeholders

Stakeholder	Shrimp size	Intercept	Slope	Mean price	R^2
Trader	Size-20	452.3	13.22	548.23	0.828
	Size-30	378.1	12.20	472.77	0.900
	Size-44	265.5	18.70	403.85	0.922
	Size-66	156.3	24.42	329.00	0.949
	Size-100	107.0	7.16	161.62	0.869
Depot	Size-20	476.9	11.90	559.23	0.796
	Size-30	404.6	11.48	481.00	0.814
	Size-44	271.6	20.64	410.46	0.897
	Size-66	171.0	23.62	334.00	0.924
	Size-100	121.6	6.98	167.92	0.910
Agent	Size-20	486.9	9.16	565.07	0.704
	Size-30	396.5	10.30	482.07	0.851
	Size-44	280.2	16.09	409.00	0.906
	Size-66	170.5	19.73	328.53	0.915
	Size-100	146.6	4.13	168.07	0.940
Processor	Size-20	500.3	9.14	575.80	0.719
	Size-30	398.1	10.52	490.87	0.879
	Size-44	278.6	16.48	416.20	0.858
	Size-66	178.6	19.61	334.87	0.846
	Size-100	145.9	4.13	174.07	0.924

Table 10: Results of the estimates of bagda resale price trend of different stakeholders

Stakeholder	Shrimp size	Intercept	Slope	Mean price	R^2
Trader	Size-20	466.7	11.47	558.77	0.496
	Size-30	393.6	12.55	482.38	0.725
	Size-44	273.6	18.65	409.85	0.920
	Size-66	160.8	24.52	335.92	0.951
	Size-100	116.7	6.63	167.69	0.870
Depot	Size-20	476.2	12.56	570.38	0.563
	Size-30	414.8	11.33	490.00	0836
	Size-44	276.5	20.93	414.69	0.894
	Size-66	179.6	23.52	330.54	0.927
	Size-100	124.2	7.20	173.23	0.926
Agent	Size-20	497.8	9.12	575.87	0.715
	Size-30	407.1	10.09	491.07	0.840
	Size-44	285.8	16.32	416.53	0.905
	Size-66	176.2	19.87	335.40	0.913

	Size-100	146.6	4.13	174.00	0.940
Processor	Size-20	11.05	0.178	7.73	0.763
	Size-30	9.95	0.144	6.47	0.590
	Size-44	8.96	0.129	5.60	0.768
	Size-66	8.24	0.079	4.87	0.360
	Size-100	8.32	0.087	3.67	0.251

Trader:

The Tradres are usually the second link in the marketing channel. The traders buy shrimp directly from the farmers. Procurement prices of all the different sizes of shrimp of the traders increased over the 15-month period starting from July 2009 to September 2010 as evident from the positive slopes of the trend line. The average monthly linear growth rates were estimated at 0.496% for size-20, 0.725% for size-30, 0.920% for size 66, and 0.870% for size-100 shrimp (Table 9). Slopes of the resale price trend of the traders were also positive. The highest average monthly growth rate for the resale price was 0.951% also for size-66 shrimp. On the other hand, the least monthly growth (0.496%) took place with the size-20 shrimp (Table 10). This makes one clear evident that prices of bigger shrimp (lower number shrimp per kg) grew less as compared to the prices of the smaller shrimp.

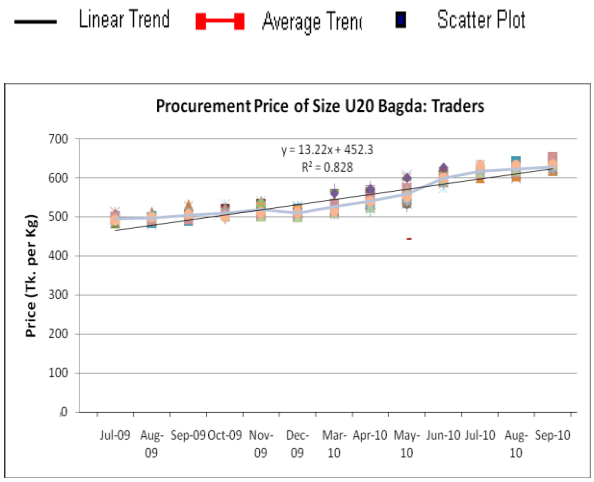


Fig-4: Trader's Procurement Price of Count size 20

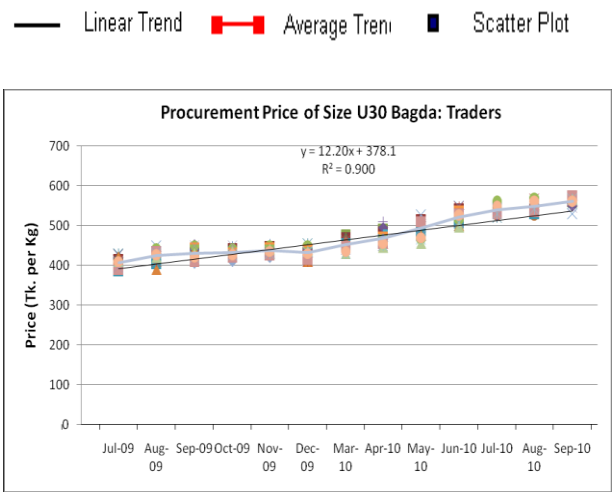


Fig-5: Trader's Procurement Price of Count size 30

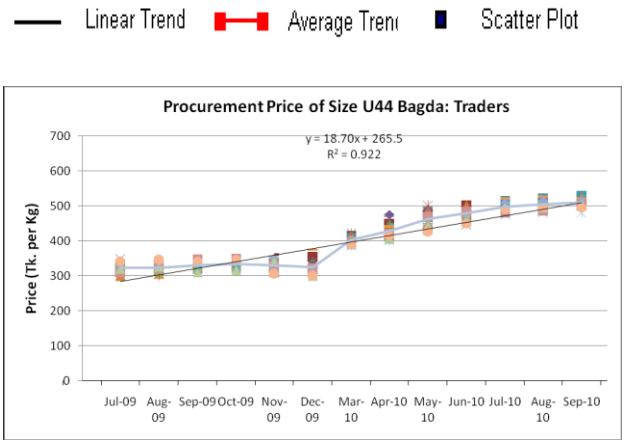


Fig-6: Trader's Procurement Price of Count size 44

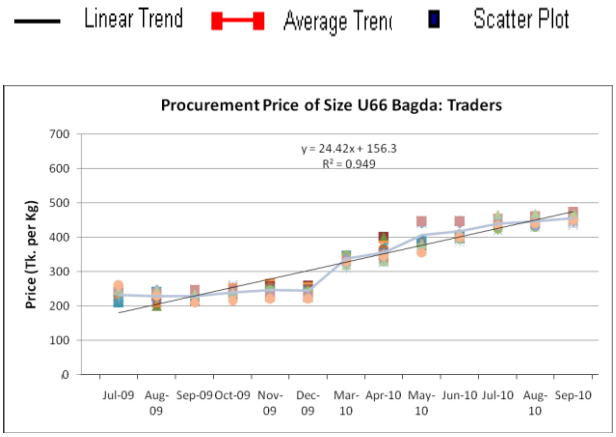


Fig-7: Trader's Procurement Price of Count size 66

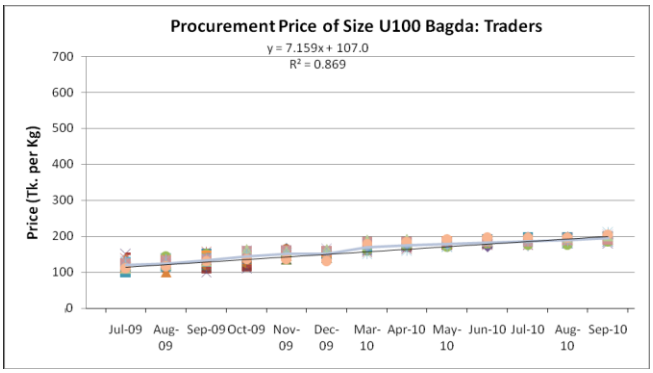


Fig-8: Trader's Procurement Price of Count size 100

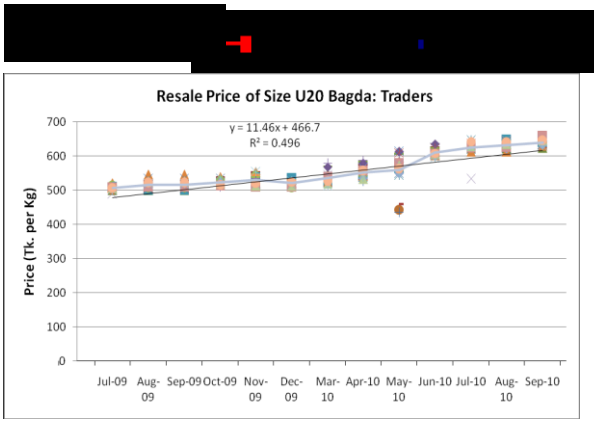


Fig-9: Trader's Sale Price of Count size 20

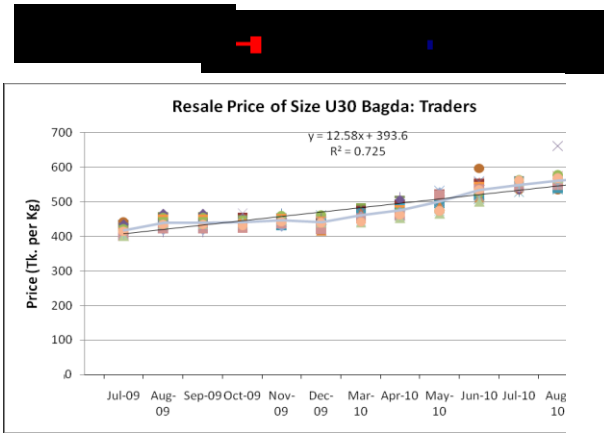


Fig-10: Trader's Sale Price of Count size 30

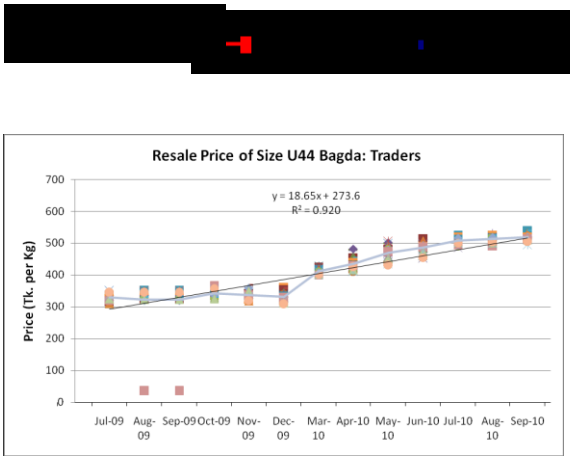


Fig-11: Trader's Sale Price of Count size 44

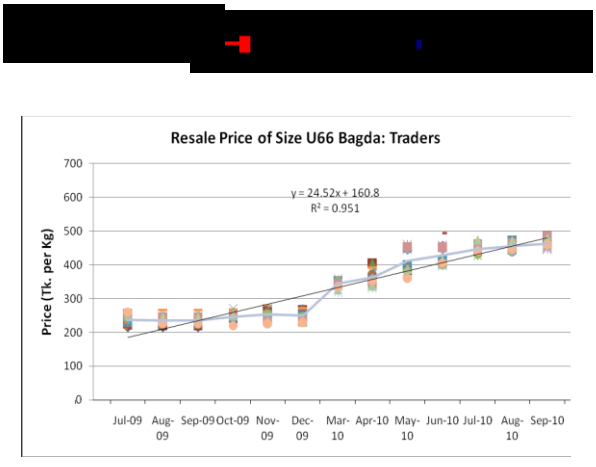


Fig-12: Trader's Sale Price of Count size 66

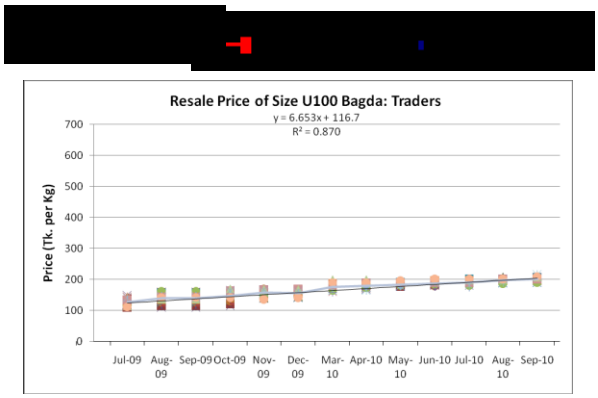


Fig-13: Trader's Sale Price of Count size 100

Depots:

The depots buy shrimps mostly from the traders. However, very insignificant portion of their procurement also comes directly from farmers. The procurement price trends of depots were also positive for all the sizes of shrimp. This holds for resale prices as well. The monthly procurement prices were estimated to have grown by 0.796% for size-20, 0.814% for size-30, 0..897% for size-44, 0.924% for size -66 and 0.910% for size-100 (Table 19 and Fig: 14-23). Rate of monthly resale price growth of shrimp was the lowest (0.796%) for size-20 and highest (0.924%) for size 66.

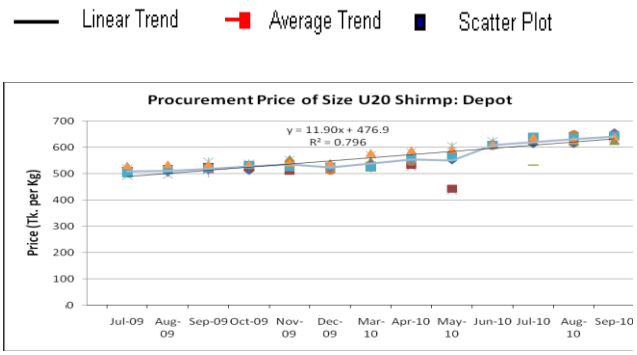


Fig-14: Depot's Procurement Price of Count size 20

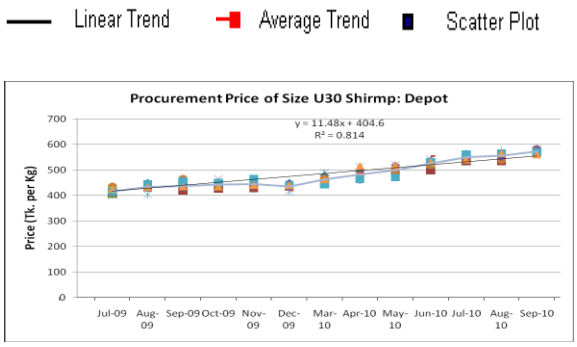


Fig-15: Depot's Procurement Price of Count size 30

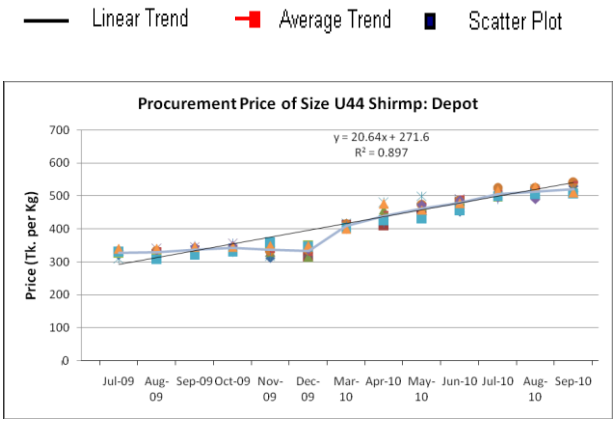


Fig-16: Depot's Procurement Price of Count size 44

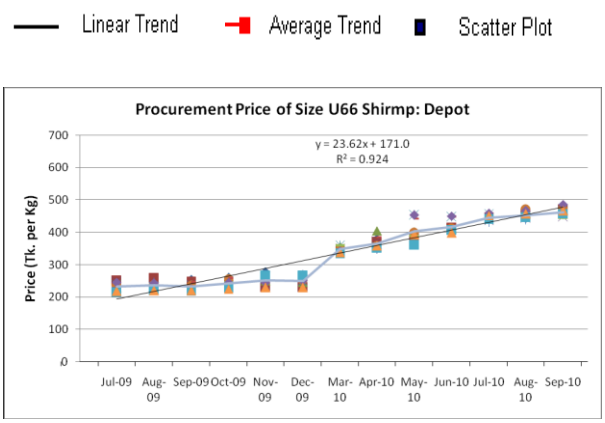


Fig-17: Depot's Procurement Price of Count size 66

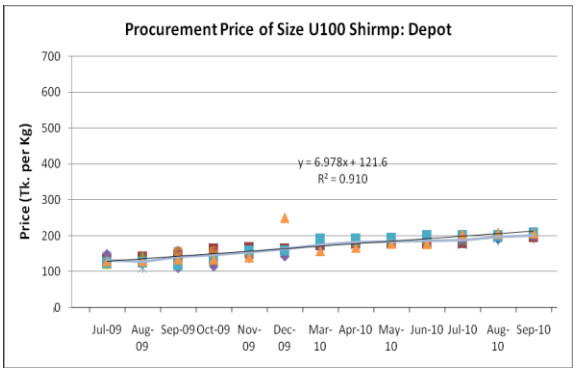


Fig-18: Depot's Procurement Price of Count size 100

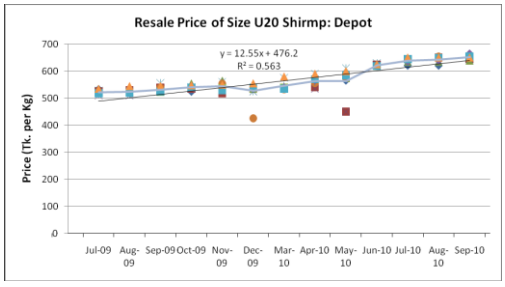


Fig-19: Depot's Sale Price of Count size 20

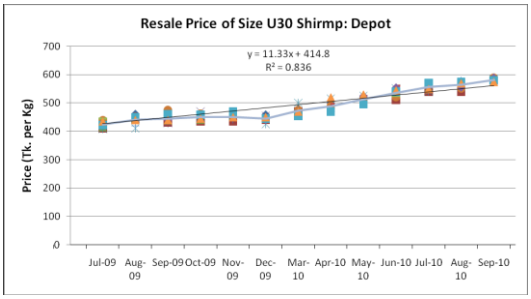


Fig-20: Depot's Sale Price of Count size 30

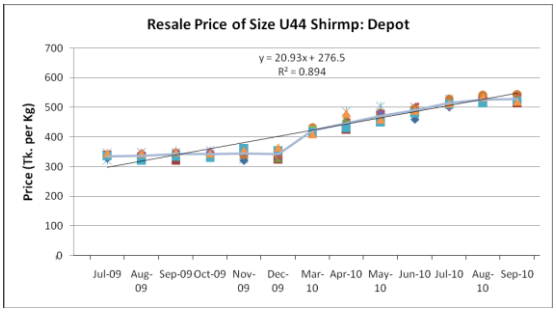


Fig-21: Depot's Sale Price of Count size 44

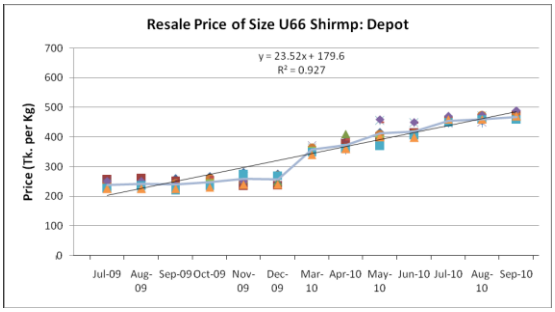


Fig-22: Depot's Sale Price of Count size 66

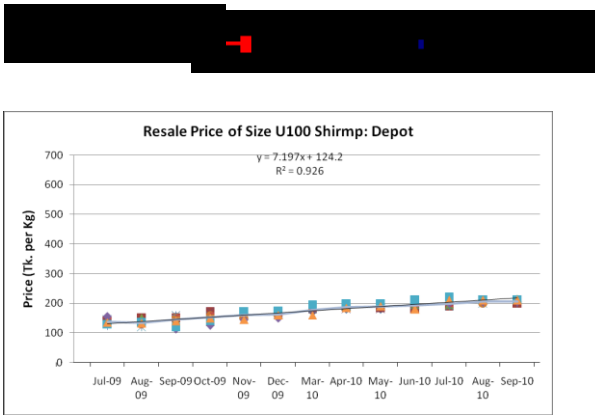


Fig-23: Depot's Sale Price of Count size 100

Agents:

Agents procure shrimp mainly (90-95%) from depots, the rest also come from traders and from farmers in Chittagong and Cox's Bazar. Having procured, they supply shrimp to the processor. Both the procurement and resale price trends of shrimp the agent hold were positive. Average monthly growth rate of the procurement price of shrimp of the agents ranges from 0.704% to 0.940%. The lowest growth rate occurred for the size-20 shrimp while the highest was with size-100 shrimp. Size 100 achieved highest monthly price growth followed by size-66 shrimp and all are presented in Fig-24 -33.

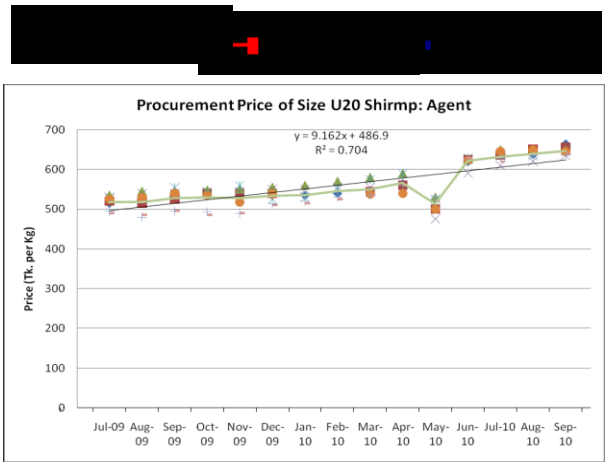


Fig-24: Agent's Procurement Price of Count size 20

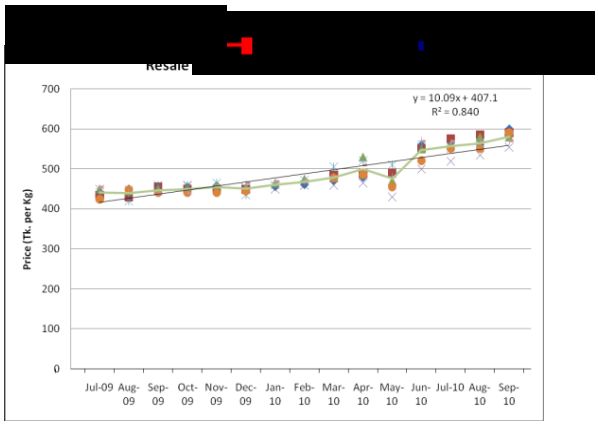


Fig-25: Agent's Procurement Price of Count size 30

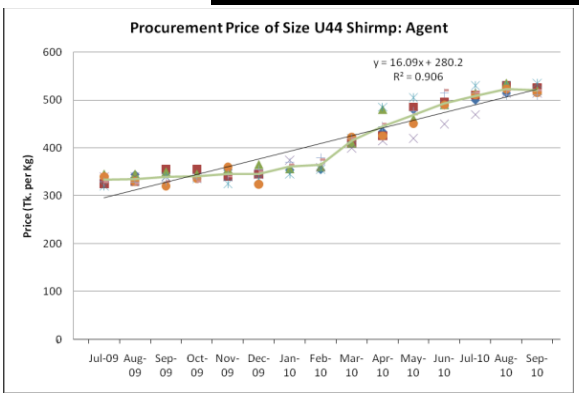


Fig-26: Agent's Procurement Price of Count size 44

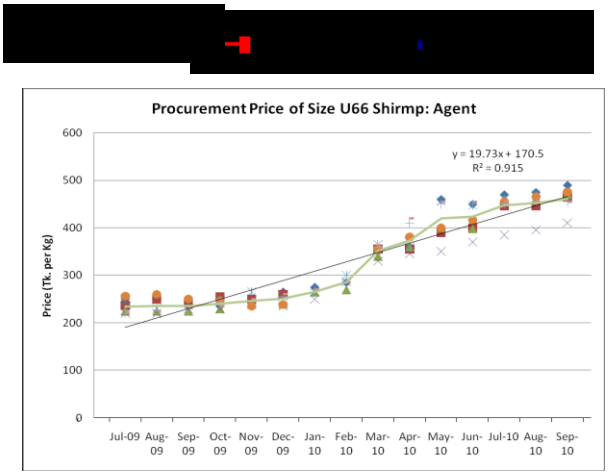


Fig-27: Agent's Procurement Price of Count size 66

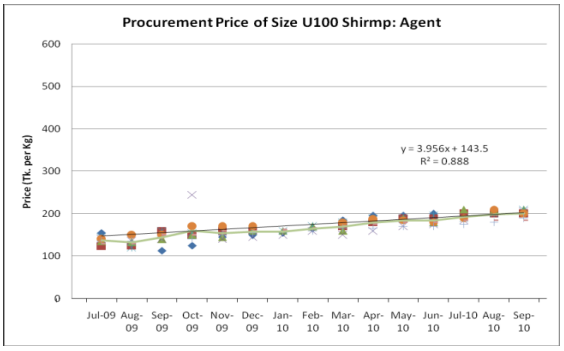


Fig-28: Agent's Procurement Price of Count size 100

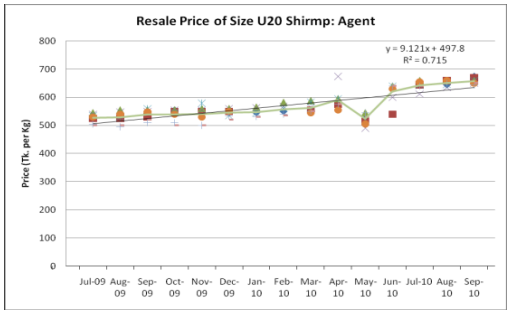


Fig-29: Agent's Sale Price of Count size 20

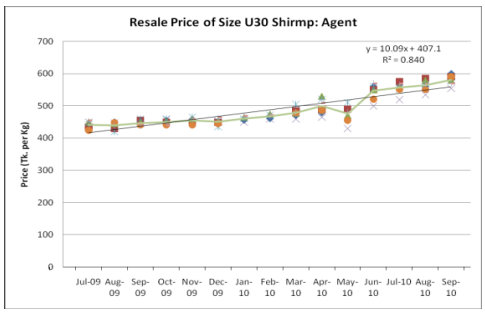


Fig-30: Agent's Sale Price of Count size 30

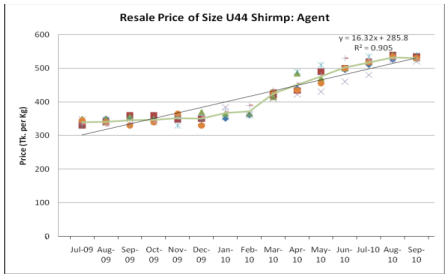


Fig-31: Agent's Sale Price of Count size 44

Fig-32: Agent's Sale Price of Count size 66

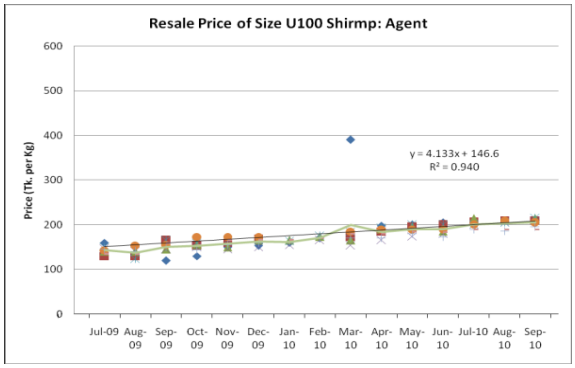


Fig-33: Agent's Sale Price of Count size 100

Processor:

Processor is the last link in the marketing channel. They procure 100% from the agents. Having collected shrimp from the agents, they process it and export in the international markets. USA, Belgium, UK and Japan are the most important international markets of the processors of Bangladeshi shrimp. Growth rates in the procurement prices of the processors ranged from a minimum of 0.719% per month to as high as 0.924%. Again the price of small shrimp (size 100) grew at a relatively higher rate. It is to be mentioned that resale price of the processors are shown in US$. The monthly growth rates in the resale price of shrimp for the processor appear to be higher for all sizes compared to other stakeholders. The growth of resale prices was the minimum for size-100 shrimp (0.251%) and maximum with the size 20 (0.940%). All about the prossesor's prices and it's trends are shown in figure: 34 – 43.

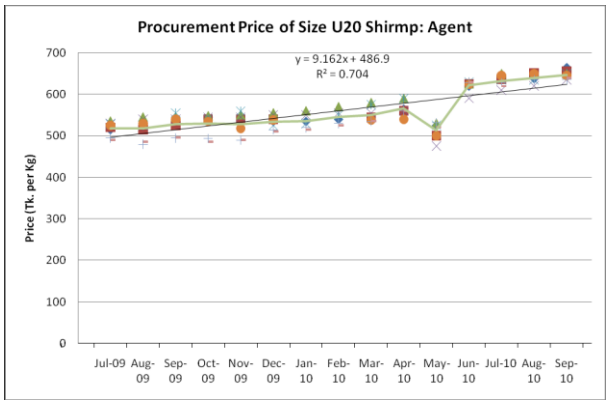


Fig-34: Processor's Procurement Price of Count size 20

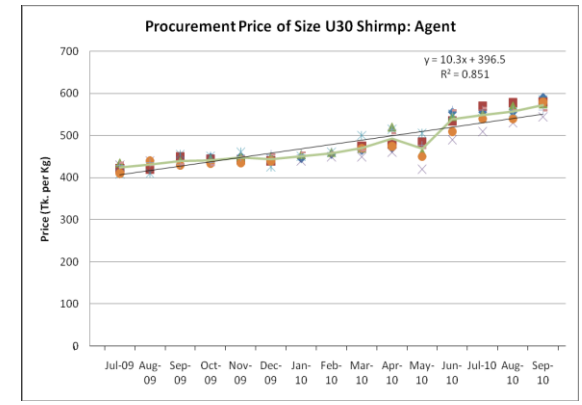


Fig-35: Processor's Procurement Price of Count size 30

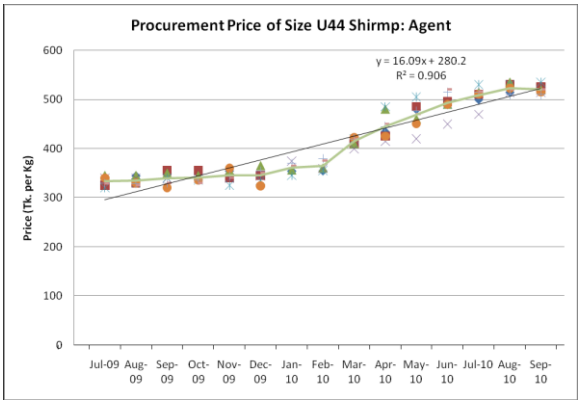


Fig-36: Processor's Procurement Price of Count size 44

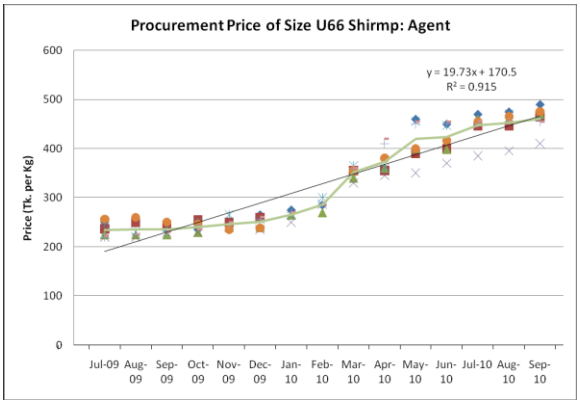


Fig-37: Processor's Procurement Price of Count size 66

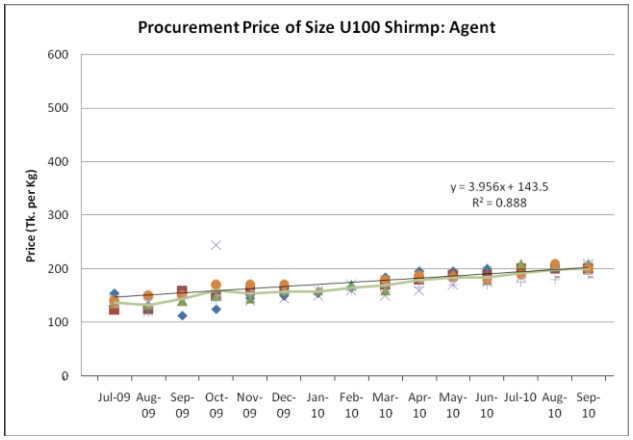


Fig-38: Processor's Procurement Price of Count size 100

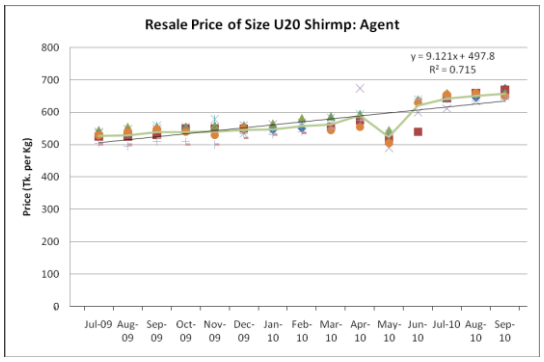


Fig-39: Processor's Sale Price of Count size 20

Fig-40: Processor's Sale Price of Count size 30

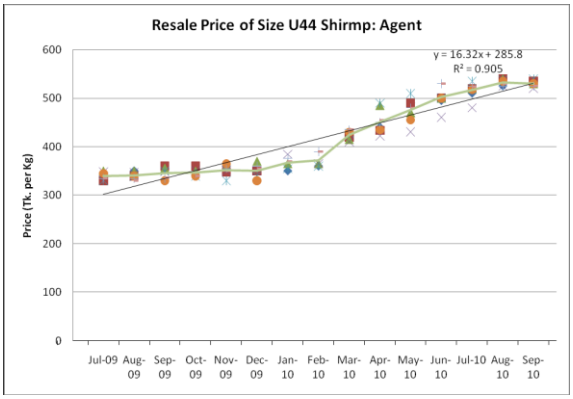


Fig-41: Processor's Sale Price of Count size 44

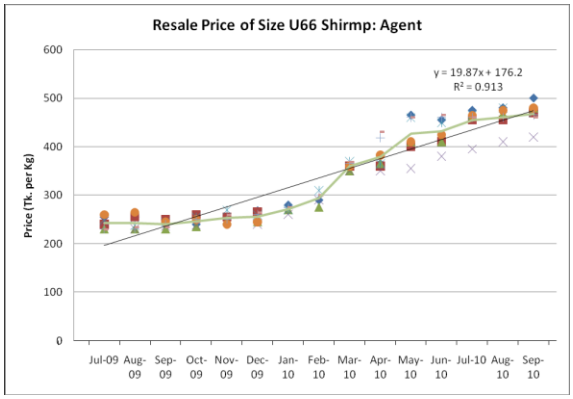


Fig-42: Processor's Sale Price of Count size 66

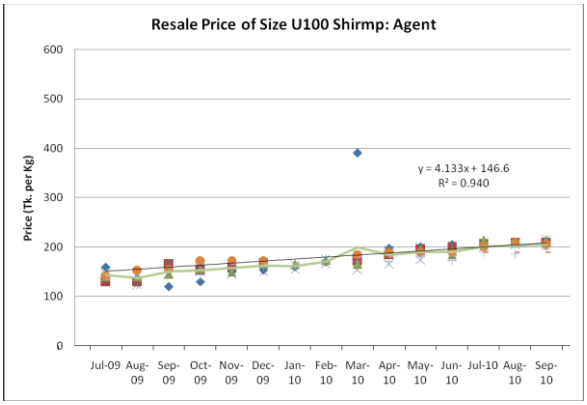


Fig-43: Processor's Sale Price of Count size 100

6.5 Conclusions and Recommendations

Impact of Price Changes on Different Stakeholder

During this study, no stakeholders were reported to have adversely affected due to price changes. The price changes affected positively to farmers, traders, depot, agent, processors, exporters, input suppliers, technology providers, associated labourers, fishermen and transporters. Overall good livelihoods were believed to have been maintained due to price increase to the families of farmer, traders, depot owners, agents, associated labourers, fishermen and transporters. Other positive benefits, as mentioned by different stakeholders, were more employment, extension of farm and business, better capacity utilization and so on.

Impact of Tsunami and US Anti Dumping

About tsunami, majority farmers did not know about the occurrence of tsunami. But from traders onward up to processor they were aware of the occurrence of tsunami. Farmers, traders and depots indicated that there was no effect of tsunami on their livelihood but the Sidr in 2007 and *Aila* in 2009 affected on shrimp production, price and on livelihoods as well. But agents and processors indicated that there were some indirect affects of imposing non-tarif barriers like quality concerned imposed by EU that declined shrimp export from Bangladesh in 2008. The processors and the agents stated that since there was less production in the *Aila* affected areas in 2009. Most of the stakeholders are concerned about the affect of climate change in Bangladesh that may decline the opportunity to export more shrimp in future.

About US anti dumping, the stakeholders other than processor were in absolute dark. They didn't hear about US anti dumping. Since the processors are directly involved with the export of shrimp, they had to hear about it. The answers relating to the impact of US anti dumping were same as those of the effect of tsunami. The farmers, traders, depots and agent were not hurt due to this. The processors identified some indirect effect. However, livelihood was not directly affected by Tsunami and US Ati-dumping.

Recommendations

This report shows that the shrimp industry in Bangladesh is quite healthy at present. Shrimp prices have been changes over the years but did not show much change. The Indian Ocean tsunami and the occurrence of the US anti-dumping case against other Asian countries did not have any negative effects.

However, a number of concerns associated with the increased market demand for quality products were also expressed. It is therefore necessary for Bangladesh to pay attention to improving quality conditions with value added products and to continue avoiding the use of banned chemicals. A good marketing path should also be defined to enable the Bangladesh shrimp to benefit best from the US market. Strategies should also be put in place to limit the potential impact of natural disasters or other events that can negatively influence the shrimp farming sector.

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Vietnam Annexes

Annex 1. Samples and locations for the study

	Bac Lieu	Ben Tre	Ca Mau	Soc Trang	Kien Giang
Farmers (P.monodon)	30	20	50	50	
Farmers (P.vanamei)		15	15		
Traders	14		10	6	
Processors	10		17	2	1
Total	**54**	**35**	**92**	**58**	**1**

Annex 2. List of surveyed farmers

No	Farmer's names	Village	Commune	District	Provine	Species
	Le Van Dut	Du Tho	Tham Don	My Xuyen	Soc Trang	P.monodon
	Tran Tan Thanh	Hoa De	HoaTu I	My Xuyen	Soc Trang	P.monodon
	Kha Minh Chien	Hoa De	HoaTu I	My Xuyen	Soc Trang	P.monodon
	Kha Turng Kien	Hoa De	HoaTu I	My Xuyen	Soc Trang	P.monodon
	Le Thanh Binh	Hoa De	HoaTu I	My Xuyen	Soc Trang	P.monodon
	Pham Thanh Liem	Hoa De	HoaTu I	My Xuyen	Soc Trang	P.monodon
	Ngo Quoc Nam	Hoa Tan	HoaTu I	My Xuyen	Soc Trang	P.monodon
	Lam Thanh Ho	Hoa Tan	HoaTu I	My Xuyen	Soc Trang	P.monodon
	Nguyen Van Hien	Phu Thanh	Thanh Phu	My Xuyen	Soc Trang	P.monodon
	Truong Be Nam	Phu Thanh	Thanh Phu	My Xuyen	Soc Trang	P.monodon
	Nguyen Van Muong	Phu Thanh	Thanh Phu	My Xuyen	Soc Trang	P.monodon
	Nguyen Van Sum	Phu Thanh	Thanh Phu	My Xuyen	Soc Trang	P.monodon
	Ho Van Huan	Hoa Truc	Hoa Tu I	My Xuyen	Soc Trang	P.monodon
	Nguyen Van Bach	Hoa Truc	Hoa Tu I	My Xuyen	Soc Trang	P.monodon

	Nguyen Van Nga	Hoa Truc	Hoa Tu I	My Xuyen	Soc Trang	P.monodon
	Nguyen Van Hoang	Hoa Truc	Hoa Tu I	My Xuyen	Soc Trang	P.monodon
	Ngo Van Cong	Hoa Loi	Ngoc Dong	My Xuyen	Soc Trang	P.monodon
	Phan Thanh Sang	Hoa Loi	Ngoc Dong	My Xuyen	Soc Trang	P.monodon
	Pham Van Hien	Quyet Thang	Ngoc To	My Xuyen	Soc Trang	P.monodon
	Trinh Minh Trong	Quyet Thang	Ngoc To	My Xuyen	Soc Trang	P.monodon
	Trinh Minh Chung	Quyet Thang	Ngoc To	My Xuyen	Soc Trang	P.monodon
	Le Hong Chuyen	Hoa Trung	Hoa Tu I	My Xuyen	Soc Trang	P.monodon
	Le Hong Lao	Hoa Trung	Hoa Tu I	My Xuyen	Soc Trang	P.monodon
	Le Hong Phuc	Hoa Trung	Hoa Tu I	My Xuyen	Soc Trang	P.monodon
	Pham Minh Khoa	Hoa Trung	Hoa Tu I	My Xuyen	Soc Trang	P.monodon
	Le Ngoc Gia	Nhon Hoa	Gia Hoa II	My Xuyen	Soc Trang	P.monodon
	Le Van Ton	Du Tho	Tham Don	My Xuyen	Soc Trang	P.monodon
	Duong Ho Vu	Du Tho	Tham Don	My Xuyen	Soc Trang	P.monodon
	Duong Van Cuong	Du Tho	Tham Don	My Xuyen	Soc Trang	P.monodon
	Bui Hoang Mit	Hoa Nho A	Hoa Tu II	My Xuyen	Soc Trang	P.monodon
	Lam Ngoc Tan	Hoa Nho A	Hoa Tu II	My Xuyen	Soc Trang	P.monodon
	Ngo Minh Lang	Hoa Nho A	Hoa Tu II	My Xuyen	Soc Trang	P.monodon
	Ngo Minh Lon	Hoa Nho A	Hoa Tu II	My Xuyen	Soc Trang	P.monodon
	Diep Van Son	Hoa Nho A	Hoa Tu II	My Xuyen	Soc Trang	P.monodon
	Lam Minh Lon	Hoa Nho A	Hoa Tu II	My Xuyen	Soc Trang	P.monodon
	Pham Van Buu	Hoa Nho A	Hoa Tu II	My Xuyen	Soc Trang	P.monodon
	Nguyen Hoang Giai	Thanh Hoa	Thanh Quoi	My Xuyen	Soc Trang	P.monodon
	Quach Hoang Tuoi	Thanh Hoa	Thanh Quoi	My Xuyen	Soc Trang	P.monodon

	Vo Van Hoa	Thanh Hoa	Thanh Quoi	My Xuyen	Soc Trang	P.monodon
	Hoa Van Chien	Thanh Hoa	Thanh Quoi	My Xuyen	Soc Trang	P.monodon
	Nguyen Van Hai	Binh Hoa	Gia Hoa II	My Xuyen	Soc Trang	P.monodon
	Nguyen Van Tuan	Binh Hoa	Gia Hoa II	My Xuyen	Soc Trang	P.monodon
	Tran Ngoc Long	Binh Hoa	Gia Hoa II	My Xuyen	Soc Trang	P.monodon
	Nguyen Van Van	Binh Hoa	Gia Hoa II	My Xuyen	Soc Trang	P.monodon
	Nguyen Thanh Van	Binh Hoa	Gia Hoa II	My Xuyen	Soc Trang	P.monodon
	Le Hoang Mai	Binh Hoa	Gia Hoa II	My Xuyen	Soc Trang	P.monodon
	Pham Van Cui	Binh Hoa	Gia Hoa II	My Xuyen	Soc Trang	P.monodon
	Tran Thi Thuy	Binh Hoa	Gia Hoa II	My Xuyen	Soc Trang	P.monodon
	Nguyen Van Nhanh	Binh Hoa	Gia Hoa II	My Xuyen	Soc Trang	P.monodon
	Lam Quang Khuong	Hoa Tan	Hoa Tu I	My Xuyen	Soc Trang	P.monodon
	Nguyen Van Yen	Cong Dien	Vinh Trach	TX Bac Lieu	Bac Lieu	P.monodon
	Do Van Huong	Cong Dien	Vinh Trach	TX Bac Lieu	Bac Lieu	P.monodon
	Quach Tong Quan	Trach Dong	Vinh Trach	TX Bac Lieu	Bac Lieu	P.monodon
	Thuong Van Nghi	Khu phố 2	Phường 5	TX Bac Lieu	Bac Lieu	P.monodon
	Quach Thanh Truong	Cong Dien	Vinh Trach	TX Bac Lieu	Bac Lieu	P.monodon
	Phan Van Quy	Cong Dien	Vinh Trach	TX Bac Lieu	Bac Lieu	P.monodon
	Vu Van Hien	Cong Dien	Vinh Trach	TX Bac Lieu	Bac Lieu	P.monodon
	Nguyen Van Bac	Ap 12	Vinh hau A	TX Bac Lieu	Bac Lieu	P.monodon
	Doan Minh Khuya	Ap 12	Vinh hau A	TX Bac Lieu	Bac Lieu	P.monodon
	Hoang Van Bong	Ap 12	Vinh hau A	TX Bac Lieu	Bac Lieu	P.monodon
	Le Van Loi	Kinh Te	P Nhà Mat	TX Bac Lieu	Bac Lieu	P.monodon
	Nguyen Trung Thong	Ap 12	Vinh hau A	TX Bac Lieu	Bac Lieu	P.monodon

	Do Thanh Bang	Ap 12	Vinh hau A	TX Bac Lieu	Bac Lieu	P.monodon
	Nguyen Van Vinh	Cong Dien	Vinh Trach	TX Bac Lieu	Bac Lieu	P.monodon
	Tran Minh Hun	Cong Dien	Vinh Trach	TX Bac Lieu	Bac Lieu	P.monodon
	Nguyen Thanh Sang	Ap 12	Vinh hau A	TX Bac Lieu	Bac Lieu	P.monodon
	Vo Thanh Binh	Ap 12	Vinh hau A	TX Bac Lieu	Bac Lieu	P.monodon
	Luu Viet Nghi	Dau Lo	P.Nha Mat	TX Bac Lieu	Bac Lieu	P.monodon
	Tran Quoc Toan	Ap 12	Vinh hau A	TX Bac Lieu	Bac Lieu	P.monodon
	Tran Van Cau	Dau Lo	P.Nha Mat	TX Bac Lieu	Bac Lieu	P.monodon
	Quach Thanh Hung	Cong Dien	Vinh Trach	TX Bac Lieu	Bac Lieu	P.monodon
	Tran Tat Hoi	Cong Dien	Vinh Trach	TX Bac Lieu	Bac Lieu	P.monodon
	Quach Thai Binh	Cong Dien	Vinh Trach	TX Bac Lieu	Bac Lieu	P.monodon
	Luu Van Teo	Cay Dua	Vinh Hau B	Hoa Binh	Bac Lieu	P.monodon
	Nguyen Hoang Giang	Cay Dua	Vinh Hau B	Hoa Binh	Bac Lieu	P.monodon
	Kim Van Cuong	Cay Dua	Vinh Hau B	Hoa Binh	Bac Lieu	P.monodon
	Nguyen The Lo	Cay Dua	Vinh Hau B	Hoa Binh	Bac Lieu	P.monodon
	Pham Minh Hai	Cay Dua	Vinh Hau B	Hoa Binh	Bac Lieu	P.monodon
	Nguyen Thanh Trieu	Cay Dua	Vinh Hau B	Hoa Binh	Bac Lieu	P.monodon
	Vu Van Hai	Cay Dua	Vinh Hau B	Hoa Binh	Bac Lieu	P.monodon
	Vo Van Ton	Lung Thuoc	Loi An	Tran Van Thoi	Ca Mau	P.monodon
	Ngo Van Tot	Lung Thuoc	Loi An	Tran Van Thoi	Ca Mau	P.monodon
	Tran Van Phuc	Lung Thuoc	Loi An	Tran Van Thoi	Ca Mau	P.monodon
	Truong Van Han	Lung Thuoc	Loi An	Tran Van Thoi	Ca Mau	P.monodon
	Ho Thiet Giap	Lung Thuoc	Loi An	Tran Van Thoi	Ca Mau	P.monodon
	Vo Huu Nhon	Lung Thuoc	Loi An	Tran Van Thoi	Ca Mau	P.monodon

	Ngo Van Moc	Lung Thuoc	Loi An	Tran Van Thoi	Ca Mau	P.monodon
	Vo Hong Nghi	Lung Thuoc	Loi An	Tran Van Thoi	Ca Mau	P.monodon
	Tran Thanh Giang	Lung Thuoc	Loi An	Tran Van Thoi	Ca Mau	P.monodon
	Nguyen Van Kiem	Lung Thuoc	Loi An	Tran Van Thoi	Ca Mau	P.monodon
	Vo Van Ril	Lung Thuoc	Loi An	Tran Van Thoi	Ca Mau	P.monodon
	Vo Van Giang	Lung Thuoc	Loi An	Tran Van Thoi	Ca Mau	P.monodon
	Ngo Viet Khanh	Lung Thuoc	Loi An	Tran Van Thoi	Ca Mau	P.monodon
	Vo Van Viet	Lung Thuoc	Loi An	Tran Van Thoi	Ca Mau	P.monodon
	Nguyen Dang Khoa	Lung Thuoc	Loi An	Tran Van Thoi	Ca Mau	P.monodon
	Truong Cong Lenh	Lung Thuoc	Loi An	Tran Van Thoi	Ca Mau	P.monodon
	Vo Thanh Hoai	Lung Thuoc	Loi An	Tran Van Thoi	Ca Mau	P.monodon
	Tran Van Truong	Lung Thuoc	Loi An	Tran Van Thoi	Ca Mau	P.monodon
	Vo Hoang Giang	Lung Thuoc	Loi An	Tran Van Thoi	Ca Mau	P.monodon
	le Vu Khuc	Lung Thuoc	Loi An	Tran Van Thoi	Ca Mau	P.monodon
	Phan Van Co	Lung Thuoc	Loi An	Tran Van Thoi	Ca Mau	P.monodon
	Nguyen Trung Cuong	Cai Bat	Hoa My	Cai Nuoi	Ca Mau	P.monodon
	Nguyen Thanh Hai	Cai Bat	Hoa My	Cai Nuoi	Ca Mau	P.monodon
	Quach Van Vu	Cai Bat	Hoa My	Cai Nuoi	Ca Mau	P.monodon
	Do Thanh Phong	Cai Bat	Hoa My	Cai Nuoi	Ca Mau	P.monodon
	Ho Van Khanh	Cai Bat	Hoa My	Cai Nuoi	Ca Mau	P.monodon
	Nguyen Thanh Quai	Cai Bat	Hoa My	Cai Nuoi	Ca Mau	P.monodon
	Nguyen Van Khai	Cai Bat	Hoa My	Cai Nuoi	Ca Mau	P.monodon
	Nguyen Hoang Hil	Cai Bat	Hoa My	Cai Nuoi	Ca Mau	P.monodon
	Le Van Dinh	Cai Bat	Hoa My	Cai Nuoi	Ca Mau	P.monodon

	Trinh Van Truc	Cai Bat	Hoa My	Cai Nuoi	Ca Mau	P.monodon
	Nguyen Van Cuong	Tan Long	Tan Duyet	Dam Doi	Ca Mau	P.monodon
	Huynh Van Tham	Tan Long	Tan Duyet	Dam Doi	Ca Mau	P.monodon
	Do Van Luy	Tan Long	Tan Duyet	Dam Doi	Ca Mau	P.monodon
	Ngo Van Tuan	Tan Long	Tan Duyet	Dam Doi	Ca Mau	P.monodon
	Phan Thanh Vu	Tan Long	Tan Duyet	Dam Doi	Ca Mau	P.monodon
	Phan Van Chuong	Tan Long	Tan Duyet	Dam Doi	Ca Mau	P.monodon
	Phan Van Lon	Tan Long	Tan Duyet	Dam Doi	Ca Mau	P.monodon
	Phan Van Bac	Tan Long	Tan Duyet	Dam Doi	Ca Mau	P.monodon
	Ngo truong Giang	Tan Long	Tan Duyet	Dam Doi	Ca Mau	P.monodon
	Phan Van Dong	Tan Long	Tan Duyet	Dam Doi	Ca Mau	P.monodon
	Lam Van Khiem	Tan Long	Tan Duyet	Dam Doi	Ca Mau	P.monodon
	Do Van Luy	Tan Long	Tan Duyet	Dam Doi	Ca Mau	P.monodon
	Huynh Van Xe	Tan Long	Tan Duyet	Dam Doi	Ca Mau	P.monodon
	Nguyen Van Muoi	Tan Long	Tan Duyet	Dam Doi	Ca Mau	P.monodon
	Nguyen Van Tuan	Tan Long	Tan Duyet	Dam Doi	Ca Mau	P.monodon
	Ha Phuong Dong	Tan Long	Tan Duyet	Dam Doi	Ca Mau	P.monodon
	Le Minh Vung	Tan Long	Tan Duyet	Dam Doi	Ca Mau	P.monodon
	Le Minh Khang	Tan Long	Tan Duyet	Dam Doi	Ca Mau	P.monodon
	Ho Tuan Giang	Tan Long	Tan Duyet	Dam Doi	Ca Mau	P.monodon
	Ta Thanh Phong	Ap 2	Thanh Phu	Binh Dai	Ben Tre	P.monodon
	Vo Van Duc	Ap 2	Thanh Phu	Binh Dai	Ben Tre	P.monodon
	Pham Van Hoa	Ap 2	Thanh Phu	Binh Dai	Ben Tre	P.monodon
	Tran Van Dung	Ap 2	Thanh Phu	Binh Dai	Ben Tre	P.monodon

	Vo Van Tung	Ap 2	Thanh Phu	Binh Dai	Ben Tre	P.monodon
	Le Hong Tham	Ap 2	Thanh Phu	Binh Dai	Ben Tre	P.monodon
	Le Van Viet	Ap 2	Thanh Phu	Binh Dai	Ben Tre	P.monodon
	Vo Van O	Ap 2	Thanh Phu	Binh Dai	Ben Tre	P.monodon
	Le Phuoc Hoa	Ap 2	Thanh Phu	Binh Dai	Ben Tre	P.monodon
	Tong Van Chien	Ap 2	Thanh Phu	Binh Dai	Ben Tre	P.monodon
	Tong Duy Thanh	Ap 2	Thanh Phu	Binh Dai	Ben Tre	P.monodon
	Vo Van Nha	Ap 2	Thanh Phu	Binh Dai	Ben Tre	P.monodon
	nguyen Van Doan	Ap 2	Thanh Phu	Binh Dai	Ben Tre	P.monodon
	Vo Van De	Ap 2	Thanh Phu	Binh Dai	Ben Tre	P.monodon
	Tran Van Phong	Ap 2	Thanh Phu	Binh Dai	Ben Tre	P.monodon
	Tran Van Chien	Ap 2	Thanh Phu	Binh Dai	Ben Tre	P.monodon
	Ho Van dDuc	Ap 2	Thanh Phu	Binh Dai	Ben Tre	P.monodon
	Nguyen Viet Hung	Ap 2	Thanh Phu	Binh Dai	Ben Tre	P.monodon
	Ho Thi Hoa	Ap 2	Thanh Phu	Binh Dai	Ben Tre	P.monodon
	Ngo Van Phuong	Ap 2	Thanh Phu	Binh Dai	Ben Tre	P.monodon
	Quach Van Xia	Cha La	Tran Tham	Dam Doi	Ca Mau	P.manamei
	Quach Da	Cha La	Tran Tham	Dam Doi	Ca Mau	P.manamei
	Le Van Thoang	Cha La	Tran Tham	Dam Doi	Ca Mau	P.manamei
	Le Van Luyen	Cha La	Tran Tham	Dam Doi	Ca Mau	P.manamei
	Le Van Muoi	Cha La	Tran Tham	Dam Doi	Ca Mau	P.manamei
	Nguyen Minh Hien	Cha La	Tran Tham	Dam Doi	Ca Mau	P.manamei
	Le Thanh Liem	Cha La	Tran Tham	Dam Doi	Ca Mau	P.manamei
	Trinh Thanh Nha	Cha La	Tran Tham	Dam Doi	Ca Mau	P.manamei

	Mai Huu Su	Cha La	Tran Tham	Dam Doi	Ca Mau	P.manamei
	Le Thanh Liem	Cha La	Tran Tham	Dam Doi	Ca Mau	P.manamei
	Le Van Thang	Cha La	Tran Tham	Dam Doi	Ca Mau	P.manamei
	Tran Tiet Hong	Cha La	Tran Tham	Dam Doi	Ca Mau	P.manamei
	Tang Sinh Sem	Cha La	Tran Tham	Dam Doi	Ca Mau	P.manamei
	Nguyen Hien Thuc	Cha La	Tran Tham	Dam Doi	Ca Mau	P.manamei
	Tran Quoc Toan	Cha La	Tran Tham	Dam Doi	Ca Mau	P.manamei
	Nguyen Van Khoi	Ap 3	Thanh Trị	Binh Dai	Ben Tre	P.manamei
	Ho Trung Hieu	Ap 3	Thanh Trị	Binh Dai	Ben Tre	P.manamei
	Ho Trung Tin	Ap 3	Thanh Trị	Binh Dai	Ben Tre	P.manamei
	Ho Tuan Kiet	Ap 3	Thanh Trị	Binh Dai	Ben Tre	P.manamei
	Tran Van Nghia	Ap 3	Thanh Trị	Binh Dai	Ben Tre	P.manamei
	Duong Van On	Ap 3	Thanh Trị	Binh Dai	Ben Tre	P.manamei
	Truong Hai Manh	Ap 3	Thanh Trị	Binh Dai	Ben Tre	P.manamei
	To Huu Loi	Ap 3	Thanh Trị	Binh Dai	Ben Tre	P.manamei
	Tran Van Phong	Ap 3	Thanh Trị	Binh Dai	Ben Tre	P.manamei
	Tran Quoc Cuong	Ap 3	Thanh Trị	Binh Dai	Ben Tre	P.manamei
	Le Hong Khanh	Ap 3	Thanh Trị	Binh Dai	Ben Tre	P.manamei
	Le Van Hai	Ap 3	Thanh Trị	Binh Dai	Ben Tre	P.manamei
	Nguyen Truong Han	Ap 3	Thanh Trị	Binh Dai	Ben Tre	P.manamei
	Le Minh Bang	Ap 3	Thanh Trị	Binh Dai	Ben Tre	P.manamei
	Nguyen Van Hai	Ap 3	Thanh Trị	Binh Dai	Ben Tre	P.manamei

Annex 3. List of surveyed traders

No	Owne's name	Village	Commune	District	Province
1	Nguyen Minh Giup	Tran Do	Thanh Phu	Cai Nuoc	Ca Mau
2	Tran Quoc Toan	Tan Thoi	An Xuyen	Tp Ca Mau	Ca Mau
3	Ma Minh Thang	Tan Thoi	An Xuyen	Tp Ca Mau	Ca Mau
4	Huynh Van Anh	Khu Pho 2	Phuong 5	Tp Ca Mau	Ca Mau
5	Tran Quoc Hung	-	Phuong 7	Tp Ca Mau	Ca Mau
6	Tran Van Ta	Lang Cung	Thanh Phu	Cai Nuoc	Ca Mau
7	Nguyen Van Ty	Cai Bat	Loi An	Tran Van Thoi	Ca Mau
8	Nguyễn Van Ben	Cai Bat	Loi An	Tran Van Thoi	Ca Mau
9	Nguyen Van Tan	-	P7	Tp Ca Mau	Ca Mau
10	Duong Van Dinh	Lang Cung	Thanh Phu	Cai Nuoc	Ca Mau
11	Nguyen Van Giang	Dao Vien	Thanh Quoi	My Xuyen	Soc Trang
12	Hoang Thi Ngoc Loan	Hoa Khanh	Thanh Quoi	My Xuyen	Soc Trang
13	Cam Thanh	-	Ngoc Dong	My Xuyen	Soc Trang
14	Pham Hong Viet	Nhu Gia	Thanh Phu	My Xuyen	Soc Trang
15	Hong Vu Quaang	Nhu Gia	Thanh Phu	My Xuyen	Soc Trang
16	Tran Minh Hoang	Nhu Gia	Thanh Phu	My Xuyen	Soc Trang
17	Duy Dan	Ap 9	Phong Thanh Nam	Phuoc Long	Bac Lieu
18	Ho Vu Quang	Ap 2	Phong Thanh Dong A	Gia Rai	Bac Lieu
19	Ta Hoang Nam	Xom Moi	Tan Thanh	Gia Rai	Bac Lieu
20	Minh Duc	Ap 4	Ho Phong	Gia Rai	Bac Lieu
21	Nguyen Thi Ngoc Nu	-	Phong Thanh Dong	Gia Rai	Bac Lieu
22	Pham Hong Viet	Phu Vinh Tay	-	Phuoc Long	Bac Lieu
23	Phan Ly Sol	Ap 12	Vinh Hau A	Hoa Binh	Bac Lieu

24	Dinh The Hai	-	P.Nha Mat	Tp.Bac Lieu	Bac Lieu
25	Ly Thi My	-	Vinh Hau A	Hoa Binh	Bac Lieu
26	Tran Le Hang	-	Phong Thanh Dong	Gia Rai	Bac Lieu
27	Chi Mi	Nhuy Cam	Vinh Loc	Hong Dan	Bac Lieu
28	Tran Van Quang	-	Vinh Phu Tay	Phuoc Long	Bac Lieu
29	Pham Hong Viet	-	Vinh Phu Tay	Phuoc Long	Bac Lieu
30	Hong Vu Quaang	Ap 2	Phong Thanh Dong A	Gia Rai	Bac Lieu

Annex 4. List of surveyed processors

N	Interviewee's na	Company name	Village	Commune	District	Provinc
1	Tran Khanh	Cong ty TNHH Thuy san Nigico	Quoc lo 1A	TT Ho Phong	Gia Rai	Bac Lieu
2	Nguyen Thi Tuyêt	Xi nghiep 2, cong ty CBTS SXNK Cà Ma	số 333 Cao Thắng	Phường 8	TP. Cà Mau	Ca Mau
3	Pham Van Thanh	Xi nghiệp KD CBTS XK Ngoc Sinh	ap 6	Khánh An	U Minh	Ca Mau
4	Mai Minh Ky	Phan xuong 3, XN CBTS XK Tra Kha- C Minh Hai	QL 1A	F8	TX Bac Lieu	Bac Lieu
5	Ngo Anh Tuan	Cong ty TNHH KDCBTS XNK Quoc Viet	Ly Thuong Ki	f6	TP. Cà Mau	Ca Mau
6	Huynh Huu Nhan	Cong ty CPCBTS XNK Kien Luong	Minh Phong	Binh An	Chau Thanh	Kien Giang
7	Doan Ngoc Ha	Cong ty CPTS Bac Lieu	Ap 2	TT Gia Rai	Gia Rai	Bac Lieu
8	Nguyen Van Dau	Cong ty CPHS Minh Phu		F8	TP. Cà Mau	Ca Mau
9	Huynh Van Vung	Cong ty XNK Ca Mau		F6	TP. Cà Mau	Ca Mau
10	Le Dung Khang	Cong ty CPCB& TS Thanh Doan	QL 1A	F8	TP. Cà Mau	Ca Mau
11	Ngo Van Bao	Cong ty TSXK Tac Dan	180A	Dịnh Bình	TP. Cà Mau	Ca Mau

12	Trinh Thanh Hung	Cong ty CP XNK tong hop Gia Rai	QL 1A	TT Ho Phong	Gia Rai	Bac Lieu
13	Ho Nhu Quy	Cong ty CP XNK Vinh Loi	QL 1A	TT Hoa Binh	Hoa Binh	Bac Lieu
14	Vo Dang Khoa	Cong ty TNHH TPTS Minh Bach	Khom B	Tan Phong	Gia Rai	Bac Lieu
15	Ho Phu Gia	Cong ty TNHH Phu Gia	Khom B	Tan Phong	Gia Rai	Bac Lieu
16	Huynh Cong Truor	Cong ty TNHH CBTS & XNK Trang Kha	So 99	F5	TX Bac Lieu	Bac Lieu
17	Nguyen Xuan Son	Cong ty TNHH DV & XNK Huynh Huor		Hung My	Cai Nuoc	Ca Mau
18	Nguyen Huu Nghi	Cong ty CP XNKTS Nam Can	So 3 duong s bay	TT Nam Can	Nam Can	Ca Mau
19	Tran Ai Quang Mir	Chi nhanh cong ty TNHH Grobest	Nhan Dan B	Tan Phong	Gia Rai	Bac Lieu
20	Cao Cong Bang	Xi nghiep CBTS XK Cadovimex	Khom 2	TT Cai Doi Va	Phu Tan	Ca Mau
21	Truong Minh Canh	XNK Ca Mau (FFC)		Luong The Tr	Cai Nuoc	Ca Mau
22	Huynh Minh Trung	Cong ty TNHH Minh Duc	QL 1A	Dinh Binh	TP. Cà Mau	Ca Mau
23	Cao Tri Nghia	Cong ty TNHH Một Thanh Vien Ngoc	QL 1A	F7	TP Soc Trang	Soc Trang
24	Truong Tri Binh	Xi Nghiep Dong lanh Phat Dat	QL 1A	F7	TP Soc Trang	Soc Trang
25	Le Trieu Vinh	Cong ty TNHH CBTS&XNK Phu Cuong	Ly Thuong Ki	F6	TP. Cà Mau	Ca Mau
26	Ha Quoc Van	Cong ty XNK Minh Hai	9 Cao Thang	F6	TP. Cà Mau	Ca Mau
27	Nguyen Thuy Anh	Cong ty CBTS Ngoc Chau	Ap 7	Khanh Hoi	U Minh	Ca Mau
28	Quach Tuan	Cong ty Phuong Anh		Dinh Thanh	Dong Hai	Bac Lieu
29	Phan Duc Truc	Cong ty Dai Duong		Luong The Tr	Cai Nuoc	Ca Mau
30	Huynh Chi Cuong	Cong ty XNK Chi Cuong		Luong The Tr	Cai Nuoc	Ca Mau

Annex 5. Socio - economic indicators of the sampled stakeholders

No.	Items	Farmers		Trader	Proeessor
		P.Monodon	*P.Vanamei*		
1	Age (years)	46.46	45.7	49.67	37.30
2	Experience in shrimp industry (years)	11.13	6.67	9.73	9.43
3	Gender				
3.1	Male (%)	98.67	100.00	86.67	96.67
3.2	Female (%)	1.33	-	13.33	3.33
4	Household size (no.)	4.48	4.67		
5	Number of family labors	3.15	2.90		
5.1	Male	3.15	2.90		
5.2	Female	1.65	1.50		
6	Number of family labors involved in shr	1.95	1.90		
6.1	Male	1.13	1.07		
6.2	Female	0.83	0.83		
7	Number of shrimp farming employees	-	-		
7.1	Male	-	-		
7.2	Female	-	-		
8	Involvement with other occupation (%)	43.33	6.67		
	Of which: (%)				
8.1	Agriculture	43.33	100		
8.2	Livestock	76.92			
8.3	Trading	12.31			
8.4	Employee	7.69			

8.5	Other	3.08			
9	Illiterate (%)	-	-		
10	Literate (%)	100	100		
10.	Illiterate	-	-		
10.	Primary	-	-		-
10.	Secondary (SSC)	38.67	26.67	20.00	-
10.	High school (HSC)	48.00	43.33	60.00	6.67
10.	Vocational	13.33	30.00	20.00	-
10.	University	-	-		93.33
10.	Other	-	-		
11	Aquaculture technical knowledge (%)				
11.	Own	100.00	100.00		
11.	Training	94.00	100.00		
11.	Vocational	-	-		
11.	BSc	0.67	-		
11.	Higher	-	-		

Annex 6. Investment made in shrimp farming (*in average*)

	P.monodon		*P.vanamei*	
	Average	*% out*	*Average*	*% out*
Items of invesments	*(million VND)*	*of the tota*	*(million VND)*	*of the tota*
Construction of the system	29.91	36.95	16.87	35.89
Upgrading of the system	16.77	23.93	11.12	23.46

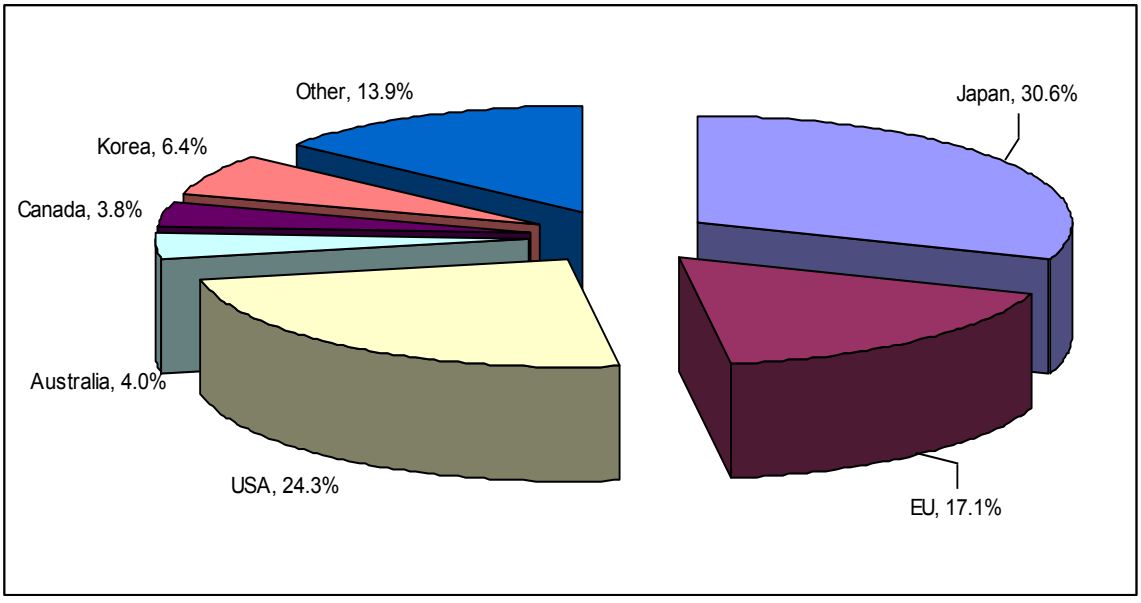
Machinery	13.20	19.55	10.97	20.02
Guard shade	3.39	5.04	2.16	4.93
Major equipment	8.58	12.86	9.67	13.99
Related fees & taxes/year	1.25	1.92	0.85	1.91
TOTAL	72.11	100.00	51.63	100.00

Annex 7: Volume and value of shrimp exported traded of Vietnam: 2006-2008

	Shimp production from culture *(1,000 tonnes)*	**Volume** *(1,000 tonnes)*	**Value** *(million USD)*
2005	327.20	159.19	1372.00
2006	354.50	158.45	1461.00
2007	384.50	161.27	1509.00
2008	388.40	191.55	1625.00

Sources: GOS 2008, VASEP 2008 & 2009

Export market structure of shrimp products in 2008 (by volume)



Sources: VASEP 2008 & 2009

Annex 8: Perception of change in shrimp farming

Annex 8.1. Perception of change in shrimp farming (*P.monodon)*

Indicator	in 2009			
	Level of change (%)			
	Decreased	Not chang	Increased	NA
Total culture area of the farm	-	100.00	-	-
Number of ponds	2.67	97.33	-	-
	No	Add	Remove	
Added or removed the nursery pond(s)	100.00			
Added or removed the sedimentation pond	100.00			
Investment (including machinery)	1.33	82.00	16.67	
Ownership of land	-	100.00		-
	More intensive	Same	More diversified	-
Type of farming		97.33	2.67	
Number of shrimp crops per year	-	100.00	-	-
Use of family labor	-	-	-	-
Use of hired labor	-	100.00	-	-
Species for aquaculture farming	-	100.00	-	-
	within district	Within province	imported from other province	-
Sources of seed	-	100.00	-	-
Average stocking density for crop 1	10.00	81.33	8.67	-
Stocking duration crop 1 (months/crop)	4.00	60.67	35.33	-
Use of home-made feed	-	-	-	-

Use of commercial feed	4.67	56.67	38.67	-
Use of chemicals/medicines	12.00	52.67	35.33	-
Shrimp yield crop 1	15.33	51.33	33.33	-
Marketing of shrimp		60.00	40.00	-
Average costs/ per ha of water area crop 1	15.33	51.33	33.33	-
Average profit per ha of water area crop 1	15.33	51.33	33.33	-

Annex 8.1. Perception of change in shrimp farming (*P.monodon) – cont.*

Indicator	in 2010			
	Level of change (%)			
	Decreased	Not changed	Increased	NA
Total culture area of the farm		100.00		
Number of ponds		100.00		
	No	Add	Remove	
Added or removed the nursery pond(s)	-	100.00	-	-
Added or removed the sedimentation pond	-	100.00	-	-
Investment (including machinery)	0.67	67.33	32.00	-
Ownership of land	-	100.00		-
	More intensiv	Same	More diversifie	-
Type of farming	-	52.67	47.33	-
Number of shrimp crops per year	-	99.33	0.67	-
Use of family labor	-	100.00	-	-
Use of hired labor	-	-	-	-
Species for aquaculture farming				
	within	Within	imported from	-

	district	province	other province	
Sources of seed	-	100.00	-	-
Average stocking density for crop 1	0.67	78.00	21.33	-
Stocking duration crop 1 (months/crop)	3.33	56.00	40.67	-
Use of home-made feed	-	-	-	-
Use of commercial feed	12.00	45.33	42.67	-
Use of chemicals/medicines	12.67	62.67	24.67	-
Shrimp yield crop 1	14.00	48.00	38.00	-
Marketing of shrimp	-	76.67	23.33	-
Average costs/ per ha of water area crop 1	14.00	48.00	38.00	-
Average profit per ha of water area crop 1	14.00	48.00	38.00	-

Annex 8.2. Perception of change in shrimp farming (*P. vanamei)*

Indicator	in 2009			
	Level of change (%)			
	Decreased	Not change	Increased	NA
Total culture area of the farm	-	10		
Number of ponds	-	10		
	No	Add	Remove	
Added or removed the nursery pond(s)	100.00			
Added or removed the sedimentation pond	100.00			
Investment (including machinery)	-	8	2	
Ownership of land	-	10		
	More intensiv	S	More diversi	
Type of farming	-	9		

Number of shrimp crops per year	-	100.00	-	-
Use of family labor	-	-	-	-
Use of hired labor	-	100.00	-	-
Species for aquaculture farming	-	100.00	-	-
	within district	Within province	imported fror other provinc	-
Sources of seed	-	100.00	-	-
Average stocking density for crop 1	-	50.00	50.00	-
Stocking duration crop 1 (months/crop)	-	76.67	23.33	-
Use of home-made feed	-	-	-	-
Use of commercial feed	-	33.33	66.67	-
Use of chemicals/medicines	16.67	56.67	26.67	-
Shrimp yield crop 1	20.00	53.33	26.67	-
Marketing of shrimp		53.33	46.67	-
Average costs/ per ha of water area crop 1	20.00	53.33	26.67	-
Average profit per ha of water area crop 1	20.00	53.33	26.67	

Annex 8.2. Perception of change in shrimp farming (*P. vanamei)- cont.*

Indicator	in 2010			
	Level of change (%)			
	Decreased	Not change	Increased	NA
Total culture area of the farm	-	100.00	-	-
Number of ponds	-	100.00	-	-
	No	Add	Remove	

Added or removed the nursery pond(s)	-	100.00	-	-
Added or removed the sedimentation pond	-	100.00	-	-
Investment (including machinery)	-	50.00	50.00	-
Ownership of land	-	100		-
	More intensiv	Same	More diversifi	-
Type of farming	-	63.33	36.67	-
Number of shrimp crops per year	-	100.00	-	-
Use of family labor	-	100	-	
Use of hired labor	-	-	-	-
Species for aquaculture farming	-	100	-	
	within	Within	imported fror	
	district	province	other provinc	-
Sources of seed	-	100	-	
Average stocking density for crop 1	-	43.33	56.67	-
Stocking duration crop 1 (months/crop)	-	63.33	36.67	-
Use of home-made feed	-	-	-	-
Use of commercial feed	26.67	16.67	56.67	-
Use of chemicals/medicines	13.33	60.00	26.67	-
Shrimp yield crop 1	16.67	56.67	26.67	-
Marketing of shrimp		73.33	26.67	-
Average costs/ per ha of water area crop 1	16.67	56.67	26.67	-
Average profit per ha of water area crop 1	16.67	56.67	26.67	-

Annex 9: Per hectare shrimp farming variable cost and their percentage

Annex 9.1: Per hectare shrimp farming variable cost and their percentage **(*P.monodon)***

Items of cost	in 2009		in 2010	
	Cost *(VND)*	%	Cost *(VND)*	%
Shrimp post larvae	7,445,128	8.65	22,025,833	11.33
Labor for pond preparation	5,752,133	5.49	1,856,667	1.19
Labor during production	7,146,747	11.48	5,090,000	3.35
Labor for harvest	696,333	1.29	900,000	0.72
Cost of Chlorine/Bleach	1,955,173	2.24	2,902,667	1.81
Cost of Lime	7,652,067	7.42	12,390,000	7.55
Cost of Chemicals/Drugs	2,083,880	2.68	1,876,500	1.17
Cost of Fertilizers	259,293	0.23	0	-
Cost of Home-made feed	0	-	0	-
Cost of Commercial feed	67,165,611	53.44	116,754,750	60.44
Cost of Electricity	800,647	0.61	316,667	0.13
Cost Fuel	5,024,227	5.73	20,513,333	12.15
Cost of Communication, harvest, transport	415,627	0.76	336,667	0.16
Cost of Others				
Total Cost	106,396,866	100.00	184,963,083	100.00

Annex 9.2: Per hectare shrimp farming variable cost and their percentage **(*P. vanamei)***

Items of cost	2009		2010	
	Cost *(VND)*	%	Cost *(VND)*	%
Shrimp post larvae	9,073,667	8.57	24,590,833	9.88
Labor for pond preparation	7,753,167	6.91	9,313,333	3.64
Labor during production	6,053,280	6.71	6,075,000	3.17
Labor for harvest	815,467	1.11	1,053,333	0.63
Cost of Chlorine/Bleach	1,882,360	1.95	3,342,667	1.69
Cost of lime	8,928,467	6.61	17,892,750	8.35
Cost of chemicals/Drugs	2,032,333	2.29	2,634,167	1.34
Cost of Fertilizers	131,953	0.10	0	-
Cost of Home-made feed	0	-	0	-
Cost of commercial feed	78,706,800	57.03	143,165,500	61.28
Cost of Electricity	1,013,367	0.60	0	-
Cost Fuel	6,836,933	7.47	19,055,333	9.62
Cost of Communication, harvest, trans.	504,000	0.64	711,667	0.39
Cost of Others	0		0	
Total Cost	123,731,793	100.00	227,834,583	100.00

Annex 10. Monthly average sale price for farmer for different sizes

Annex 10.1. Monthly average sale price for farmer for different sizes ***(P.monodon)***

	0-20	21-30	31-44	45-66	More tham 66
Sep-09	-	99,000	80,667	77,800	-
Oct-09	-	92,500	83,500	73,400	-
Nov-09	120,000	120,000	89,500	74,667	45,000
Dec-09	120,000	117,500	96,800	86,250	65,000
Jan-10	120,000	110,000	90,000	82,000	-
Feb-10	115,000	105,000	90,000	78,000	-
Mar-10	115,000	105,000	90,000	75,000	-
Apr-10	115,000	100,000	90,000	76,000	-
May-10	128,000	100,250	104,000	67,000	-
Jun-10	170,000	105,778	90,571	81,200	-
Jul-10	175,000	115,571	95,211	79,429	-
Aug-10	-	149,000	115,600	90,500	61,000
Sep-10	190,000	124,000	120,750	79,833	-
Oct-10	190,000	156,250	145,455	70,000	58,000
Nov-10	200,000	165,000	145,111	98,167	80,000

Unit: VND/kg

Annex 10.2. Monthly average sale price for farmer for different sizes ***(P. vanamei)***

	0-70	71-100	more than 100
Sep-09	76,500	58,000	-
Oct-09	82,800	56,667	-
Nov-09	78,200	65,667	-
Dec-09	84,333	65,750	-

Feb-10	87,000	-	-
Apr-10	85,000	70,000	-
May-10	84,000	63,333	-
Jun-10	90,000	73,000	52,500
Jul-10	91,000	68,000	-
Aug-10	87,000	59,000	-
Sep-10	88,000	72,000	-
Oct-10	88,000	78,857	-
Nov-10	90,000	77,000	-

Unit: VND/kg

Annex 11. Monthly average sale price for trader for different sizes

Annex 11.1. Monthly average sale price for trader for different sizes ***(P.monodon)*-HOSO** *Unit: VND/kg*

Date	Buying price:							Selling price:					
	0-20	21-30	31-44	45-66		67-100	Broken	0-20	21-30	31-44	45-66	67-100	Broken
Jul-09	140,345	107,724	88,017	70,793		54,241		147,138	114,517	94,810	77,586	61,034	
Aug-09	135,741	107,724	88,017	70,793		54,241		142,534	114,517	94,810	77,586	61,034	
Sep-09	146,483	112,931	92,862	75,793		59,241		153,103	120,103	100,103	82,897	66,034	
Oct-09	146,931	114,931	93,552	76,034		59,379		153,690	121,655	100,276	82,759	66,103	
Nov-09	155,897	117,724	98,655	76,586		60,931		162,621	124,448	131,193	83,310	67,655	
Dec-09	162,379	122,966	97,793	79,483		62,448		169,103	129,690	104,517	86,207	69,172	
Jan-10	162,379	122,966	97,931	79,483		62,448		169,103	129,690	104,655	86,207	69,172	
Feb-10	160,690	118,276	99,069	78,862		60,966		167,414	125,000	105,793	85,586	67,690	
Mar-01	161,276	120,034	99,379	77,172		60,552		168,000	126,759	106,103	83,897	67,276	
Apr-10	162,000	121,310	99,828	75,241		60,138		168,724	128,034	106,552	81,966	66,862	
May-10	164,414		97,552	73,621		60,138			129,345	104,276	80,345	66,862	

		122,621						171,138					
Jul-10	165,103	126,862	100,310	76,966		60,483		171,828	133,586	107,034	83,690	67,207	
Jun-10	171,655	131,828	102,448	76,345		59,310		178,379	138,552	109,172	83,069	66,034	
Aug-10	183,276	142,207	109,862	79,103		61,724		190,000	148,931	116,586	85,828	68,448	
Sep-10	206,517	162,276	116,517	86,965		61,552		213,241	169,000	123,241	93,690	68,276	
Oct-10	219,724	180,172	131,621	92,724		68,172		226,448	186,897	138,345	99,448	74,897	
Nov-10	231,517	181,862	137,621	96,345		70,345		238,241	188,586	144,345	103,069	77,069	

Annex 11.2. Monthly average sale price for trader for different sizes ***(P.monodon)*-HLSO**

	Selling price:						
	0-20	21-30	31-44	45-66		67-100	Broken
Jul-09	208,125	155,765	121,059	104,294		81,824	-
Aug-09	208,125	155,765	121,059	104,294		81,824	-
Sep-09	197,182	151,771	130,753	110,000		88,059	-
Oct-09	209,412	160,824	131,588	107,176		85,088	-
Nov-09	225,118	168,471	134,141	107,359		84,778	-
Dec-09	224,471	174,588	138,529	113,094		88,676	-
Jan-10	232,800	175,324	139,024	115,294		90,235	-

Feb-10	220,706	167,118	134,294	112,088		84,706	-
Mar-01	233,588	176,224	141,472	107,818		87,765	-
Apr-10	231,529	171,294	135,778	109,235		87,118	-
May-10	235,647	173,647	136,706	105,059		86,118	-
Jul-10	237,824	179,559	140,588	106,706		82,682	-
Jun-10	234,059	184,929	143,294	105,588		84,176	-
Aug-10	258,824	197,412	151,706	108,941		88,529	-
Sep-10	294,824	231,059	167,176	110,794		90,471	-
Oct-10	312,412	253,882	183,294	111,000		99,118	-
Nov-10	326,647	265,294	191,118	211,618		103,282	-

Unit: VND/kg

Annex 12. Monthly average sale price for processor for different sizes

Annex 12.1. Monthly average sale price for processor for different sizes ***(P.monodon)*-HOSO ,** *Unit: VND/kg*

Date	Buying price:							Selling price:					
	0-20	21-30	31-44	45-66		67-100	Broken	0-20	21-30	31-44	45-66	67-100	Broken
Jul-09	141,233	106,600	90,767	-		-		171,233	130,433	101,767			
Aug-09	139,867	109,133	88,533	-		-		157,867	127,133	100,533			

Sep-09	152,433	114,600	93,500	-		-		172,433	132,600	108,500			
Oct-09	157,833	117,567	95,600	-		-		178,833	135,567	108,600			
Nov-09	176,533	122,467	101,967	-		-		198,533	142,467	116,967			
Dec-09	185,367	134,300	111,467	-		-		205,367	149,300	126,467			
Jan-10	177,467	127,467	110,000	-		-		197,467	145,467	125,000			
Feb-10	154,833	122,867	135,000	-		-		174,833	140,867	153,000			
Mar-10	160,000	124,867	100,800	-		-		180,000	142,867	118,800			
Apr-10	161,767	126,533	104,333	-		-		176,767	126,549	114,333			
May-10	163,967	134,367	110,233	-		-		183,967	174,367	120,233			
Jun-10	164,633	130,233	109,433	-		-		184,633	148,233	124,433			
Jul-10	170,100	130,067	105,200	-		-		188,100	145,067	115,200			
Aug-10	182,600	141,100	109,567	-		-		192,600	153,100	119,567			
Sep-10	187,567	150,000	114,000	-		-		199,567	162,000	135,000			
Oct-10	189,800	152,367	109,567	-		-		209,800	170,367	124,567			
Nov-10	228,733	184,500	137,667	-		-		243,733	172,500	147,667			

Annex 12.2. Monthly average sale price for processor for different sizes ***(P.monodon)*-HLSO,** *Unit: VND/kg*

	Buying price:							Selling price:					
Date	0-20	21-30	31-44	45-66		67-100	Broken	0-20	21-30	31-44	45-66	67-10	Broken
Jul-09	168,700	130,133	102,767					189,667	141,033	126,700			
Aug-09	224,867	159,133	128,533					190,800	147,500	119,933			

Sep-09	237,433	159,600	133,500					207,333	155,333	129,400			
Oct-09	227,833	167,567	130,600					216,119	161,507	131,249			
Nov-09	256,533	177,467	146,967					241,689	167,917	140,128			
Dec-09	265,367	184,300	151,467					253,413	183,067	152,308			
Jan-10	252,467	205,467	155,000					243,060	173,995	150,760			
Feb-10	234,833	172,867	175,000					209,717	167,168	188,706			
Mar-10	238,000	174,867	130,800					217,166	170,058	180,800			
Apr-10	211,767	128,520	144,333					219,305	172,520	142,922			
May-10	238,967	164,367	130,233					222,626	182,763	149,463			
Jun-10	204,633	150,233	129,433					223,370	190,233	148,755			
Jul-10	200,100	150,067	125,200					230,460	177,172	143,392			
Aug-10	221,600	171,100	138,433					248,369	191,636	149,125			
Sep-10	137,567	187,000	134,000					256,323	204,668	114,001			
Oct-10	204,800	172,367	129,567					259,374	208,055	149,091			
Nov-10	243,733	194,500	157,667					250,733	252,048	187,515			

Annex 12.3. Monthly average sale price for processor for different sizes ***(P. vanamei)*-HOSO,** *Unit: VND/kg*

	Buying price:							Selling price:					
Date	0-20	21-30	31-44	45-66		67-100	more than 100	0-20	21-30	31-44	45-66	67-100	more than 100
Jul-09				58,133		52,400	48,333				88,200	81,933	78,167
Aug-09				58,067		53,533	45,900				86,067	83,533	75,900
Sep-09				60,300		55,033					90,533	85,400	78,933

							48,367						
Oct-09				62,100		56,600	51,467				92,100	86,600	81,467
Nov-09				63,267		57,067	51,800				93,267	87,067	81,800
Dec-09				68,500		61,467	57,567				98,500	91,467	87,567
Jan-10				72,133		64,667	57,733				102,133	94,667	87,733
Feb-10				66,967		61,133	54,933				96,967	91,133	84,933
Mar-10				69,333		62,467	57,167				99,333	92,467	87,167
Apr-10				72,300		66,167	60,133				102,300	96,167	90,133
May-10				70,233		60,333	55,633				100,233	90,333	85,633
Jun-10				68,833		60,433	53,733				98,833	90,433	84,733
Jul-10				68,600		60,133	53,833				98,600	90,133	83,833
Aug-10				72,400		62,167	56,600				102,400	92,167	86,600
Sep-10				84,267		73,367	64,733				114,267	103,367	94,733
Oct-10				86,167		81,967	73,233				117,167	110,967	100,233
Nov-10				89,167		82,967	75,233				119,167	112,967	104,667

Annex 12.4. Monthly average sale price for processor for different sizes ***(P. vanamei)*-HLSO,** *Unit: VND/kg*

	Buying price:							Selling price:					
Date	0-20	21-30	31-44	45-66		67-100	>100	0-20	21-30	31-44	45-66	67-100	> 100
Jul-09				88,367		82,567					108,367	102,567	96,767

							78,300						
Aug-09				87,400		83,533	75,900				107,400	103,533	95,900
Sep-09				89,867		85,167	78,367				110,033	104,633	98,967
Oct-09				92,100		86,600	81,467				112,233	106,600	101,467
Nov-09				93,267		87,067	81,800				113,267	107,067	101,800
Dec-09				98,500		91,467	87,567				118,500	111,467	107,567
Jan-10				102,133		94,667	87,733				122,133	114,667	107,733
Feb-10				96,967		91,133	84,933				116,967	111,133	104,933
Mar-10				99,233		92,267	87,167				118,733	112,467	107,167
Apr-10				102,300		96,167	90,133				122,300	116,167	110,133
May-10				100,233		90,333	85,633				120,233	10,333	105,633
Jun-10				98,833		90,433	75,206				118,833	110,433	98,206
Jul-10				98,600		90,133	83,833				118,600	110,133	103,833
Aug-10				102,400		92,167					122,400	112,167	106,600

							86,600						
Sep-10				114,267		103,367	94,733				134,267	123,367	114,733
Oct-10				117,167		110,967	100,233				135,167	129,967	120,233
Nov-10				119,167		112,967	105,233				139,167	132,967	123,967

Annex 13. Perception of the stakeholders on the unusual events last two years (%)[1]

No.	Events:	*PMF (N=154)*	*PVF(N=23)*
1	Knew that the tsunami affected some Asian countries	81.17	78.26
2	Affected by the tsunami	30.40	5.56
3	Knew that the US anti-dumping affected some Asian countries	85.06	56.52
4	Affected by the US anti- dumping	85.50	76.92
5	Have done anything to prevent the effect of th US anti-dumping?	89.31	39.13

Annex 14. Impact of the US anti-dumping[1]

No.	Impacts:	*PMF (N=154)*	*PVF(N=23)*
1	Affected to mental farmers	25.89	-
2	Lost profits/reduce income	56.25	30.0
3	Shrimp price reducing	42.86	60.0
4	Faced limitation for export markets	10.71	-
5	Reduce surface areas	-	10.0
6	Others	4.46	10.0

Annex 15: Solutions to mitigate the impact of the US anti-dumping[1]

No.	Solutions:	*PMF (N=154)*	*PVF(N=23)*
1	Government helps to stabilize price	32.48	-
2	Develop organic shrimp farming	38.46	-
3	Government policy for final support	4.27	-
4	Strictly manage and test food safety criterion before exporting	33.33	-

5	Expansion of the markets, more market penetration	14.53	-
6	Others	7.69	-

Annex 16. Perceived reasons and impact of price trends from shrimp farmer survey[1]

	N	**%**
Received the incentives	**105**	**100**
Loan	73	67.59
Other	32	29.63
The sources of incentives		
Relatives	13	12.38
Bank	59	56.19
Wholesale	18	17.14
Collector	12	11.43
Other	3	2.86

(1) Sources: NACA,2006 & 2010

Annex 17: Questionnaire for shrimp farmers

Study on Evaluation of the impact of the Indian Ocean Tsunami and US anti-dumping duties on the shrimp farming sector of South and South-East Asia

Questionnaire for shrimp farmers

(Cultured species: [ ] *P. Vanamae*; [ ] *P.Monodon*)

Sample No _____ Name of interviewer: _____ Date: _____

The objective of this questionnaire is to collect information on your experiences in shrimp farming over the past few years so that we can advise the government of the regional countries that buy shrimp on ways to maximize the income from shrimp farming.

Although we will collect a lot of information about the money you spend and the money you earn, this information will not be reported to anybody outside our team, it will only be used to assess the overall process and it will not be used to impose taxes against you or your product.

General questions

1. Farmer's name: _____; Tel:_____;
2. Address: _____

2.1. Village _____2.2. Commune_____

2.3. District _____2.4. Province _____

3. Age: _____
4. Gender: □ Male □ Female
5. Household size:_____ pers.
6. Family labor: _____ 6.1. Male _____ 6.2. Female_____
7. Family labors involved in shrimp farming _____ 7.1. Male _____ 7.2. Female _____
8. Regular hired labors for shrimp farming: 8.1. Male _____ 8.2. Female _____
9. Do you have any other occupation? □ Yes □ No

   If YES, please specify

   □ Agriculture □ Livestock □ Trading □ Employee

   □ Other (specify)_____

10. Education: ☐Illiterate ☐Primary ☐Secondary(SSC) ☐Highschool(HSC)

☐Vocational ☐University☐ Other (specify) ____

11. Aquaculture technical level: ☐Own ☐Training☐Vocational ☐Bsc ☐Higher

12. How long have you been farming shrimp? _____ years

13. What is the total area of the farm? _____ha

14. What is the total area of the shrimp pond(s)? _____ha

15. What is the total number of shrimp ponds? _____ pond(s)

16. The area of sedimentation/treatment pond(s)? _____ha

17. area of used nursery pond(s)? _____ha

18. How many owners does you farm have? ☐Singleowner ☐2-4 ☐5ormore

19. What is the shrimp cultured area you lease?_____ha,

19.1 The costs to which you lease the farm/yr? VND_____/____year(s)

20. Do you have any other arrangement for using the land? ☐ Yes ☐No

20.1 If YES, please describe the arrangement:_____ _____

Investment for shrimp farming	**1. When (yr)?**	**2. Value (VNDs)**	**3. Usable duration (yrs)**
21. Construction of the system			
22. Upgrading of the system			
23. Machinery			
24. Guard shade			
25. Major equipment			

26. Related fees & taxes/year	x		x

Comparing 2 years, 2004 & 2005 (ask if there were any changes, How and Why)

Issue	**1. Level of change** **(1=Decreased; 2=Not changed; 3=Increased)**	**2. If CHANGED,** **specify how & why (a = 2008; b = 2009)**
27. Total culture area of your farm	Code _____ Code _____	a._____ b._____
28. Number of ponds	Code _____ Code _____	a._____ b._____
29. Added or removed the nursery pond	☐No ☐Add ☐Remove	a._____ b._____
30. Added or removed the sedimentation pond(s)	☐No ☐Add ☐Remove	a._____ b._____
31. Investment (including machinery)	Code _____ Code _____	a._____ b._____
32. Ownership of land	Code _____ Code _____	a._____ b._____
33. Type of farming (1=more intensive; 2=same; 3= more diversified)	Code _____ Code _____	a._____ b._____
34. Number of shrimp crops per year	Code _____ Code _____	a._____ b._____
35. Use of family labor	Code _____ Code _____	a._____ b._____
36. Use of hired labor	Code _____ Code _____	a._____ b._____
37. Species for aquaculture farming	Code _____	a._____

	Code _____	b._____
38. Sources of seed (a=within D b=within prov; c= imported from o prov)	Code _____ Code _____	a._____ b._____
39. Average stocking density for crop 1	Code _____ Code _____	a._____ b._____
40. Stocking duration crop 1 (months/cr	Code _____ Code _____	a._____ b._____
41. Use of home-made feed	Code _____ Code _____	a._____ b._____
42. Use of commercial feed	Code _____ Code _____	a._____ b._____
43. Use of chemicals/medicines	Code _____ Code _____	a._____ b._____
44 Shrimp yield crop 1	Code _____ Code _____	a._____ b._____
45. Marketing of shrimp	Code _____ Code _____	a._____ b._____
46. Average costs/ per ha of water crop 1[6]	Code _____ Code _____	a._____ b._____
47. Average profit per ha of water area 1	Code _____ Code _____	a._____ b._____
48. Any other change Specified:	Code _____ Code _____	a._____ b._____

Some questions specific to the first crop of shrimp you harvested in 2008 & 2009

	1. 2008	**2. 2009**
49. What is the total pond area in which you produced shrimp in your farm (__ha)?		
50. How many crops did you have that year of a.Udang windu/monodon b. Vanamae	a. _____	a. _____

	b._____	b._____
51. What type of farming did you apply during that year? (1 = monoculture ; 2 = polyculture)		
52. In which month did you stock the 1st crop fo the 1st time?		
53. How many times did you stock shrimp for t crop?		
54 What species did you stock in the 1st crop?	a. _____ b._____	a. _____ b._____
55. How many seed did you stock in the 1st cro	a. _____ b._____	a. _____ b._____
56. Where the Monodon PL produced or wild caught? (1 = hatchery; 2 = wild caught)	a. _____ b._____ c._____	a. _____ b._____ c._____
57. What was the stocking density in the grow-ponds (pieces/m^2) in the 1st crop? (a =Monodo = Vannamei)	a. _____ b._____	a. _____ b._____
58 Did you stock any fish in that pond and cultu them with the shrimp in the 1st crop? (Y/N)	a. _____ b._____	a. _____ b._____
59. What species of fish?		
60. How many fish did you stock?		
61. In which month did you start harvesting the shrimp for the first crop?		
62. How many times did you harvest in the cro		
63. In which month did you finish harvesting th shrimp for the 1st crop?		
64. To whom did you sell the shrimp after harvesting the 1st crop? (a=collector/trader; b=wholeseller; c=processing plant; d=others)		

Now some questions about the cost of farming the first crop of SHRIMP in 2008 & 2009

Cost items	65. 2008			66. 2009		
	a. Quantity	b. Unit cost (VND)	c. Total co (VND)	a. Quantity	b. Unit cost (VND)	c. Total cost (VND)
1. Shrimp postlarvae						
2. Other fish seed						
3. Labour for pond preparati (mandays)						
4. Labour during production (mandays)						
5. Labour for harvest (mand						
6. Chlorine/Bleach (litre)						
7. Chemicals/Drugs						
8. Lime (kg)						
9. Fertilizers, if any (kg)						
10. Home-made feed, if ar (kg)						
11. Commercial feed, if an (kg)						
12. Electricity						
13. Fuels						
14. Communication, harve transport						
15. Others, if any						

67. What incentives did you get? □ Loan □ Other (specify)_____

68. From whom do you get incentives? _____

69. Have the prices you get for your shrimp changed over the past 5 years?

□Yes Decreased □Yes Increased

□Fluctuated □No change

69.1 If yes, when did prices change over the past 5 years? _____ □ Don't know

69.2 What do you think were the reasons for this change?

1. Reason 1: _____

2. Reason 2: _____

3. Reason 3: _____

70. Have the prices you get for your shrimp changed since the start of 2008?

□Yes Decreased □Yes Increased □Fluctuated □No change

70.1 If yes, when did prices change? _____ □ Don't know

70.2 What do you think were the reasons for this change?

1. Reason 1: _____

2. Reason 2: _____

3. Reason 3: _____

71. What stakeholders are most negatively/positively affected by these changes? □□ No one or

Stakeholder	1. Negative effec	2. Positive effec
a. □□ Farmers		
b. □□ collector/trader		
c. □Wholeseller		
d. □□ Processors		
e. □□ Exporters		

f. Other		

I will now ask you some questions about the prices you got over the last 3 years for your shrimp. We know that you harvested shrimp many times since the first crop of 2008. For each time you sold shrimp we would like to know:

- in which month you sold the shrimp

- for each species of shrimp you sold, how many kg of shrimp did you sell for each size - for each species of shrimp you sold, what was the price of every size at that time.

72. First of all, you sell the shrimp as HOSO or HLSO? ☐ HOSO ☐ HLSO

IMPORTANT! FOR THE INTERVIEWER
If both HOSO and HLSO are sold, it is important that "HOSO" or "HLSO" shoul specified in the last column
If possible use the sizes reported in the table below
Pieces/kg
20=1-20 pieces/kg
30=21-30 pieces/kg
44=31-44 pieces/kg
66=45-66 pieces/kg
100=67-100 pieces/kg
Broken=Broken

Prompt month by month starting from January 2008 and finishing with June 2009

73. Prompt month by month starting from January 2008 and finishing with June 2009

Month/Year	Species	Pieces / kg	Quantity (kg)	Price (VNDs)	HOSO/HLSO

74. Do you know about the Tsunami that hit some countries in Asia in 2004?

□Yes □No

75. Do you think that the Tsunami had an impact on your livelihood?

□Yes □No

If YES, what impact did it have?

75.1. Impact 1 _____

75.2. Impact 2 _____

75.3. Impact 3 _____

76. Do you know about the US antidumping affecting some countries in Asia in 2004?

□Yes □No

77. Do you think that the US antidumping had an impact on your livelihood?□Yes□No

If YES, what impact did it have?

77.1. Impact 1 _____

77.2. Impact 2 _____

77.3. Impact 3 _____

78. What did you do to prevent the impact of US antidumping on your livelihood?

78.1. Activity 1 _____

78.2. Activity 2 _____

78.3. Activity 3

THANK YOU VERY MUCH FOR YOUR HELP

FOR THE INTERVIEWER

Add below any comments you may have on this interview (eg quality of the information, quality of farm management, etc.)

Annex 18: Questionnaire for shrimp traders

Study on Evaluation of the impact of the Indian Ocean Tsunami and US anti-dumping duties on the shrimp farming sector of South and South-East Asia

Questionnaire for Collector/Traders/Wholeseller

(Sub: used for both P.Monodon and P. Vanamae traders)

Sample No _____ Name of interviewer: _____ Date: _____

The objective of this questionnaire is to collect information on your experiences in shrimp farming over the past few years so that we can advise the government of the regional countries that buy shrimp on ways to maximize the income from shrimp farming.

Although we will collect a lot of information about the money you spend and the money you earn, this information will not be reported to anybody outside our team, it will only be used to assess the overall process and it will not be used to impose taxes against you or your product.

Interviewee information

1. Name of interviewee _____; Tel:_____ ;

2. Name of the business: _____

25.1 Village_____ 25.2 Sub-district_____

25.3 District_____25.4 Province _____

3. Age: _____

4 Gender: ☐ Male ☐ Female

5. Household size:_____ pers.

6. What is your position in the business? _____

7. Do you have any other occupation? ☐ Yes ☐ No

If YES, please specify

☐ Shrimp farming ☐ Agriculture ☐ Livestock ☐ Employee ☐ Other (specify)_____

8. Education:

☐ Illiterate ☐ Primary ☐ Secondary (SSC) ☐ Highschool (HSC)

☐ Vocational ☐ University ☐ Other (specify) _____

9. Aquaculture technical level:

☐ Own ☐ Training ☐ Vocational ☐ BSc ☐ Higher

10. How long is the longest experience in shrimp trading among the management of the business?_____ years

11. How many owners does you business have?

☐ Single owner ☐ 2-4 Person ☐ >=5 Person

Investment for shrimp trading	1. When (year)?
12. Construction of the business	
13. Upgrading of the business	
14. Machinery	
15. Trading place	
16. Major equipment	
a. Property/location rent	
b. Related fees & taxes/year	

Major traded commodities

17. What are the most important fisheries species and the total quantity traded by you in 2008?

Commodity	Quantity (kg)	Commodity	Quantity (kg)
1.		6.	
2.		7.	
3.		8.	
4.		9.	
5.		10.	

18. Now I would like to ask you some more specific information on the volume of shrimp your business traded over the last 4 years for *Monodon* and *Vannamei*.

Year	*Monodon* (kg)		*Vannamei* (kg)	
	HOSO	HLSO	HOSO	HLSO
2006				
2007				
2008				
2009				

19. Do you think there is enough supply of shrimp for your business? ☐Yes ☐No

If NOT, what are the main reasons for the lack of shrimp?

19.1 Reason 1 _____

19.2 Reason 2 _____

19.3 Reason 3 _____

20. Do you have problems with selling shrimp? □Yes □No

If YES, what are the main problems in selling shrimp?

20.1 Problem 1 _____

20.2 Problem 2 _____

20.3 Problem 3 _____

Price trends

21. Have the prices you get for your shrimp changed over the past 5 years?

□Yes Decreased □Yes Increased □Fluctuated □No change

21.1 If yes, when did prices change over the past 5 years? _____ □ Don't know

21.2 What do you think were the reasons for this change?

1. Reason 1: _____

2. Reason 2: _____

3. Reason 3: _____

22. Have the prices you get for your shrimp changed since the start of 2008?

□Yes Decreased □Yes Increased □Fluctuated □No change

22.1 If yes, when did prices change? _____ □ Don't know

22.2 What do you think were the reasons for this change?

1. Reason 1: _____

2. Reason 2: _____

3. Reason 3: _____

23. What stakeholders are most negatively/positively affected by these changes? □□ No one or

Stakeholder	1. Negative effects	2. Positive effects
a. □ Farmers		
b. □ Collector/trader		
c. □Wholeseller		
d. □Processors		

e. Exporters		
f. Other _____		

Now I would like to know some specific information about your business. I will ask you for some information on the prices you pay to procure and you get from resale. Please be aware that this information would be used in complete confidentiality and we will not reveal to people outside our team specific information about your business. We have a common goal, which is to maximize profits from shrimp farming and we would require accurate information from you to be able to do that.

	Năm 2008	**Năm 2009**
24. How many family labors involving in shrimp trading? a. Male b. Female	a._____ b. _____	a._____ b. _____
25. How many regular labors involving in shrimp trading did you hire? a. Male b. Female	a._____ b. _____	a._____ b. _____
26. How many seasonal labors involving in shrimp trading did you hire? a. Male b. Female	a._____ b. _____	a._____ b. _____
27. Total amount bought (kg)		
a. from farmers		
b. from collector/trader		
c. from wholeseller		
d. from processors		
e. from others *(specify)*		
28. Total amount resold (kg)		

a. to farmers		
b. to collector/trader		
c. to wholeseller		
d. to others *(specify)*		
29. Did you give any incentives (e.g. commission) to anybody supplying shrimp to you? ☐ Yes ☐		
30. If yes, to whom did you give incentive	a._____ b. _____	a._____ b. _____
31.What incentives did you give?	a._____ b. _____	a._____ b. _____
32. Did you get any incentives (e.g. commission) from anybody supplying shrimp to you? ☐ Yes ☐☐ No		
33. If yes, to whom did you get centives?	a._____ b. _____	a._____ b. _____
34. What incentives did you get?	a._____ b. _____	a._____ b. _____

I will now ask you some questions about the prices you got since January 2008 for your

shrimp and the prices at which you sold the shrimp. If you have records of these prices we would very much like to look at them. If you don't have records, you may not remember exactly the prices for every size and every month.

Please provide us at least data for the months and count sizes you remember from January 2008 to June 2009

MONODON /VANNAMEI

If possible use the sizes below

<u>Pieces/kg</u>

20=1-20 pieces/kg

30=21-30 pieces/kg

44=31-44 pieces/kg

66=45-66 pieces/kg

100=67-100 pieces/kg

Broken=Broken

Month	Pieces/ ____/kg	Procurement price (VND)		Resale price (VND)	
		HOSO	HLSO	HOSO	HLSO
1/2008					

Continue until June 2009

Penaeus vannamei

(Table similar to the one used for P.monodon was removed)

35. Do you know about the Tsunami that hit some countries in Asia in 2004?

☐Yes ☐No

36. Do you think that the Tsunami had an impact on your business?

☐Yes ☐No

If YES, what impact did it have?

27.1. Impact 1 _____

27.2. Impact 2 _____

27.3. Impact 3 _____

37. Do you know about the US antidumping affecting some countries in Asia in 2004?

☐Yes ☐No

38. Do you think that the US antidumping had an impact on your business?

☐Yes ☐No

If YES, what impact did it have?

38.1. Impact 1 _____

38.2. Impact 2 _____

38.3. Impact 3 _____

39. What do you do to prevent the impact of US antidumping on your livelihood?

39.1. Activity 1 _____

39.2. Activity 2 _____

39.3. Activity 3 _____

THANK YOU VERY MUCH FOR YOUR HELP

FOR THE INTERVIEWER

Add below any comments you may have on this interview (eg quality of the information, quality of business management, etc.)

Annex 19: Questionnaire for shrimp processors

Study on Evaluation of the impact of the Indian Ocean Tsunami and US anti-dumping duties on the shrimp farming sector of South and South-East Asia

Questionnaire for Processors

(Sub: used for both P.Monodon and P. Vanamae traders)

Sample No _____ Name of interviewer: _____ Date: _____

The objective of this questionnaire is to collect information on your experiences in shrimp farming over the past few years so that we can advise the government of the regional countries that buy shrimp on ways to maximize the income from shrimp farming.

Although we will collect a lot of information about the money you spend and the money you earn, this information will not be reported to anybody outside our team, it will only be used to assess the overall process and it will not be used to impose taxes against you or your product.

Interviewee information

24. Name of interviewee _____; Tel:_____ ;

25. Name of the business: _____

25.1 Village_____ 25.2 Sub-district_____

25.3 District_____25.4 Province _____

26. Age: _____

27. Gender: ☐ Male ☐ Female

29. What is your position in the business? _____

30. Do you have any other occupation? ☐ Yes ☐ No

If YES, please specify

☐ Shrimp farming ☐ Agriculture ☐ Livestock ☐ Employee ☐ Other (specify) _____

31. Education:

☐ Illiterate ☐ Primary ☐ Secondary (SSC) ☐ Highschool (HSC)

☐ Vocational ☐ University ☐ Other (specify) _____

32. Aquaculture technical level:

□Own□Training □Vocational □BSc □Higher

33. How long is the longest experience in shrimp trading among the management of the business? _____ years

34. How many owners does you business have?

□ Single owner□ 2-4 Person□ >=5 Person

Investment for shrimp trading	**1. When (year)?**
35. Construction of the business	
36. Upgrading of the business	
37. Machinery	
38. Trading place	
39. Major equipment	
c. Property/location rent	
d. Related fees & taxes/year	

Major traded commodities

40. What are the most important fisheries species and the total quantity traded by you in 2008?

Commodity	**Quantity (kg)**	**Commodity**	**Quantity (kg)**
1.		6.	
2.		7.	
3.		8.	
4.		9.	
5.		10.	

41. Now I would like to ask you some more specific information on the volume of shrimp your business traded over the last 5 years for Monodon and Vannamei.

Year	**Monodon (kg)**		**Vannamei (kg)**	
	HOSO	**HLSO**	**HOSO**	**HLSO**
2006				

2007				
2008				
2009				

42. Do you think there is enough supply of shrimp for your business? ☐Yes ☐No

If NOT, what are the main reasons for the lack of shrimp?

42.1 Reason 1 _____

42.2 Reason 2 _____

42.3 Reason 3 _____

43. Do you have problems with selling shrimp? ☐Yes ☐No

If YES, what are the main problems in selling shrimp?

43.1 Problem 1 _____

43.2 Problem 2 _____

43.3 Problem 3 _____

Price trends

44. Have the prices you get for your shrimp changed over the past 5 years?

☐Yes Decreased ☐Yes Increased ☐Fluctuated ☐No change

44.1 If yes, when did prices change over the past 5 years? _____ ☐ Don't know

44.2 What do you think were the reasons for this change?

1. Reason 1: _____

2. Reason 2: _____

3. Reason 3: _____

45. Have the prices you get for your shrimp changed since the start of 2008?

☐Yes Decreased ☐Yes Increased ☐Fluctuated ☐No change

45.1 If yes, when did prices change? _____ ☐ Don't know

45.2 What do you think were the reasons for this change?

1. Reason 1: _____

2. Reason 2: _____

3. Reason 3: _____

46 What stakeholders are most negatively/positively affected by these changes? ☐☐ No one or

Stakeholder	1. Negative effects	2. Positive effects
a. Farmers		
b. Collector/trader		
c. Wholesaler		
d. Processors		
e. Exporters		
f. Other _____		

Now I would like to know some specific information about your business. I will ask you for some information on the prices you pay to procure and you get from resale. Please be aware that this information would be used in complete confidentiality and we will not reveal to people outside our team specific information about your business. We have a common goal, which is to maximize profits from shrimp farming and we would require accurate information from you to be able to do that.

	Năm 2008	**Năm 2009**
47. How many family labors involving in shrimp trading? a. Male b. Female	a._____ b. _____	a._____ b. _____
48. How many regular labors involving in shrimp trading did you hire? a. Male b. Female	a._____ b. _____	a._____ b. _____
49. How many seasonal labors involving in shrimp trading did you hire? a. Male b. Female	a._____ b. _____	a._____ b. _____
50. Total amount bought (kg)		
a. from farmers		
b. from collector/trader		

c. from wholeseller		
d. from processors		
e. from others *(specify)*		
51. Total amount resold (kg)		
a. to farmers		
b. to collector/trader		
c. to wholeseller		
d. to others *(specify)*		
52. To which country did you sell the shrir	USA : _____ % EU : _____ % Japan : _____ % Other1: _____ Other2: _____ %	USA : _____ % EU : _____ % Japan : _____ % Other1: _____ Other2: _____ %
53. What shrimp commodities did you sel HOSO, HLSO, etc)?	HOSO : _____ % HLSO : _____ % PUD : _____ % Other1:_____% Other2: _____%	HOSO : _____ % HLSO : _____ % PUD : _____ % Other1:_____% Other2: _____%
54.What shrimp commodities did you (e.g. block, IQF)?	Block : _____ % IQF : _____ % Semi-IQF : _____ % Other1:_____% Other2: _____%	Block : _____ % IQF : _____ % Semi-IQF : _____ % Other1:_____% Other2: _____%
55. Did you give any incentives (e.g. commission) to anybody supplying shrimp to you? □ Yes □		
56. If yes, to whom did you give incentive	a._____ b. _____	a._____ b. _____
57.What incentives did you give?	a._____	a._____

	b. _____	b. _____
58. Did you get any incentives (e.g. commission) from anybody supplying shrimp to you? □ Yes □□ No		
59. If yes, to whom did you get centives?	a._____ b. _____	a._____ b. _____
60. What incentives did you get?	a._____ b. _____	a._____ b. _____

I will now ask you some questions about the prices you got since January 2008 for your

shrimp and the prices at which you sold the shrimp. If you have records of these prices we would very much like to look at them. If you don't have records, you may not remember exactly the prices for every size and every month.

Please provide us at least data for the months and count sizes you remember from January 2008 to June 2009

MONODON /VANNAMEI

If possible use the sizes below

Pieces/kg

20=1-20 pieces/kg ; 30=21-30 pieces/kg

44=31-44 pieces/kg; 66=45-66 pieces/kg

100=67-100 pieces/kg; Broken=Broken

Month	**Pieces/ ____/kg**	**Procurement price (VND)**		**Resale price (VND)**	
		HOSO	**HLSO**	**HOSO**	**HLSO**
1/2008					

Continue until June 2009

Penaeus vannamei

(Table similar to the one used for P.monodon was removed)

61. Do you know about the Tsunami that hit some countries in Asia in 2004?

☐Yes ☐No

62. Do you think that the Tsunami had an impact on your business?

☐Yes ☐No

If YES, what impact did it have?

27.1. Impact 1 _____

27.2. Impact 2 _____

27.3. Impact 3 _____

63. Do you know about the US antidumping affecting some countries in Asia in 2004?

☐Yes ☐No

64. Do you think that the US antidumping had an impact on your business?

☐Yes ☐No

If YES, what impact did it have?

30.1. Impact 1 _____

30.2. Impact 2 _____

30.3. Impact 3 _____

65. What do you do to prevent the impact of US antidumping on your livelihood?

31.1. Activity 1 _____

31.2. Activity 2 _____

31.3. Activity 3 _____

66. Do you know about any other international trade factors affecting some countries in Asia in 2004? ☐Yes ☐No

67. If yes, what are these factors? _____

68. What impact did these factors have? _____

THANK YOU VERY MUCH FOR YOUR HELP

FOR THE INTERVIEWER

Add below any comments you may have on this interview (eg quality of the information, quality of business management, etc.)

Indonesia Annexes

Annex 1: Social and Economic Characters of Farmers

No	Socio-economic characteristics of *P. monodon* farmers	Average Response
1	**Age (years)**	48.2
2	**Experience in shrimp farming/trading/processing (years)**	16.3
3	**Gender**	
3.1	Male (%)	98.3
3.2	Female (%)	1.7
4	**Household size (no.)**	4.4
5	**Number of family laborers**	
5.1	Male	1.4
5.2	Female	0
6	**Number of family laborers involved in shrimp farming/trading/processing**	
6.1	Male	1
6.2	Female	0
7	**Number of shrimp farming/trading/processing employees**	
7.1	Male	1.5
7.2	Female	0
8	**Involvement with other occupation (%)**	
8.1	Trade	13.7
8.2	Agriculture	35.9
8.3	Livestock	0.0
8.4	Employment	10.3
8.5	Working for the government	0.9
8.6	Workshop	0.0
8.7	Estate	0.0
8.8	Shop	0.0
8.9	Transportation	0.0
8.10	Huller	0.0
8.11	Teaching	1.7
8.12	Sewing	0.0
8.13	fisherman	5.1
8.14	Mining	0.0
8.15	Other/freelance	0.0
8.16	Aquaarmer	0.0
9	***Illiterate (%)***	0.0
10	***Literate (%)***	
10.1	Primary attended	36.8
10.2	Secondary school attended	26.5
10.3	High school attended	23.1
10.4	Diploma	1.7
10.5	College/University. Attended	12.0
11	**Aquaculture technical knowledge (%)**	
11.1	Own initiative	88.0
11.2	training	10.3
11.3	vocational school	0.0
11.4	college/university	1.7
11.5	Own initiative and training	0.0
11.6	Post graduate	0.0

No	Socio-economic characteristics of *P. vannamei* farmers	Average Response
1	**Age (years)**	45.7
2	**Experience in shrimp farming/trading/processing (years)**	18.0
3	**Gender**	
3.1	Male (%)	100
3.2	Female (%)	0
4	**Household size (no.)**	4.0
5	**Number of family laborers**	
5.1	Male	1.3
5.2	Female	0
6	**Number of family laborers involved in shrimp farming/trading/processing**	
6.1	Male	1
6.2	Female	0
7	**Number of shrimp farming/trading/processing employees**	
7.1	Male	6.1
7.2	Female	0
8	**Involvement with other occupation (%)**	
8.1	Trade	6.7
8.2	Agriculture	13.3
8.3	Livestock	0.0
8.4	Employment	6.7
8.5	Working for the government	0.0
8.6	Workshop	0.0
8.7	Estate	0.0
8.8	Shop	0.0
8.9	Transportation	0.0
8.10	Huller	0.0
8.11	Teaching	0.0
8.12	Sewing	0.0
8.13	Paddy farmer	0.0
8.14	Mining	0.0
8.15	Other/freelance	0.0
8.16	Aquaarmer	0.0
9	***Illiterate (%)***	0.0
10	***Literate (%)***	
10.1	Primary attended	20.0
10.2	Secondary school attended	20.0
10.3	High school attended	33.3
10.4	Diploma	0.0
10.5	College/University. Attended	26.7
11	**Aquaculture technical knowledge (%)**	
11.1	Own initiative	53.3
11.2	training	26.7
11.3	vocational school	0.0
11.4	college/university	20.0
11.5	Own initiative and training	0.0
11.6	Post graduete	0.0

Annex 2: Social and Economic Characters of Traders

No	Socio-economic characteristics	Trader
1	**Age (years)**	43.6
2	**Experience in shrimp farming/trading/processing (years)**	15.4
3	**Gender**	
3.1	Male (%)	100
3.2	Female (%)	0
4	**Household size (no.)**	4.5
5	**Number of family laborers**	
5.1	Male	1.4
5.2	Female	0.3
6	**Number of family laborers involved in shrimp farming/trading/processing**	
6.1	Male	1
6.2	Female	0
7	**Number of shrimp farming/trading/processing employees**	
7.1	Male	5
7.2	Female	3
8	**Involvement with other occupation (%)**	
8.1	Trade	5.3
8.2	Agriculture	10.5
8.3	Livestock	0.0
8.4	Employment	0.0
8.5	Working for the government	0.0
8.6	Workshop	0.0
8.7	Estate	0.0
8.8	Shop	0.0
8.9	Transportation	0.0
8.10	Huller	0.0
8.11	Teaching	0.0
8.12	Sewing	0.0
8.13	Paddy farmer	0.0
8.14	Mining	0.0
8.15	Other/freelance	0.0
8.16	Aquaarmer	57.9
9	***Illiterate (%)***	0.0
10	***Literate (%)***	
10.1	Primary attended	21.1
10.2	Secondary school attended	10.5
10.3	High school attended	47.4
10.4	Diploma	0.0
10.5	College/University. Attended	21.1
11	**Aquaculture technical knowledge (%)**	
11.1	Own initiative	84.2
11.2	training	15.8
11.3	vocational school	0.0
11.4	college/university	0.0
11.5	Own initiative and training	0.0
11.6	Post graduate	0.0

Annex 3: Social and Economic Characters of Processors

No	Socio-economic characteristics	Average Response
1	**Age (years)**	53.5
2	**Experience in shrimp farming/trading/processing (years)**	26.3
3	**Gender**	
3.1	Male (%)	100
3.2	Female (%)	0
4	**Household size (no.)**	3.5
5	**Number of family laborers**	
5.1	Male	0
5.2	Female	0
6	**Number of family laborers involved in shrimp farming/trading/processing**	
6.1	Male	1
6.2	Female	2
7	**Number of shrimp farming/trading/processing employees**	
7.1	Male	47
7.2	Female	92
8	**Involvement with other occupation (%)**	
8.1	Trade	0
8.2	Agriculture	0
8.3	Livestock	0
8.4	Employment	0
8.5	Working for the government	0
8.6	Workshop	0
8.7	Estate	0
8.8	Shop	0
8.9	Transportation	0
8.10	Huller	0
8.11	Teaching	0
8.12	Sewing	0
8.13	Paddy farmer	0
8.14	Mining	0
8.15	Other/freelance	0
8.16	Aquaarmer	0
9	***Illiterate (%)***	0
10	***Literate (%)***	
10.1	Primary attended	0
10.2	Secondary school attended	0
10.3	High school attended	50.0
10.4	Diploma	0
10.5	College/University. Attended	50.0
11	**Aquaculture technical knowledge (%)**	
11.1	Own initiative	0
11.2	training	50.0
11.3	vocational school	25.0
11.4	college/university	25
11.5	Own initiative and training	0
11.6	Post graduate	0

Annex 4: Stakeholder perceptions on changes in the shrimp farming sector

P. monodon

No	Indicator	Level of change (%)		
		Decreased	Not changed	Increased
1	Total culture area of the farm	1.7	96.6	1.7
2	Number of ponds	2.0	96.6	1.7
3	Nursing pond area	0	98.3	1.7
4	Settlement pond area	0	98.3	1.7
5	Investment (incuding machinery)	17.1	73.5	9.4
6	Ownership of land	0.9	97.4	1.7
7	Shrimp farming mode	0.9	94.9	4.3
8	Use labourers (family and employed)	3.4	94.9	1.7
9	Farmed species	0	96.6	3.4
10	Seed sources	within district	within province	outside province
	within district	66.7	32.5	0.9
	within province			
	outside province			
11	Average stocking density of 1st crop	3.4	90.6	6.0
12	Stocking duration of 1st crop	0	94.0	6.0
13	use of feed	20.5	51.3	28.2
14	Use of drugs/chemicals	28.2	67.5	4.3
15	Shrimp productivity of the 1st crop	15.4	49.6	35.0
16	Marketing of shrimp	1.7	91.5	6.8
17	Average cost per ha of the 1st crop	0.9	38.5	60.7
18	Average profit per ha of the 1st crop	35.0	30.8	34.2

P. vannamei

No	Indicator	Level of change (number)		
		Decreased	Not changed	Increased
1	Total culture area of the farm	0	14	1
2	Number of ponds	0	15	0
3	Nursing pond area	0	15	0
4	Settlement pond area	0	15	0
5	Investment (incuding machinery)	0	9	6
6	Ownership of land	0	15	0
7	Shrimp farming mode	0	15	0
8	Use labourers (family and employed)	0	15	0
9	Farmed species	0	15	0
10	Seed sources	within district	within province	outside province
	within district	40%	60%	
	within province			
	outside province			
11	Average stocking density of 1st crop	0	12	3
12	Stocking duration of 1st crop	1	14	0
13	use of feed	0	13	2
14	Use of drugs/chemicals	0	15	0
15	Shrimp productivity of the 1st crop	0	9	6
16	Marketing of shrimp	0	13	2
17	Average cost per ha of the 1st crop	0	6	9
18	Average profit per ha of the 1st crop	2	11	2

Annex 5: Production Costs

P. monodon

No	Items of cost (unit: 1000 IDR/ha/crop/year)	2009		2010	
		Cost	%	Cost	%
1	Shrimp post larvae	3,282,239	19.00	2,772,923	18.24
2	Fish seed	1,670,598	9.67	1,768,205	11.63
3	Labour for pond preparation	763,077	4.42	684,615	4.50
4	Labour during production	729,915	4.23	724,786	4.77
5	Labour during harvesting	452,350	2.62	440,470	2.90
6	Chlorine/bleach	-	0.00	-	0.00
7	Chemical/drugs	271,795	1.57	290,641	1.91
8	Lime	415,342	2.40	508,376	3.34
9	Fertilizer	867,564	5.02	926,111	6.09
10	Home made feed	172,598	1.00	228,402	1.50
11	Commercial feed	6,108,568	35.36	4,740,278	31.18
12	Electricity	587,863	3.40	377,414	2.48
13	Fuels	1,372,479	7.95	1,242,716	8.17
14	Harvest/Transportation	308,034	1.78	311,552	2.05
15	Others	271,368	1.57	187,500	1.23
16	Total	17,273,791		15,203,989	

P. vannamei

No	Items of cost (unit: 1000 IDR/ha/crop/year)	2009		2010	
		Cost	%	Cost	%
1	Shrimp post larvae	40,264,667	11.27	52,330,667	11.15
2	Fish seed	353,333	0.10	353,333	0.08
3	Labour for pond preparation	2,407,333	0.67	2,427,333	0.52
4	Labour during production	25,006,667	7.00	25,006,667	5.33
5	Labour during harvesting	1,458,333	0.41	1,463,333	0.31
6	Chlorine/bleach	1,778,000	0.50	1,778,000	0.38
7	Chemical/drugs	8,670,667	2.43	8,724,000	1.86
8	Lime	4,893,333	1.37	7,563,333	1.61
9	Fertilizer	2,300,000	0.64	2,436,667	0.52
10	Home made feed	-	0.00	-	0.00
11	Commercial feed	183,158,000	51.25	252,351,333	53.77
12	Electricity	18,566,667	5.20	18,766,667	4.00
13	Fuels	61,733,333	17.27	88,926,667	18.95
14	Harvest/Transportation	6,113,333	1.71	6,206,667	1.32
15	Others	666,667	0.19	1,000,000	0.21
16	Total	357,370,333		469,334,667	

Annex 6: Monthly average sales price of different sized shrimps (*P. monodon*)

No	Month	U20	21-30	31-44	45-66	67-100
1	July-09	69,000	58,916	49,000	39,800	31,000
2	August-09	-	57,643	52,167	46,900	36,000
3	September-09	-	59,667	47,900	43,000	29,000
4	October-09	-	56,167	47,667	41,667	37,000
5	November-09	-	59,773	48,500	44,500	35,500
6	December-09	-	59,500	52,000	48,200	35,000
7	January-10	-	55,000	52,167	45,667	36,500
8	February-10	-	55,000	53,250	46,500	35,000
9	March-10	-	57,000	55,750	46,286	36,500
10	April-10	-	55,000	51,250	44,000	35,000
11	May-10	-	65,870	50,619	42,725	35,500
12	June-10	77,000	64,700	51,571	45,000	33,000
13	July-10	80,000	59,875	48,000	43,167	34,000
14	August-10	-	59,375	52,167	42,417	34,500
15	September-10	-	60,056	52,000	47,500	36,000

Annex 7: Monthly average sales price of different sized shrimps (*P. vannamei*)

No	Month	30 - 40	41 - 50	51 - 60	61 - 100
1	July-09	-	-	-	-
2	August-09	-	-	-	38,000
3	September-09	52,000	45,333	-	39,000
4	October-09	-	-	-!	38,500
5	November-09	-	45,000	41,000	38,750
6	December-09	-	-	-	40,000
7	January-10	-	42,667	42,000	42,000
8	February-10	-	-	38,000	-
9	March-10	-	-	-	-
10	April-10	-	46,000	-	41,000
11	May-10	-	47,800	40,333	39,500
12	June-10	-	-	-	40,250
13	July-10	-	-	-	-
14	August-10	-	-	-	-
15	September-10	-	49,000	-	-

Annex 8: Monthly average procurement prices for traders

P. monodon

No	Month	Size 30	Size 40	Size 50	Size 60
1	July-09	57,067	46,625	38,227	31,167
2	August-09	57,107	46,688	37,650	29,800
3	September-09	56,654	46,967	39,227	31,000
4	October-09	58,273	49,231	41,938	34,333
5	November-09	59,227	49,625	41,714	31,000
6	December-09	59,773	49,808	41,688	31,000
7	January-10	60,182	50,273	44,333	33,000
8	February-10	59,591	50,042	43,429	34,000
9	March-10	59,611	49,591	43,417	33,000
10	April-10	59,800	48,692	42,214	34,500
11	May-10	58,800	47,808	40,357	32,500
12	June-10	58,222	47,545	38,750	30,000
13	July-10	58,036	46,700	38,250	30,200
14	August-10	58,722	47,542	38,167	32,000
15	September-10	59,462	48,625	40,600	30,600

P. vannamei

No	Month	Size 50	Size 60	Size 70	Size 80
1	July-09	46,357	40,071	36,357	32,667
2	August-09	45,929	40,214	36,357	32,833
3	September-09	47,714	41,714	37,000	32,500
4	October-09	48,714	42,714	38,429	33,500
5	November-09	49,071	43,071	38,786	33,333
6	December-09	49,286	43,714	39,429	33,500
7	January-10	50,714	46,000	41,286	34,750
8	February-10	50,857	46,143	41,429	36,000
9	March-10	50,143	45,429	40,714	36,000
10	April-10	49,000	44,286	39,571	36,500
11	May-10	48,714	43,714	39,000	36,500
12	June-10	49,857	44,857	40,143	37,000
13	July-10	52,714	47,571	43,286	40,750
14	August-10	53,429	48,714	44,429	42,500
15	September-10	55,143	50, 429	45,286	42,500

Annex 10: Monthly Average procurement prices for processor for different size

P. monodon

No	Month	21 - 30	31 - 44	45 - 66	67 - 100
1	July-09	62,250	49,333	39,000	25,000
2	August-09	64,000	52,000	39,500	26,000
3	September-09	59,000	48,667	34,500	26,000
4	October-09	61,875	54,333	38,500	27,500
5	November-09	64,625	59,667	42,500	26,500
6	December-09	58,500	51,500	47,500	26,000
7	January-10	64,625	55,000	48,750	26,000
8	February-10	63,375	56,667	46,500	25,000
9	March-10	59,750	51,667	39,000	25,500
10	April-10	59,000	49,667	38,000	26,000
11	May-10	59,750	50,667	40,000	26,000
12	June-10	59,750	52,333	44,500	25,500
13	July-10	60,000	52,333	44,000	25,500
14	August-10	58,875	52,167	43,750	26,000
15	September-10	59,750	53,833	44,500	25,000

P. vannamei

No	Month	31 - 44	45 - 66	67 - 100
1	July-09	42,750	34,000	25,000
2	August-09	42,000	33,250	24,750
3	September-09	42,000	33,000	24,750
4	October-09	44,000	34,000	24,000
5	November-09	45,500	34,000	25,000
6	December-09	46,750	34,750	24,500
7	January-10	45,750	34,250	24,500
8	February-10	44,750	33,750	25,000
9	March-10	45,250	34,250	25,000
10	April-10	45,250	34,250	25,000
11	May-10	49,250	37,250	25,000
12	June-10	48,750	38,000	25,500
13	July-10	43,750	38,000	25,500
14	August-10	43,750	33,000	25,500
15	September-10	43,250	33,000	25,500

Bangladesh Annexes

Annex-1: Name and Addresses of Respondents

Table 1: Shrimp farmers and Farm Profile:

District	Thana	Union	Village	Farmer's name	Farmer's father name
Bagerh	Bagerh Sadar	Barai Para	Goalkhali	Nokib Akramul	Late Jobbar Nokib
		Bemarta	Bojoypur	Abul Hossan	Late Md. Ismaile Hossan Sak
			Bojoypur	Md. Akram Sheikh	Late Rohim Uddin Shek
			Khrasombol	Dulal Haulader	Battu Haulade
			Rogunatpur	Md.Mafuj Sardar	Md. Abul Hossion Sardar
		Dema	Kasimpur	Md. Babul Nakib	Late Md. Mohor Fakir
		Jatrapur	Afra	Shidur Rahaman	Late Sardar Hafizur Rahama
			Moswhad pur	Md. Hafizur Rahaman	Sak Diin Mohammad
			Muijidpur	Ali Newaz Tuhin	Lat Shek Musilim Ali
			Musidpur	Shek Mutaleb Hossan	Late Adom Ali
		Kara Para	Koliadaour	Kamruzzaman	Jafor Shek
		Shat Gambuj	Fulbari	Md. Abul Hossin	Late Akim Uddin
			Fulbari	Gaous Hauldar	Late Nur Mohammad Hauld
			Phulbari	Abdul Gani Sarder	Md Asimuddin Sarder
			Phulbari	Abdul Shobhan Sarder	Late Mofiluddin Sarder
			Poschim Danga	Asok Kumer Sen	Late Kalipod Sen
	Mongl	Burirdanga	Digraj	Konkon Roy	Gurudas Roy
		Chandpi	Brammannath	Salina Bebum	Md. Shawket Hossin
			Kainmari	Somer Puddar	Upandranat Puddar
			Kainmari	Harun-ur-rasid	Sirazul Islam
			Kayenmari	Profulla Kumar Bishwa	Lat. Samacharan Bishwas
			Khalikabri	Horidash Bishwas	Late Sharat Chandar Bishwa

District	Thana	Union	Village	Farmer's name	Farmer's father name
		Chila	Holdibulia	Farid Uddin	Late Abdul Kader Shek
		Sundarban	Bashtala	Gulan Mustafa Fakier	Late Abdul Samad Fakier
			Bashtala	Abdul Azia Faquer	Late Kadem Ali Faquer
			Bastala	Hassan Ali	Hatem Ali
			Bastala	Mustafa	Late Md. Ibrahim
			Bastola	Afzal Hossain	Aamier Ali Musa
			Bastola	Easkandar Talukder	Hossion Ali Talukder
			Burburia	Motiar Shikari	Late khursed Ali
			Burburiga	Atiar Shikkari	Karim Shikkari
			Khoma	Abul Kalam	Mobin Uddin
			Khorma	Harun	Hakim Ali Hauldar
		Suniltala	Ulubonia	Gazi Gulam Rosul	Late. Amin Gazi
Cox's Baz	Chakaria	Badarkhali	Bodorkhali	Md. Musa	Asaduzzaman
			East Big Vheola	Nurul Amin	Mustafa Ahmed
			Maisgoma	Anwar Hossain	Monir Ahmed
		Bheola Mani Char	Ilisia	Shahenawas Chowdhu	Late Mustafa Ahmed Chowdhury
			Koral Khali	Md. Rafiq	Late Abdul Motlob
		Paschim Bara Bheola	Ilisia	Shumsul Alam	Sirajul Islam
			Ilisia	Shamsul Alam	Late Muklesur Raham
		Shahar Beel	Eid moni, East Bi Vheola	Sarwar Kamal	Akam Uddin
			Eid moni, East Bi Vheola	Azim Uddin	Hazi Bodi Alam
			Ilisia	Nur Mohammad	Late Abdul Rahaman
			Koral Khali	Nurul Islam	Late Ali Ahmed
			Koral Khali	Ruhul Amin	Late Ali Ahmed

District	Thana	Union	Village	Farmer's name	Farmer's father name
			Koral Khali	Nurul Islam	Md. Ali Mia
			Koral Khali	Abdul Sukur	Siragul Islam
			Koral khali	Abu Shama	Late Asiare Rahaman
			Koral Khali	Syed Alam	MONIR AHMED
			Rampur	Mujahar Mia	Abdul Kader
			Rampur	Monjur alam	Mujahar mia
	Maheshk	Bara Mahesk	Boro Moheshkha	Amanullah	Hazi.Kibur Ahamade
		Dakshin Mithachhari	Adharkhola	Md. Sharif Madbor	Late Haz Mokbul Ali Madbor
		Nhilla	Nilabazar	Md. Afsar Ali	Late Shamsuddin
		Palong Khali	Dhimonkhali	Haji Abdul gafur	Late.Moulobi Abdul Haqu
			Balukhali	Md. Firoz Ahmed	Late Zakir Ahmed Chow
			Borosora	Nurul Alam	Late Hazi Md. Kashem
			Fakir Ali	Mustafa Ahmed Babu	Janab Ali
			Fokirkhali	Md. Foridul Alam	Late Moulabi Hazi Nur Ahem
			Fokirkhali	Abu kaisar	Late Sale Ahmed
	Tekna		Foriasora	Abul kashem	Mia Hossain
			Huaiking	Kabir Ahmed	Lat.A Rajak Chow
		Whykong	Huaikong	Mustak Ahmed Chow	Late Ali mia Chow
			Kalaliabata	Md. Nizam Uddin	Hazi Member Islam
			Kangarpara	Afsar Ali	Late Abdul Ali
			Kharongkhali	Hazi Mazahar Ahmed	Hazi Ruson Ali
			Mohorkata	Abu Taleb	Late Hazi Sazzatulla
			Tolatuli	Nazir Ahmed	Late.Kalamia Saudger
			Tolauli	Md.Gias uddin	Gulimsurer
Khuln	Dacop	Bajua	Bajua	Sheak Azizul Islam	Late Sheak Sirajul

District	Thana	Union	Village	Farmer's name	Farmer's father name
			Bajua	Debobrota Sarker	Late Dhurgapad Sarker
			Chunuburi	Ramesh Chandra Kobi	Late Soshidhar Kobiraj
		Chalna	Baruikhali	Md. Nurul Islam	Late Ishaq Ali
			Khalisha	Md.Shakal Ahamd Dil	Sake Abdul Hamide
		Dacope	Orabonia	Sonjoy Kumer	Late Mochindra nat
			Sahrabad	Poresh Chanda Mond	Late Razanda nat Moldol
		Kailasganj	Koilashgonj	Gazi Jahangir Alam	Late Ansar Ali
			Koilashgonj	Abdul Kalek Sana	Late Mahatab sana
			Ramnagar	Bimolandra Mondol	Horendo Nath Mondol
		Kamarkhola	Kamarkhula	Md.Oliar Rahman	Late Abdul Kader Gazi
			Rekakhali	Mohadev Roy	Horendronat Roy
			Shree nagar	Md. Hashemuzzaman	Late Tofajjel Hossan
			Sivnagar	S.M. Rofikul	Late
			Srinagr	Sarder Faruq	Late Sarder Munsurul Haqu
			Srinagr	SM Golam Akber	Iskendar Ali
		Pankhali	Ananda Nagar	Md.Mohsin Akonji	Late Ahed Ali
			Katabonia	Abdul Gafur Sheak	Late Abu Bakar Sheak
			Katabunia	Seike Ashikur rohamin	Md. Sherajul Hqu
			Khuna	Sheikh Abul Hossain	Late. Ashraf Ali Sheikh
			Pankhali	S.M.Omar Faruk	Late Keramot Ali
			Pankhali	ABM Rohul Amin	Late.Ansar Ali Sarder
		Sutarkhali	Gumari	Bimolandra Mondol	Late Ramakanta Mondal
			Kalabagi	M.A. Malek	Late MunSur Rahaman Shea
			Nolian	Arshad Ali Gazi	Late Md. Ansar Ali Gazi
			Nolian	Md. Hafizur Rahaman Sana	Mhirul Uddin Sana

District	Thana	Union	Village	Farmer's name	Farmer's father name
			Nolian	Abdul Barik Gazi	Abdul Hanid Gazi
			Sutarkhali	Noni Gupal Boiddah	Late Vogoban Boiddah
		Tildanga	Botbunia	Dulal Chandra Sarder	Late Sukendra Nath Sarder
			North Kamine Ba	Anil Roy	Late Pironate Roy
Satkhira	Assasuni	Anulia	Anulia	Abdul Khalek Sana	Abdul Aziz
			Cheytia	Hazi Jonab Ali	Madar Ali
		Assasuni	Harydanga	Volanath	Kalipud Mondol
			Sheekalash	Shamsur Rahaman	Rohaman Gazy
		Durgapur	Sridharpur	Md. Mozammel Gazi	Late. Mokbul Sharder
			Sridharpur	Anar Gazi	Md. Fokir Ali
		Kadakathi	Sriramkhali	Md. Gaziul Huq	LateSharwar Sana
		Khajra	Godaipur	Dalim	Mojaharul Uddion Sardar
		Pratap Nagar	Kola	Mujibur Rahaman	Shohal Huq Sardar
			KooanPur	Nurul	Late Belahet Sarker
			Protab Nagar	Hazi Daud Ali	Late Hazi Kaem Uddin
		Sobhnali	Bashirampur	Abul Kasam	Ismail Mulla
			Bashukhali	Shajahan	Mukshed Ali
			Hagepur	Sharfattula	Abdul Yahab Gazi
			Kaikhali	Milon	jalal Gazi
			Shovonali	Md. Mannan	Abdul Hannan Gazi
			Shovonali	Talebul Islam	Gohor Ali
	Debhata	Debhata	Choto Shanta	Alhaj Md. Fazlur Rahm	Haji Dalil Uddin
			Debhata	Md. Roushan Ali	Md. Mubarak Ali
			Shokhipur	Nur Mohammad	Alhaj Babar Ali Gaji
			Talsripur	Md. Ibrahim Khalil	Late. Kabil Uddin

District	Thana	Union	Village	Farmer's name	Farmer's father name
			Vatshala	Md. Abdul Wahab	Late. Ahmed Sarder
		Noa Para	Atapur	Md. Abdul Majed Shik	Nouapara
		Pabnapur	Najirer Gher	Md.Sahajahan Sana	Lt.Osman Sana
		Purulia	Najirer Kher	Haji Monsur Ali	Late. Azim Morol
			Purulia	Mrinal Kanti Gosh	Gobinda Gosh
			Subarnbad	Binoy Krishna Haulade	Roy Charan Haulader
	Shyamna	Bhurulia	Burilia	Jaker Hossion	Md. Kamrul Hossion
		Ishwaripur	Ishordipm	Solaiman	Md.Babul Sharker
			Khagraghat	Abu Based Sardar	Abu Akram Sardar
		Kaikhali	Mirzapur	Noushar Ali	Md.Pappu Ali
		Kashimari	Ghola	Toufiqur Rahaman	Md. Amzad Rahaman
		Munshiganj	Munshinagar	Hafijur Rahaman	Hafijur Rahman
		Nurnagar	Durduskhali	Krishpod Mondal	Bipul Mondal
		Padma Puku	Chuterpur	AGM Amanulla	ATM Alamin
			Jhapa	Jamat Ali	Md.Kanon Ali
		Shyamnagar	Chakba	G.M. Fajul	Md. Asam Ali

Table 2: Shrimp Traders' name and address:

Sample No.	Respondent's Name	Location			
		Village	Union	Upazilla	District
1	Md. Abdus Satter Sana	Saharabad	Kamarkhola	Dacope	Khulna
2	Panchanan Mandal	Perchalna	Chalna	Dacope	Khulna
3	Prodip Kumar Roy	Tildanga	Tildanga	Dacope	Khulna
4	MD. Nasir Uddin	Khona	Chalna	Dacope	Khulna
5	MD. Shafiqul Molla	Nalian	Sutarkhal	Dacope	Khulna
6	Suroth Golder	N.Kaminibasia	Tildanga	Dacope	Khulna
7	Milton Sarkar	Garkathi	Chalna	Dacope	Khulna
8	Shahidul islam	Garkathi	Chalna	Dacope	Khulna
9	Gaffar Shak	Goalkhali	Baripara	Bagerhat	Bagerhat
10	Suko Ranjan	Kapalibandar	Bamorta	Bagerhat	Bagerhat
11	Ramizul Islam	Kainmari	Chandpie	Mongla	Bagerhat
12	Panchanon Bairagi	Kunainagar	Chandpie	Mongla	Bagerhat
13	samor Sarkar	Kainmari	Chandpie	Mongla	Bagerhat
14	Gourungo Rai	Kainmari	Chandpie	Mongla	Bagerhat
15	Md. Zillur rahman	Dema	Dema	Bagerhat sadar	Bagerhat
16	Md. Motaleb Tarafder	Dema	Dema	Bagerhat	Bagerhat
17	Rakhal Chandra Roy	Beledanga	Kulia	Debhata	Satkhira
18	Prodip Kumar Mandal	Kulia	Kulia	Debhata	Satkhira
19	Md. Shahinur Islam	Godaipur	Khazra	Asasuni	Satkhira
20	Milon	Kadakati	Kadakati	Asasuni	Satkhira
21	Monotosh	Dhalirchak	Anulia	Asasuni	Satkhira
22	Md. Rabiul Islam	Mariala	Sriulla	Asasuni	Satkhira
23	Md. Mizanur Rahman	Kadamtola	Munsigonj	Shyamnagar	Satkhira

24	Anadi Biswas	Porakatla	Burigoalini	Shyamnagar	Satkhira

Table 3: Depot Name and Address:

	Respondent's Nam	Positio	Business Name	Location			
				Village	Union	Upazilla	District
1	Bikash Chandra Mor	Owner	Bhai Bhai Fish Ltd	Munsigonj	Munsigonj	Shyamnaga	Satkhira
2	Md. Akram Hossain	Owner	Ms Mayer Doa Fish	Chapra	Budhata	Assasuni	Satkhira
3	Md. Rahul Amin	Owner	Ms Salina Fish	Asasuni	Asasuni	Asasuni	Satkhira
4	Alhaz Rowsan Ali	Owner	Mahmud Fish & Commission	Beledanga	Kulia	Debhata	Satkhira
5	Md. Yellas Ali	Owner	Russel Fish Ltd.	Bager Baze	Sadar	Bagerhat	Bagerha
6	Ham Chandra Mistre	Owner	Joint Fish Ltd.	Joymahal	Mongla	Mongla	Bagerha
7	Siddiqur Rahman	Owner	Bap-mayer Doa Fish	Bazer Roac	Mongla	Mongla	Bagerha
8	Md. Babul Ahmed	Owner	Babul Fish Ltd.	Sonatala	Doma	Bagerhat	Bagerha
9	Kh. Golam Hossain	Owner	Anik Raju Fish Ltd.	Jontrapur	Jontrapur	Rupsha	Khulna
10	Prokash Chandra Ro	Owner	Papia Fish	Betbunia	Tildanga	Dacope	Khulna
11	Md. Nurunabbi Dhal	Owner	Ms Nabi Fish	Achavua	Chalna	Dacope	Khulna
12	Gouranga Mollik	Owner	Golok Fish	Perchalna	Chalna	Dacope	Khulna

Table 4: Agents' Name and Address:

Respondent's Name & Position		Business Nam	Location			
			Village	Union	Upzla	District
1	Badhan Mojumder, Manager	Ms Zabber & Co.	Notun Bazar	Sadar	Rupsha	Khulna
2	M Delwar Hossain, Manager	Tala Fish Ltd.	Purba Rupsha	Rupsha	Rupsha	Khulna
3	Abdur Razzak, Manager	Imam Fish Ltd.	Soth Rupsha	Rupsha	Rupsha	Khulna
4	Panna, Manager	Shepsah Fish ltd.	Notun Bazar	Sadar	Rupsha	Khulna
5	M Azadul Isalam, Owner	Ms Friends Tradi	Battawali	Katakhali	Sadar	Bagerhat
6	Md. Jahangir Alam, Owner	Ms Jesmin Fish Agent	Parulia	Parulia	Debhata	Satkhira
7	Haji Jalal Ahmed, Owner	ShilaMoni Enterp	Main Road	Sadar	Sadar	Cox's Bazar
8	Md. Jamil Sawdegar Owner	Chatgoan Fish Lt	Firingi Bazar	Sadar	Sadar	Chittagong

Table 5. Names and address of Processors

	Mrinal Kanti Das	GM	Bagerhat Sea Food	Bagerhat
	Kazi Tipu	AGM	Southern Sea Food Ltd.	Khulna
	Abdul Baki	MD	Oriental F Pr. Industries	Khulna
	Monir Hossain	CA	COBI Fish Limited	Khulna
	K H Rahaman	GM	Rupsha Fish/Alide Indus	Khulna
	M Shariful Islam	GM	Delta Fish Ltd.	Satkhira
	M S A Chowdhury	CEO	Cox's Bazar Sea Food	Cox's Bazar
	Iqbal H Chodhury	MD	Sea Marks Ltd.	Chittagong

Annex-2: Production and Prices Data

Table 1: Shrimp production during 1990-91 to 2009-10

Year	Shrimp catch (metric ton)			
	Inland Fisheries		Marine Fisherie	Total
	Capture	Culture		
1990-91	43,262	19,489	17,633	80,384
1991-92	61,042	20,335	20.042	101,419
1992-93	78,226	23,530	23,975	125,731
1993-94	50,721	28,302	21,519	100,542
1994-95	58,973	34,030	20,363	113,366
1995-96	44,079	46,223	26,353	116,655
1996-97	41,868	52,272	24,818	118,958
1997-98	46,635	62,167	24,790	133,592
1998-99	49,296	63,164	31,742	144.,202
1999-00	43,167	64,647	31,395	139,209
2000-01	44,343	64,970	31,037	140,350
2001-02	54,965	65,579	31,976	152,520
2002-03	60,876	66,703	31,931	159,510
2003-04	63,103	75,167	36,488	174,758
2004-05	68,768	82,661	44,261	195,690
2005-06	77,381	85,510	48,119	211,010
2006-07	82,422	86,840	51,869	221,131
2007-08	75,678	94,211	53,206	223,095
2008-09	89,901	102,854	52,217	244,972
2009-10	46,388	87,972	52,592	186,892

Source: DoF, 2005 and 2011. Jatiya Motsho Pakkho, DoF, MOFL

Table-2: Farmer's Monthly Average Sale Price of Bagda in 2009 and 2010

	20	30	44	66
Jul-09	479	422	317	217
Aug-09	480	424	317	219
Sep-09	485	429	322	228
Oct-09	488	431	325	234
Nov-09	487	435	328	236
Dec-09	500	447	344	247
Jan-10	521	455	413	348
Feb-10	549	502	448	400
Mar-10	521	455	413	348
Apr-10	549	502	448	400
May-10	576	516	471	447
Jun-10	603	548	500	448
Jul-10	607	549	500	449
Aug-10	621	555	507	453
Sep-10	625	559	510	455

Table 3. Trader's Monthly Bagda Procurement Price in BDT/Kg by Count size

	20	30	44	66	100
Jul-09	495	407	323	231	121
Aug-09	496	425	323	229	124
Sep-09	504	430	330	228	134
Oct-09	510	432	334	239	144
Nov-09	519	437	330	247	152
Dec-09	511	440	331	250	155

Jan-10					
Feb-10					
Mar-10	526	453	404	338	169
Apr-10	541	469	428	356	175
May-10	559	493	462	406	178
Jun-10	599	521	479	417	195
Jul-10	616	539	498	440	185
Aug-10	622	548	505	447	190
Sep-10	629	560	511	455	194

Table 4. Trader's Monthly Bagda Sale Price in BDT/Kg by Count size

	20	30	44	66	100
Jul-09	506	418	329	237	128
Aug-09	515	438	335	235	139
Sep-09	515	438	335	235	139
Oct-09	524	442	342	246	148
Nov-09	530	446	337	253	157
Dec-09	521	440	331	250	155
Jan-10					
Feb-10					
Mar-10	535	461	412	345	175
Apr-10	552	476	436	362	180
May-10	560	502	469	412	184
Jun-10	611	533	486	428	200
Jul-10	624	547	507	447	190
Aug-10	632	560	514	454	197

Sep-10	639	570	519	463	201

Table 5: Depot's Monthly Bagda Procurement Price in BDT/Kg by Count size

Month	20	30	44	66	100
Jul-09	558	448	343	256	159
Aug-09	558	446	341	257	160
Sep-09	551	433	332	253	155
Oct-09	546	431	328	252	155
Nov-09	533	421	325	250	152
Dec-09	524	413	317	246	148
Jan-10	519	414	315	243	143
Feb-10	504	400	307	256	149
Mar-10	511	404	310	250	149
Apr-10	508	404	305	249	150
May-10	504	401	304	248	150
Jun-10	508	403	314	254	147
Jul-10	525	420	325	259	154
Aug-10	544	442	345	264	157
Sep-10	556	446	346	264	163

Table 6: Depot's Monthly Bagda Sale Price in BDT/Kg by Count size

Month	20	30	44	66	100
Jul-09	565	456	350	259	167
Aug-09	566	454	348	265	168
Sep-09	558	442	339	261	162
Oct-09	554	438	336	260	163

Nov-09	542	430	334	259	160
Dec-09	533	424	326	256	157
Jan-10	527	421	323	251	151
Feb-10	513	409	314	264	154
Mar-10	519	411	317	259	157
Apr-10	518	412	312	256	158
May-10	513	409	312	254	157
Jun-10	542	412	321	262	155
Jul-10	531	425	333	266	161
Aug-10	549	445	348	270	162
Sep-10	559	450	352	270	169

Table 7: Agent's Monthly Bagda Procurement Price in BDT/Kg by Count size

Month	**20**	**30**	**44**	**66**	**100**
Jul-09	561	458	353	269	169
Aug-09	560	457	349	268	166
Sep-09	543	446	341	268	165
Oct-09	537	441	336	262	162
Nov-09	532	429	327	257	158
Dec-09	529	421	327	254	159
Jan-10	526	423	320	260	159
Feb-10	523	419	319	256	162
Mar-10	527	422	323	257	155
Apr-10	523	422	320	258	156
May-10	532	429	328	259	159
Jun-10	535	430	333	258	159

Jul-10	543	440	337	262	161
Aug-10	561	456	354	271	174
Sep-10	569	463	356	273	170

Table 8: Agent's Monthly Bagda Sale Price in BDT/Kg by Count size

Month	**20**	**30**	**44**	**66**	**100**
Jul-09	569	465	356	276	176
Aug-09	567	456	356	275	172
Sep-09	550	453	347	275	171
Oct-09	545	460	343	269	168
Nov-09	540	436	335	264	164
Dec-09	536	429	338	260	166
Jan-10	533	431	327	267	165
Feb-10	530	427	327	264	169
Mar-10	534	430	330	264	161
Apr-10	530	428	327	264	162
May-10	539	434	333	265	164
Jun-10	541	436	339	264	165
Jul-10	548	445	342	268	167
Aug-10	568	462	361	278	181
Sep-10	576	470	363	279	176

Table 9: Processor's Procurement Price of Bagda in BDT/Kg by count size

Months	Count Size-wise BDT/Kg				
	20	30	44	66	100
July 2009	526	441	340	243	144
Aug 2009	529	440	341	242	137
Sept 2009	539	447	346	240	150
Oct 2009	539	450	348	247	153
Nov 2009	540	455	352	253	158
Dec 2009	544	452	351	256	162
Jan 2010	548	458	361	269	163
Feb 2010	554	468	373	289	170
March 2010	561	480	424	360	200
April 2010	590	500	451	380	184
May 2010	596	523	476	428	190
June 2010	620	547	502	432	190
July 2010	642	557	517	455	201
Aug 2010	651	564	532	461	203
Sept 2010	658	581	529	468	206

Table-10: Processor's Sale Price of HOSO Bagda in USD/Kg by Count Size

Month	Count Size-wise USD/Kg				
	20	30	44	66	100
Jul-09	6.74	5.93	5.08	4.50	3.07
Aug-09	6.82	5.88	5.04	4.49	3.08
Sep-09	6.71	5.95	5.20	4.53	3.08
Oct-09	6.94	5.92	5.06	4.51	3.19
Nov-09	6.93	5.93	5.07	4.52	3.27
Dec-09	6.88	5.94	5.07	4.51	3.27
Jan-10	6.92	5.95	5.10	4.52	3.32
Feb-10	7.08	6.10	5.29	4.56	3.31
Mar-10	7.16	6.28	5.65	4.66	3.43
Apr-10	7.35	6.51	5.77	4.73	3.51
May-10	7.67	6.85	6.28	5.11	4.09
Jun-10	7.98	7.05	6.29	5.10	4.09
Jul-10	8.14	7.05	6.28	5.11	4.09
Aug-10	8.27	7.24	6.54	5.19	4.32
Sep-10	8.32	7.24	6.54	5.31	4.19

Table-11: Processor's Sale Price of HLSO Bagda in USD/Kg by Count Size

Month	Count Size-wise USD/Kg				
	20	30	44	66	100
Jul-09	11.71	10.45	9.45	8.28	7.74
Aug-09	11.71	10.43	9.44	8.27	7.73
Sep-09	11.71	10.44	9.52	8.26	7.77
Oct-09	11.78	10.14	9.25	8.50	7.72
Nov-09	11.57	9.92	9.27	8.69	8.04
Dec-09	11.57	9.92	9.27	8.71	8.04
Jan-10	11.59	9.93	9.29	8.72	8.07
Feb-10	12.18	11.38	10.31	9.32	7.99
Mar-10	12.18	11.39	10.31	9.31	8.14
Apr-10	13.52	11.65	10.29	9.37	8.17
May-10	13.58	12.42	10.75	9.93	8.17
Jun-10	12.97	11.83	10.82	8.21	7.19
Jul-10	13.81	11.75	10.68	8.23	7.12
Aug-10	13.25	11.69	10.68	9.60	7.18
Sep-10	13.52	11.51	10.68	9.56	7.21

Annex-3: The Name of Study Team

1. Mr. Humayun Kabir, Team Leader, PSP Ltd
2. Dr. Ferdous Alam, Senior Economist, PSP Ltd.
3. Mr. Goutam Chandra Dhar, Data Analyst and Statictician, PSP Ltd.
4. Mr. Horendra Nath Sarker, Senior Upazilla Fisheries Officer, Dacup, Khuilna
5. Mr. Mizanur Rahman, Field Supervisor and Data Entry Operator, PSP Ltd.
6. Mr. Shahidul Alam Chowdhury, Production Manager, Cox's Bazar, Sea Foods Ltd. Cox's Bazar
7. Mr. Shahan Al Monir, Field Supervisor and Data Entry Operator, PSP Ltd.
8. Mr. Shahanoor Bin Habib, Field Supervisor and Data Entry Operator, PSP Ltd.
9. Mr. Golam Kibria, Field Supervisor and Data Entry Operator, PSP Ltd.