CHAPTER 1

INTRODUCTION

1.1 Justification of the study

Since shrimp is considered as a luxury and a nutritious food, it has a good potential for elite consumers in the market. Demand for shrimp has increased faster than the rise in supply leading to high prices. This also leads to the seeking of solutions and technical methods to increase shrimp production. One solution applied by many countries is trawling natural shrimp, as well as exploring new shrimp species from seas and oceans etc. by investing in modern fishing fleets. This solution needs much capital investment and it is constrained by the ability of shrimp to reproduce. For these reasons, this solution is not ideal to meet the human being's increasing shrimp demand. Additionally, with modern equipment and fishing gear, the issues of over exploitation and over trawling will occur. As a result, natural shrimp resources will be exhausted and difficult to recover naturally itself. Consequently, the second solution, shrimp aquaculture, has been researched and applied. This solution would supply the favorite shrimp species appropriately to consumers and would also allow producers to seek initiatives in supplying, adjusting the harvest time, the shrimp market size and the harvest quantity according to the demand and market prices. Above and beyond, this solution helps protect and sustain the natural shrimp resources.

The world's shrimp demand is very high. This provides a good opportunity for Vietnam to increase shrimp production for exporting to harvest foreign currency for the country. In order to do so, there are two solutions. The first solution is to increase shrimp production from trawling shrimp in seas, rivers, and lagoons, etc. If the first solution is selected, Vietnam has to deal with some problems: the trawling areas are limited and natural shrimp stock has fallen gradually. In addition, tools, gear and equipment for trawling are of low quality and in poor condition. Moreover, capital is

still lacking for investment in this sector, since trawling fleets and fishing equipment are expensive. If it is possible, only the Government or big companies that have enough capacity in terms of capital can do this. Small farms have difficulty in applying this solution. Therefore, the second solution, shrimp aquaculture, is appropriate with the Vietnamese situation, especially for small farms. When shrimp aquaculture develops, this sector also helps use the coastal resources sustainably. Furthermore, other services will appear relating to or supporting shrimp aquaculture such as: shrimp processing factories, shrimp feed manufacturers, materials and shrimp inputs services, etc. One more important role shrimp aquaculture would play is to provide jobs for laborers and make stable the social issues in the region.

Endowed with a good internal network of rivers, lakes and ponds, as well as an extensive coastline, the potential for sustainable fisheries and aquacultural development in Vietnam is huge. Vietnam has a 3,260 km coastline, 12 lagoons, straits and bays, 112 estuaries, canals and thousands of small and big islands scattered along the coast. In the inland area, an interlacing network of rivers, canals, irrigation and hydro-electric reservoirs has created a great potential of water surface with an area of about 1,700,000 ha, in which 120,000 ha are small ponds, lakes, canals, and gardens; 340,000 ha are large water surface reservoirs; 580,000 ha are paddy fields which can be used for aquacultural purposes and 660,000 ha are tidal areas. The above figures do not include the water surface of rivers and about 300,000-400,000 ha of straits, bays and lagoons along the coast, which can be used for aquacultural activities but have not been planned yet (Ministry of Fisheries, 2001).

1.2 Statement of problem and usefulness of the study

Phu Vang is a coastal district of Thua Thien Hue province, Vietnam with a 40-kilometer coastal border. In the east, it faces one of the largest lagoons in Southeast Asian known as Tam Giang, which stretches from the top to the end of the district coastal border. The total land area of Phu Vang is 28,031.8 ha of which 6,400 ha is lagoon. On account of the long coastal border and the huge water lagoon surface, Phu Vang has abundant potential for fishery trawling and aquaculture. Consequently, in

the economic structure of the district, fishery is a significant sector (Department of Agriculture and Statistics of Phu Vang, 2002).

There exist four shrimp aquacultural systems in Thua Thien Hue and Phu Vang: traditional extensive, improved extensive, semi-intensive, and intensive. The areas of the four shrimp aquacultural systems in Phu Vang are presented in Table 1. 1.

Table 1.1 Area of the shrimp aquacultural systems in Phu Vang

Unit: ha

System	1999	2000	2001	2002
Traditional extensive	559	525	616.2	na
Improved extensive	163.5	243	124.9	na
Semi-intensive	112.2	154	594.3	na
Intensive	0	0	18.3	48

Source: Department of Agriculture and Statistics of Phu Vang District, 2002.
Note: na = not available.

In the first two shrimp aquacultural systems, traditional extensive and improved extensive, shrimps are reared in net ponds, in other words they are reared in lagoons while in the two remaining shrimp aquacultural systems, semi-intensive and intensive, shrimps are reared in earthen ponds. The extensive and improved extensive shrimp aquacultural systems show both increases and decreases in area between 1999 and 2001, while the semi-intensive and intensive shrimp aquacultural systems show aquacultural area increasing rapidly year-by-year. From 1999 to 2002, the aquacultural area of the semi-intensive shrimp aquacultural system (SSAS) increased more than five fold. The intensive shrimp aquacultural system (ISAS) only started in 2001, but its area increased 2.6 times in 2002 as compared to the previous year.

Moreover, according to the prediction of the Department of Agriculture and Statistics of Phu Vang district, there will be an increasing trend of the ISAS in the future. The reason supporting the prediction is based on the district's policies to

transfer low productivity crop areas and saline land areas into shrimp ponds. Hence, there will be alternatives for farmers to choose either SSAS or ISAS; since in these two systems, shrimp are normally aquacultured in earthen ponds, not in net ponds.

The research on comparative study of economic performance of shrimp aquacultural systems was selected to help aquaculturists and local district leaders see the picture of each shrimp aquacultural system for making production decisions and strategies at household level and district level as well.

1.3 Objectives of the study

The objectives of this study are as follows:

1. To describe major shrimp aquacultural systems
2. To evaluate and compare economic performance of two different shrimp aquacultural systems: semi-intensive and intensive
3. To identify possible solutions for improving the performance of different shrimp aquacultural systems

1.4 Scope of the study

There are several shrimp species found in Vietnam and in Phu Vang district, Thua Thien Hue province; e.g., *Metapenaeusensis*, *Penaeusmerguiensic*, *Penaeus monodon*, *Penaeus japonicus, Penaeus orientalis*, etc. The shrimp species considered in this study is Black Tiger shrimp *(Penaeus monodon)*. This species is widely raised in Phu Vang, the aquacultural area shown in Table 1.1 is mainly from Black Tiger shrimp. It is widely aquacultured in Phu Vang for two reasons. First, the shrimp price is high and its market is stable. Second, the technical process of Black Tiger shrimp aquaculture has been entirely disseminated in the province (Department of Fisheries of Thua Thien Hue, 1995).

Phu Vang was selected for study since its geographical characteristics are appropriate for shrimp aquaculture and it is a good representative of Thua Thien Hue lagoon. According to the People's Committee of Thua Thien Hue province (2001), Phu Vang is one of the four main specialized aquacultural districts of Tam Giang lagoon. It is also a district that has a high average shrimp yield in Thua Thien Hue province. Accordingly, the results of this study can be disseminated and applied to the province as a whole.

As predicted by the Department of Agriculture and Statistics of Phu Vang, there will be an increasing trend of the semi-intensive and intensive shrimp aquaculture in the future; therefore the SSAS and ISAS were selected for the study.

Since farmers in the research site do not apply farm records, so it is difficult to have the data from the previous crops. Accordingly, the study covers only the second crop of 2002.

In order to achieve the objectives of the study, three research methods will be used i.e. descriptive statistics, budgeting analysis, and stochastic production frontier.