

## Study on the development of a safe, environmentally friendly shrimp culture system in Vietnam

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(ベトナムにおける安全かつ環境配慮型エビ養殖システムの開発に関する研究)  
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### Thesis Summary

The study aims to recommend the solutions for the development of a safe and environmentally friendly shrimp culture system in Vietnam. The first specific objective of the study is to determine factors affecting the productivity of integrated mangrove-shrimp culture model in Ca Mau province. The OLS estimated results of Cobb-Douglas production function reveal that the farmers who use quality shrimp seed (above 50% of seed amount) achieve higher productivity than the other farmers while the increasing in shrimp seed cannot increase the shrimp yield; the increase of other outputs in the crop (crab, natural shrimp and natural fish) reduces the shrimp yield because of competition of feed and living space; farmers who have higher education and large water surface area could achieve higher productivity; farmers who use tea seed cake or derris roots to kill predators before starting new crop have higher yield than farmers not using it; and finally, training is the most important determinant of shrimp yield. Farmers participating in training course will achieve much higher shrimp yield than non-participating farmers. The second specific objective is to determine factors affecting the profit of integrated mangrove-shrimp culture model, considering the effect of organic certification scheme. The OLS estimated results of profit function present that profit is positive affected by shrimp price, crab seed price, water surface area, the use of tea seed cake or derris roots to kill predators before the crop, and the participation of shrimp farmers in the training courses. Especially, certified farmers have a higher profit than non-certified farmers, because of higher shrimp productivity. Furthermore, the difference in benefit received by certified farmers is further discussed to help farmers and companies build closer cooperation. The third specific objective is to determine factors affecting shrimp farmers' decision to convert their culture from non-certified organic shrimp farms to certified-organic shrimp farms. The estimated results of the multinomial logit model show that farmers who have a higher mangrove coverage in their shrimp farms are more likely to participate in the project. The likelihood of adoption also increases when farmers have a higher level of education. Interestingly, the premium commanded by the certified organic shrimp is not among the important factors affecting farmers' decision to participate in the project. The fourth specific objective is to explore farmers' preferences for farming contract when intending to convert to certified-organic shrimp farms. The contracts were described by four attributes, including premium for certified organic shrimp, premium-payment delay, selling place and the provision of quality seed. Conditional logit and mixed logit models were used to analyze the data which were collected among shrimp farmers in Vietnam. The results indicate that farmers prefer the contract with a higher premium; however, premium-payment delay decreases farmers' utility and the

probability of choosing the contract. Besides the premium, the provision of quality seed is an important attribute which attract farmers to choose a contract. Almost farmers prefer to sell their shrimp at farms. The results also show the heterogeneity in farmers' preferences for the contract's attributes and in their willingness to accept for these attributes.