

Analyses of drug use and constraints for adopting good aquaculture practices: A case of the shrimp aquaculture in the Mekong Delta

農業使用とグッドプラクティス導入の制約に関する考察：メコンデルタ地域におけるエビ養殖の事例から

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1. Introduction- problem

In Vietnam, for decades, shrimp aquaculture sector has played a dynamic role of economic growth. It has been improving the livelihood for people who are living in the rural areas, contributing to poverty reduction and enhancing the food processing industry. Shrimp export takes the biggest share, nearly a half of total seafood exports of Vietnam, places Vietnam at the World's top shrimp suppliers, aims at about 100 markets and supplies about 14% of the world shrimp market in value (VASEP, 2019).

However, there are several challenges ahead for the sustainable growth of this sector. Especially, Vietnam has been standing in the top countries of port rejection caused by antibiotic residues. Disease outbreak in Mekong Delta, the main shrimp production area, is the root of antibiotic overuse and it causes a lot of negative impacts to hinder sustainable development goals of this sector. The risk of disease comes from three main reasons, including disease germ, shrimp health and disadvantage environment. Therefore, it is necessary to well control all the factors which affect shrimp health and widespread disease germ through the environment.

To deal with the above issues, disease outbreak and drug use. Technology solution and governance solution have been established and highly recommended such as short-term/ long-term plans, regulations, standards, official supports and supervisions. Among many good aquaculture practices which are recommended by the government, a technical guidance called Integrated Preventive Measures (IPM) targets to reduce disease outbreak based on very basic principles of disease risk prevention.

However, why these issues persist in Vietnamese aquaculture sector is the big question. Seem that both of technology solution

and governance solution don't work very well in reality, especially in case of small-scale farmers.

2. Research objectives - questions

Motivating by the problems, the purpose of this study is to aim at:

a. To investigate and update the current issues of shrimp aquaculture in Mekong Delta focusing on the issues of drug use and the disease outbreak at micro level.

b. To examine the reasons for the persistence of the above issues.

c. To examine the effectiveness of some current mechanisms which are expected to support farmers to solve the shrimp farming problems.

In detail, this thesis is divided into two objectives, objective 1 focuses on the issue of drug use and objective 2 focuses on the issue of disease outbreak. Each objective aims at the 3 above goals, answers to its specific questions.

3. Research methodologies

3.1. Case study- data collection

Camau is the largest provincial area of shrimp aquaculture in Vietnam. Covering 12,97% of the area of Mekong Delta, however, Ca Mau produces the largest volume of shrimp aquaculture, accounting for about 30% shrimp production of Mekong Delta, 23% shrimp production of Vietnam (GSO, 2019). Although the shrimp aquaculture system is divided into several types of farming, this study focuses on intensive farming and semi-intensive farming by small-scale farmers because they are the subjects of disease outbreak and drug use.

The data used in this study were collected by questionnaire surveys for the first time in November 2016, and the second time in August 2017 under the project funded by the Japanese Society of Promotion of Science (KAKENHI).

Face-to-face interview with the head of each household was conducted by local enumerators. Of 1546 households in 9 villages of Phutan commune, Camau Province, 256 households are randomly selected for the analysis.

3.2. Empirical strategies

To analyze the data, the study employs several methods including descriptive statistics, document analysis, and quantitative models.

As for the objective 2 (the issue of disease outbreak), to analyze the relationship between IPM awareness and practices, the study selected 20 IPM criteria which were referred from Shrimp-rice development project by Ca Mau province and also highly recommended and widely disseminated by The Ministry of Agriculture and Rural Development of Vietnam (DARD Camau, 2013). The effectiveness of two current mechanisms in term of constraint mitigation, shrimp cooperative and information canals, are analyzed quantitatively using the method of ordinary least squares (OLS) and Propensity Score Matching (PSM).

4. Results and Discussions

As for the issue of drug use, the study finds that apart from antibiotics, farmers widely use several kinds of drug such as veterinary drugs, hand-made drugs. Different from some previous studies, shrimp farmers use drugs purposely to prevent disease (as prophylactic medicines) rather than to treat disease. Besides, input seller and other informal information canals such as friend, family member play the important role in term of technology diffusion and disease treatment. In contrast, the role of the formal information canals such as extension workers and official media is limited. Moreover, the weak tie between farmer and processor results in the problematic shrimp export value chain by small scale farmers which heavily relies on the middlemen. By this value chain, farmers don't be motivated or enforced to change their behaviours of drug use.

Another aspect, the study finds the gap between Vietnamese standards and the international standards. The lower domestic quality standards in comparison with the international standards, the slow response to the market standards as well as some other

ineffective mechanisms contribute to the drug residues and a high rate of port rejection of Vietnam shrimp.

As for the issue of disease outbreak, the study finds that adopting IMP is challenging by small farmers because of several existing constraints. In addition, shrimp cooperative as expected to be an active farmer self-help group doesn't work very well in reality. However, training experience and lab-test experience bring positive significant effects in term of enhancing shrimp farmers' awareness and knowledge of IPM.

5. Conclusions and Implications

The study investigates and updates the issues in Vietnamese shrimp aquaculture. Based on the conclusions, policy implications are proposed to improve some key points such as intensifying input market supervision, reducing the standard gap, mitigating current constraints, empowering the role of farmer self-help group, formal information canals, promoting shrimp- farm training and lab-testing services.

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