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**Collaboration for Agriculture and Rural Development
(CARD) Program**

Project Completion Evaluation Report

002/05VIE

**Technical and Economic Feasibility of applying Better
Management Practices to household aquaculture in Vietnam**

(20th – 23rd July, 2009)

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Executive Summary

Household coastal aquaculture farms, ranging in area between 0.5 ha and 3 ha, produce 90% of the output of farmed shrimp from in Vietnam, worth \$USD 1 billion in 2004. The economic viability and environmental sustainability of farms in this sector are threatened by poor farming practices that lead to disease outbreaks, environmental degradation; crops contaminated with chemical and antibiotic residues and decreased yields. Pilot-scale Better Management Practices (BMP) can, and have been applied to larger commercial aquaculture ventures in Vietnam, with the outcomes of improved yields and quality, environmental sustainability and reduced risk of disease. However, difficulties arise in the administration of BMP to household farms because of financial constraints, lack of knowledge and little incentive or initiative to adopt BMP. The overall objective of this project is to investigate the effectiveness of BMP application to household farms and to develop methods to initiate BMP within this sector. The project has used consultative, incentive, demonstration, training and dissemination methods that are appropriate to the needs and abilities of household farmers. Project outcomes are the development of methods for dissemination and utilisation of BMP amongst household farmers, leading to tenable farm practices, reduced disease risks, reduction in environmental degradation, increased yields and improvement of economic viability of the sector in the long term. The project has contributed to the Government of Vietnam's Comprehensive Poverty Reduction and Growth Strategy (CPRGS), which is aligned with CARD program strategic framework.

1. Introduction

1.1. Project's General Information

Project Number and Name:	002/05VIE. Technical and Economic Feasibility of applying Better Management Practices to household aquaculture in Vietnam
Vietnamese Institution	Research Institute for Aquaculture No.1, Vietnam
Vietnamese Project Team Leader	Dr. Le Xan, Vice Director of Research Institute for Aquaculture No.1, lexan@hn.vnn.vn or vie97030.ria1@fpt.vn
Australian Organisation	The University of Western Australia (UWA), Australia
Australian Personnel	Dr. Steven Schilizzi, Senior lecturer, The University of Western Australia (UWA): schilizz@cyllene.uwa.edu.au
Date commenced	August/2006
Completion date (original)	December/2007
Completion date (revised)	December/2008
Project location	Nghe An, Ha Tinh and Thua Thien Hue provinces
Project budget (A\$): Total: 498,663	From: AusAID: 292,043 Vietnamese institution: 76,600 Australian institution: 130,020

Project Goal:

The overall objective of this project is to investigate the effectiveness of BMP application to small-scale household farms through reducing negative environmental impacts, increasing yields, lowering risks and improving product quality - thereby contributing significantly to long-term poverty alleviation and income generation for households directly involved in aquaculture production chains.

Project Objectives:

1. Document current status of shrimp culture in north central provinces, experience on BMP application to aquaculture worldwide; and to select suitable farms for BMP demonstration.
2. Demonstration trial of BMP proposed in on farm trials in 3 provinces in coastal region of north central Vietnam.
3. Data analysis and modelling of BMP from demonstration trials
4. Dissemination of BMP

1.2 Purpose of Project Completion Evaluation

The purpose of this project completion evaluation is to identify outputs/results that the project has achieved and to evaluate the quantitative and qualitative achievements against the project's objectives. It also addresses and assesses the relevance, effectiveness, efficiency, impact and sustainability of the project. Furthermore, this evaluation indicates lessons learned from the project and gives recommendations in terms of government policy that may promote the adoption of project results as well as scale up the application of BMP for wider scale inside and outside pilot provinces.

1.3 Evaluation Methodology

The evaluation undertaken by evaluation team includes the following steps:

- Review all project documents such as the project proposal, milestone reports and completion report, the PMU appraisals to clarify all project objectives, outputs and activities, and then complete an initial review of project performance.
- Prepare a work plan for evaluation and compose semi-structured questions for interviews of four relevant stakeholders during the field trip: 1) project staff/implementers (RIA1); 2) Fisheries/extension staff and officials at provincial and district levels; 3) commune leaders and fish farmers at pilot areas; and 4) possible fish dealers.
- Taking a meeting with RIA1 project staff to clarify issues to be made in initial review of the project. Undertake a field trip to project sites to collect primary information by meetings and discussions with relevant stakeholders in project areas (pilot provinces, including Nghe An and Ha Tinh as representatives, Thua Thien Hue is not visited because of distance).
- Analyse collected primary data and information of project outputs and project outcome and impacts.
- Prepare a draft evaluation report and finalise the report.

2. Project Implementation Review

2.1 Review of Log-frame

The log-frame is assessed to be appropriate with achieving the project goal and specific objectives. All information required, performance indicators, assumptions/risks were well-defined with regard to the Objectives, Outputs. Activities were also clearly identified. However, the objectives, outputs and activities (in log-frame) in the proposal and completion report are not the same. This creates some difficulties to clarify what in relation to specific output of the project.

2.2 List of Milestones Scheduled and Completed

Milestone	Scheduled	Completed
MS1: CARD Contract Signed	April 2006	August 2006
MS2: BMP Protocols	June 2006	May 2007
MS3: Shrimp Culture Baselines	August 2006	May 2007
MS4: 1st Six-monthly Report	October 2006	March 2007
MS5: 2nd Six-monthly Report	February 2007	August 2007
MS6: BMP Extension Materials	March 2007	October 2007
MS7: 3rd Six-monthly Report	August 2007	February 2008
MS8: Research Publications/Technical Reports	October 2007	February 2008
MS9: Staff Competencies	December 2007	December 2008
MS10: Project Validation	January 2008	January 2009
MS11: Project Completion Report	April 2008	February 2009

The time of achieving milestones as scheduled and completed is different as a result of some reasons:

- The arrangement for signing the project contract between CARD and project partners was delayed for about 4 months
- The stocking time of shrimp seed was also delayed, therefore, the project was postponed for some months to wait for a new season of a new year (full 2 stocking seasons per year).

3. To Confirm If the Project Has Achieved Its Objectives

3.1 Findings from PCIE in relation to project outputs (see project log-frame Annex 3):

Each output is assessed to achieve its objective and ranked in four levels of High satisfactory; Satisfactory; Moderately satisfactory; and Un-satisfactory, as follows:

Output 1: Improved knowledge on status of BPM application in country, regional and international and find out the current status of technical, socio-economic, environment and constrains of shrimp households in North Centre region.

Based on the information from written report for MS2, appraisal report as well as current conditions of pilot areas, the evaluation team found that the project has successfully

achieved its Output 1 although MS2 had been resubmitted for higher quality. The following deliverables have been produced:

Deliverables for Output 1 (Milestone 2):

Milestone 2: BMP Protocols

Deliverables include:

- Literature Review of BMP (regionally and internationally)
- Draft protocol for establishment of BMP in smallholder aquaculture in Vietnam that deals with:
 - Pond Preparation
 - Post-Larval Selection and Stocking
 - Pond Environment and Disease Management
 - Harvesting and Marketing

The deliverables were well-presented with good quality and considered to be practical. Therefore, Output 1 is assessed to be “Satisfactory”.

Output 2: To ensure BMP protocols are suitable and applicable to the project area to improve the production effect in term of technical, social, economic and environmental.

A baseline survey and environmental reports were presented. The survey of 90 shrimp farmers in three north-central provinces in Vietnam (Ha Tinh, Nghe An and Thua Thien-Hue) was implemented. Valuable information of shrimp culture practices, shrimp seed sources and quality, pond preparation, chemical and bio-product application, feeding and other inputs to production, environmental and disease conditions, shrimp revenue and other income sources and factors influencing and being influenced by shrimp culture were addressed. The information was used to analyse what are possible positive and/or negative impacts on shrimp farming and it also used to determine more precisely what project interventions would have the greatest impact.

Development of methods for dissemination and utilization of BMP were implemented to reduce risk of diseases, mitigate environmental degradation, increase yields and improve economic viability of the sector in the long term. Main deliveries for Output 2 include milestones 3 and 6.

Deliverables for Output 2 (Milestones 3 & 6):

Milestone 3:

Deliverables include:

Baseline survey report of 90 small-scale shrimp farms, including: -

- Shrimp culture practices of smallholders
- Environmental assessment (particularly water quality)
- Social and economic data, including financial analysis of a range of size of smallholder holdings
- Analysis of current attitudes (beliefs, practices and constraints) towards BMP in extensive and semi-intensive systems
- Analysis of results and identification of appropriate project interventions

The reports of MS3 (Baseline survey report and Environmental assessment report) are a good source information (issues and indicators) these are a base for comparison during and after project implementation. The quality of the survey was good with much information about technical and economic issues. The baselines were well used for the project validation part.

Milestone 6:

The main content of MS6 is BMP training manual, including smallholder record keeping formats

Main deliveries of milestone 6 include:

- BMP training manual (2000 copies) including extension aids including smallholder record keeping formats that deals with the following aspects:
 - Disease management
 - Environmental management
 - Shrimp Farm Record Book
 - Quality and quality management
 - Food safety hazards
 - Post mortal quality change
 - Guidelines on handling of fishery materials after harvest

The deliverables of Output 2 were well-presented with good quality. Some farmers from the pilot areas expressed their satisfaction with regard to the training manual. Therefore, Output 2 is assessed to be “Satisfactory”.

Output 3: Indicators of culture techniques, environment, economic and social aspects were collected during implementation of BMP

The project team has provided an evaluation of BMP shrimp aquaculture in North Central Vietnam on technical indicators, economic indicators, environmental indicators, social and related indicators and BMP adoption rate of trial farms and farmers attended BMP training courses.

Most of trial farmers practiced BMP guidelines such as pond preparation, seed selection and stocking, pond environment and disease management, harvesting and selling products. In other cases, lacks of capital, lack of knowledge, lack of time are the main reasons for not adopting BMP in the areas. It seems that the major driver for changed practices will be economic rather than environmental.

The main delivery of Output 3 is milestone 8 (Technical Report on Environmental and Economic Evaluation of Better Management Practices for Shrimp Culture in Vietnam).

Deliverables for Output 3 (Milestone 8):

- Analysis of 30 extensive and 21 intensive smallholder BMP trials

- BMP as methodology for improving pond biological and chemical contaminants and improving the health and quality (level of contaminants) of shrimp
- Comprehensive BMP model

The analysis of extensive and intensive smallholder BMP trials was made. However, in the initial proposal, trials were proposed to choose 51 farms as smallholder trials but in practice, the number of core farm trials reduced from 51 to 9 as a result of change made after receiving comments from TAP and PCC. The project demonstrated 9 core farms (3 per province), but the operational approach of the project was to work with 9 x 30 = 270 farms, not 9 farms. However, the change from 30 to 3 did not impact on the initial estimated budget.

The project team has successfully implemented BMP model in three provinces and demonstrated farms were recorded and reported specifically. In conclusion, the Output 3 is assessed to be “Satisfactory”.

Output 4: The capacities of BMP implementation and application of different project stakeholders such as researchers, extension workers, managers and shrimp farms were improved

The investigation of the effectiveness of BMP application to household farms had been made. Further more, the project team also developed methods to initiate BMP within this sector. The project used consultative, incentive, demonstration, training and dissemination methods that are appropriate to the needs and abilities of household farmers.

Deliverables for Output 4 (Milestones 9 & 10):

Milestone 9:

Deliverables include:

Competency analysis of project staff, extension staff, shrimp farmers, and aquaculture groups /associations including:

- Competency of RIA1 staff in BMP techniques and ability to train fisheries extension staff and motivated farmers
- Competency of trained fisheries extension staff as trainers of smallholder farmers
- Competencies of at least 51 BMP trial farmers in understanding and implementation of BMP trails
- Effectiveness and sustainability of aqua-clubs/associations as a mechanism for extension beyond target smallholders

Milestone 10:

The deliverables of milestone 10 include:

- Report comparing production performance of target and non-target smallholders with baselines
- Economic, social and environmental analysis (particularly water quality) of project impact.
- Assessment of adoption rates of trial farmers (51) and likely future adoption rates of 650 farmers attending BMP training

The report of project validation was well produced and well organised with different analyses as above. The quality of analyses was good. In general assessment, the Output 4 is to be “Satisfactory”.

3.2 Project Progress & Implementation Issues

The completion of the project was delayed for about one year as a consequence of contract negotiation and the seasonal issues for shrimp farming. The delay of money transfer from Australian partner to Vietnamese partner also caused some delay of project progress, especially to the component of farm demonstration.

In general, the implementation of the project progressed smoothly and most activities were completed on time in relation to new timeline although there was some delay of report for MS2 as a result of resubmission.

The steady implementation progress was assessed to be greatly aided by a strong communication between project partners and project team with local partners and farmers. Good relationship between RIA1 and three provinces in the past has contributed to the close coordination and cooperation of theirs into the project. There are no significant issues regarding the implementation of the project.

3.3 Major Problems Identified and ranked in four levels of High satisfactory; Satisfactory; Moderately satisfactory; Un-satisfactory:

Some major problems identified regarding the practising of BMP include: 1) BMP was developed for common tiger shrimp only. At present, there are many farms of raising white leg shrimp. BMP, therefore, may not be appropriate if it needs further guidelines for farmers to adopt the BMP for such type of shrimp; 2) the costs for farms to practise BMP are significant higher than that of traditional practices, however, the price of product shrimp does not differ in practice. This is because of shrimp dealers/sellers prefer good looking shrimp rather than the inside quality of shrimp. At present, shrimp is sold for domestic consumption, but if the product is produced for export, it may not meet the required quality standards. This implies the need for an authorised agency to assess and provide certificates for farms adopting BMP.

The field investigation identified that there are still farms where farmers keep their traditional practices. After the completion of the project, most farms do not follow the full process in BMP. For example, the records of environmental parameters are not implemented since farmers do not have equipment to sample and test. Other processes of BMP are often dropped by farmers such as killing crabs or using surrounding nets.

Although the economic efficiency of adopting BMP was analysed to be higher, the analysis was only implemented in case of before and after for pilot models. After a period of 2 years, there may many other factors that could lead to better efficiency of shrimp farming. It would be more reliable if there was analysis of some models in cases of with and without adopting BMP at the same area.

The evaluation of the project achievements in relation to its objectives is as follows:

Code	Narrative	Assessment
Objective 1	Assessing current status of shrimp households operation and find out advantages and disadvantages of BMP application	S
Output 1.1	<ul style="list-style-type: none"> • Study on BMP overview of in country and other countries in the region and over the world. 	S
Output 1.2	<ul style="list-style-type: none"> • Questionnaire design to survey of current status, survey 90 small-scale shrimp households 	S
Output 1.3	<ul style="list-style-type: none"> • Assessment of initial environment (water quality) of the project sites before implementing activities. 	S
Objective 2	Developing suitable BMP protocols for project area and BMP applying to aquaculture households and communities scales in North Centre Vietnam	S
Output 2.1	Preparation of suitable BMP protocols for North Centre provinces where project is implemented	S
Output 2.2	Application of BMP protocols into BMP trial farms and local communities.	S
Output 2.3	Organizing BMP training courses (9), cross-visiting (6), monthly meeting at communes (more than 50)	S
Objective 3	Testing BMP application parameters at household and community levels	S
Output 3.1	<ul style="list-style-type: none"> • BMP technical and community based parameters applying into shrimp farms and communities in the project provinces. 	S
Output 3.2	<ul style="list-style-type: none"> • Monitoring, recording all data of techniques, socio-economic and environment of trial farms and communities during implementing BMP protocols. 	S
Objectives 4	Improving capacity of implementation and application of BMP for different stakeholders of different levels of central, provincial and local.	S
Output 4.1	<ul style="list-style-type: none"> • Capacities of project staff at central level are improving though activities that project management, training, short trip to UWA, attendant of national and international and student supervision. 	S
Output 4.2	<ul style="list-style-type: none"> • Capacities of provincial staff (managers and extension workers) are improving though activities that BMP training courses, workshops, cross-visiting, train farmers and monitoring the technical, environment, diseases and communities based management 	S
Output 4.3	<ul style="list-style-type: none"> • Capacities of local staff and farmers are improving though activities that BMP training courses, workshops, cross-visiting, communities based management, BMP application, data collection and recording. 	S

In short, the overall goal of the project was achieved and specific objectives were assessed to be “Satisfactory”.

4. Project Evaluation

Five key evaluation questions: Relevance, Effectiveness, Efficiency, Impact and Sustainability were asked for answers. More specific questions for evaluation during the field trip were addressed in Annex 4.

4.1 Relevance:

Key Question: Does the design of the project correctly address problems or real needs? Were the objectives clear, realistic and measurable and was the project design adequate to achieve the objectives?

The project objectives were highly relevant to Vietnam in the context of development of fisheries sectors since Vietnam is still one of the leading fisheries exporting countries of the world, and it has a competitive advantage in producing shrimp. The design of the project, which focused on exploring best management practices in Vietnam and other countries and investigating current issues with regard to shrimp farming in pilot provinces to promote better management practices, addresses the real needs of Vietnam. The process of identifying existing problems in association with selecting current best management practices in Vietnam and other countries to adopt, implementing trials in project areas, then assessing the efficiency of BMP is evaluated being as a good approach to achievement of its objectives. The objectives were clear, realistic and measurable. However, the BMP is designed for farming common tiger shrimp only. Other types of shrimp need more research for adopting the BMP.

Mr. Pham Ngoc Hung, technician of Fisheries Extension Division, Nghe An Province, assessed that “the project is very necessary. Local farmers are happy because they need to complete process for shrimp farming”.

4.2 Effectiveness:

Key Question: did the project do the right things to address the purpose or objectives? Need to consider progress in achieving objectives, quality of outputs, and extent of benefit to target population.

The project appears to have done the right things and succeeded in achieving its objectives. In particular, the project has proposed a new method of management of shrimp farmers based on groups/ clubs. This is assessed as a very important factor in terms of shrimp diseases as well as choosing good quality of shrimp seed for stocking. The mechanism for operation of such types of group is to select representatives of the groups to be responsible for taking care of disease control and checking the quality of seed before buying.

Mr. Dinh Van Can, Chairman of Farmers’ Association, chairman of fisheries farming project management unit of Hung Hoa 2 commune, said “aquaculture is difficult and complex. The project has a large effect on awareness of the community. Community groups had been established and operated thanks to the project. The project has increased the knowledge of the community and made shrimp farmers to work together closely”.

4.3 Efficiency:

Key Question: Were the resources used in the best possible way or could things have been done at lower cost? Timeliness of implementation processes, efficiency by contractor, strength of partner support and value of dialogue etc.

The project team is assessed to be successful in organizing and cooperating with relevant stakeholders during the implementation of the project. Resources used in the project are appropriate with regard to equipment and BMP procedures as well as human resources.

In terms of farm trials for BMP development, the project team selected different types of farming systems: semi-intensive and improved extensive and organising them into groups /clubs. Then during the demonstration, data was recorded for group of farms (reduce the costs of experiment) because normally farms belong to group have the same conditions on water quality as well as environmental parameters. The project invested tool kit for testing environmental parameters to be a good support for them to work in groups and to be familiar with BMP.

The project worked with 9 core farms (3 per province), but the operational approach of the project is to work with 270 farms. The change of trial farms to work in groups did not impact on the initial estimated budget because the budget was spent mainly for group demonstration and building capacity. This is a good approach because if all individuals of farms in groups were implemented with environmental control it would take time and the results of farms in a group are often similar to each other in the group.

The timeliness of the implementation of the project was considered good. However, during the implementation of the project, the shrimp households were affected by natural disasters such as the storm number 5 in Ha Tinh and Nghe An, and the flood in Thua Thien Hue in 2007. The white spot disease outbreak in Vietnam in 2007 and 2008 also affected to shrimp farms in project sites. In addition, in 2008, global financial crisis caused some negative effects on shrimp culture in Vietnam in general and in the project areas in particular.

4.4 Impact:

Key Question: To what extent has the project contributed to the improvement of livelihoods and overall CARD objectives? Should consider: financial impacts (increased income or decreased cost); social impacts; environmental impacts

The project has a significant impact of knowledge skills, practices, profitability on stakeholders and beneficiaries, especially on shrimp farmers, fisheries extension staff at provincial and district level in the pilot areas. The project has been contributing to increasing yields, lowering risks and improving product quality of shrimp farming, therefore to long-term poverty alleviation and income generation for households directly involved in aquaculture production chains.

BMP requires higher costs than non-BMP such as for pond preparation, shrimp seed and feed, bio-product, chemical, energy and others. However, the income of BMP group is higher (about 109.5 million VND per ha) as a result of less disease, higher yields, etc. The economic analysis of the project indicates that the average benefit-cost ratios of shrimp farming in three pilot provinces are 1.29, 1.23, and 1.37 in response to baseline, non-BMP,

and BMP respectively. This is a very important factor to encourage farmers to apply BMP. Although the net average benefit of shrimp culture per ha in case of BMP is 30,844,000 VND in compared to 13,895,000 VND in case of non-BMP, the most important factor of applying BMP shrimp culture is to ensure to again income for households as a result of good disease control and high quality of product shrimp.

The project has some good environmental and social impacts such as distributing to a better quality of farming environment. Female participants in the project were encouraged to attend in project activities such as training, cross visiting and association meetings. However, the percentage of females who attended was still low. Two female students (Bachelor and Master) were given to write their theses based on the project scope. These female students received very good results for their theses.

In terms of capacity building (research activities and training), the project has contributed to improving capacities of stakeholders at different levels:

- At central level, RIA1s' staff, who directly involved in the project (both managers and technical experts), improved their capacity in both abilities of management and research skills and ability to train others.
- At provincial level, extension staff in three provinces, who worked for the project, improved BMP implementation capacities and they approached to BMP knowledge through management, technical transferring and training activities. The extension workers were competent to train farmers, etc.
- At local level, communities' leaders, aquaculture communities' managers and shrimp farmers in project areas, improved their capacities on BMP implementation, and more importantly, the capacity to manage and operate aquaculture clubs/associations in order to develop effective and sustainable shrimp culture.

The number of households/shrimp farmers using the BMP is, at initial stage, evaluated to be extended or scaled up outside pilot areas. According to Mr. Nguyen Van Ngon, shrimp farmer in Thach Ha Commune, other households from different communes, have come to his farm to learn about the experience of BMP farming (to adopt BMP). Mr. Ngon also praised the important contribution of the project.

In the future, the impact of the project will be high since the issue of secured and safety food has been paid attention by the government as well as consumers. The culture following traditional farming always involves much risk such as diseases and high antibiotic residual in product shrimp affecting consumers' health. Such problems need to be eliminated. Therefore, the BMP will have a chance to be extended widely. However, it also needs the promotion of shrimp culture toward adopting BMP. Fisheries extension staff at different levels of provinces will take an important role in introducing and transfer the BMP to different households/ or shrimp farmers to ensure that they practise farming efficiently and toward sustainable development.

During the field visit, although there are some opinions of local people that households who did not apply BMP could earn more income because they beared lower costs of farming. However, they take a high risk of loosing income, for example, the occurrence of shrimp diseases, the problem of anti-biotic residual affecting consumers. In the future, for sustainable development, the BMP adaptation should be essential and strictly required.

4.5 Sustainability:

Key Question: Are the positive outcomes from the project likely to be maintained, replicated or extended?

As the evaluation mentioned above, the project has produced different positive outcomes which are likely to be maintained and replicated. Indicators that were identified during the field trip include:

1) The awareness of the community is higher with regard to shrimp culture adopting BMP to reduce risk of farming.

2) Households understand the need to coordinate or cooperate in groups or associations in controlling diseases as well as input shrimp seeds to ensure farming more efficiently. Technical issues are more controlled by farmers and community management and organisation has been promoted. If BMP is adopted, the survival rate of shrimp is increased; shrimp diseases could be eliminated or easily stopped when shrimp diseases occur.

3) The information on BMP is circulated through training courses, workshops, and training MSc student and technicians. Related information and outcomes of the project were published through different sources such as:

- The results of general BMP training course were published in Thua Thien-Hue Newspaper.
- The BMP practical process was broadcasted on Ha Tinh Television
- The project information and project results were published in the Newsletter and the Website of RIA1 and the website of CARD.
- The project outcomes were presented at international ViFINET workshop at Cantho University and national young scientist workshop at RAI1
- The BMP training materials and BMP protocols were delivered to local offices and households in project provinces. Therefore, the benefits of the project are likely to be maintained, as a consequence of financial returns, stability, etc.

5. Conclusion, Lessons learned and Recommendations

Based on the evaluation team's findings, this project can be considered to have successfully achieved its objectives and has demonstrated early signs of positive impact for both the fisheries industry and the project participants. There are also good indicators that project outputs will be sustained and extended. In relation to the relevance, effectiveness and efficiency of the project, the evaluation found that the project was successful when assessed against these factors.

The project team has made good coordination with relevant stakeholders at locals and among partners. However, there is still an opinion from Mr. Truong Cong Trung, chairman of Thach Ha commune, that the cooperation between sector management at central level, provincial, and district and commune was not very good. Links for talking, discussing and contribution are not many. The responsibility of local government was not good and this needs to be considered as a weakness to be learned.

The information about the BMP and the model of community management (in forms of clubs/ associations/ groups) should be circulated or disseminated across the whole sector for potential producers/ farmers to know and adopt in practice. The manuals and protocols of the BMP could be published as a guideline for farmers' adoption. Further research may

be needed to modify and develop the BMP for different types of shrimps, especially tiger shrimp and white leg shrimp. These two are most popular in farming across provinces of Vietnam.

Further impact would depend on further support from decision makers at provincial level and even MARD in terms of promoting the adoption of BMP and related policies for development of community organisations in shrimp culture. Fisheries extension staff in provinces also needs to take an important role in introducing and assisting farmers in terms of technical issues and management model to change traditional culturing methods toward best management practices. There are some evidence that farmers can assist in transfer of practices as mentioned above.

It may need an establishment of a unit inside provincial department of agriculture and rural development to assess and endorse shrimp farms where BMP is applied. For product shrimp for export, it needs to require strict BMP and to be compulsory for farmers to implement. Further propaganda about the quality of product shrimp should be made to raise awareness of farmers and consumers toward the issues.

Other opinions of shrimp farmers need to be considered for further support. Shrimp seed with high quality is most important to farmers; therefore, it needs to have projects to support/ promote producing seeds with high quality because if the shrimp seed is low, farming shrimp could be died even farmers follow BMP strictly. It also needs to have recommendations on how long shrimp farmers should spend some time for ponds free (not farming) to ensure the issues of environmental quality. At provincial management level, it needs to establish units to assess and produce certificates for shrimp farmers who adopt BMP.

Mr. Le Van Tuan, a farmer at Hung Hoa 2, expressed his emotion: “BMP can last the time of shrimp farming longer, the survival rate is higher, the growth is better, the control of environmental quality and shrimp diseases is better”. However, he suggested that the project needs to provide more practical experiences, needs more “on farm” workshops, and have an information channel to consult technical issues when farmers face problems.

The delay of the project compared with the anticipated start (as the result of contract negotiations for about 4 months) caused further delay as a consequence of shrimp farming by seasonal. In terms of recommendation to CARD project management, it needs to process procedures as well as finish contract negotiations at proposed time since projects with experiments/ demonstrations especially with fisheries and shrimp trials, they largely depends on seasons with available seeds as well as weather conditions.

In short, in terms of policy recommendations, some issues need to be implemented to promote the development of BMP, including: to establish a unit inside provincial department of agriculture and rural development to assess and endorse farms where BMP is implemented to certify the meeting of environmental standards and quality of shrimp farming; to promote the development of community management (in form of clubs/ associations/ groups) to control shrimp diseases as well as seed quality; to set information provision channels at provincial level to consult technical issues to farmers’ groups/associations/clubs even extension staff to come to farms in necessary cases; to provide extension activities on BMP in form of “on farm” workshops to spread the experience of BMP to other areas in each province.

Annex 1. LIST OF INTERVIEWEES

1. Project team member:

- Mr Nguyen Xuan Suc, team member, researcher RIA1
- Mr Tran Long Phuong, team member, researcher RIA1

2. Nghe An Centre for Extension of Agriculture – Forestry – Fisheries

- Mr Cao Ba Hien, deputy director of the centre
- Pham Ngoc Hung, deputy head of technical section

3. Hung Hoa 2 Cooperative, Nghe An province

- Mr Chu Van Ngu, chairman of Hung Hoa 2 cooperative
- Mr Dinh Van Can, chairman of farmers' association
- Mr Dinh Van Dung, shrimp farmer
- Mr Le Van Tuan, shrimp farmer

4. Ha Tinh Sub-department for techniques and fisheries resources protection

- Mr Luu Quoc Can, deputy head of sub-department
- Mr Luong Si Cong, head of technical section
- Pham Ngoc Dai, staff of fisheries seed management section
- Nguyen Hoang Thuy, staff of fisheries environmental and feed management section

5. Thach Ha commune, Thach Ha district, Ha Tinh province

- Mr Truong cong Trung, chairman of the commune
- Nguyen Hong Quyen, shrimp farmer
- Nguyen Quang Chiem, shrimp farmer
- Nguyen Van Ngon, shrimp farmer
- Nguyen Ngoc Huyen, shrimp farmer
- Tran Ngoc, shrimp farmer

Annex 2: PHOTOS FROM THE FIELDWORK



Meeting with Nghe An Centre for
Extension of Agriculture - Forestry -
Fisheries



Meeting with Hung Hoa 2
Cooperative, Nghe An Province



Lifting the net is a regular work of the
farmers to check shrimp



Visiting a pilot pond of shrimp farming
at Hung Hoa 2 Commune



Meeting with Ha Tinh Sub-department of Techniques and Fisheries Resources Protection



Meeting with Thach Ha Commune People's Committee, Ha Tinh Province



Meeting with commune leader and shrimp farmers at Thach Ha Commune



Discussion with commune leader and shrimp farmers at Thach Ha Commune



A sincere talk of a shrimp farmer at Thach Ha Commune



Visiting a pilot pond at Thach Ha commune, Thach Ha District, Ha Tinh Province



Enjoying seating above a shrimp pond!

Annex 3: PROJECT LOGFRAME: Progress Against Proposed Objectives, Outputs, and Activities

Project Log-frame

Project Title: Technical and economic feasibility of applying the Better Management Practices (BMP) to household aquaculture in Vietnam				
Vietnamese Implementing Institution: Research Institute for Aquaculture No. 1				
Narrative	PROPOSAL			COMPLETION REPORT
	Information Required	Performance Measures	Assumptions/Risks	
OBJECTIVES	1) Assessing current status of shrimp households operation and find out advantages and disadvantages of BMP application	1a) Study on BMP overview of in country and other countries in the region and over the world. 1b) Questionnaire design to survey of current status, survey around 100 small-scale shrimp households 1c) Assessment of initial environment (water quality) of the project sites before implementing activities.	1a) Believable collected BMP information and documents, especially note the countries that similar with Vietnam 1b) Random selection of surveyed households 1c) Ensure the environment of project area suitable for BMP implementation.	1a) BMP overview study report. 1b) Assessment report of shrimp households operation. 1c) Initial assessment report of water environment of project area.
	2) Developing suitable BMP protocols for project area and BMP applying to aquaculture households and communities scales in North Centre Vietnam	2a) Preparation of suitable BMP protocols for North Centre provinces, where project implementation 2b) Application of BMP protocols into BMP trial farms and local communities. 2c) Organizing BMP training courses (9), cross-visiting (6), monthly meeting at communes (more than 50)	2b) Comments for BMP protocols from local staffs and key farmers in the project area. 2b) Trial farms and communities of project are suitable with project criterions. 2c) Selection of suitable persons for training, cross-visiting and meetings.	2a) The first draft of BMP protocol. 2b) List of 9 core trial farms in connect with 9 communities in 3 project provinces. 2c) Brief BMP training courses, cross-visiting, and meetings reports.

OBJECTIVES	3) Testing BMP application parameters at household and community levels	<p>3a) BMP technical and community based parameters applying into shrimp farms and communities in the project provinces.</p> <p>3b) Monitoring, recording all data of techniques, socio-economic and environment of trial farms and communities during implementing BMP protocols.</p>	<p>3a) The parameters of BMP protocols are suitable to shrimp operation of project area.</p> <p>3b) Extension workers, local officers, trial farms are trained on data collection and recording</p>	<p>3a) Assessment report of socio-economic, technical and environment issues of core trial farms.</p> <p>3b) Report on progress of project implementation of provinces</p>
	4) Improving capacity of implementation and application of BMP for different stakeholders of different levels of central, provincial and local.	<p>4a) Capacities of project staff at central level are improving through activities that project management, training, short trip to UWA, attendant of national and international and student supervision.</p> <p>4b) Capacities of provincial staffs (managers and extension workers) are improving through activities that BMP training courses, workshops, cross-visiting, train farmers and monitoring the technical, environment, diseases and communities based management</p> <p>4b) Capacities of local staffs and farmers are improving through activities that BMP training courses, workshops, cross-visiting, communities based management, BMP application, data collection and recording.</p>	<p>4a) Base on the responsibility and role in the project (managers, experts) to arrange the suitable activities.</p> <p>4b) Selection of suitable staffs to undertake suitable place at province level (managers, supervisors, field-staffs)</p> <p>4c) Local officers, trial farms and shrimp households satisfy the project criterion.</p>	<p>4a) Report on competency assessment of related persons and parties from top to local.</p> <p>4b) Report of training, workshops, cross-visiting programmers</p> <p>4c) BMP materials providing to local staffs and shrimp farmers.</p>

<p>OUTPUTS</p>	<p>1) Improved knowledge on status of BPM application in country, regional and international and find out the current status of technical, socio-economic, environment and constrains of shrimp households in North Centre region.</p> <p>2) To ensure BMP protocols is suitable and applicable to the project area to improve the production effect in term of technical, social, economic and environmental.</p> <p>3) Indicators of culture techniques, environment, economic and social were collected during implementation of BMP.</p> <p>4) The capacities of BMP implementation and application of different project stakeholders such as researchers, extension workers, managers and shrimp farms were improved.</p>	<p>1) Collected information, data were the basis sources for project staffs and experts draft the specific BMP protocols for project sites</p> <p>2) BMP protocols were pilot application into trials farms and communities in the first year. The results were assessed and widely application into larger areas during the second year.</p> <p>3) The results on economic, environment, technical and social of BMP application will be used by researchers and policy makers to decide the scale of BMP application in the future.</p> <p>4) Though the project activities that workshops, trainings, cross-visiting, study tour, meeting, data collection, etc were opportunities to improve of capacities for related stakeholders.</p>	<p>1) Information data of BMP overview were collected from different sources. The surveyed households were delegated for the shrimp farms in the project area.</p> <p>2a) The trial farms met the project requirements and delegated for the communities.</p> <p>2b) Project communities were delegated for over project area.</p> <p>3) Collected data may not delegated for other regions due to the particular conditions of North Centre region</p> <p>4a) The staffs who implemented the project come from different sources, therefore the ability to implement and receive BMP may be differences.</p> <p>4b) The conditions of trials and communities were not homogenous.</p>	<p>1) Available data, information on BMP in international, regional and Vietnam; the current status data of shrimp farms (100 farms); initial environment data.</p> <p>2a) BMP protocols were completed;</p> <p>2b) Nine trial farms in connected with nine communities were selected in North Centre Vietnam</p> <p>3) The results of collected information, data during BMP application were presented in the different specific reports.</p> <p>4) Two workshops, eleven BMP trainings, 6 cross-visiting and more than 100 meeting were organised. Many other activities were attended by project staffs.</p>
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Project Title: Technical and economic feasibility of applying the Better Management Practices (BMP) to household aquaculture in Vietnam		
Vietnamese Implementing Institution: Research Institute for Aquaculture No. 1		
Narrative	PROPOSAL	COMPLETION REPORT
	Information Required	
ACTIVITIES	<p>1. Making/designing the detail of project activities in short and long run (Aug./2006).</p> <p>2. Studying BMP overview, households survey and initial environment assessment (Sep.-Nov./2006)</p> <p>3. Selecting local partners, local staffs, local officers, trial farms, communities to implement project (Dec./2006-Jan./2007)</p> <p>4. Preparing the draft of BMP protocols for shrimp households in the project area (Sep.-Nov./2006)</p> <p>5. Analysing data, reporting BMP overview and assessing socio-economic, technical, environment of shrimp households at initial phase (Oct./2006-Jan./2007)</p> <p>6. Organizing the inception project workshop (Jan./2007)</p> <p>7. Preparing the BMP training materials, shrimp record book (Dec./2006-Mar./2007)</p> <p>8. Organizing general BMP training course for different stakeholders participating (Mar./2007)</p> <p>9. Providing office and environment equipments (Jan.-Mar./2007 and Feb./2008).</p>	<p>1. Project coordinator make/design the project plan for activities</p> <p>2. Collection of information for BMP overview; design questionnaire; survey about 100 shrimp farms; collect sample of environment.</p> <p>3. Project managers discuss with local partners to collect 3 field staffs, 9 trial farms in connect to 9 shrimp communities.</p> <p>4. Project experts prepare the BMP protocols then receive comments from local staffs and key farms.</p> <p>5. BMP overview report; current status of shrimp culture of households report; environment assessment report were completed.</p> <p>6. The inception workshop in Nghe An for participating of project staffs, provincial staffs, local staffs and trial farms (45 participants) was organised</p> <p>7. Training materials of different topics and shrimp diary record book were prepared.</p> <p>8. Selection of 48 trainees to participate the general BMP training course. Participants that are technical staffs, extension workers, local managers and trial farms. This workshop was conducted in TT-Hue in 3 days.</p> <p>9. Office and environment equipments were purchased and provided to project, provinces and trial farms.</p>
ACTIVITIES	<p>10. Checking seed quality for shrimp household in the project sites (Jan.-Mar./2007 and Jan.-Mar./2008)</p> <p>11. Organising the monthly meeting for households in communities exchange experiences on shrimp culture (Feb.-Aug./2007 and 2008).</p> <p>12. Organising the cross-visiting for staffs and households participating (Jun./2007 and 2008)</p>	<p>10. Shrimp seed quality of 9 trials farms and households in 9 communities was checked by PCR.</p> <p>11. Fifty two monthly meetings were organized in communities for households to exchange shrimp culture experiences during crops.</p> <p>12. Six cross-visiting for 90 participants to learn and exchange experiences of shrimp culture techniques, community based management skills were organized.</p>

	<p>13. Selecting the data of environment and diseases of trial farms and communities during crops (Feb.-Aug./2007 and 2008)</p> <p>14. Recording all of related information and data of shrimp crops of trial farms (Jan.-Aug./2007 and 2008)</p> <p>15. Testing shrimp product quality and food safety of shrimp product of trial farms (Jun.-Jul./2007 and 2008).</p> <p>16. Organizing the training course of aquaculture product quality management and food safety (Jul./2007).</p> <p>18. Organizing the study tour for project staff to UWA (Dec./2007)</p>	<p>13. Trial farms were provided environment test kits to monitor environment indicators during crops. Provincial Extension Dept. was provided environment equipment to monitor and warning to households and communities in term of environment conditions.</p> <p>14. Trial farms was provided “shrimp diary record book” to record all information, data over shrimp culture crops (technical, environment, economic data - all of input to output information and data)</p> <p>15. Cooperation with NAFIQUAVED branch 1&2 to test shrimp product quality samples of 9 core trials. The product quality tested indicators follow the EU standards</p> <p>16. Successful to organize the workshop on product quality management and food safety for attending of 40 participants.</p> <p>18. A study tour of 10 days to UWA for three project staffs was organized.</p>
ACTIVITIES	<p>19. Organising the project workshop after one year implementation (Jan.-2008)</p> <p>20. Organizing the BMP training courses for households in the communities (Jan.-Mar./2008)</p> <p>21. Analysing and reporting of assessment of socio-economic, technical and environment of project trial farms (Jan.-Mar./2008)</p> <p>22. Selecting students and preparing methods to supervise student to practice thesis (2007 and 2008)</p> <p>23. Preparing presentation and attending national and international science workshops (Nov.-Dec./2008)</p> <p>24. Assessing competency of project stakeholders of different levels from top to local (Nov./2008)</p> <p>25. Preparing questionnaires and conducting survey of BMP and non-BMP farmers and assessing BMP adoption rate of shrimp farms (Nov.-Dec./2008)</p> <p>26. Assessing the terminal environment of project sites after implementing project (Oct.-Dec./2008)</p> <p>27. Reporting the project validation on technical, socio-economic, environment of BMP and non-BMP farms and BMP adoption rate of farms (Dec./2008 and Jan.-Feb./2009)</p> <p>28. Reporting the project completion (Feb./2009)</p>	<p>19. First year project close workshop was organized for attending of 52 participants that are project staffs, project experts, provincial, district, commune officers, extension workers, key farms.</p> <p>20. Nine BMP training courses were organised in 3 provinces run by extension workers for the attending of shrimp households in communities.</p> <p>21. Assessment of technical, social, economic and environment of trial farms report was completed.</p> <p>22. Two students (Bachelor and Master) were supervised to practice their theses. They had received very good results.</p> <p>23. Presentation of project outcomes were presented in international ViFINET workshop at Cantho Uni, and young scientist workshop at RIA1</p> <p>24. Report of project staffs competency assessment was completed.</p> <p>25. Design questionnaires and survey of 120 shrimp households to assess the project effect in term of technical, economic and social and related issues and BMP adoption rate of trials and BMP farms</p> <p>26. Completion of collection, analysing, and reporting the terminal environment samples after implementing project.</p> <p>27. Completion of report of assessment of project validation in term of technical, economic, social and environment impacts and the BMP adoption rate of shrimp households.</p> <p>28. Project completion report was completed</p>

Annex 4: LIST OF SPECIFIC QUESTIONS FOR EVALUATION OF THE PROJECT

I. Regarding project implementing team (RIA1)

1. Could you briefly introduce about the formulation, implementation process and outputs/outcomes of the project (main points)?
2. How do you evaluate the achieved outputs and outcomes of the project? Did the project achieved scheduled goal and specific objectives? What are its impacts to beneficiaries (scale, scope and magnitude of impact)?
3. Were the contents of the project that have been piloted extended and scaled up to different areas in the country? More specifically?
4. How do you evaluate the cooperation and coordination between 2 partners of the project (Australian institution and Vietnamese institution)?
5. Can you tell the reason why the project was delayed for about one year in compared to scheduled time?
6. Was the concept of aquaculture club/association the idea of the project or existing activity in the provinces?

II. Regarding staff/officials in Nghe An and Ha Tinh provinces (fisheries extension staff at provincial and district levels, officials at different levels, including communes)

1. How do you evaluate the project BMP?
2. Do you think that “BMP” is an essential requirement in practice of shrimp farming in the province and how?
3. Do you think that the project has followed a good approach and efficient implementation to achieve its objectives?
4. What do you assess about the contents of training courses and are they practical?
5. Do you apply the techniques that you have learned from the project for shrimp farming at the province and how?
6. How do you evaluate the impact of the project to shrimp farming at the province?
7. How do you evaluate the effectiveness/efficiency of the project to the current shrimp farming? Is the efficiency higher in compared to without project? And why?
8. Are shrimp yields, productivity and environmental quality improved in compared with without project? Are the risks of diseases reduced?
9. Is the economic efficiency of shrimp farming improved in compared with without project? (B-C value)

10. Are there any benefits that were not addressed in the project benefits (e.g: the prestige of international customers for clean products, environmental and sustainable benefits, etc.)?
11. Do the contents of pilot issues need to apply for other provinces in the country? And how?

III. Regarding shrimp farmers (project participants)

1. How do you evaluate the project BMP (VIE002/05)?
2. Are the contents of the training courses appropriate with your ability? And how?
3. What have you applied the knowledge from the project for your business/production?
4. What are the changes of your shrimp management practices after participating in the project?
5. Is your shrimp farming more efficient in compared with practicing before the project? And why?
6. Are shrimp yields, productivity and environmental quality improved in compared with without project? Are the risks of diseases reduced?
7. Is the economic efficiency of shrimp farming improved in compared with without project? (B-C value)
8. Are there any benefits that were not addressed in the project benefits (e.g: the prestige of international customers for clean products, environmental and sustainable benefits, etc.)?

IV. Regarding shrimp dealers/purchasers (if any)

1. How do you evaluate the contents of BMP that you have been participated in (with regard to shrimp dealers, e.g: harvesting, storing, and transporting, etc.)?
2. How do you evaluate the changes in shrimp farming practices after the project? Is the efficiency of the farming improved in case of with and without the project?
3. How do you evaluate the benefits and possibility to scale up the knowledge about BMP in shrimp farming in the province as well as other provinces?