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Final report

Small research and development activity

project

Policy, institutional and economic constraints to aquaculture research adoption in Vietnam

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A number of people helped me to understand the aspects of the current ACIAR technical projects and their successful impacts; including

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- Mr Trung and Mr Ha of the Research Institute for Aquaculture No 1, Vietnam
- Dr Peter Mather of the Queensland University of Technology, Australia
- Mr Nguyen Co Thach of the Research Institute for Aquaculture No 3, Vietnam
- Dr Kevin Williams (CSIRO Marine Research), Australia
- Dr Nguyen Dinh Mao of Nha Trang University, Vietnam.

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- Mr Nguyen Hoai Nam, Ms Nguyen Thai Phuong and Ms Nghiem Thi Dung of the Vietnam Association of Seafood Exporters and Producers
- Mr Phung Giang Hai of the Vietnam Institute for Fisheries Economics and Planning
- Mr Geoff Morris, ACIAR Country Manager for Vietnam.

2 Executive summary

The aim of this Scoping Study is to assess the feasibility of conducting a policy linkage study with ACIAR-funded projects on Vietnamese aquaculture and, if feasible, develop a policy linkage Small Research Activity proposal which suits the most appropriate set or sets of projects.

The feasibility of conducting a policy linkage study with ACIAR-funded projects on Vietnamese aquaculture was determined through a consultative process with ACIAR staff, Australian and Vietnamese project partners of technical projects, and additional potential project partners. A field trip to Vietnam was taken from the 8 – 18 October 2007 as part of this consultative process to engage with potential collaborators, collect data and relevant literature, and seek project-relevant advice.

On advice from the ACIAR Fisheries Program Manager and ACIAR Program Consultant for Aquaculture, four technical projects were considered for the potential linkage project:

- improving feeds and feeding for small scale aquaculture in Vietnam and Cambodia (focussing on catfish and tilapia)
- assessing the potential for low cost formulated diets for mud crab aquaculture in Australia, Indonesia and Vietnam
- sustainable tropical spiny lobster aquaculture in Vietnam and Australia
- improved hatchery and growout technology for marine finfish in the Asia-Pacific.

A review of potential policy, institutional and economic constraints to the adoption of outputs from these technical projects was conducted, highlighting six potential constraints:

- business environment policies and regulation
- constraints to the allocation of land and marine areas
- weaknesses in extension networks
- quality, food safety and environmental protection requirements
- trade policies, e.g. tariffs, taxes and regulations
- economic issues, such as the opportunity costs of inputs to production.

A review of literature found that there are five main methodologies for assessing potential policy, institutional and economic constraints to the adoption of research findings. These include:

- benefit cost analysis
- bio-economic models
- case studies
- regression analysis
- surveys.

Four recommendations are made in the report, as outlined below. They suggest that ACIAR conduct a Policy Linkage study with Projects 1 and 2 above. It is recommended that policy, institutional and economic analysis be integrated within the extension of Project 2 rather than in a separate linkage study. Project 4 has only a minor geographical focus on Vietnam, hence it is suggested that a policy linkage with this project may not be warranted.

Recommendation 1

That ACIAR conduct a policy linkage study with projects focussed on developing low-cost diets for catfish, mud crab and tilapia aquaculture (FIS/2002/068 and FIS/2000/065) to assess the economic viability of project outcomes, and how the policy, institutional and economic environment may influence adoption of these outcomes.

Recommendation 2

That ACIAR integrate economic analysis within the extension to lobster aquaculture research in Vietnam, or that a parallel study is established to ensure the policy, institutional and economic environment is considered, and that the technical research focuses on maximising farmer profits rather than production.

Recommendation 3

That the policy linkage study (as articulated in Recommendation 1) be conducted in collaboration with the Fisheries College and Research Institute for Aquaculture No 1, with minor cooperation with the Research Institute for Aquaculture No 3, the Vietnam Association of Seafood Exporters and Producers, and the Vietnam Institute for Fisheries Economics and Planning.

Recommendation 4

That the policy linkage methodology use a number of research techniques, including inception and final workshops for all stakeholders, case studies of business environment constraints, extension, household and exporter surveys, and whole-of-household economic modelling (based on the benefit cost technique).

3 Introduction

The aquaculture industry in Vietnam has grown rapidly since the country began its transition to a market economy, such that it is now a significant player in the world market for certain aquaculture products. As a result, it is addressing increasingly complex quality and food safety requirements from export markets as well as domestic concerns over the sustainability of the industry and its impacts on poverty alleviation.

ACIAR funds a number of projects in Vietnam aimed at solving key problems constraining the productivity and sustainability of the aquaculture sector. Examples include assessing the potential for low cost formulated diets for catfish, tilapia and mud crab aquaculture¹ and fostering sustainability of tropical spiny lobster and marine finfish aquaculture².

These projects focus on technical aspects of productivity and sustainability. They generally do not give full consideration to economic issues associated with possible adoption of project outcomes, or assessing how the policy environment may influence this. The aim of this scoping study is to assess the feasibility of a Small Research Activity (SRA) for a policy linkage study with some of ACIAR's aquaculture projects in Vietnam.

Aim of the scoping study: To assess the feasibility of conducting a policy linkage study with ACIAR-funded projects on Vietnamese aquaculture and, if feasible, develop a policy linkage SRA which suits the most appropriate set or sets of projects.

¹ FIS/2002/068: *Improving feeds and feeding for small scale aquaculture in Vietnam and Cambodia, and FIS/2000/065: Assessing the potential for low cost formulated diets for mud crab aquaculture in Australia, Indonesia and Vietnam.*

² FIS/2002/077: *Improved hatchery and growout technology for marine finfish in the Asia-Pacific region, and FIS/2001/058: Sustainable tropical spiny lobster aquaculture in Vietnam and Australia.*

4 Scoping study methodology

The scoping study was conducted in a number of steps as follows:

- Preliminary consultation with ACIAR staff
- Preliminary consultation with Australian project staff
- Consultation with potential Vietnamese project partners
- Field trip to Vietnam
- Literature review and data collection
- Assessment of the feasibility of a policy linkage study with one or more ACAR technical projects
- Development of the Small Research Activity proposal.

A brief description of each of these steps is outlined below.

Preliminary consultation with ACIAR staff

Mr Barney Smith, Fisheries Research Program Manager, was initially consulted for his views about the feasibility of conducting a policy linkage study with aquaculture projects within his program, and to ascertain an initial list of potential projects. Barney was positive about the potential feasibility of a policy linkage study and suggested investigating possible linkages with the first three projects detailed in Table 1.

Table 1: Details of potential ACIAR projects to participate in linkage project

	Project title	ACIAR project number	Australian project leader	Primary Vietnamese project partners	Project duration
1	Improving feeds and feeding for small scale aquaculture in Vietnam and Cambodia	FIS/2002/068	Dr Brett Glencross Department of Fisheries, Western Australia	- Can Tho University - Research Institute for Aquaculture No. 1 - Aquaservice	01/01/2004 – 30/06/2007
2	Assessing the potential for low cost formulated diets for mud crab aquaculture in Australia, Indonesia and Vietnam	FIS/2000/065	Dr Peter Mather Queensland University of Technology	- Research Institute for Aquaculture No 3	01/07/2006 – 30/06/2008
3	Sustainable tropical spiny lobster aquaculture in Vietnam and Australia	FIS/2001/058	Dr Kevin Williams CSIRO Marine Research	- Research Institute for Aquaculture No. 3 - Institute of Oceanography - Nha Trang University	01/01/2005 – 30/06/2008
4	Improved hatchery and growout technology for marine finfish in the Asia-Pacific region	FIS/2002/077	Dr Mike Rimmer	- Research Institute for Aquaculture No. 1	01/07/2004 – 31/12/2007

Dr Geoff Allan, ACIAR Program Consultant Aquaculture, was subsequently consulted for comment about the potential for a policy linkage study with ACIAR aquaculture projects. Geoff saw merit in research on the Vietnamese policy framework in relation to improving outcomes from ACIAR projects, suggested investigating possible linkages with the fourth project in Table 1, and noted the big policy issues that he saw affecting the adoption of ACIAR project outputs (quality and food safety, use of low-value feed fish for aquaculture feed, trade policies and land ownership).

Preliminary consultation with Australian project staff

Each of the project leaders for the four potential projects (see Table 1) were contacted to make initial assessment of the feasibility and appropriateness of conducting a policy linkage study with their project. The project leaders of Projects 1, 2 and 3 were positive about a potential linkage project and provided contact details for their primary Vietnam project partners for further discussion. Dr Mike Rimmer indicated that the project he is leading (Project 4 in Table 1: Improved hatchery and growout technology for marine finfish in the Asia-Pacific region) has geographical focus on Indonesia, Philippines and Thailand with only a small Vietnamese component. Hence, he suggested that a policy linkage project on just the Vietnamese component may not be appropriate.

Consultation with potential Vietnamese project partners

Email correspondence was made with the primary Vietnamese project partners for Projects 1, 2 and 3 to invite them to participate in the Scoping Study. All of the partners were happy to participate. It was proposed that Dr Liz Petersen travel to Vietnam to assess the suitability of the ACIAR-funded projects to link with a policy study, and where suitable, collect data and determine the most appropriate collaborators and methodology. Meeting times were established with each of the potential collaborators.

Field trip to Vietnam

Dr Liz Petersen travelled to Vietnam from 8 to 18 October 2007. An itinerary is provided below. For more details on the discussions held at each meeting the reader is referred to the Trip Report.

Monday 8 October

Arrival in Hanoi

Tuesday 9 October

Hanoi

- 2pm meeting with Geoff Morris, ACIAR Country Manager, Australian Embassy

Wednesday 10 October

Research Institute for Aquaculture No 1 (RIA1) and Vietnam Fisheries College No 4 (Fisheries College)

- 9:00am greeted RIA1 staff – Mr Thanh, Mr Suc, Mr Phuoc, Mr Hoa, Mr Trung, and Mr Ha
- 9:30am visited the Fisheries College and held initial discussions with Mr Viet (Rector) and Ms Hien (Lecturer and Head of Division of Administration and Finance)
- 11:30am meeting with Dr Luu (Director of RIA1)
- 12:00noon lunch with RIA1 and Fisheries College staff
- 2:00pm meeting with RIA1 and Fisheries College staff to discuss a proposed linking study with the catfish/tilapia project (FIS/2002/068: Improving feeds and feeding for small scale aquaculture in Vietnam and Cambodia)

Thursday 11 October

Hanoi

- 11:30am lunch with Fisheries College staff – Mr Viet, Ms Hien, Mr Le Van Thang (Vice Rector) and Mr Nguyen Huu Loan (Managing of Training Department)

Friday 12 October

Hanoi

- 10am visited the Vietnam Association of Seafood Exporters and Producers (VASEP) – Mr Nguyen Hoai Nam (Deputy General Secretary), Ms Nguyen Thai Phuong (Deputy Director) and Ms Nghiem Thi Dung (Marketing Specialist). Discussions focused on potential constraints to the adoption of research outcomes, and potential collaboration opportunities.
- 11:30am visited the Vietnam Institute for Fisheries Economics and Planning (under the Ministry of Agriculture and Rural Development) - Mr Phung Giang Hai. Discussions focused on opportunities for research collaboration.

Saturday 13 October

Travelled to Nha Trang

Monday 15 October

Nha Trang University

- 8am meeting with Dr Nguyen Dinh Mao (ACIAR Project Partner) to discuss a proposed linking study with the lobster project (FIS/2001/058: Sustainable tropical spiny lobster aquaculture in Vietnam and Australia.)

Tues 16 October

Research Institute for Aquaculture No 3 (RIA3)

- 10am meeting with Mr Nguyen Co Thach and Mr Vo The Dzung (ACIAR Project Partners) to discuss a proposed linking study with the mud crab project (FIS/2000/065: Assessing the potential for low cost formulated diets for mud crab aquaculture in Australia, Indonesia and Vietnam).

Wednesday 17 October

Drafted Trip Report

Thurs 18 October

Departed Vietnam

Literature review and data collection

Throughout the Scoping Study, literature, data and advice was sought on a number of issues, including:

- Basic data on the production, marketing and socio-economic impacts of aquaculture production in Vietnam (see SRA proposal)
- Information on the actual and potential outputs of the ACIAR technical projects
- The potential policy, institutional and economic constraints to research adoption, (see Section 5)
- Methodologies used in other studies to assess the constraints to research adoption (see Section 6).

Assessment of the feasibility of a policy linkage study with one or more ACIAR technical projects

On the conclusion of the consultation and review process, an assessment was made on the feasibility of a policy linkage study with one or more of the possible projects listed in Table 1. This assessment is provided in Section 8.

Development of the Small Research Activity proposal

A Small Research Activity proposal was developed for a policy linkage study with Projects 1 and 2.

5 Review of potential policy, institutional and economic constraints to research adoption

The following review of potential policy and institutional constraints to the adoption of outputs from ACIAR's technical projects on aquaculture in Vietnam is based on information provided during the Scoping Study consultation process, and through website research. The potential constraints are highlighted as:

- Business environment policies and regulation
- Constraints to the allocation of land and marine areas
- Weaknesses in extension networks
- Quality, food safety and environmental protection requirements
- Trade policies, e.g. tariffs, taxes and regulations
- Economic issues, such as the opportunity costs of inputs to production.

Many of the possible policy, institutional and economic constraints are derived from the Fisheries Law – Law No. 17/2003/qh11 (NASRV 2003). The law aims to facilitate sustainable fisheries and aquaculture development, encourage favourable conditions for organisations and individuals to rationally exploit resources, and support the rehabilitation of fisheries resources.

Business environment policies and regulation

The Fisheries Law requires the development of aquaculture masterplans for the aquaculture sector, formulated by the relevant Ministries and provincial People's Committees (chaired by the Minister for Fisheries) to be approved by Government. The People's Committees at lower levels are required to prepare specific masterplans on aquaculture sites within their jurisdictions to present to the People's Councils at the same and higher levels. Hence, standards, processes and procedures required for establishing and running aquaculture operations differ across provinces in Vietnam. The potential for these to be arduous in some provinces, stifling aquaculture development, should be further investigated.

Constraints to the allocation of land and marine areas

The Fisheries Law articulates that the People's Committees of districts, communes or cities under provinces should allocate marine areas free of charge to local residents who directly conduct aquaculture and whose livelihood mainly depends on income derived from aquaculture, or those who have to shift their job structure, as certified by local commune's People's Committees.

The People's Committees are allowed to lease marine areas for aquaculture where organisations and individuals are foreigners and/or those whose livelihood does not mainly depend on aquaculture income but who use the marine areas for aquaculture purposes approved by State competent agencies.

This certification obtained by People's Committees to use or lease marine areas has different administrative requirements across communes and may pose a constraints to aquaculture development in some areas. Moreover, the allocation and lease of marine areas for aquaculture purposes is not allowed to exceed 20 years and marine areas are to be revoked if they are not used continuously for 24 months, except for reasons accepted by State agencies. These time constraints may stifle investment if the use rights are not considered by the operators to be secure in the long-term.

Individuals with marine allocations can leave it as inheritance property and can mortgage their assets to secure bank loans. Those who pay for the lease of marine areas can mortgage their properties related to leased marine areas at Vietnamese credit organisations for bank loans and can transfer their properties to other leasees upon request. Those who have paid full leasing fees for at least 10 years can mortgage the value of leased marine areas use rights as well as the marine properties at Vietnamese credit organisations, leave the right as inheritance property during its leasing duration (the inheritor and transfer receiver will have the same rights), and can sub-lease the use right of marine areas during the leasing duration.

It is unclear how many aquaculture operations use these mortgaging provisions to secure loans for investment. However, lack of credit and difficulty in securing bank loans due to the lack of collateral was posed as significant constraints to aquaculture investment by a number of potential Vietnamese project partners during the consultative process. Further research is needed to investigate whether the mortgaging provisions for aquaculture land and marine areas in the Fisheries Law is sufficient to provide incentives for operators to make long-term investments, with secure collateral to attract sufficient capital for this investment.

Initial investigations suggest there are no significant constraints to company ownership. It is simple to set up a company whether it is a domestically or foreign-owned, or a joint venture. Further analysis in this area is important to establish whether this is true in most regions in Vietnam.

Weaknesses in extension networks

The Fisheries Law stipulates that those engaged in aquaculture should enjoy the advocacy, training and transfer of new techniques on aquaculture, new fish fry production, and the prevention and detection of fish disease. Specialised fisheries agencies should inform aquaculture producers on environmental and fish disease status as well as fish marketing.

This advocacy, training and transfer of new information and technologies is mainly conducted by provincial and district extension officers. Concerns were raised during the consultative process that these extension networks are weak in some regions as Extension Officers are not always fully informed of the latest research findings (for example, ACIAR-funded projects generally do not include funding to train these extension officers in the latest research outputs).

Quality, food safety and environmental protection requirements

Quality, food safety and environmental protection are growing concerns in the production of seafood in Vietnam. In recent years, residues and contaminants have been detected in exported products, with devastating results on markets and decreasing farm gate prices. For example, in 2003, five shrimp consignments from the Hue province to the European Union were destroyed or returned because of the presence of residues. As a consequence, the livelihood of many of these farmers was seriously threatened, and productivity stifled.

The Fisheries Law provides regulations on veterinary services, commodity quality, environmental protection, trade and goods labelling. The Ministry of Agriculture and Rural Development is responsible for preparing a number of lists and standards of products and practices that are allowed, restricted or prohibited for use in aquaculture. These include feeds, drugs and chemicals, specialised fisheries products that can be imported or exported, veterinary sanitary requirements and environmental production standards.

Vietnam's National Fisheries Quality Assurance and Veterinary Directorate (NAVIQAVED) controls food safety and veterinary services for seafood products. It has six branches at the major ports in Vietnam (Hai Phong, Denang, Nha Trang, Ho Chi Minh City, Ca Mau and Can Tho) which enforces processing regulations and final product testing as required by exporting countries. Information from NAVIQAVED is provided to the producers about these regulations through seminars in Hanoi and Ho Chi Minh City. The Vietnam Association of Seafood Exporters and Producers (VASEP) also distributes quality and food safety information to its members. Further research is needed to establish whether adherence to these regulations and tests place a significant economic and administrative burden on aquaculture producers such that productivity and development of the industry is constrained.

Quality, food safety and environmental impact concerns have provided impetus for the development of Better Management Practises (BMP) for catfish and shrimp production. However, NAVIQAVED does not have the personnel to ensure compliance and farmers rarely administer them. Preliminary research has shown that farmers are not administering BMPs in shrimp production due to a lack of awareness of BMPs as well as economic and technical constraints (Thanh et al. 2007). However, it is expected that the adoption of BMPs will increase in the medium term as domestic and international pressure increases for clean and green produce, and as research into the development of cost-effective BMPs matures.

Trade policies

Import tariffs are charged for a number of raw materials to aquaculture (including fishmeal). Export tariffs are not charged on seafood exports, although import taxes are generally charged at the border of the importing country. These tariffs may be distorting prices received by farmers in Vietnam, affecting development of the industry. Trade policy issues will grow in importance through time as the quantity of fish exported increases do to development of the industry and Vietnam's recent accession to the World Trade Organization.

Economic issues

Development of small-scale aquaculture is constrained due to the opportunity cost of land, capital and labour. Returns on capital are reportedly higher for livestock and rice compared with aquaculture, hence operators prefer to put their scarce capital into these alternative enterprises. Further investigation is required to determine why capital is scarce, although it is likely to be due to constraints on land and marine area tenure and ownership.

6 Literature review on methodologies for assessing policy, institutional and economic impacts on the adoption of research findings

A review of literature indicates five main methodologies for assessing potential policy, institutional and economic constraints to the adoption of research findings. These include:

- Benefit cost analysis
- Bio-economic models
- Case studies
- Regression analysis
- Surveys.

A description of these different methodologies is provided in what follows.

Benefit cost analysis

Benefit cost analysis is an economic tool to aid social decision-making. It is generally used to assess the value of private or public sector projects, generally by gauging the efficiency of a project relative to the status quo. Key cost-benefit indicators include the present value of the benefits, the present value of the costs, the net present value, the benefit cost ratio and the internal rate of return. Examples of the use of benefit cost analysis to investigate policy, institutional and economic impacts on the adoption of research findings are Gatsi et al. (2000) and Lindner (2005).

Bio-economic models

Bioeconomic models integrated the biophysical relationships associated with an issue with economic models of the values that are generated. The models vary in degree of complexity, depending on the complexity of the issue and the implications of the policy impacts in question. Examples of the use of bio-economic modelling to investigate policy, institutional and economic impacts on the adoption of research findings are Bell and Heaney (2001), Nordblom et al. (2006) and Brennan (2007).

Case studies

Case studies involve an in-depth, longitudinal examination of a single instance or event; a case. They generally provide a systematic way of looking at events, collecting data, analysing information and reporting the results. They differ from other methodologies in that they do not use a large sample size or rigid protocol to examine a limited number of variables. Case studies allow analysis of why the instance happened as it did, and what might become important to look at more extensively in future research. Examples of the use of case studies to investigate policy, institutional and economic impacts on the adoption of research findings are Carruthers (2003) and Jamal and Pomp (1993).

Econometric analysis

Econometric analysis uses detailed quantitative data (generally from surveys) to examine the relationship between a dependent variable whose value is uncertain with regard to specified independent variables. The regression equation contains estimates of one or more hypothesized parameters which measure the relationship between the dependent variable and each of the independent variables. Examples of the use of regression analysis to investigate policy, institutional and economic impacts on the adoption of research findings are He et al. (2007) and Llewellyn et al. (2007).

Surveys

Surveys are used to collect quantitative or qualitative data from a population, generally in a structured and standardised way so as to ensure reliability, validity and comparison. Data can include factual information or opinions depending on the purpose. Raw data can be used in their own right to explain a hypothesis, or can be used in subsequent analysis, such as econometric analysis. Examples of the use of surveys to investigate policy, institutional and economic impacts on the adoption of research findings are Thanh et al. (2007) and Kington and Pannell (2003).

7 Proposed SRA methodology

A brief outline of the proposed research methodology is presented below, for discussion and subsequent revision and development. Further details on the proposed methodology are provided in the SRA proposal.

Task 1

Develop a preliminary analysis of the value chain for each fish species, including prices, and margins at each stage of the chain to give a clear picture of the relative cost/price component of each stage

Task 2

Facilitate an initial project workshop with all relevant stakeholders to further tease out the value chain analysis and potential constraints to the adoption of ACIAR research outcomes, and amend the proposed research methodology where necessary

Task 3

Conduct case studies for in-depth examination of business environment policies and regulations for establishing and running aquaculture operations

Task 4

Administer extension network surveys to examine potential constraints to information flows to producers

Task 5

Administer household surveys to generate information on the economic viability of aquaculture operations compared with their other enterprises (e.g. livestock and rice), and the household impacts of land and marine areas allocation requirements, quality, food safety and environment and protection requirements

Task 6

Develop a whole-of-household economic model (based on the benefit cost technique) to assess the cost-effectiveness of the pelleted diets formulated in the ACIAR-funded projects

Task 7

Administer an exporter survey to examine possible trade policy issues (such as tariffs, taxes and regulations) that may constrain the adoption of ACIAR-developed formulated diets

Task 8

Facilitate an end-of-project workshop to finalise research outcomes and development recommendations, and to disseminate these to all relevant stakeholders.

It is proposed that the following institutions be project partners, with roles and responsibilities as summarised below.

Advanced Choice Economics Pty Ltd

- Lead the development of research survey questionnaires
- Coordinate data analysis
- Lead reporting

- Assist with organising project workshops.

Fisheries College

- Provide feedback on draft survey questionnaires
- Assist with data collection and analysis
- Assist with reporting and recommendation formation
- Facilitate final project workshop.

RIA1

- Assist with developing survey questionnaires
- Assist with data collection and analysis
- Assist with reporting and recommendation formation.

RIA3

- Facilitate initial project workshop
- Assist with developing survey questionnaires
- Assist with reporting and recommendation formation.

VASEP

- Provide feedback on draft survey questionnaires
- Assist with reporting and recommendation formation.

VIFEP

- Provide feedback on draft survey questionnaires
- Assist with data collection and analysis
- Assist with reporting and recommendation formation.

8 Conclusions and recommendations

The aim of this Scoping Study was to assess the feasibility of conducting a policy linkage study with ACIAR-funded projects on Vietnamese aquaculture and, if feasible, develop a policy linkage Small Research Activity proposal which suits the most appropriate set or sets of projects.

The feasibility of conducting a policy linkage study with ACIAR-funded projects on Vietnamese aquaculture was determined through a consultative process with ACIAR staff, Australian and Vietnamese project partners of technical projects, and additional potential project partners. A field trip to Vietnam was taken from the 8 – 18 October 2007 as part of this consultative process to engage with potential collaborators, collect data and relevant literature, and seek project-relevant advice.

On advice from the ACIAR Fisheries Program Manager, four technical projects were considered for the potential linkage project:

- Improving feeds and feeding for small scale aquaculture in Vietnam and Cambodia (focussing on catfish and tilapia)
- Assessing the potential for low cost formulated diets for mud crab aquaculture in Australia, Indonesia and Vietnam
- Sustainable tropical spiny lobster aquaculture in Vietnam and Australia
- Improved hatchery and growout technology for marine finfish in the Asia-Pacific.

Ideally, analysis of the policy, institutional and economic constraints to the adoption of potential and actual outputs of ACIAR's technical projects would be either incorporated within these projects, or conducted as a separate but concurrent project. That way, the initial economic feasibility of the potential outcomes could be made before significant project funds are invested, with updated analysis conducted as the project progressed. Such integration of technical, policy, institutional and economic research is likely to lead to more practical research outcomes and stronger adoption of research findings, than in its absence.

Projects 1 and 2 listed above have similar aims focussing on different fish species (catfish and tilapia in Project 1 and mud crabs in Project 2). They are both at a similar stage, being finished or close to finishing and in preparation for project extensions. Both projects have made strong progress in achieving the project aims; being focussed on the technical aspects of developing low-cost formulated diets for catfish, mud crab and tilapia aquaculture in Vietnam. The dietary requirements have been formulated for these projects, but the ingredients used to make up these formulations have not been determined. As determination of the ingredients used in these formulations is largely an economic issue, introduction of an economic component is timely for these projects. Little or no analysis has been done on the economic viability of these diets, or on the policy, institutional and economic environment that may affect their adoption. It is recommended that ACIAR conduct policy, institutional and economic analysis on adoption of least-cost diets to be developed in these technical projects.

Recommendation 1

- That ACIAR conduct a policy linkage study with projects focussed on developing low-cost diets for catfish, mud crab and tilapia aquaculture (FIS/2002/068 and FIS/2000/065) to assess the economic viability of project outcomes, and how the policy, institutional and economic environment may influence adoption of these outcomes.

Project 3 listed above is focussed on generating information on lobster development, survival and nutritional requirements. Improved techniques for lobster grow-out (including the development of low-cost diets for lobster) are likely to be developed in a project extension. It is recommended that policy, institutional and economic analysis be conducted as part of the extension to ensure that grow-out techniques are developed to maximise farmer profit. Without such simultaneous policy, institutional and economic analysis, the project runs the risk of developing techniques that optimise production rather than profit (maximum production may be costly to achieve such that profits are sub-optimal or even negative) and that are not practical in the current policy environment.

It is feasible that a policy linkage study be established to conduct initial policy, institutional and economic analysis on potential project outcomes. Different types of grow-out techniques and their potential impacts on productivity and therefore profits could be estimated with sensitivity analysis conducted on the different uncertain factors. However, without provision for integration of this analysis with the technical project as it progresses, there is a risk that economic factors will not be given sufficient focus in developing the grow-out techniques and the initial economic study be considered irrelevant due to outdated assumptions. Hence, it is recommended that ACIAR integrate the policy, institutional and economic analysis within the project extension, or that a parallel project be established to ensure the policy, institutional and economic environment is considered.

Recommendation 2:

- That ACIAR integrate economic analysis within the extension to lobster aquaculture research in Vietnam, or that a parallel study is established to ensure the policy, institutional and economic environment is considered, and that the technical research focuses on maximising farmer profits rather than production.

Project 4 listed above has geographical focus on Indonesia, Philippines and Thailand with only a small Vietnamese component. Hence, it is suggested that a policy linkage study with this project may not be appropriate.

A review of potential policy and institutional constraints to the adoption of outputs from ACIAR's technical projects on aquaculture in Vietnam was conducted. Six potential constraints were highlighted as summarised below.

1. Business environment policies and regulations for establishing and running aquaculture operations

Standards, processes and procedures required for establishing and running aquaculture operations differ across provinces in Vietnam. The potential for these to be arduous in some provinces, stifling aquaculture development, requires further investigation.

2. Constraints to the allocation of land and marine areas

Vietnamese nationals who conduct aquaculture as their main livelihood are allocated marine areas free of charge. Foreigners, or those who use aquaculture as a secondary livelihood, can lease marine areas. Allocation and lease of marine areas can not exceed 20 years and can be revoked if they are not used continuously for 24 months. These time constraints may stifle investment if the use rights are not considered by the operators to be secure in the long-term. Marine allocations or leases can be mortgaged to secure Vietnamese bank loans. It is unclear how many aquaculture operations use these mortgaging provisions to secure loans for investment. However, credit is generally reported to be scarce suggesting that these mortgaging provisions are not sufficient to provide incentives for operators to make sufficient long-term investments.

3. Weaknesses in extension networks

Weaknesses in extension networks were highlighted as constraints to information flows to extension officers.

4. Quality, food safety and environmental protection requirements

Further research is required to establish whether quality, food safety and environmental protection regulations and testing place an economic burden on aquaculture producers such that productivity and development of the industry is constrained. Better Management Practices for shrimp and catfish have been developed but adoption is limited, although expected to increase in the medium-term.

5. Trade policies, e.g. tariffs, taxes and regulations

The impacts of trade policies, such as import tariffs on inputs to production and import tariffs at the export country border, will grow in importance through time as the quantity of fish exported increases due to development of the industry and Vietnam's recent accession to the World Trade Organization. Further research is required to fully assess these impacts.

6. Economic issues

The opportunity cost of land, capital and labour are significant constraints to aquaculture development. Capital is scarce, and return to capital is reportedly higher for livestock and rice than aquaculture.

A review of literature indicates five main methodologies for assessing potential policy, institutional and economic constraints to the adoption of research findings. These include:

- Benefit cost analysis
- Bio-economic models
- Case studies
- Regression analysis
- Surveys.

Recommendation 3:

- That the policy linkage study (as articulated in Recommendation 1) be conducted in collaboration with the Fisheries College and Research Institute for Aquaculture No 1, with minor cooperation with the Research Institute for Aquaculture No 3, the Vietnam Association of Seafood Exporters and Producers, and the Vietnam Institute for Fisheries Economics and Planning.

Recommendation 4:

- That the policy linkage methodology use a number of research techniques, including inception and final workshops for all stakeholders, case studies of business environment constraints, extension, household and exporter surveys, and whole-of-household economic modelling (based on the benefit cost technique).

A suggested methodology for conducting the proposed policy linkage study is provided in this report. It includes:

- Initial analysis of the value chain with estimates of prices, costs and margins at each stage
- An inception workshop with all relevant stakeholders

- Case studies to examine business environment constraints
- An extension network survey to investigate weaknesses in information flows
- A household survey to generate information on the economic viability of aquaculture operations compared with their other enterprises (e.g. livestock and rice), and to assess the household impacts of land and marine areas allocation requirements, quality, food safety and environment and protection requirements, and economic issues
- Development of a whole-of-household economic model (based on the benefit cost technique) to assess the cost-effectiveness of ACIAR-funded research outcomes
- A final workshop with all relevant stakeholders to validate, finalise and disseminate project findings.

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