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project

**Strengthening regional mechanisms
to maximise benefits to smallholder
shrimp farmer groups adopting better
management practices**

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2 Executive summary

Small scale farmers face numerous challenges in the global market place. Implementing Better Management Practices (BMPs) through a localised cluster management approach is a rational and practical way to combat these challenges. The success of FIS/2006/144 is that the project has increased the awareness of BMP theory in shrimp farming. This project has also contributed to BMP promotion in the Asia Pacific region.

BMP projects conducted in India, Indonesia, Thailand and Vietnam have been suitable precedents for this SRA. These projects provide examples of how the principles of responsible aquaculture can be translated into BMPs that adapt to local farming conditions. This process significantly increases the possibility that BMPs will be implemented by relevant stakeholders.

Evidence shows that when BMPs are implemented there are:

- Gains in production;
- Improvement in quality;
- Improvement of market accessibility; and
- An increase in organised farmers groups and societies.

FIS/2006/144 has created a robust regional mechanism for networking and exchanging information. The SRA has focused primarily on benefiting small-scale shrimp farmers in Asia by considering how to:

- Reduce disease risks;
- Improve yields;
- Produce quality shrimp;
- Access better markets; and
- Address socio-economic sustainability and comply with international principles.

Key project outputs include:

- Strengthening communication and networks amongst BMP implementers in the Asia Pacific region.
- Contextualized BMPs for shrimp farming developed and widely disseminated in Asia Pacific
- Strategies for maximizing market opportunities for BMP-compliant small scale shrimp farmers tested
- Draft methodology and approaches for shrimp farmer group/cluster certification developed

3 Introduction

Small scale aquaculture farmers in Asia face many challenges. Obstacles to successful livelihoods include:

- Lack of access to technical knowledge;
- Lack of enabling government policies and programs;
- Limited access to credit and insurance;
- Limited compliance to food safety standards (e.g. antibiotics);
- Inability to minimise disease related losses;
- Inability to meet stringent market requirements, including certification; and the
- Inability to meet environmental and ethical standards or wildlife and biodiversity requirements.

Furthermore, it is predicted that the demand for quality and responsibly produced and certified aquaculture products will continue to outweigh sustainability efforts. It is very important that small scale farmers are better prepared to meet these challenges in order to sustain their livelihoods and support the consumer market.

Development and adoption of BMPs for key aquaculture commodities is gradually increasing in the region. However, there appears to be lot of confusion in the minds of farmers, policy makers and other stakeholders about the concept and approaches. Often, it is confused with standards and certification.

BMP's are voluntary management practices and implementation can help to achieve compliance with domestic and international standards. They are **not** a standard for certification but can improve the quantity, safety and quality of products, health and welfare, food safety, environmental and socio-economical sustainability.

Standards are set from a consumer view point, taking into account food safety, the environment and quality regulations. BMPs, on the other hand, are commodity and location specific management practices that have been developed to meet the norms of responsible farming. BMPs aim to reduce risks to culture operations and maximize returns. In simple terms, standards tell us what is expected while BMPs tell us how farmers can create sustainable aquaculture livelihoods whilst achieving industry standards.

BMP development can be divided into the following process.

1. Gain an in-depth understanding of the culture system(s) and cultured species. This should be done at the population level and not in one or two ponds.
2. Identifying the risk factors that may endanger the long term sustainability of the farming system.
3. Revise or develop management interventions. Management strategy should include identifying risk factors in consultation with practitioners and other stakeholders.
4. Test the interventions and validate them. This is normally carried out through farm demonstration studies, where BMP Demonstration Farms are set up for scrutiny by the community. Interventions validated through pilot testing, demonstrations and farmer consultations are referred to as BMPs.

Promoting the adoption of BMPs by small scale farmers is not simple. A dedicated team of field workers need to work with farmers daily to bring about attitudinal changes in the small scale farmers and wean them from preconceived ideas and conventional practices which may not be conducive to the environment, sustainability and food safety. This is a slow process and takes lot of time and resource investment. Using appropriate extension

methodologies to bring about change in the attitude of farmers and encouraging them to change their culture practices by incorporating BMPs are vital for successful adoption of BMPs. A critical aspect of the introduction of BMPs has been the role of farmer groups/clusters (cluster management).

Cluster management in simple terms can be defined as collective planning, decision making and implementation of crop activities by a group of farmers in a cluster (defined geographical area for example sharing common water source) through a participatory approach in order to address the common risk factors and accomplish a common goal (e.g. maximize returns, reduce disease risks, increase market access, procure quality seed). Promotion of BMP adoption through cluster management approach reaches more farmers. Cluster management brings several advantages to individual farmer members which otherwise is not possible. ***Above all, cluster farming brings social harmony in a community, fundamental to the progress of society.***

BMPs need to be grounded in valid scientific justification, rather than perceptions and or superficial experiences. Thus there is a need for R & D to validate key BMPs, and to quantitatively assess their impact on farm production and economics. Equally, there is a need to develop implementation mechanisms to permit large-scale scaling up of BMPs to create impacts among large numbers of small-scale farmers.

Market links are now being explored between BMP implementers and buyers, but considerable further R&D work is necessary on strategies that connect small-farmers to markets. Enhanced regional cooperation is required to build on existing experiences and promote wider adoption of better management practices across selected commodities and countries in the Asian region.

4 Objectives

The intention of this SRA was to create a robust regional networking mechanism to benefit small-scale shrimp farmers in Asia with the following key objectives:

1. *Communications and networking* – To strengthen regional networking mechanisms between stakeholders for exchange of knowledge on BMPs to enable adoption to maximize benefits to small holder shrimp farmers
2. *Development and dissemination of contextualized BMPs* – To promote development and dissemination of contextualized BMPs for country/location/farming system/species
3. *Forward integration* - To explore strategies that maximize market opportunities for BMP-compliant farmer groups
4. *Farmer group certification* - To develop a methodology for enabling certification of BMP-compliant small holder farmer groups

5 Key Outputs of the Project

The SRA built on the ongoing shrimp BMP programs in the Asia-Pacific region (e.g. Australia, Indonesia, India, Vietnam and Thailand). Project activities and three project annual meetings have enabled project partners to contribute to the following project outputs:

- Strengthening communication and networking amongst BMP project implementers in the Asia Pacific region;
- Development and dissemination of contextualized BMPs for shrimp farming;
- Testing strategies for maximizing market opportunities for BMP-compliant small scale shrimp farmers; and
- Developing draft methodology and approaches for shrimp farmer group certification.

5.1 Strengthening communication and networking amongst BMP project implementers in the Asia Pacific region

Communication and networking amongst BMP project implementers in the Asia Pacific region was significantly strengthened through the following project activities and mechanisms.

Website

A dynamic BMP website has been developed and made operational under the NACA website. The website is continuing to function beyond the duration of the project. Key BMP information from all project partners has been made available on the website. In addition, BMP information from other related projects in the Asia Pacific region is also available in the website. The website is widely visited and reports, brochures and publications in the website have been made available for free download. The website provides links to websites of project partner institutions. In addition, links have been established to similar networking and communication initiatives (e.g. Aceh Aquaculture Communication Centre (AACC)/Aquaculture Livelihood Service Centres (ALSC) in Aceh) implemented under ADB ETESP-NACA project in Aceh, Indonesia. A discussion forum has been established on the NACA home page for farmers and other stakeholders to ask questions and seek solutions on BMPs.

E-Newsletter

Shrimp e-newsletters providing information on shrimp BMPs, market prices, and other relevant information have been produced and disseminated at regular intervals to project partners, and NACA e-newsletter subscribers.

Project Meetings

Three annual project meetings were held. The First project annual meeting was completed in November 2007, in Cochin, India (**Report-Annex 1**). Second annual project meeting was completed in November 2008, in Bangkok (**Report-Annex 2**). And the Third annual project meeting was completed in November 2009, in Semarang, Indonesia (**Report-Annex 3**). The project meetings provided an excellent opportunity for project partners to share and exchange information on BMP activities ongoing in different countries of the region.

Discussion Forums

The project also provided an opportunity to bring together representatives from WWF, IUCN, FAO, Fish Wise, Lyon Seafood and ACIAR Aceh Aquaculture Rehabilitation Project to discuss issues surrounding small farmers, BMP adoption and market access during its second and third annual meetings.

5.2 Development and dissemination of contextualized BMPs for shrimp farming

The project has facilitated on-line and face to face collaboration between project partners enabling the development of contextualized technical BMPs. The annual meetings were used to make scientific and economic assessment of BMPs followed in partner countries and allow for suggestions and recommendations. BMP information developed and presented in the form of brochures was made available on the BMP website.

The cluster approach emerged as a major platform for extension and dissemination of BMP information in project partner countries. The benefits of small-scale farmers coming together to make collective decisions about responsible farming and BMP implementation was realised in project partner countries (e.g. India, Thailand, Aceh in Indonesia).

The NACA BMP website (www.enaca.org) portrays success stories of BMP adoption by farmer groups.

5.3 Testing strategies for maximizing market opportunities for BMP-compliant small scale shrimp farmers

Considerable work was carried out in Thailand over the last 24 months and is still continuing. NACA, DOF-Thailand, Fairtrade, WWF, a private processing plant (Seafresh), and a private EU import company (Aquastar) are collaborating in this work. This SRA facilitated the required networking between different agencies and succeeded in connecting BMP-compliant farmer group to modern markets. This initiative succeeded in identifying supply chains in Thailand and providing premium market opportunities for BMP-compliant farmer groups.

In India, the project facilitated a relationship between MPEDA/NaCSA and SYSCO (USA) to promote marketing of BMP-compliant shrimp coming from small scale farmers clusters under the guidance of NaCSA. MPEDA and SYSCO have signed an MOU to promote marketing of shrimp coming from BMP-compliant clusters in India. This work is in progress.

In Thailand and India farmer groups were assessed for their ability to comply with WWF shrimp standards. For the first time feed-back from small scale farmers on WWF standards and indicators was provided to the WWF Shrimp aquaculture dialogue process. In addition, the networking and communication mechanism established under the project enabled participation of small scale farmer representatives from India and Thailand at the WWF shrimp aquaculture dialogue in Indonesia in March 2010.

A pilot study was conducted in Thailand by DOF (Thailand) to assess the profitability for BMP-compliant farmer groups in exporting fresh, chilled shrimp product to the Korean market (**Final report-Annex 4**). The study clearly showed that it is possible for BMP-compliant farmer group to access better markets.

5.4 Developing draft methodology and approaches for shrimp farmer group certification

The project did not develop a certification methodology for BMP-compliant farmer groups. However, the networking platform facilitated by this project enabled the development and implementation of 2 key projects in farmer group/cluster certification.

Several ideas and approaches for this component were generated by the project partners during the first and second annual project meetings. Following up on this, a project proposal was developed by NACA for implementation in India in collaboration with MPEDA/NaCSA. NaCSA provided the financial support to develop the draft methodology and pilot tested it in selected clusters in India. The project is in progress and some of the project outputs are published (e.g. **cluster certification brochure, guidelines for cluster certification**) on the NACA website (www.enaca.org).

The networking and communication platform of the project also assisted the Thailand Department of Fisheries to develop a project on “Certification for small scale aquaculture in Thailand with a focus on cluster certification”. Additionally, funding was secured from FAO under the FAO TCP umbrella. The project is ongoing and NACA is one of the collaborating partners in the project

5.5 Other outcomes associated with this project

The visibility of BMP programs has increased significantly in the region and as a result additional NACA member governments are requesting NACA and other donors to establish BMP projects in their countries (e.g. Malaysia, Sri Lanka and Bangladesh). Based on the lessons learned from shrimp BMP projects, new partnerships and projects are being developed in the region in order to develop, validate and implement commodity specific BMPs for other key aquaculture commodities (e.g. marine finfish, carps, tilapia, catfish).

In 2008, BMP work on Mekong catfish was initiated in Vietnam under the CARD program supported by AusAid (2008-2010) in collaboration with DPI, Victoria and RIA2 and CTU, Vietnam

The regional BMP work **and the networking mechanism established under this project** has received a further boost with the support from the recently approved EU-ASEM project under the 7th framework.

A significant contribution of this project is the establishment of an innovative communication and networking model in Aceh (Aceh Aquaculture Communication Centre (AACC)/Aquaculture Livelihood Service Centres (ALSC) under the ADB-NACA ETESP project). The AACC/ALSC model seeks to augment provision of services to farmer groups established around aquaculture livelihood service centres. AACC is located at the Brackishwater Aquaculture Centre, Ujung Bate, Aceh Besar District. ACIAR supported projects in Aceh played a major role in rehabilitating the Brackishwater Aquaculture Centre in Ujung Bate.

AACC currently provides four major services (information services, technical information and advice, disease diagnosis and training) to aqua-farmer associations through the ALSC network. This novel approach links rural aqua aqua-farmers through their associations (ALSCs) to AACC using modern communication technologies. ALSCs are based on farmer groups at sub-district and district level who implement and manage their own aquaculture activities through a participatory approach. The common goal is to reduce risk and maximise profits while meeting the expected market demands through sustainable aquaculture operations. At present 4 ALSC are operating in Aceh.

Effective dissemination of BMPs is steadily being achieved through ALSC-AACC system in four sub-districts. The ALSCs are set to become self sustaining units, technical centres for fish/shrimp farmer associations with greatly improved business acumen. Considering the long term benefits of the AACC/ALSC model set up in Aceh, other donor assisted projects operated through ACIAR, OISCA-JFPR, FAO and WFC are making use of the model to implement some of their ongoing field activities. This recognition coming from other projects is noteworthy.

6 Achievements against activities and outputs

Objective 1: Communications and networking – To strengthen regional networking mechanisms between stakeholders for exchange of knowledge on BMPs, based on the International principles, to enable adoption to maximize benefits to small holder shrimp farmers

no.	activity	outputs/ milestones	comments
1.1	Develop structured, open and dynamic BMP web site	Functional website	BMP website developed and made operational. BMP information from all project partners available on the website. BMP information from other related projects available The website widely visited and reports, brochures and publications available in the website downloaded in large numbers
1.2	Develop a portal for farmers within the website with links to information in different languages	Functional portal and links	Links established to project partner institutions Links established to similar initiatives (e.g. AACC/ALSC in Aceh) implemented under ADB ETESP-NACA project in Aceh, Indonesia Discussion forum established on the NACA home page for farmers and other stakeholders on BMPs Specific portals for farmers in local languages could not be established in view of technical problems
1.3	Periodically produce a shrimp e-newsletter	Shrimp e-newsletter	Shrimp e-newsletters produced and disseminated at regular intervals.
1.4	Conduct annual meetings of project partners	Review and update relevant information First, Second and third annual project meeting reports Project proposals developed and submitted to ACIAR, MPEDA/NaCSA, FAO, and EU	First project annual meeting completed in November 2007, in Cochin, India (Report-Annex 1) Second annual project meeting completed in November 2008, in Bangkok (Report-Annex 2) Third annual project meeting completed in November 2009, in Semarang, Indonesia (Report-Annex 3) In addition to project partners, the three annual meetings brought together representatives from WWF, IUCN, FAO, Fish Wise, Lyon Seafoods and ACIAR Aceh Aquaculture Rehabilitation Project.

Objective 2: Development and dissemination of contextualized BMPs–To promote development and dissemination of contextualized BMPs for country/location/farming system/species

no.	activity	outputs/ milestones	comments
2.1	On-line and face to face collaboration by stakeholders in development of contextualized technical BMPs	Contextualized BMPs specific for country /location/farming system /species	On-line and face to face collaboration between project partners took place regularly. Information on BMPs developed and adopted in different projects shared amongst partners and disseminated widely in the region. BMPs regularly revised and contextualized by project partners
2.2	On-line and face to face collaboration by stakeholders in development of contextualized extension methodologies	Contextualized extension methodologies	Farmer group/cluster approach emerged as a major platform for extension and dissemination of BMP information in project partner countries. The benefits of small-scale farmers coming together to make collective decisions about responsible farming and BMP implementation realised in project partner countries (e.g. India, Thailand, Aceh in Indonesia) Innovative communication and networking model established in Aceh under the ADB-NACA ETESP project. The AACC/ALSC model seeks to augment provision of services to farmer groups established around aquaculture livelihood service centres.
2.3	On-line dissemination of contextualized technical BMPs and extension methodologies	Dissemination to regional countries	Success stories of BMP adoption by farmer groups widely disseminated in the region through short articles and news stories in NACA BMP website (www.enaca.org)

Objective 3: Forward integration - To explore strategies that maximize market opportunities for BMP-compliant farmer groups

no.	activity	outputs/ milestones	comments
3.1	Identify supply chains in Thailand providing premium market opportunities for BMP-compliant farmer groups	Supply chains identified	<p>Considerable work done in Thailand over the last 24 months. NACA, DOF-Thailand, Fairtrade, WWF, a private processing plant (Seafresh), and a private EU import company (Aquastar) are collaborating in this work. ACIAR project facilitated the required networking between different agencies and succeeded in connecting BMP-compliant farmer group to modern markets.</p> <p>In India, the project facilitated a collaboration between MPEDA/NaCSA and SYSCO (USA) in order to promote marketing of BMP-compliant shrimp coming from small scale farmers clusters under the guidance of NaCSA.</p> <p>In Thailand and India farmer groups were assessed for their ability to comply with WWF shrimp standards and indicators. ACIAR project facilitated the networking and communication. For the first time feed-back from small scale farmers on WWF standards and indicators provided to the WWF Shrimp aquaculture dialogue process.</p> <p>The networking and communication mechanism established under the project enabled participation of small scale farmer representatives from India and Thailand at the WWF shrimp aquaculture dialogue in Indonesia in March 2010.</p>
3.2	Conduct a pilot study within selected supply chains to assess improved profitability for BMP-complaint farmer groups	Feasibility and Profitability assessed	A pilot study was conducted in Thailand by DOF, Thailand to assess the profitability for BMP-compliant farmer groups in exporting fresh chilled shrimp product to Korean market (Final report-Annex 4).
3.3	Exchange information with partners involved in similar activities in the region, including Indonesia and India	Strategies assessed and their validity across countries compared	The lessons learned and experience gained was shared widely amongst project partners and disseminated in the region.

Objective 4: Farmer group certification - To develop a methodology for enabling certification of BMP-compliant small holder farmer groups

no.	activity	outputs/ milestones	comments
4.1	Develop a certification methodology for BMP-compliant farmer groups	Draft certification methodology developed for pilot testing	<p>The project did not develop a certification methodology for BMP-compliant farmer groups. However, the networking platform facilitated by this project enabled the development and implementation of 2 key projects in this important area of farmer group/cluster certification.</p> <p>Several ideas and approaches for this component were generated by the project partners during I and II annual project meetings. Following up on this, a project proposal was developed for implementation in India in collaboration with MPEDA/NaCSA. NaCSA provided the financial support to develop the draft methodology and pilot test it in selected clusters in India. The project outputs are published (e.g. cluster certification brochure, guidelines for cluster certification) in NACA website (www.enaca.org) and shared with project partners.</p> <p>The networking and communication platform of the project also helped Thai Department of Fisheries to develop a project on “Certification for small scale aquaculture in Thailand with a focus on cluster certification” and get funding support from FAO under the FAO TCP umbrella. This project is ongoing and NACA is one of the collaborating partners in the project</p>

7 Impacts

7.1 Scientific Impacts

- Improved farm management practices promoted through BMPs can reduce environmental impacts, ensure food safety and improve farm profit. The “win-win” situation created by adoption of BMPs provides a strong incentive for positive change.
- BMP programs for other key aquaculture commodities are being developed and funded in the region (e.g. BMP project for Vietnamese catfish funded by CARD, AusAID; BMP project for Murray Cod in Australia).
- Shrimp BMP programs operating in partner countries have helped to identify and isolate potential risk factors and assist in the development of intervention strategies (e.g. shared nurseries).
- Shrimp BMP programs in partner countries have helped to identify researchable field problems (e.g. genotypes of WSSV and potential entry points)
- ACIAR supported molecular epidemiology project (FIS/2002/075) implemented in close collaboration with this networking project has clearly shown that BMP programs in India have helped to minimize disease risks and maximize returns. The molecular epidemiology project provides scientific evidence that well implemented farm level BMP projects can significantly reduce disease risks and disease related losses.

7.2 Capacity Impacts

- Continued communication and exchange of information between project partners has improved capacity and skills of project partners and their staff.
- Interaction between technical service providers and farmers at the ground level has enhanced the capacity of stakeholders.
- Farmer groups organized for implementation of BMP programs have a stronger negotiation capacity with the input suppliers and traders. Farmer groups in India have clearly shown “Together we bargain, divided we beg” when it comes to procuring quality inputs and marketing their produce.
- The innovative AACC/ALSC communication and networking model established in Aceh under the ADB-NACA ETESP project has contributed significantly to building capacity of farmer groups around ALSCs and capacity of technical staff of AACC. The AACC/ALSC model seeks to augment provision of services to farmer groups established around aquaculture livelihood service centres.

7.3 Community Impacts

- Organization of small-scale aquaculture farmers brings about positive social and economic benefits to members. Collective planning and shared responsibility helps achieve better management of risks.
- Cluster model of BMP implementation is developing into a self propagating model in some of the project partner countries. Promoting the 'group approach' has assisted in bringing about communal harmony, a fundamental requirement for community development.
- The establishment of Aquaculture Livelihood Service Centres (ALSC) around farming groups is an innovative approach that was experimented in Aceh under the ADB ETESP – NACA project. ALSCs act as information centres for farmer groups. Farmer communities established around the ALSCs are better able to make informed decisions. The ALSCs in Aceh have contributed to the empowerment of rural communities.

7.4 Economic Impacts

- Reduced risk of crop losses and the reduced cost of production realised through implementation of BMPs has contributed to increased profits to small scale farmers in project partner countries (e.g. India and Aceh in Indonesia).
- The group approach promoted under this networking project has enabled farmer groups to enhance their bargaining power and procure quality aquaculture inputs (e.g. seed, feed) at reasonable prices. In addition, the group approach has also helped farmers in some instances to seek group/cluster certification (e.g. organic certification of two clusters in Andhra Pradesh, India) for their produce and realise higher income.
- The group approach has helped farmers to undertake improvements to common facility resources (e.g. deepening of feeder canals, maintenance of connecting roads) at reduced costs.

7.5 Social Impacts

The BMP programs have shown that a disciplined approach in farming can give rise to all round benefits. This has resulted in significant attitudinal changes in small scale farmers and enhanced harmony and understanding within the community in some of the project partner countries.

7.6 Environmental Impacts

- The BMP programs aim to translate the *International Principles for Responsible Shrimp Farming* into practice. Compliance to international principles would significantly reduce environmental impacts of shrimp culture in coastal ecosystems.
- Cluster farming and BMP adoption are seen as opportunities for small scale farmers to participate in certification programs and access better markets. Compliance to certification will come with significant positive environmental impacts

- BMP programs have helped to revive responsible shrimp farming in abandoned shrimp ponds, thus contributing to efficient utilization of national resources.

7.7 Communication and Dissemination Activities

- Much of the communication activities between project partners in 5 countries took place on-line. In addition, annual project meetings provided opportunities for face-to-face discussions and exchange of information. The annual project meetings were instrumental in sharing BMP information and lessons learned. The annual meetings helped project partners to revisit/revise their ongoing programs considering the experiences of other BMP projects. The networking and communication platform established in the project certainly fulfilled its primary objective of improved communication and information sharing.
- Much of the dissemination at the regional level was done through the NACA BMP website. At the country and project implementation level, dissemination was mainly through farmer meetings, workshops, and training programs..
- Success stories about BMP work ongoing in the region was also publicized through review articles and general publications
- The project provided opportunities for networking with other organizations and institutions that are interested in shrimp farming. The first annual meeting of the project (Nov 2007) was attended by representatives from WWF, FAO, and Seafood Alliance in addition to project partners from 5 countries. The II annual meeting (Nov 2008) brought together representatives from WWF, IUCN, Fish Wise, Lyon Seafoods and ACIAR Aceh Aquaculture Rehabilitation Project. The third annual meeting (Nov 2009) was attended by representatives of WWF, ACIAR Aceh Aquaculture Rehabilitation Project, FAO-ARC project, Aceh Aquaculture Communication Centre (AACC)
- The project also facilitated the participation of project partners from 5 countries in the WWF shrimp dialogues (Nov 2008 in Bangkok and April 2010 in Indonesia). Through this mechanism, the project contributed to the provision of feedback from small scale farmer perspective to the WWF shrimp standard setting process.

8 Conclusions and recommendations

8.1 Conclusions

BMP projects, in India, Indonesia, Thailand and Vietnam provide good examples of translating the principles of responsible aquaculture into specific BMPs adapted to local farming conditions and ensuring their implementation by relevant stakeholders. This has resulted in gains in production, quality improvements and market accessibility. The projects also show evidence of the advantages of small-scale farmers being organized. Advantages include:

- sharing resources;
- empowering stakeholders;
- helping each other; and
- the implementation of the better management practices has provided benefits to the farmers, environment and society.

This ACIAR supported networking project has created a robust regional mechanism for networking and exchange of information, specifically focused to benefit small-scale shrimp farmers in Asia through:

- reducing disease risks;
- improving yields;
- producing quality shrimp;
- better market access;
- increased focus on socio-economic sustainability; and
- compliance with international principles

In summary, the networking mechanism has helped to promote the concept of responsible and sustainable shrimp farming in the Asia Pacific region. The lessons learned and experience gained strongly suggest that BMPs is the gateway to ensuring sustainability of small scale aquaculture and meeting modern day market challenges and opportunities. The project has increased awareness about the concept of Better Management Practices in shrimp farming and contributed to its promotion in the Asia Pacific region.

8.2 Recommendations

BMPs need to be grounded in valid scientific justification, rather than perceptions and or superficial experiences. Equally, there is a need to develop implementation mechanisms to permit large-scale BMPs which facilitate impact for large numbers of small-scale farmers.

Further research needs to be undertaken in the following areas with focus given to projects that will:

- validate key shrimp BMPs, and quantitatively assess their impact on farm production and economics;

- develop national and regional strategies for large-scale scaling up of shrimp BMP promotion;
- develop and validate BMPs for other key aquaculture commodities (e.g. carps, freshwater prawn);
- explore market strategies that will connect small-farmers to markets;
- undertake R&D work on strategies that will connect BMP compliant small scale farmer groups to modern markets;
- undertake assessment of key shrimp BMPs against standards and indicators formulated by third party certification bodies;
- pilot test cluster certification methodologies;
- strengthen existing networks and communication channels to promote wider adoption of BMPs in the region for key aquaculture commodities;
- pilot test models similar to AACC/ALSC in Aceh in other countries of the region; and
- transfer the cluster management approach from India to other countries (e.g. Bangladesh, Sri Lanka) in the region.

9 Appendixes

9.1 Appendix 1:

First annual project meeting report

9.2 Appendix 2:

Second annual Project meeting report

9.3 Appendix 3:

Third annual project meeting report

9.4 Appendix 4

Supply chain integration project report