EU-FP7 Project "ASEM Aquaculture Platform"

ICAR/MPEDA/MOA/EU-ASEM/NACA Workshop

Better Management Practices (BMPs) and Cluster Management for Empowering Small Scale Farmers: Scaling Up Strategies

National Workshop Report

Central Institute for Brackishwater Aquaculture (CIBA), Chennai, India

16- 18 May 2011

Network of Aquaculture Centres in Asia-Pacific

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1. EU-ASEM Project:

The European Commission, under the 7th frame work programme (FP7) Cooperation Theme: Food, Agriculture, Fisheries and Biotechnologies is supporting a project "ASEM Aquaculture Platform", coordinated by Ghent University, Belgium, and involves nine participating European and Asian institutions/ organizations. The project's major aim is to develop a strong 'Community of Practice' to reconcile ecosystem and economic system demands to promote and consolidate sustainability in aquaculture development in both regions. The Network of Aquaculture Centres in Asia-Pacific (NACA) is coordinating Work Package (WP) 2 on, **"Development and validation of commodity-specific Better Management Practices (BMPs) for smallholder farmers in the Asia-Pacific region**". This work package focuses on promoting wider adoption of Better Management Practices (BMPs) for key aquaculture commodities in selected member countries of NACA, thereby ensuring sustainability of this important food production sector and improving the livelihoods of the stakeholders. WP 2 is being implemented in 2 parts.

- **Part 1** deals with commodities for which BMPs are already developed and being implemented (e.g. shrimp in India), with a focus on assessment of the impact of BMP implementation through the cluster management approach and developing strategies for scaling up at the national and regional level.
- **Part 2** deals with commodities for which BMPs are presently being developed (e.g. striped catfish in Vietnam) with the focus on development and implementation of BMPs through the cluster management concept.

The national workshop conducted in CIBA, Chennai from 16-18 May 2011 is one of the activities under part 1 of WP2.

2. Background to the Workshop:

Asian aquaculture is predominated by small scale operations. Small scale farmers, irrespective of the country and the farming systems face numerous challenges in a globalized market place; among which are access to technical knowledge, lack of enabling government policies and programs, access to credit and insurance, compliance to stringent standards (e.g. health and animal welfare, food safety, environmental integrity and social issues) and market requirements including certification. It is widely accepted that the demand for quality and responsibly produced and certified aquaculture products is predicted to increase substantially both in the domestic and international markets in the foreseeable future. It is imperative, therefore, that

small scale farmers are better prepared to meet these challenges in order to sustain their livelihoods, and indeed continue to provide sea food to consumers. One way to meet the above challenges and the most rational, pragmatic and technically and economically feasible option is to implement Better Management Practices (BMPs) facilitated through a cluster management approach.

Since 2001, NACA has played a major role on the development of BMPs and promoting their adoption through a cluster based approach in a number of countries in the Asia-Pacific region, working in conjunction with country partners and donors, and international organizations. NACA's experience with BMP promotion work in India, Indonesia, Thailand and Vietnam in relation to commodities clearly suggests that BMPs improve yields, safety and improve quality of products taking into consideration animal health and welfare, food safety, environmental and socio-economical sustainability. Key BMP and cluster management work carried out by nACA to this date, in the region includes:

- Shrimp project in India in collaboration with MPEDA/NaCSA and CIBA(ICAR), since the year 2000 and ongoing
- Shrimp work in Aceh, Indonesia under the ADB-ETESP project (2005-2009) in collaboration with FAO and IFC,
- Development of BMPs for the catfish farming sector in the Mekong Delta, Vietnam under the CARD program supported by AusAid (2008-2010) in collaboration with DPI, Victoria and Research Institute for Aquaculture No. 2 (RIA2) and Can Tho University (CTU), Vietnam
- WWF supported shrimp work in Thailand and India (2007-2009)
- ACIAR supported work of strengthening networking and information sharing amongst BMP project implementers in the region (2006-2009).

The lessons learned and experience gained strongly suggest that BMPs and cluster management as the way forward for ensuring sustainability of small scale aquaculture and meeting modern day market challenges and opportunities[1].

The EU-ASEM project with funding support from EU-FP7 has enabled NACA to continue the work on the development and implementation of BMPs through a cluster management approach, that it commenced nearly a decade ago in the Asia Pacific region. Considering the advancements made in shrimp BMP implementation in the region, and the net gains thereof[2,3], the focus of WP 2 (Part 1) is on promoting a wider adoption of BMPs in selected member countries of NACA, through developing strategies for scaling up at the national and regional level. In this regard a national workshop on scaling up strategies was conducted at CIBA, Chennai, India from 16-18 May 2011.

[1] CV Mohan and Sena DeSilva (2010). Better management practices (BMPs)-gateway to ensuring sustainability of small scale aquaculture and meeting modern day market challenges and opportunities. **Aquaculture Asia**, 15: 9-14

[2] Umesh NR (2007) Development and adoption of BMPs by self-help farmer groups. *Aquaculture Asia Magazine* **XII**: 8-10

[3] Umesh RN, Chandra Mohan AB, Ravibabu G, Padiyar PA, Phillips MJ, Mohan C., Vishnu Bhat, B (2010) Implementation of better management practices by empowering small-scale farmers through a cluster-based approach: the case of shrimp farmers in India. In: De Silva, S.S., Davy, F.B. (Eds.), *Success Stories in Asian Aquaculture*. pp. 43-65. Springer and IDRC, Canada

3. Purpose of the National Workshop:

The main purpose of the national workshop was to develop practical scaling up strategies at the national level and build consensus for an implementation plan for wider adoption of shrimp BMPs through a cluster management approach. The specific objectives of the workshop were to :

bring together key national institutions and stakeholders

perform a thorough assessment of the impact of shrimp BMP and cluster management programs in India, including technical, social, economic, environmental and institutional concerns

identify factors for success and constraints to adoption

identify opportunities and challenges for scaling up

provide projections on the impact of scaling up at the national level, and

develop scaling up strategies for implementation by national institutions, regional organizations and potential donors

Additional objectives included:

build awareness and capacity of relevant national stakeholders on BMPs, Cluster management, Standards and Certification, cluster/group certification, Internal Control system (ICS), market access, etc

share lessons from BMP and cluster management projects in India, Vietnam, Thailand and Indonesia

strengthen the networking of shrimp BMP project implementers in the region, and

learn from other sectors like agriculture, the dairy industry and links to other sectors such as the information and communications (ICT) sector

4. Preparatory work done in support of the national workshop:

The proposed workshop idea was discussed with all the key national institution heads and consensus generated for holding the workshop in CIBA, Chennai. A detailed workshop prospectus was developed (Annex 1) and formal invitation letters sent to all the potential institutions, private sector and primary stakeholders within India. Similar steps were taken to invite experts and resource persons from outside India.

A team of experts constituted with defined TOR for undertaking the impact assessments of shrimp BMP and cluster management work in India. Facilitated series of informal and formal stakeholder consultations to understand issues and constraints to adoption of BMPs and cluster management. The findings were summarized as a background guidance paper for the workshop (Annex 2).

5. Participation

The workshop brought together key stakeholders from all over India. These include representatives from Marine Products Export Development Authority/ National Center Sustainable Aquaculture (MPEDA/NaCSA; of the Ministry of Commerce, Government of India), Indian Council for Agricultural Research (ICAR) and its research institutes (CIBA, Central Institute for Freshwater Aquaculture- CIFA, Central Marine Fisheries Research Institute- CMFRI and Central Inland

Fisheries Research Institute- CIFRI), State Departments of Fisheries (Kerala, Karnataka, Andhra Pradesh, Tamil Nadu), National Fisheries Development Board (NFDB), Coastal aquaculture Authority (CAA), Fisheries Colleges of State Agricultural Universities, Farmer leaders, hatchery operators and processors, certification and standard setting bodies. In addition, experts representing various regional and international organizations from Thailand, Indonesia, Malaysia and Australia with expertise on aquaculture development, small-scale aquaculture, BMPs and cluster management attended the workshop. The full list of participants is provided in Annex 3.

6. Process

Opening Session: Dr Ponniah, Director of CIBA welcomed the participants and expressed happiness for hosting the workshop on behalf of national and international collaborating partners. Prof Sena DeSilva, Director General of NACA addressed the gathering and described the role of NACA in supporting development of responsible aquaculture. Dr CV Mohan of NACA spoke about the workshop objectives, process and expected outcomes. Dr Tharun Sridhar Joint Secretary, Department of Animal Husbandry, Dairying and Fisheries, MOA provided the inaugural address and emphasized the need for preparing the small scale aquaculture sector to meet the challenges of the modern markets. Dr Meenakumari, DDG Fisheries provided the Presidential address and highlighted the need for national institutions to work for the betterment of the small scale farmers and promoting responsible aquaculture. Dr Upadhyay from MPEDA provided details of MPEDA/NACA collaboration and proposed vote of thanks to all the delegates.

The workshop was conducted as per the agenda (Annex 4). The workshop was conducted through 7 technical sessions that were integrated in a logical fashion to ensure continuity, facilitate discussion and enhance uptake. All presentations made are available in Annex 5.

The **First session** was chaired by Mr Tarun Sridhar, Joint Secretary, Department of Animal Husbandry, Dairying and Fisheries, MOA and Co-chaired by Dr Joice, CEO of NaCSA. The session focused on understanding the concepts of BMPs and cluster management. Presentations included BMPs and Cluster management, aquaculture certification and group certification, linking small scale farmers to modern markets, and fair-trade certification.

The **second session** was chaired by Prof Sena De Silva, DG of NACA and Co-chaired by Dr Upadhyay, Director of MPEDA. This session focused on sharing of experiences from India, Thailand, Indonesia and Malaysia with regards to development, validation and implementation of shrimp BMP programs.

The **third session** was chaired by Dr Vasudevappa from NFDB and Co-Chaired by Dr Zumillah from UPM Malaysia. Here the focus was understanding the concepts of scaling up and out, learning from other sectors and impact analysis of shrimp BMP programs in India and ideas for scaling up and follow up actions

The **fourth session** was chaired by Dr Meenakumari, DDG Fisheries, ICAR. This session was devoted to the role of public institutions in future scaling up work. Presentations were made by

MPEDA, CIBA, CIFA, CAA, NFDB, state fisheries departments and fisheries colleges belonging to state agricultural universities.

The **fifth session** was chaired by Dr. Brian Davy, NACA and Dr. Joanne Millar from Australia. This session provided an opportunity to cluster leaders, hatchery operators, service providing companies, certification agencies and others to share their views and their potential roles in future scaling up programs.

The **sixth session** was devoted to working group discussions. Two working groups were constituted ensuring representation from all the relevant stakeholder groups. The two working groups were given the same task of brainstorming on (a) issues and constraints for scaling up and to come up with suggestions for (b) strategies and an implementation plan for scaling up at the national level. This approach allowed some degree of validation of working group findings and recommendations. Drs Brian Davy and Joanne Millar facilitated the working group discussions. Drs Kumaran and Ravishankar assisted the working groups for note taking and preparation of working group outputs in the form of presentations.

The **plenary session** was chaired by Dr AG Ponniah and the panel members were Dr Joice, CEO of NaCSA, Dr Manimaran, Director of CAA, Dr Brian Davy of NACA and Dr Joanne Millar from Australia. The two working group findings were presented (Annex 6). This was followed by open discussions and development of recommendations. The panel members facilitated and guided the discussions so as to develop useful recommendations and follow up actions.

7. Key Observations, Recommendations and suggested follow up actions

Observations

The workshop clearly recognized the critical role of BMPs and cluster management as a way forward for small scale farmers to remain sustainable. The ground breaking work done by MPEDA/NaCSA in promoting adoption of shrimp BMPs through the cluster management approach was highly commended. It was also noted that most of the individual farmers are also adopting the BMPs at varying levels.

There was a general consensus that BMPs are location specific and need to be evolved and improved taking into consideration farming practices, scientific information and market requirements. It was also noted that some farmers not belonging to clusters have also taken up some components of BMPs on their own accord and continue to implement these and therefore this spinoff benefit of BMPs also needs better recognition and understanding

The workshop acknowledged that BMPs are not standards or a certification process but their adoption can lead to and/or facilitate achieving compliance towards mandatory and voluntary standards and certification schemes, and in this regard examples were cited from Thailand case studies.

BMP variation: The workshop recognized that the Guidelines issued by the Ministry of Agriculture for the culture of shrimps in the year 1995, and the guidelines issued in 1997 by

Aquaculture Authority and the Guidelines indicated in the Coastal Aquaculture Authority Act 2005 are all list of BMPs developed through expert committees. The BMPs developed by MPEDA/NACA were based on risk factor studies for WSSV outbreak through the detailed epidemiological survey of small scale farmers. The uniqueness of these BMPs are their adaptation through cluster management. NaCSA/MPEDA were noted as lead agencies given their work to date and the important knowledge base now being accumulated around BMP implementation in most coastal Indian states. It was agreed the wider use of this knowledge base would pay important dividends in terms of scaling up and capturing appropriate lessons learned.

Regional efforts: Equally, it was noted that in some countries adoption of BMPs have been less successful than expected and or desired, and lessons learned from India and through this workshop will be useful to rectify this situation where relevant More effort is therefore suggested on capturing and sharing lessons learned increasingly by regions/areas and over time.

Roles of Organizations: Most importantly the workshop clearly recognized the need for implementing a shared national program for scaling up of shrimp BMP and cluster management work and emphasized the need for all national institutions and other stakeholders to play their role in such a national scaling up exercise. The need for research follow up to better understand, document and share lessons learned was noted across most of the sessions. Farmer organizations working with processors (eg Devi Seafoods) on new market development was also cited as examples of further follow up.

Clustering/collective action and sustainability: There was consensus that scaling up of a cluster approach will be the most appropriate way to proceed for the overall sustainability and further development of this predominantly small scale producer based sector. A cluster approach was also seen as a path to attaining group certification, thereby relieving small scale farmers of the burden of bearing a high cost for this purpose, individually. In the above regard the workshop also took note of instances where group certification and or new lucrative markets have been accessed through this approach. It was noted that clusters of small scale producers need support both in terms of supporting research but increasingly in terms of marketing and meeting the evolving demands of the new but rapidly evolving global marketplace. The use of cell phones and related information and communications technologies were noted as providing a variety of new often low cost market information services that merit continued exploration and testing in terms of effectiveness for small scale farmers. Certification will continue to evolve and small farmer linked certification was discussed and various options put forward, for instance by the FairTrade program (www.fairtrade.org) and GAA BAP. The draft bibliography (Annex 7) given in the booklet supplied to the participants of the workshop provides various references on related background reading related to small farmer support in their moves towards a new sustainability approach.

Networking at all levels: It was noted that many existing constraints to scaling up are organizational. Therefore the workshop endorsed the need for strong national networking mechanism in India and the region to facilitate lesson learning/sharing and overall collaboration to further promote the scaling up strategies and associated implementation plans and in time further strengthen the regional and international collaboration to enable the shrimp farming sector to develop and sustain itself.

Information/knowledge availability: The workshop also recognized that there are key research needs that would help improve and further evolve the BMPs; in effect it was agreed that the research needs, at least at the current stage, could be directed to sieve out the relevant information that is already available from organisations in India and in the region, and such information be more widely shared among researchers / research institutions and used to develop, report and disseminate information on specific issues of BMPs, which could be used for the overall improvement of BMPs. For instance a stronger learning based approach to facilitate wider sharing of lessons learned between different shrimp BMP regions in India, learning from other sectors (eg the dairy industry in India) are important issues for follow up. Various organizational barriers, for instance among key BMP organizations in India were suggested as one constraint that needs examination and early remedy.

India is seen as a regional leader in terms of experience and practice of shrimp BMPs and cluster development and Indian institutions should play an increasing leadership role with other countries in the region where possible. In this regard, NFDB indicated their ability to support various followup initiatives and overall showed strong interest to support a variety of next steps.

Recommendations

1. A thorough scientific evaluation/documentation of success/failure stories of MPEDA/NaCSA and other BMP programs implemented in India be undertaken based on the suggestions presented in order to evaluate the impact and develop projections for national scaling up.

2. The workshop recognized that the NaCSA/MPEDA on farm extension over the years has collected large volumes of primary data. Considering the scientific value of the data gathered from a national and regional perspective, it was suggested that attempts be made by NaCSA/MPEDA in collaboration with key national (e.g. CIBA, Universities) and international organizations (e.g. NACA) to further analyse the data in order to better refine/revise the BMPs and suitably modify the cluster approach to support national level scaling up. The workshop suggested that the following outputs be generated from such a study
    a. Key impacts of BMP adoption
    b. Constraints to BMP adoption
    c. Adoption rates among farmers within a cluster and between clusters, especially by innovative farmers/clusters.
    d. Social and cultural aspects of cluster formation and cluster functioning
    e. Cost benefit analysis of individual BMPs

3. The workshop suggested that domestic and export market development including market information services and cluster certification be considered in future scaling up strategies.

4. Considering the need to develop location/cluster specific BMPs, the workshop suggested that modifications to BMPs done by societies should be documented as this will lay an important foundation for further development of contextualized BMPs

5. The workshop recommended that the shrimp BMPs for India need to be revised and redrafted in the light of fresh information that is now available and that this task be undertaken by selected institutions in India (e.g. CIBA, NaCSA/MPEDA) in conjunction with NACA. It was also suggested that the revised version should follow the newly developed formats for other commodities and consider the whole supply chain, to retain uniformity and coherence.

6. The workshop recognized that non compliance to BMPs by some members of a society/ society as a whole is an important issue and mechanisms for compliance monitoring and tackling should be developed and implemented in future scaling up work.

7. The workshop supported the idea of creating a federation of clusters so that infrastructure like hatcheries/ advanced lab facilities can be developed by the farmers where possible. In this connection it was suggested that the success of Thambikottai Maravangadu and Jambavonadai cluster of Tamil Nadu should be documented and widely disseminated

8. Considering the significance of the work done by the MPEDA/NaCSA program, the workshop strongly recommended that NaCSA needs to be strengthened with increased financial support mechanisms & human resources to undertake some of the suggested strengthened roles. Appropriate linkages should be established with institutions /other agencies so that a single window delivery of extension services can be developed for future scaling up work in the country (e.g. ATMA: Agriculture Technology Management Agency – district level body for planning and implementation of programmes for agriculture and allied sectoral departments with exclusive financial provisions)

9. To support further scaling up, policy arrangements with appropriate related government agencies on financial assistance/ institutional support for infrastructure such as drainage systems, electricity, roads, reservoir/sedimentation ponds, etc in areas of BMP shrimp clusters should be strongly considered

10. In order to further strengthen BMP and cluster management programs and enable scaling up at the national level, strong collaboration between various national institutions and exchange mechanisms should be established and made operational. The workshop suggested that annual national workshops could be one of the ways to initiate the process

11. Detailed studies on successful clusters should be conducted and used for the purpose of replication at the national level. Such studies should cover amongst others; dealing with noncompliant farmers, intervention by influential cluster leaders, strong internal control systems, compensation or incentive mechanisms linked with adherence to BMPs.

12. To support national scaling up, governance issues related to land use & lease hold operators, problems in getting CAA registration/license & becoming members of clusters should be carefully addressed

13. The workshop recognized that markets will play a major role in future scaling up of shrimp BMP and cluster programs. The workshop recommended that market linkages need to be created for the clusters, market intelligence (domestic/export) needs to be given to clusters

and trial partnerships with buyers/processors and the private sector more generally need to be tried in the functioning of clusters and adoption of BMPs in the new and evolving market economy.

14. To support BMP adoption through a cluster approach, the workshop suggested that incentives be linked to BMP adopters and such incentives should come in the form of common facilities like electricity, source canal dredging, roads, social and environmental impact assessments , etc

15. To promote wider understanding of the concept of BMPs and cluster management the workshop suggested that universities imparting aquaculture education and training should consider including some of these concepts in their aquaculture teaching programs

Follow up actions to support scaling up at the national level

1. Further strengthening of NaCSA by provision of trained human resources with special focus on research linkages, market intelligence, certification, socio-economics, communication and networking (MPEDA to take lead)

2. Market information services including the preparation of market intelligence reports/discussion papers on export prospects for BMP shrimp from clusters (MPEDA to take lead) and a revitalized research program around a better understanding of key issues on BMPs (CIBA to take lead) were suggested.

3. Organization of the field data collected over the last 10 years by NaCSA to facilitate careful retrospective analysis to identify factors for success, constraints to adoption, BMP adoption rates, impact of BMPs, socio-economic issues, etc (MPEDA/NaCSA, CIBA and NACA to take the lead)

4. Revision and redrafting of shrimp BMPs for use by MPEDA/NaCSA for future scaling up at the national level (CIBA to take the lead in collaboration with MPEDA/NaCSA and NACA)

5. Initiating activities to link BMP and cluster management programs to markets through cluster certification programs and involvement of processors (NFDB to take the lead in collaboration with MPEDA/NaCSA and NACA)

6. Conduct of annual review workshops with the objective of reviewing progress of BMP implementation, refining/revising BMPs, sharing lessons learned, and strengthening networking and collaboration (MPEDA/NaCSA to take the lead with the involvement of CIBA)

7. Capacity building of prospective cluster leaders and field level extension officers, on concepts of BMPs and cluster management through dedicated short term training programs, workshops and exposure visits. (MPEDA/NaCSA and NFDB to take the lead)

8. Linking state fisheries departments to activities of MPEDA/NaCSA to promote participation and involvement of state fisheries departments (NaCSA and NFDB to take the lead)

9. Capacity building of fishery graduates on concepts of BMPs and cluster management through study visits, internships and inclusion of BMPs in aquaculture course curriculum (Fisheries College, Tutucorin to take the lead)

8. Workshop Outcomes

The key outcomes of the EU-ASEM project supported workshop are as follows:

Networking, collaboration and cooperation

Heads and representatives from key national institutions dealing with aquaculture including shrimp aquaculture were brought together in one platform and provided with an opportunity to discuss, interact and agree on strategies for scaling up shrimp BMP and cluster management programs in India and develop initial follow up actions. These institutions included most of the key organizations/stakeholders; Marine Products Export Development Authority (MPEDA), National Centre for Sustainable Aquaculture (NaCSA), Ministry of Animal Husbandry, Dairying and Fisheries (MAHDF), Coastal Aquaculture Authority (CAA), Indian Council of Agricultural Research (ICAR), Central Institute of Brackishwater Aquaculture (CIBA), Central Institute of Freshwater Aquaculture (CIFA), Central Marine Fisheries Research Institute (CMFRI), Central Inland Capture Fisheries Research Institute (CICFR), State fisheries Departments of Kerala, Karnataka, Andhra Pradesh and Tamil Nadu and Fisheries Colleges of state Agricultural Universities. This is the first time key institutions were brought together to discuss shrimp farming issues in India and agree on some strategies for scaling up BMP programs

The workshop succeeded in bringing together nationally for the first time key representatives of farmers, cluster leaders, representatives from hatcheries, processing plants, input suppliers and certification schemes to discuss issues and share experiences relating to shrimp BMPs and cluster management and future plans for scaling up at the national level.

The workshop also facilitated the participation of shrimp BMP program implementers from the region including Indonesia, Malaysia and Australia to share their experiences. The workshop contributed to the strengthening of the shrimp BMP networking in the region and discussed the possibility of sharing of Indian experiences with Indonesia and Malaysia through exchange programs including that of farmers.

Awareness and Capacity Building

The workshop contributed to building capacity and awareness of participants on concepts of small scale aquaculture, opportunities and challenges facing small scale aquaculture, BMPs, cluster management, certification, group certification, mandatory and voluntary standards, regional and international trading requirements, scaling up and scaling out issues.

Overall Scaling up strategies and implementation plan

The workshop provided an opportunity to assess the impact of shrimp BMP and cluster management programs, and to identify issues and constraints

The workshop successfully identified issues and constraints for scaling up and provided suggested approaches and strategies for scaling up the shrimp BMP and cluster management programs at the national level

The workshop identified priority follow up action plans for undertaking the scaling up work at the national level

The workshop led to a reasoned consensus and agreement amongst national institutions for undertaking follow up work in order to implement scaling up strategies

Final Documentation and Dissemination

Comprehensive workshop report including all the presentations, working group findings, recommendations and follow up plans will be made available on NACA, EU-ASEM, MPEDA and CIBA websites for wider dissemination.

EU-FP7 Project "ASEM Aquaculture Platform"

CIBA/ASEM/MPEDA//NACA Workshop

Better management practices (BMPs) and cluster management for empowering small scale farmers: Scaling up strategies

About the EU-FP7 Project:

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NACA is coordinating work package (WP) 2 on, **"Development and validation of commodity-specific Better Management Practices (BMPs) for smallholder farmers in the Asia-Pacific region**". This work package focuses on promoting wider adoption of BMPs for key aquaculture commodities in selected member countries of NACA, thereby ensuring sustainability of this important food production sector and improving the livelihoods of the stakeholders. Work package 2 is being implemented in 2 parts.

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- **Part 2** deals with commodities for which BMPs are presently being developed (e.g. striped catfish in Vietnam) with the focus on development and implementation of BMPs through the cluster management concept.

The proposed national workshop, scheduled to be held in Chennai, India, is one of the activities under part 1 of WP2.

Background:

Asian aquaculture is predominated by small scale, often defined as farmer owned/ leased, operated and managed. Small scale farmers, irrespective of the country and the farming systems, face numerous challenges in a globalized market place, amongst which are:

- access to technical knowledge,
- lack of enabling government policies and programs,
- access to credit and insurance,
- compliance to food safety standards (e.g. antibiotics),
- minimizing disease related losses,
- meeting stringent market requirements, including certification,
- meeting environmental and ethical standards, meeting wildlife and biodiversity requirements.

At the same time, the demand for quality and responsibly produced and certified aquaculture products is predicted to increase substantially in coming years. It is very important that small scale farmers are better prepared to meet these challenges in order to sustain their livelihoods, and indeed continue to provide sea food to the consumers; past experiences have shown, particularly in the Asia-Pacific region small scale

farmers are more adaptable to change and are resilient. The way to meet the above challenges and the most rational, practical and technically and economically feasible option is to implement Better Management Practices (BMPs) adoption through a cluster management approach, in a given locality.

Development and adoption of Better Management Practices (BMPs) for key aquaculture commodities is gradually gaining momentum and is 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, BMPs are confused with standards and certification.

NACA has been involved on BMP development and adoption since 2000 in a number of countries in the Asia-Pacific region, working in conjunction with country partners and donors, and international organizations. 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[1].

What are BMPs?

Better Management Practices (BMPs) in the aquaculture context outline norms for responsible farming- environmentally and socially- of aquatic animals. BMP's are management practices, and implementation of which is voluntary. BMPs are **not** a standard for certification. Implementation of BMPs improve the quantity, safety and quality of products taking into consideration animal health and welfare, food safety, environmental and socio-economical sustainability. Implementation of BMPs will help to achieve compliance with quantifiable standards and indicators set by international agencies and third party certification bodies.

Standards are set from a consumer view point, taking into consideration social equity and well being, environmental, food safety and quality, national regulations and other criteria. BMPs, on the other hand, are commodity specific and location specific management practices that have been developed to meet the norms of responsible farming and at the same time reduce risks to culture operations and maximize returns, the adoption of which by and large satisfies by implication the standards set from a consumer view point. Development of BMPs are based on the existing farmer practices, and is not a theoretical approach to a problem but a pragammatic one which is developed from "Bottom Up" rather than "Top Down".

BMPs have most of the ingredients that are required to meet independent standards. Most standards use the principles of responsible farming which takes into account both mandatory and voluntary standards. BMPs are not a one time solution, they are subjected to gradual evolution, improvement and revision– in other words a dynamic protocol. BMPs can be tailor made and contextualized to meet some of the quantifiable standards, where and if necessary. In simple terms, standards tell us what is expected while BMPs tell us how farmers can reduce risks to their culture operations, maximize returns, reduce losses and at the same time achieve compliance to quantifiable standards.

How are BMPs developed and validated?

As emphasized earlier, BMPs are commodity specific and location specific and have to follow the generic principles of responsible aquaculture. It is generally agreed that for all cultured commodities it is necessary to underpin the general principles for responsible farming that would cover environmental, social, ethical, food safety and husbandry issues. The first step in developing BMPs is gaining an in depth understanding of the culture system(s) and cultured species and the practices thereof This should be done at the population level and not in one or two ponds. Population based approaches to understand the

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problems and issues confronting a cultured commodity in a specific farming area are gaining importance. Identifying risk factors (e.g. environment, disease, food safety, market access, etc) for the long term sustainability of the farming system, at the population level using epidemiological principles (e.g. risk analysis) is fundamental to developing BMPs[2].

Once risk factors are identified, new management interventions are either developed or existing management methods revised/modified to address the identified risk factors, but always done in consultation with the practitioners and other stakeholders. Once a set of science based interventions are developed, through farm surveys, stakeholder consultations and scrutiny of existing scientific knowledge, it is necessary to 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 better management practices. These have to be rational, practical and technically and economically feasible for small scale farmers to implement. BMPs are constantly evolving and changing and it is necessary to consider approaches to continuously evaluate and improve BMPs.

Promotion of BMP adoption among small scale farmers

Promoting the adoption of BMPs by small scale farmers is not simple. Dedicated teams of field workers need to work with farmers day in and day out to bring about attitudinal changes in the small scale farmers and wean them from preconceived ideas and concepts and conventional practices that are not 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 famers 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). Provision of science based information to farmer groups through effective networking and communication is one important key to success. The best example of this model is the *modus operandi* of NaCSA[3]

What is cluster/group management?

Aquaculture practices occur in areas that are conducive to the practice and availability of basic resources primarily water. Unlike land based agriculture in the case of aquaculture there is a much higher degree of interaction, e.g. use of a common water resource; common discharge channel etc. among adjacent practices/ farms. Therefore, in a group of farms sharing these common resources if one farmer does not practice BMPs there is a possibility of the others who are practicing BMPs being negated; in other words the "all or none principle" is applicable to aquaculture practices in a locality in respect of BMP adoption. This calls for a cluster and or a group approach; all farms acting collectively and in unison and not individually.

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 (a defined geographical area, for

[2] Umesh, N.R., Mohan, C.V., Phillips, M.J., Bhat, B.V., Ravi Babu, G., Chandra Mohan, A.B. and Padiyar, P.A. 2008. Risk analysis in aquaculture – experiences from small-scale shrimp farmers of India. In M.G., Bondad-Reantaso, J.R. Arthur and R.P. Subasinghe (eds). Understanding and applying risk analysis in aquaculture. ***FAO Fisheries Technical Paper***. No. 519. Rome, FAO. pp.237-244.

[3] Umesh, N.R., Chandra Mohan, A.B., Ravi Babu, G., Padiyar, P.A., Phillips, M.J., Mohan, C.V. and Bhat, B.V. 2009. Shrimp farmer in India: Empowering small scale farmer through a cluster-based approach. In: ***Success Stories in Asian Aquaculture*** (S.S. De Silva, F.B. Davy, eds.), pp.43-68. Springer-IDRC-NACA, Dordrecht

example sharing a 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, generates synergies in the community.
- Cluster management brings several advantages to individual farmer members which otherwise is not possible (ref).
- Because of the economy of scale which a cluster can achieve, forward and backward integration of culture operations with processors and hatcheries, respectively, is possible.
- Cluster approach increases the bargaining power and helps farmers to source quality inputs.
- Certification, which is generally prohibitive for individual farmers can be accomplished through cluster certification.
- Cluster/group approach makes it easy to access credit and insurance compared to an individual farmer.

The principle of sharing costs in a cluster approach ensures that common facilities (e.g. feeder canal, roads) and infrastructure can be developed and maintained properly. Peer pressure prevents fellow farmers from resorting to irresponsible culture practices (e.g. use of banned antibiotics, release of water from disease affected ponds).

Above all, cluster farming brings social harmony in a community, fundamental to the progress of society.

BMP work in Asia-Pacific

NACA's experience with BMP promotion work in India, Indonesia, Thailand and Vietnam in relation to commodities clearly suggests that BMPs improve yields, safety and improve quality of products taking into consideration animal health and welfare, food safety, environmental and socio-economical sustainability. Key BMP and Cluster management work carried out in the region include:

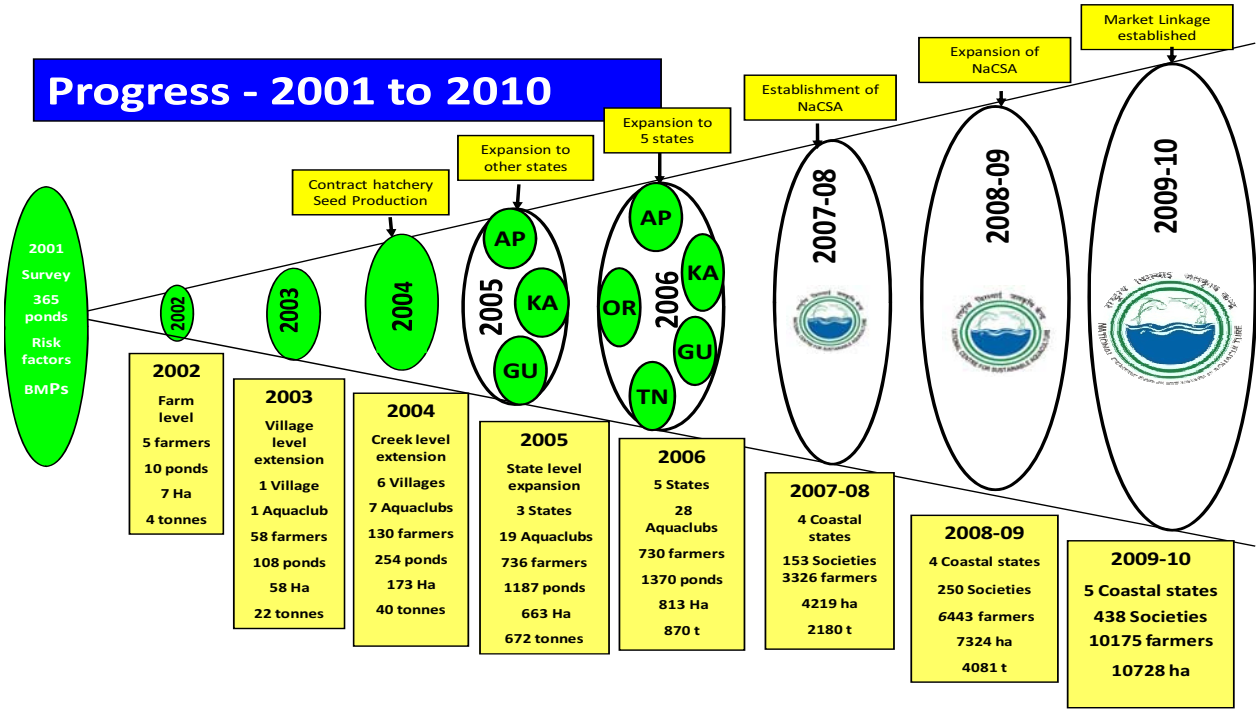
- Shrimp project in India in collaboration with MPEDA/NaCSA and CIBA(ICAR), since the year 2000 and ongoing
- shrimp work in Aceh, Indonesia under the ADB-ETESP project (2005-2009) in collaboration with FAO and IFC,
- Catfish work in the Mekong Delta, Vietnam under the CARD program supported by AusAid (2008-2010) in collaboration with DPI, Victoria and RIA2 and CTU, Vietnam
- WWF supported work in Thailand and India and
- ACIAR supported work of strengthening networking and information sharing amongst BMP project implementers in the region.

India Shrimp BMP work

Since the early 1990s, the Indian shrimp aquaculture sector has been hard hit by viral diseases. To address rising concerns about the effect of diseases on the sustainability of the sector, the Government of India's Marine Products Export Development Authority (MPEDA) with the technical assistance of NACA and the support of the Indian Council of Agricultural Research (ICAR) and the Australian Center for International Agricultural Research (ACIAR) initiated a programme in 2000 on "**Shrimp disease control and coastal management**". The programme started in 2001 with a large epidemiological study aimed at identifying the risk factors for key shrimp diseases. It also undertook to develop and disseminate BMPs to minimize farm-level risk factors for disease outbreaks and to address shrimp farming sustainability more broadly. The programme, which is now in its 10th year, was implemented in a phased manner. Some of the key stages of the programme included:

- A baseline study of the major diseases affecting the shrimp aquaculture operations (2000)
- A longitudinal epidemiological study in 365 ponds in Andhra Pradesh, east coast of India, to identify major risk factors associated with WSD (White spot disease) and low productivity in Penaeus monodon culture ponds (2000-2001)
- Development of farm level contextualized BMPs to address the identified risk factors (2002)
- Pilot testing of BMPs in selected farms (2002)
- Production of a simple and practical shrimp health management manual based on the outcomes of the risk factor study and piloting of BMPs, to support farm and village level extension programmes (2002)
- Development and testing of the concept of cluster farming for effective BMP adoption amongst farmers in a cluster, and expansion of BMP promotion to a large number of clusters (2003-2004)
- Extension of some of the BMPs to downstream activities like hatcheries
- Review and refinement of BMPs, and production of BMP extension leaflets for each stage of the culture operation (2005)
- Expansion of the BMP programme to clusters in five different states in India (2005-2006)
- Conceptualization of an institutional framework for maintaining the BMP and shrimp health extension programme (2006)
- Establishment and inauguration of the National Center for Sustainable Aquaculture (NaCSA) to carry forward the MPEDA/NACA programme activities (2007)
- 2008-2010 and ongoing: consolidation of the program in the state of Andhra Pradesh and expansion to neighboring states. Supporting clusters to access markets through certification programs on a pilot scale. Development of cluster certification guidelines

As of September 2010, NaCSA has formed 700 societies (clusters) covering 15,753 farmers and 16,126 ha with sustainable production of around 15,000 tonnes of shrimp.



Purpose of the National Workshop

- To build awareness and capacity of relevant stakeholders on BMPs, Cluster management, Standards and Certification, cluster/group certification, Internal Control system (ICS), market access, etc
- To share lessons from BMP and cluster management projects in India, Vietnam, Thailand and Indonesia
- To perform a thorough assessment of the impact of shrimp BMP and cluster management programs in India, including technical, social, economic and environmental concerns
- To identify factors for success and constraints to adoption
- To identify opportunities and challenges for scaling up
- To provide projections on the impact of scaling up at the national level
- To develop scaling up strategies for use by national institutions, regional organizations and potential donors

Participation

The workshop will bring together key stakeholders from all over India. These include representatives from MPEDA/NaCSA, ICAR (CIBA, CIFA, CMFRI), State Fisheries Departments, NFDB, CAA, Fisheries Colleges of State Agricultural Universities, Farmer leaders, hatchery operators and processors, certification and standard setting bodies. In addition, experts from various regional and international organizations (e.g. NACA, FAO, WFC, INFOFISH) with expertise on aquaculture development, small-scale aquaculture, BMPs and cluster management will attend the workshop

Process

The workshop will have three sessions that will be integrated in a logical fashion to ensure continuity, facilitate discussion and enhance uptake.

- The **First session** will include expert presentations on opportunities and challenges for small scale aquaculture in Asia, development and implementation of commodity specific BMPs, Cluster management, innovative networking and communication channels in support of small scale farmers, group/cluster certification, and linking small scale farmers to markets.
- The **second session** will focus on sharing of experiences from India, Thailand, Indonesia and Vietnam.
- The **third session** will focus on impact analysis and strategies for scaling up, including working group discussions, development of action plans and recommendations and presentation back to the workshop.

Expected outputs

Outputs from the workshop will be discussed and expected to be agreed as policy by the major stakeholders (e.g. MPEDA/NaCSA, ICAR, State Fisheries Departments) for supporting small scale farmers to remain competitive, profitable, responsible and sustainable. Key outputs expected include:

1. Better understanding of opportunities and challenges facing small scale farmers in India

2. Increased awareness and capacity in development and implementation of BMPs for key aquaculture commodities
3. Increased awareness and capacity on cluster formation, cluster management
4. Increased awareness and capacity on certification, cluster certification and market access
5. Strategies for scaling up BMP and cluster management programs at the national level for key aquaculture commodities
6. Recommendations in support of small scale farmers to remain competitive and sustainable
7. Recognition of inter- country benefits and ways to enhance such collaboration
8. Definition of next steps and an action plan
9. Preparation of a Workshop report summarizing the above

Annex 2

EU-FP7 Project "ASEM Aquaculture Platform"

CIBA/ASEM/MPEDA/NACA Workshop

16-18 May 2011, CIBA, Chennai, India

Better management practices (BMPs) and cluster management for empowering small scale farmers: Scaling up strategies[1]

Workshop Briefing Note to guide the discussions

Annex 1

Annex 1

F Brian Davy and C. V. Mohan

April 2011

[1] This draft is part of an ASEM review of BMPs in selected cases of Asian Aquaculture in India, Indonesia Vietnam and Thailand

Background

Asia is the global centre for aquaculture production, where it contributes widely to food security, trade, export earnings and rural economies. The most significant feature of the sector is the domination by small-holders, with the livelihoods of millions of farmers, suppliers, traders and workers directly or indirectly dependent on this important rural economic activity. These livelihoods, and the potential of aquaculture to contribute further to poverty reduction and food security, are at risk from regional and global influences now sweeping the aquaculture sector. Certification of aquaculture products, ever tighter food safety and environmental standards, integrated supply chains, and global competition – on top of the need for ever more economically efficient production and management -- are some of the emerging global aquaculture trends to be addressed if Asian small-scale aquaculture farmers are to remain competitive. It is very important that small scale farmers are better prepared to meet these challenges in order to sustain their livelihoods, and indeed continue to provide sea food to consumers. One of the best ways to meet the above challenges is implementation of commodity specific **Better Management Practices (BMPs)** through a **cluster/group management approach**.

Small-scale producers are facing new opportunities and challenges in today's markets. One important approach to assist small-scale farmers overcome these challenges and more effectively participate in and influence modern market chains and trade, is through collective approaches or group action. Such approaches are often facilitated by the successful establishment and operation of Farmers' Organisations (FOs) to support collective action among small-scale producers.

This includes cluster management in which a group of farmers, or FOs, collectively implement certain production standards. Cluster/group management has been used successfully as a tool by the Network of Aquaculture Centers in Asia-Pacific (NACA) and other international development organizations to facilitate the implementation of BMPs for small-scale aquaculture development in a number of countries in Asia (e.g. India, Indonesia, Thailand, Vietnam and Sri Lanka). Cluster management enables self-regulation for the implementation of BMPs including mandatory standards at the farm level to ensure responsible aquaculture farming. Cluster management thus seeks to achieve responsible aquaculture production by encouraging farmers to adhere to BMPs as a group and to monitor each others' activities to ensure that the group complies with its set common objectives and goals.

Recent experiences (e.g. MPEDA/NaCSA-NACA project in India, Aquastar/Seafresh/WWF/DOF/NACA project in Thailand; Aceh .....Indonesia) in the shrimp sector show collective action (cluster management) can yield a number of positive benefits; facilitate the certification of groups as opposed to individuals; benefit farmers through economies of scale related to bulk purchasing of inputs and services, collective processing and marketing; support communication, extension training and technology dissemination; and lead to effective management through collective implementation of 'better management practices' (BMPs).

Asian aquaculture, even in respect of the commodities that constitute major export products, such as shrimp (Litopenaeus vannamei and P. monodon in China, India, Indonesia, Thailand and Vietnam) and tra catfish (Pangasianodon hypophthalmus in Vietnam), and the growing rohu (Labeo rohita culture in Bangladesh and Myanmar) are all essentially based on small-scale, locally clustered farming systems. This is an approach that is very different from farming practices in Europe mostly due to the largely different socio-economic systems in each region. With increasing impacts of globalization, small-scale aquaculture farmers need access to more scientific knowledge, financial and technical services and market information in order to sustain their livelihoods and compete in modern market chains.

The WTO-SPS Agreement sets out the basic rules for food safety and animal and plant health standards. The basic aim of the SPS Agreement is to maintain the sovereign right of any government to provide the level of health protection it deems appropriate, but to ensure that these sovereign rights are not misused for protectionist purposes and do not result in barriers to international trade. The demand for food quality and responsibly produced and certified aquaculture products is predicted to increase substantially in coming years and the most feasible, economical and acceptable way to achieve these goals is for small scale farmers to adopt Better Management Practices, collectively as a cluster.

However there remain many questions for which there are few definitive answers:

- Is voluntary third party certification driven by buyers and retailers going to determine market access for small scale farmers in the future?
- Will small scale farmers be marginalized?
- Will third party certification be seen as technical barriers to trade erected by trading partners?
- What role should governments play to ensure compliance to mandatory technical regulations under the WTO-SPS and WTO-TBT agreements?

While appreciating these issues and concerns, it is necessary to prepare the small scale sector to farm and trade responsibly so that they are not marginalized. This mean s better understanding and complying to mandatory technical regulations (e.g. food safety and animal health standards as determined by CAC and OIE respectively) and a host of voluntary standards (e.g. social, environmental, etc as determined by third party certification schemes). Participation in a certification scheme and the benefits there of to the small scale sector should be left to the discretion of small scale farmers and market dynamics. Preparing the small scale sector to farm and trade responsibly is a mammoth task; there are no simple solutions to this. Adoption of BMPs through the cluster management approach is one of the feasible approaches.

BMPs and cluster management work done in the region

BMPs improve the quantity, safety and quality of products taking into consideration animal health and welfare, food safety, environmental and socioeconomic sustainability. BMP's are management practices, and implementation is generally voluntary; they are **not** a standard for certification. However, implementation of BMPs will help to achieve compliance with standards set by international agencies, certification bodies and trading partners. It is noteworthy that the FAO consultation workshops on aquaculture certification clearly pointed to the need for a better

involvement of retailers in the process of BMP development as a tool for certification. Jointly organizing BMP validation mechanisms will yield a better understanding of local Asian farming practices in which lies the assurance of feasible, effective and acceptable European regulatory processes. It is in this context that facilitation, validation and implementation of commodity specific better management practices for small holder farmers of Asia-Pacific is a timely and appropriate measure towards the proper certification of aquaculture products.

It is a crucial condition for a fair market access of Asian produced seafood into the European market. BMPs for shrimp farming have been successful in improving shrimp production and profitability and reducing risk for smallholder farmers in India and in Indonesia (Java and Aceh). BMPs for marine finfish farming and for tra catfish farming are at advanced stages of development. It is also believed that use of BMPs by small scale farmers will enable access to better markets and address socio-economic sustainability. However, BMPs need to be grounded in valid scientific justification, rather than perception and experience. 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 wider scaling up of BMPs to create impacts among large numbers of small-scale farmers. Implementation mechanisms should also, as far as possible, be supported by and built on systems already in place in the relevant country i.e. the socio-economic contexts prevalent in each country have to be taken into consideration.

Progress to date on BMPs & cluster management in India

Based on our initial review to date[2] , good progress is being made and success is developing, guided by the work in developing/promoting the clustering process through the able guidance of NaCSA/MPEDA[3]. Better understanding of successful clusters, in a variety of contexts, including analysis of the links to key supporting organizations, are important ingredients to this success. Another ingredient to successful clusters is the important role of key people. We need more lead and innovative farmers such as Mr Murthy (leader of the first cluster established in AP (Andhra Pradesh) India).

Previous shrimp farm poor practice is being replaced with better management practices. Ultimately longer term BMP success will be measured in terms of increasing numbers of farmers, from increasingly different contexts, adopting these evolving set of BMPs; ie ultimately in terms of changed farmer behaviours. Most surveyed clustered small scale shrimp farmers are achieving increased productivity and profitability....and increasingly moving towards improved sustainability. Scaling up and out of BMPs is taking place both across the various shrimp culture potential areas in India as well as across the Asian region; each area is developing their own variant of what represents better practice. However much more remains to be done. In India

[2] mainly via field visits/workshops & meetings with a wide mix of shrimp value chain actors in AP India; most recently in late 2010.

[3] For more details see their websites and Umesh et al 2010 Shrimp Farmers in India: Empowering Small-Scale Farmers through a Cluster-Based Approach in S.S.De Silva & F.B.Davy (eds) Success Stories in Asian Aquaculture. Springer 214p.

MPEDA data[4] suggest that only about 14% of the potential area in India is being taken up under this program, so there remains a considerable need for continued scaling up.

BMP Drivers

In terms of the evolution of the shrimp farmer BMP work in India, it is worth noting that success to date, has initially been driven by a need to deal with water management and disease; early success grew from groups of producers coming together in a given area, around tackling a shared water supply management problem. The evolution of the Thai Samroiyod and Indonesian Aceh cases have been stimulated by a different mix of drivers. However in all cases the development of a shared collaborative strategy to overcome each crisis was key to action and success. Our review suggests that this situation is now moving into a variety of increasingly market driven changes coupled with continued better disease management practice. Better understanding of some of this process of change is suggested to be part of a follow up action plan.

Market Opportunities for Small scale farmers & Value Chain Actor Roles: Where to from here?

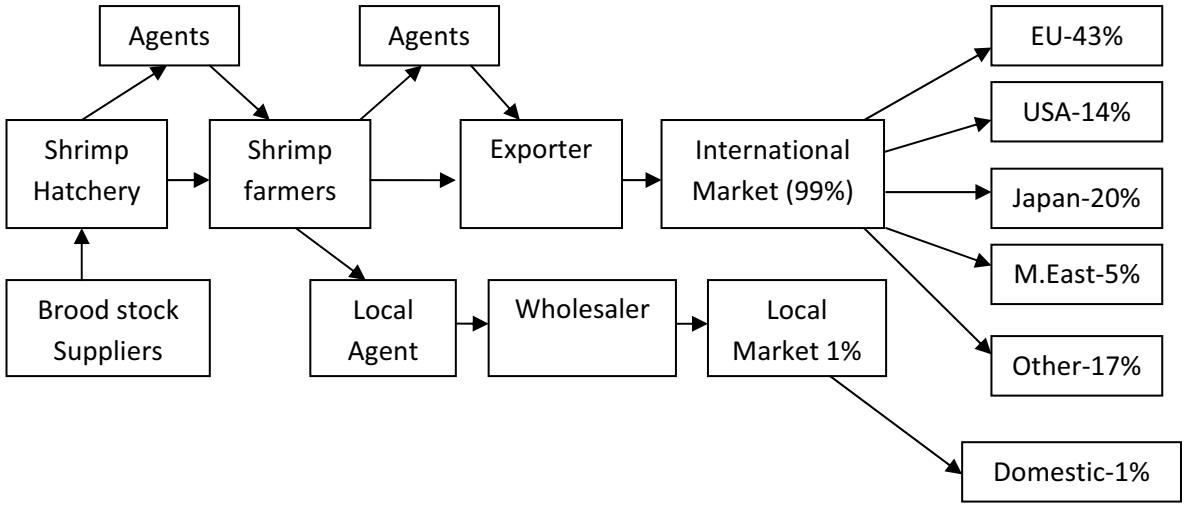


Fig 1 Indian shrimp value chain; note that 99% of the market was to international markets (adapted from Umesh et al 2010)

But of course production increases need to fit into evolving markets and the changing demands of such markets (including certification schemes). As shown in Fig 1 the majority (99%) of the markets for Indian shrimp are international. Many farmers who were interviewed, noted that market prices in AP were good at the time of our most recent interviews (late 2010) but many worried that these good prices for shrimp will fall in the coming months. Processors face a related set of assured supply problems. It is important to note that some initial farmer cluster-processor-buyer linkage successes have been achieved. More work is needed here. Experiments

[4] See MPEDA website

with organic and other product development (eg scampi) have been mixed. Traceability and certification are issues needing more examination. Overall more links to market concerns are what most clusters suggest needs to be part of a strengthened follow up program (linked to the continuing refinement of the BMP process). Experimentation on the future directions for BMPs is suggested to involve linkages with a wider variety of value chain actors in the development of functional markets for the future. Therefore more scaling up is needed but it is suggested that success in such efforts will be complex, needing careful planning and analysis, particularly around the development of a better understanding of factors leading to success. Our initial review of the literature[5] suggests a need to look in more detail at a mix of both theory and practice including work from other sectors. For example some scaling up experiences by Carter & Currie Alder 2006[6] suggest a better understanding of lessons learned in terms of context is critical; lessons include framing the context, promoting participation, fostering learning, strengthening institutions, and disseminating successful experiences. Such level and scale thinking has helped guide success in natural resource management cases in Latin America. Note that mechanisms that promote a shared learning approach are suggested as keys to success, particularly those by which small scale operators can more effectively participate in the changing global market chains.

In India key players in the success to date have been innovative farmers in clusters in the shrimp value chain, participating in the development of shared solutions; mainly to date, with government actors (extension & research). The scaling out process from AP is taking a number of different forms and a variety of different ingredients are suggested as key to success. In some cases new products, in others new partnerships and others improved infrastructure and service support (eg roads, access to electricity, insurance). But increasingly, if there is agreement to move to a more market oriented approach, follow up work may need to involve more work with various other actors in the shrimp value chain eg processors. Overseas buyers linked to processors are increasingly seeking l inks with innovative farmers. In particular, more work is needed in understanding/probing what is working and how to better track such processes at appropriate scales (including improved indicator development). As well there is also a need for continued promotion of awareness and strategic influence with other value chain audiences, around this set of issues (getting the word out about what is working, about the value of wider research links, both national and international; and in terms of policy and links to other levels of government for instance). These efforts are also suggested to include greater efforts in raising the needed resources, human and financial, and developing the needed partnerships to carry out this future work.

Expanding the partnerships

In India there is therefore a need to examine mechanisms to promote better understanding of the BMP work to date and options on how to move to a more analytical cluster support mechanism among a wider mix of interested partners (eg a research network or other partnership arrangement). Overall our message is that more research should be an important part of this

[5] Draft bibliography available

[6] Carter, S.E. and B. Currie-Alder. 2006. Scaling-up natural resource management: insights from research in Latin America. Development in Practice **16**:128-140.

continuing program; particularly action research, both in terms of improved understanding of these processes as well as capturing and reviewing lessons learned as part of the scaling up approach. In brief, more unpacking the rest of this success story is suggested, linked to the development of a shared learning framework among all interested value chain actors. Sharing of experiences of what is working in terms of where, why and how has been shown to be critical to other success stories both in other sectors and other regions.

BMPs and clustering are scale issues and a variety of other groups/sectors have also been looking at scale and the participation of small scale actors, both in terms of theory and practice. There is an important and evolving literature on how the mainly small scale producers in other sectors can continue to effectively and equitably participate in the emerging global markets. There are considerable lessons to be learned by looking at BMPs and success stories more generally in other sectors. For instance, our initial review has suggested that the milk sector in India provides a variety of interesting and in many ways comparable experiences[7]. More detailed examination and a wider variety of possible links can be seen in the work of various other programs; see for example the Regoverning Markets program[8] or in other small scale funding options (cf the Grameen Bank). As well, it may be useful to also look more broadly and compare with the change processes in other sectors such as coffee and wine (to choose two interesting candidate processes with a fair amount of background experience and documentation). More generally mechanisms to continue this process, for instance through a wider exploration of knowledge and communications thinking more generally, may be useful (see eg Davy et al 2011)[9]. In terms of knowledge sharing more generally, ASEM partners such as the ASEM EU Aquatip are developing the concept of knowledge platforms (see EU Aquatip[10]) and work here in India is suggested to explore links with such groups.

The rapidly expanding field of information and communications technology (ICTs) offers a variety of exciting options; see for example, ITC Choupals[11], the Swaminathan Foundation and other partnerships with the private sector; for instance the support by Nokia in other areas of agriculture[12]). Overall there are a variety of experiences now developing on how small farmers can more effectively participate in global markets and more generally in these rapidly evolving change processes. Timely access to key knowledge is one key component to this process.

As will be discussed in the workshop, little work has examined the issue of gender and related social issues in BMP thinking to date. There is some gender segregated data on the various groups but no real analysis to date at least that we have so far uncovered.

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[7] See for example http://www.regoverningmarkets.org/en/filemanager/active?fid=943

[8] http://www.regoverningmarkets.org/en/resources/south_asia/c1_meso_agrifood_sector_study_restructuring_agrifood_markets_in_india_the_dairy_sector

[9] Davy et al (2011) in press. Report of the FAO NACA Global Conference in Aquaculture. Phuket 2010.

[10] http://www.eatip.eu/

[11] http://www.echoupal.com/

[12] http://www.nokia.co.in/support/download-software/ovi-life-tools/how-to/nokia-life-tools-1.4--help-and-support/agriculture-service

Overall we suggest that shrimp aquaculture needs to reach out to a wider mix of new partners and partnerships linked to the small scale farmer. Therefore a continuing thread of this story also includes promoting a better understanding of the scale issue; particularly how small scale farmers, can become better connected to the new market opportunities around globalization. Better understanding of these processes (and related thinking) remains at an early stage in aquaculture in most countries in the Asian region and effective efforts on scaling up will need to better understand what is working and what is not.

More generally this report's main message is that Better Management Practices (BMPs) are an important tool in the move to aquaculture sustainability. Future work should continue to examine some of the critical ingredients for success as seen in this process to date, including identifying and supporting key people and innovative organizations. Work should begin to widen the partnerships, including shared learning with parallel work in other sectors (for example links in India such as the dairy and other interested agriculture sectors) and also experiments with stronger partnerships to information science (ICT) thinking more generally[13] and social science (for example around clustering and shared learning approaches). There is an increasing variety of both public and private sector experiences developing and Indian shrimp aquaculture needs to be more active in looking at others' paths to success

Definitions of scaling up and scaling out

We suggest following the definitions used by the CGIAR (Consultative Group on International Agricultural Research) NGO Committee which refers to scaling out as the geographical spread of a technology, practice or systems change over time. Scaling up refers to expanding beneficial institutional and capacity building practices within and across organizations and networks at local to international levels. Both mechanisms are needed to achieve widespread and significant systems change[14]. These definitions can be usefully supplemented by the lessons learned suggested by others (eg Carter and Currie-Alder 2006[15]) who suggest that scaling-up is a multi-stakeholder process consisting of five components including: framing the context, promoting participation, fostering learning, strengthening institutions, and disseminating successful experiences. Key bottlenecks to scaling-up are the absence of open communication and the mutual recognition among stakeholders of each other's rights, responsibilities, and roles. More details will be presented at this workshop and discussion will allow a wider sharing of experiences.

[13] http://www.ciard.net

[14] See Millar, J &J Connell 2009. Strategies for scaling out impacts from agricultural systems change: the case of forages and livestock production in Laos. Agric Hum Values16: 389–399.

A Draft list of Ideas for follow up

Our main ideas regarding strategies for scaling-up are broadly centred around the idea that this important work needs to be continued and expanded; good progress has been made but more remains to be done. Much of our thinking focuses on wider encouragement of innovation both in organizations and people; for example building on some of the experiences developed by NaCSA, continuing the society development processes and developing a strengthened action research mechanism.

In the following points, we outline some of these ideas in more detail:

Continued Development and Investment in Innovative Bridging or Knowledge Organizations: There is a need to pursue with greater vigour the development of new modes of partnership and organizational experimentation. Creation of NaCSA in India, ALSCs in Aceh and the Samroiyod Shrimp Farmers' Co-operative in the Thai case were bold moves to test/refine the conceptual approach and an excellent start to address some of the key problems of small scale aquaculture operations. These include strengthening processes that support and better understand scale eg processes & organizations that act as knowledge and learning platforms, that link small scale farmers with evolving opportunities whether these are markets, training modalities, knowledge sources or whatever. An organization such as NaCSA should continue to level the playing field in the sense that it better assists small scale operators to more equitably participate in the rapidly evolving new global marketplace. In India, what is needed is continued support for the evolution of NaCSA. In the other countries surveyed, new or expanded platforms such as NaCSA should be examined. The work to date suggests that creation of organizations that focus on the problems particularly from the small scale farmers point of view and that seek to promote solutions appropriate to small scale operators assist to balance some of the inequities of the present system.

Proving the point: Next steps need to continue the process of demonstrating success in terms of small farmer participation in the shrimp (and seafood more generally) marketplace (eg see the agricultural cases cited that seek to do this). The traditional "rules of this game" are changing; markets are becoming more demanding, more complex in terms of requirements and increasingly are globally farther away..... with often rapidly changing demands that will continue to evolve. Important progress has been made in terms of global presence but more needs to be done in better understanding how small producers can more effectively participate globally. Data to date confirms that small scale farmers can effectively participate if given the means and tools to facilitate such processes. Future success involves finding mechanisms to level the playing field by providing innovative support, capacity building, lesson learning, hand holding and whatever is needed to assist such stakeholders to better participate.

What is also needed are more examples (of different types) of small farmer groups successfully selling product(s) in this global marketplace. This should include documentation and shared lessons learned around such success. Success breeds success so this message and the lessons learned need to be shared as guides to other newer entrants. Greater successes should include

knowledge/experience more generally on issues such as what this market is looking for and how to compete more effectively in it[16]. Greater efforts on sharing this knowledge across all levels (local to national to regional) is suggested. Most farmers are interested to know about these kinds of successes so this support system needs to get these ideas out to them and then feedback on others experiences, both to see and from which to learn. How to keep up in such dynamic markets presents a related set of challenges. For instance the NaCSA SYSCO case needs to be revisited and a way found to move ahead on this opportunity. Experiments with new concepts (eg the organic farming experiment in AP) although of limited success to date, merit continued testing including documentation even where success was problematic.

It is suggested to develop a Sample list of research issues identified by the workshop

What is needed to expand the success story: further experiments with new forms of knowledge partnering and building trust

One thing that has been learned from the success to date is that the approach; eg building innovative partnerships to understand and develop practical solutions to the problems.....for instance in terms of drivers (eg related to the earlier disease problem, isolating the key components and developing a plan for solution and then BMP processes to scale this up and out), works reasonably well. This process needs to be extended to the new problems. Therefore more targeted research that continues to experiment with the cluster concept directly, working with farmers to improve their capacity to adapt to changing conditions, is suggested. For example new knowledge dissemination that builds on small scale opportunities eg flexibility in the supply chain of shrimp for whatever market product is the focus. There is need to develop resilient systems that can experiment with new products and processes and adapt to changing prices as sustainability processes continue to be tested. Structural changes around some of the adaptive comanagement thinking may offer further suggestions; see http://www.resalliance.org/index.php/adaptive_comanagement.

Knowledge for Global decision making: Timely targeted knowledge to farmers (eg market related) will be key to the pursuit of new opportunities. More links to ICTs can assist in terms of matching buyers and sellers with up to date knowledge on markets and other farmer inputs/needs. This report argues that timely information on markets in particular, could be one of the great scale equalizers ie allows small scale farmers to pursue global markets on a competitive basis with large operators. Capturing experiences from other sectors including examining collaboration with cell phone providers in a variety of new forms is suggested (see suggested links with supportive companies such as Nokia).

Value Chain Analysis: Continued experimentation with new partnerships among value chain actors is suggested. This needs support and probing relative to better understanding what works supported by stronger links with the evolving research theory. It is suggested that NaCSA or MPEDA have staff working on these issues linked with selected outside researchers so that development of the theory can develop appropriately guided by the practice of what is happening

in the farmer societies (including how the BMP process can make best use of this evolving theory).

Wider linkages: Another suggestion is to look for ways to link this work to the existing (and the expanding) global interest in, and research on, value chains more generally. Mechanisms to share this learning need continued examination and active linkage by lead partners. Cross over learning from other agricultural sectors is also suggested. Small farmer coffee (Fair Trade, Shade grown etc), and an increasing variety of other agricultural products, suggest that aquaculture needs to adapt and keep on top of these parallel activities.

Traceability is expected to be an increasing concern in the competition for global shrimp markets. However to date it has mainly been used in recall processes and the priority to this set of concerns needs more analysis. Partners need to take a closer look at this issue and if appropriate start working on the development of programs that could support such a system in working with small scale farmers. Buyer/consumer confidence is expected to be of increasing importance in the markets of the future.

More research is also needed on target species: eg white shrimp P vannamei (now L vannamei) instead of P monodon or switching to fin fish in some situations; eg look at Thai and other experiences in more detail.

Scenarios and futures thinking more generally may provide another useful strategy. The globalization process and what future markets might look like could be another useful area for follow-up research. According to World Bank forecasts, by 2030, over 50% of the global middle class with disposable income, will come from the Asia Pacific region. How should the aquaculture sector prepare for and respond to such shifting market dynamics?

Ultimately what is needed is a better understanding of production systems thinking and whether and where does the small farmer have a collective advantage. Other authors[17] have suggested that flexibility around being able to adapt and respond to market and other changes is one of those factors. As well small farms are suggested to have advantages in terms of ecosystem goods and services thinking more generally.

Innovative Organizations supporting small scale farmers: more work on NaCSA and what it needs to continue its success: opportunism and agility are keys which require independence and flexibility of action, resources and capable staff. NaCSA should continue to distinguish itself from the traditional agriculture/fisheries departments or extension agencies. The latter departments exist and NaCSA should not seek to duplicate their services but rather to position itself as a market related organization designed to assist farmers in better participating in the new and evolving global marketplace.

[17] Hassanai & Davy 2010.Backyard Hatcheries &Small Scale Shrimp & Prawn Farming in Thailand. in S.S.De Silva & F.B.Davy (eds) Success Stories in Asian Aquaculture. Springer 214p.

A Vision & Strategy: Long term Planning coupled with Short Term Specific Targets

Development of new and innovative programs such as the Regoverning Markets program www.regoverningmarkets.org need testing in aquaculture and perhaps as a wider set of visioning such as outlined in the Phuket Consensus.[18] Partners are suggested to spend some time on futures thinking guided by the outputs/outcomes to date. The existing MPEDA vision should be revisited with some of the above in mind to provide impetus to this planning.

Building on the India experience. Other NaCSA's in other countries? This question merits examination and exploration. There are always dangers in transporting organizational models to other regions so this needs careful examination but at one level NaCSA is an organizational experiment in brokering between the small producer and the rest of the world. This concept needs further examination in different ways and where relevant, replication/adaptation.

Also maybe this issue should be looked at in terms of the regional level. There appears to be a gap regionally in terms of an action oriented regional lesson learning, knowledge sharing approaches/platforms; yes there are various activities going on but there seems to be a gap in pulling this all together, providing information to new groups, communicating more widely to outsiders and others in the shrimp value chain, raising resources etc across the Asian region. NACA or some other regional body should examine this niche for fit with their programming interests.

NACA BMP regional niche and its future role around this set of issues: It is suggested that through continuing discussions with partners, this review and strategies to develop future projects that NACA think strategically regarding how and where best to position itself. This process might encompass some of the following:

- Continued niche definition including development of research to implementation plans
- Supporting further partner role definition and capacity building
- resource development & enhancement strategies
- links to other related activities

This document is meant to serve as a draft to be review and other ideas are to be generated at this workshop.

[18] FAO 2010. (2011) in press. Report of the FAO NACA Global Conference in Aquaculture. Phuket 2010.

Annex 3

NATIONAL WORKSHOP ON SCALING UP OF SHRIMP BMP PROGRAM AT THE NATIONAL LEVEL
16-18 May, 2011

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Annex 4

EU-FP7 Project "ASEM Aquaculture Platform"
CIBA/ASEM/MPEDA/NACA Workshop
16-18 May 2011, CIBA, Chennai, India

Better management practices (BMPs) and cluster management for empowering small scale farmers: Scaling up strategies

16th May 2011	Opening Session
8.00-9.00	Registration
9.00-10.00	Opening Ceremony (separate program provided)
10.00-10.15	Coffee Break
16th May Session I	Understanding the BMP and Cluster Management Concept (Session Chaired by MPEDA)
10-15-10.30	Workshop background, purpose and expected outcomes by CV Mohan, NACA
10.30-11.00	BMPs and Cluster management: way forward for small scale farmers to remain competitive and sustainable by Sena DeSilva, NACA
11.00-11.30	Aquaculture certification and market access: opportunity or bottleneck for small scale farmers? By CV Mohan, NACA
11.30-12.00	Experiences from Agriculture and Dairy by Prof KV Raju, IRMA
12.00-12.30	Fair trade certification: enabling mechanism for small scale farmers groups by Kenneth Boyce, Fair Trade Foundation, UK
12.30-13.00	Open Discussions
13.00-14.00	Lunch Break
16th May Session II	Sharing of shrimp BMP and Cluster Management experiences (Session Chaired by CIBA)
14.00-14.30	Shrimp BMP adoption through cluster management approach in India: by NaCSA
14.30-15.00	Lessons learned from ACIAR shrimp BMP programs in Indonesia by Richard Callinan
15.00-15.30	Lessons learned from shrimp BMP programs in Malaysia by Prof Shariff and Team
15.30-16.00	Coffee Break
16.00-16.30	Lessons learned from shrimp GAP programs in Thailand by TBI
16.30-17.30	Open Discussions
17th May Session III	Impact assessment and scaling up strategies (Session Chaired by NACA)
9.00-9.30	Theory and practice of scaling up and scaling out by Dr Joanne
9.30-10.00	BMP and cluster management in India: Impact assessment and ideas for potential scaling up strategies by Dr Brian Davy
10.00-10.30	Coffee Break
17th May Session IV	Role of Institutions in scaling up (Session Chaired by Department of Animal Husbandry, Dairying and Fisheries)
10.30-10.45	MPEDA
10.45-11.00	CIBA (ICAR)
11.00-11.15	CIFA (ICAR)
11.15-11.30	CAA
11.30-11.45	NFDB

11.45-12.15	Department of Animal Husbandry, Dairying and Fisheries (State Fisheries Departments)
12.15-13.00	Universities
13.00-14.00	Lunch Break
17th May Session V	Role of the industry in scaling up (Session Chaired by CAA)
14.00-14.30	Cluster Leaders
14.30-14.45	Hatcheries
14.45-15.00	Processors
15.00-15.15	Input suppliers
15.15-15.30	Certification Bodies
15.30-16.00	Coffee Break
17th May Session VI	Working Group Discussions (Working Group guidelines to be provided)
16.00-17.30	Group A: Identifying Scaling up strategies Group B: Identifying enabling mechanisms for implementing scaling up strategies
18th May Session VII	Working Group Discussions
9.00-13.00	Continuation of group discussions and preparation of group presentations
13.00-14.00	Lunch Break
18th May Session VIII	Plenary Session (Chaired by MPEDA/CIBA/NACA/NFDB)
14.00-14.30	Presentation by Group A
14.30-15.00	Presentation by Group B
15.00-16.00	General Discussions
16.00-16.30	Closing Formalities

Better management practices (BMPs) and cluster management for empowering small scale farmers: Scaling up strategies
EU-FP7 Project "ASEM Aquaculture Platform"
CIBA/ASEM/MPEDA/NACA Workshop

BMPs and Cluster management: way forward for small scale farmers to remain competitive and sustainable

Sena S De Silva
Network of Aquaculture Centres in Asia Pacific, Bangkok, Thailand
&
School of Life & Environmental Sciences
Deakin University, Victoria, Australia

Organisation

- A bit about aquaculture
  - Change from a hunted to farmed food fish supply
  - Where aquaculture
- Challenges confronting aquaculture
- The role of small scale farmers
- What next

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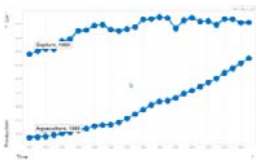
Aquaculture

- Food fish supplies:
  - Major change in the last 3-4 decades
  - Gradual transition from a "hunted" to a "farmed" supply
    - To meet increasing demand from:
      - Population increase
      - Increasing consumption of fish
- Currently aquaculture accounts for ~ 50% of global fish consumption



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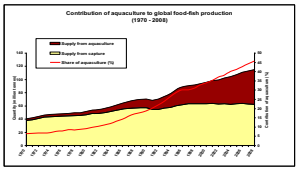
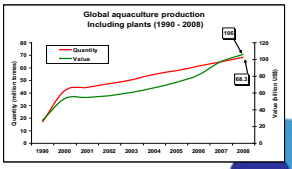
Aquaculture

- Currently aquaculture accounts for ~ 50% of global fish consumption





(from Ahmed & Subasinghe, 2010)

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Aquaculture:
Where does it come from?

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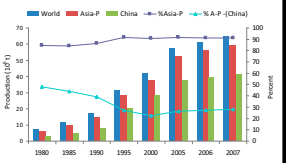
Aquaculture:
Where does it come from?

- A-P dominated aquaculture globally
  - Accounts for 90% of global production

Year	Global (t)	A-P (t)
1987	13,961,611	11,939,706 (85.5%)
1997	34,261,739	31,075,412 (90.7%)
2007	65,190,029	59,568,049 (91.4%)

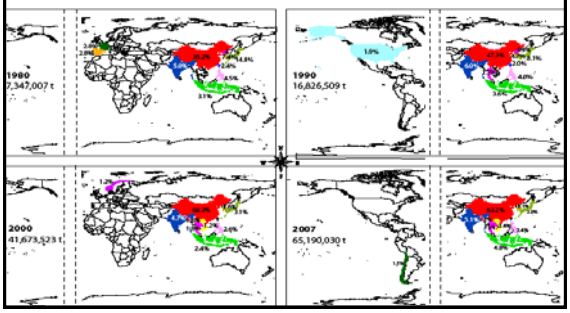
- **PR China is the mainstay in the region**
  - Without PR China region's contribution only 30%




Shrimp culture/green-house conditions; enables 2.5 crops/yr


Backyard hatcheries for many species-Hainan Is

The dominance of A-P countries over the years



Who are the main producers?

- **Small scale farmers:**
  - Difficult to define:
    - Farmer owned/ leased, operated & managed
- **Why do I say so?**

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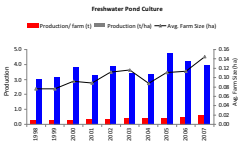
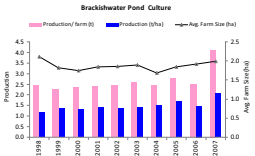
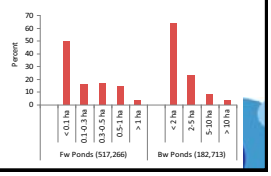
A-P Aquaculture predominated by Small scale farmers

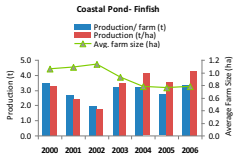
- **Examples**
  - Indonesia
    - Freshwater ponds: 0.14 ha
    - Increase in area and productivity

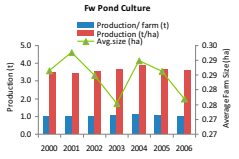




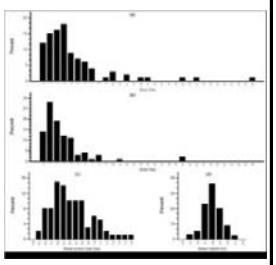


- Thailand
  - Coastal pond: 0.8 ha
  - Freshwater pond: 0.28 ha





- **Vietnam catfish culture**
  - >55% under 4 ha
  - But production per ha very high, average 350-400 t/ha/crop
  - Still the great bulk are farmers own, manage and operate



Take home message (?)

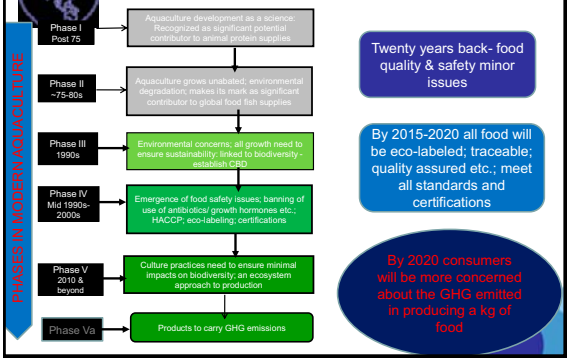
- **Great bulk small, farmer owned/ leased, operated and managed**



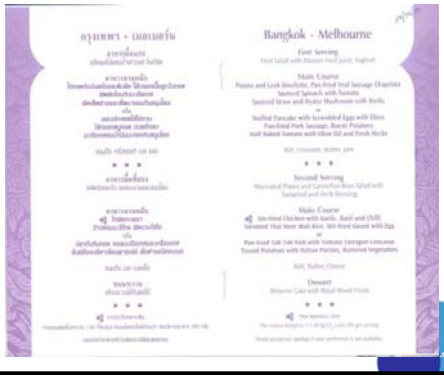
Take home message (?)

- **No difference to the rest of the primary production sectors in the A-P**
  - Rice:
    - E.g. China – world biggest rice producer
      - $182.04*10^6$ t (2006); 29% global production
      - Avg. farm size 0.93 ha/farm
  - Dairy (RAP, 2008)
    - E.g. India – highest global producer
      - $210*10^6$ cows and buffaloes
      - But owned by $70*10^6$ households
- **Aquaculture in Asia will remain small-scale**
  - Development strategies have to "factor" this in

Paradigm shift/change



An example of a paradigm shift?



What are the modern/ global challenges that confront small scale farmers

- **Globalization & concurrent developments in information technology:**
  - New global initiatives/ main drivers
    - Bruntland Report ("Our common future")
    - CBD (1992)
    - MDG

  - Changed aspirations/ perceptions of the public
  - Increased awareness on:
    - **food quality & safety**
    - **Issues on development & sustainability**
      - **E.g. endeavour to minimise impacts on biodiversity**
    - **social responsibility**

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How can small scale farmers meet the modern/ global challenges

- **Adopting acceptable practices:**
  - Also referred to as Better Management Practices (BMPs)
- **BMPs adopted in agriculture, water management etc.**
- **BMPs in aquaculture relatively new**
  - Beginning with Indian shrimp culture

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What are BMPs

- BMPs are:
  - Guidelines to improve existing farming practices
    - E.g. improve feed management
    - Improve aeration,
    - Improve water quality etc. etc.
  - Developed in concurrence with stakeholders
  - Therefore Pragmatic and Easily adoptable
  - No major changes at any one time
  - Subjected to continuous improvement
  - Cost effective
  - Scientific
- **BMPs developed for major commodities**
  - E.g. shrimp, catfish etc.

BMPs-

- **BMPs when adopted by small scale farmers will**
  - Minimize risks
  - Improve production efficiency
  - reduce costs of production
  - maximize economic returns.
- **BMPs also provide a PATH towards**
  - compliance to food safety and market requirements
  - Participation in certification programs
- **Investing in BMPs**
  - could help small scale farmers to maximize returns
  - and sustain their livelihoods in the long run.

How are BMPs developed?-1

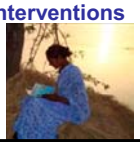
- **Risk factor identification (step 1)**
  - e.g. environment, disease, food safety, social, production related, market access, etc) to the long term sustainability of the sector at the population level using epidemiological principles (e.g. risk analysis) is fundamental to developing BMPs
- **Examples of risk factors in shrimp culture**
  - Stocking of unscreened seed
  - Not removing pond bottom sludge
  - Not drying the pond
  - Not using filters at inlet points to prevent entry of carriers of virus (e.g. WSSV carriers)

How are BMPs developed?-2

- **Development of management interventions**
  - new management interventions are either developed or existing management methods revised/modified to address the identified risk factors
- **Examples of BMPs (cost of interventions, cost benefit analysis)**
  - Stock only PCR screened seed
  - Remove pond bottom sludge
  - Install filters
- **BMPs when properly developed are:**
  - **science based**
  - **Pragmatic**
  - **Cost effective**
  - **Relatively easily adoptable**

How are BMPs developed?-3

- **Test the interventions and validate them**
  - Pilot testing
  - farm demonstration studies
  - Farmer consultations
  - Farmer training
    - E.g. record keeping
- **Scientifically validated Interventions referred to as BMPs**

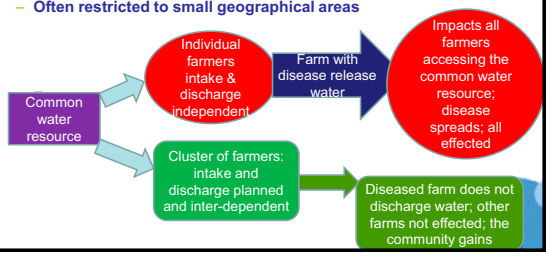


What are the benefits of BMPs?

- **Well designed BMPs can support producers to**
  - (a) increase efficiency and productivity by reducing the risk of health problems
  - (b) reduce or mitigate the impacts of farming on the environment
  - (c) improve food safety and quality of farm product
  - (d) improve the social benefits from farming and its social acceptability and sustainabi

Part II: Cluster management

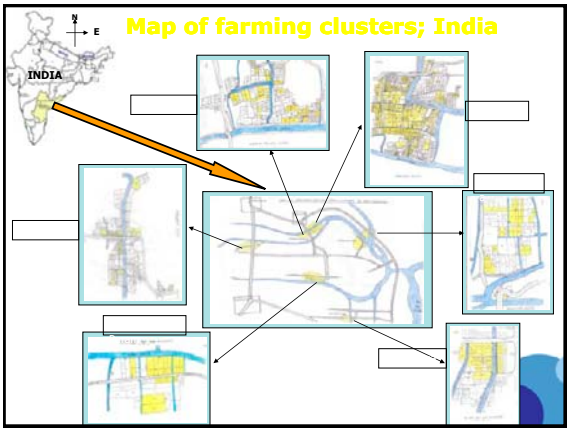
- Why cluster?
  - When common resources (e.g. water intake from a channel) are used by many the best results are obtained when the stakeholders act in unison and NOT AS INDIVIDUALS
  - Often restricted to small geographical areas



What is cluster farming?

- Collective planning, decision making and implementation of crop activities:
  - reduce risks,
  - Permits collective bargaining
    - E.g. feed bought collectively; obtain discount
    - Approach a bank/ finance institution for loan; increase probability of obtaining finance
  - maximize returns,
  - Access certification,
  - improve market access

Map of farming clusters; India



Cluster Farming:

- Collective planning, decision making
- implementation of crop activities by a group of farmers in a cluster through participatory approach
- accomplish common goal (reduce risks and maximize returns)

What are the advantages of cluster/group farming?

- Regular information sharing among farmers
- Cooperation in selecting/testing and buying seeds by Contract hatcheries
- Farmers in a cluster stocking at same period; develop water/crop calendars
- Reduced contamination when there is disease outbreak due to information sharing
- Increased cooperation with input suppliers, buyers and processors; improvement of shared facilities -deepening inlets, drains etc
- Meeting economies of scale
- Possibility of group certification

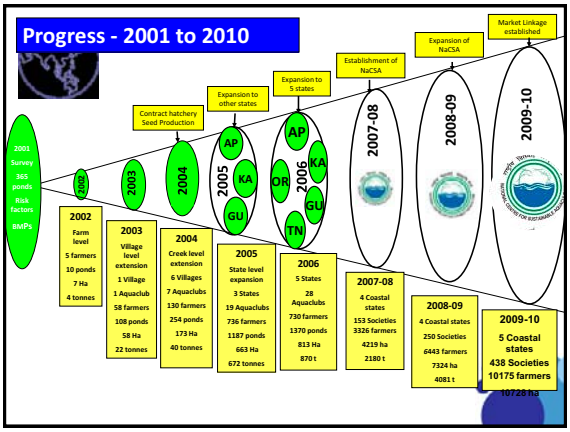
Impact on production and management

- Increased production
- Reduced disease incidence
- Reduced FCR and increased efficiency of resource use (feed, seed, energy, finance in particular)
- Reduced pollution
- Reduced chemical and antibiotic use

Social impacts of cluster farming

- Reduced costs and improved profits
- Reduced risk to small-scale farmers
- Increased co-operation and harmony among farmers
- Better organized farmer groups
- Social harmony and community developme

Progress - 2001 to 2010



Social responsibility -what & why?-

- In the past, aquaculture has been found at fault:
  - Lack of social responsibility
    - Clearing mangroves
    - Impacting on biodiversity
    - Land "grabbing"
    - Unplanned developments
    - Adverse environmental impacts, etc. etc.

Currently most of the above have been taken care of:
However, there still remains a "social responsibility' towards the community/ society at large

Social responsibility -what & why?-

- "Acting in a manner that does not impact the fellow stakeholders, society and environment in an adverse manner"
- Eg.

Use of banned chemicals → Contaminates the surrounding environment/ common water resource → Impacts on surrounding farms; environment impacted; unable to sell product; impacts fellow farmers and sciety

Social responsibility -what & why?-

- Eg.

Bring in an alien species → Escapes to the environment → Establishes itself in the wild → Potential negative impacts on biodiversity

Public perceptions on alien spp. Not very favourable

• Minimising biodiversity impacts of aquaculture is a societal obligation
•Alien species play a major role, however, in Aquaculture
•But we have to be careful on new introductions and translocations at the present time

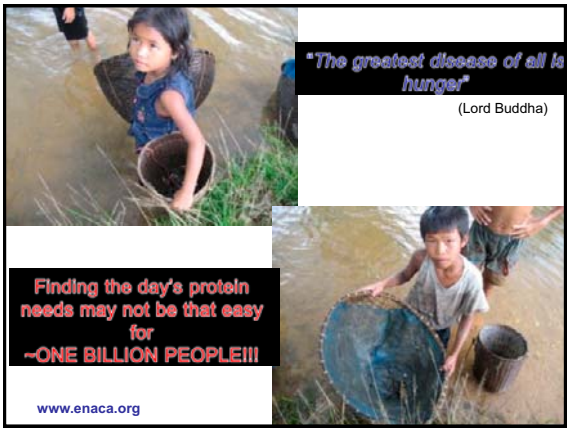
Social responsibility -what & why?-

- It is true that alien spp. are important to aquaculture, as much as many of our staple food types (rice, wheat, meat types etc.)
- However:

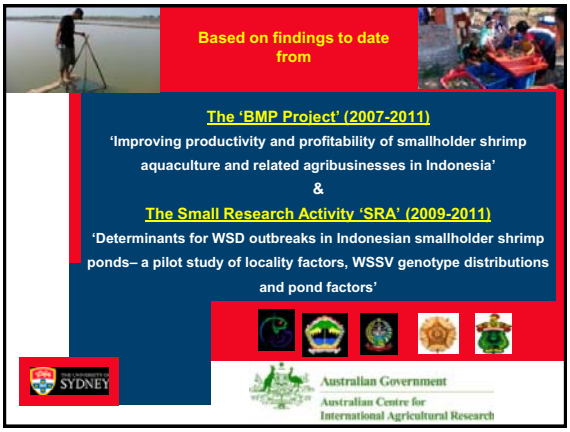
• Minimising biodiversity impacts of aquaculture is a societal obligation
•But we have to be careful on new introductions and translocations at the present time

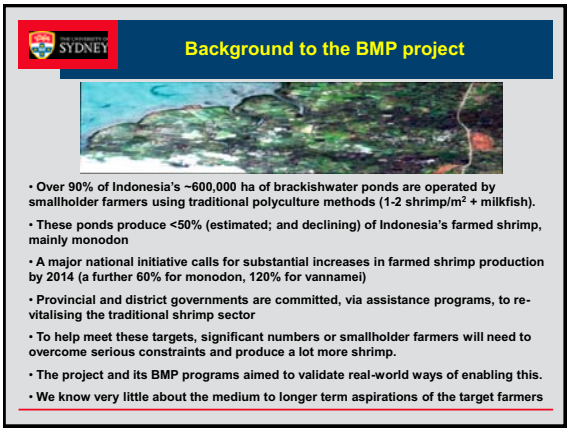
Take home message

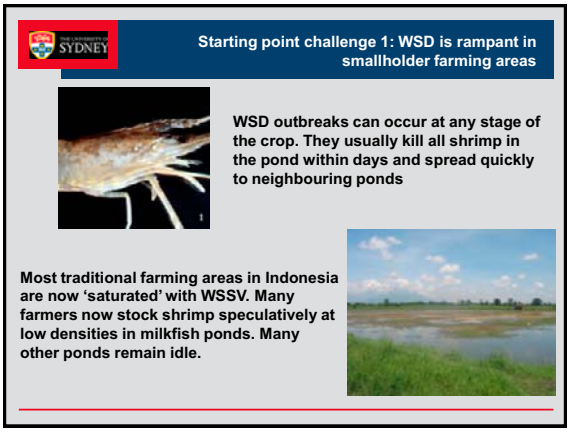
- **Certain aquaculture systems, in different locations, have to make adaptive changes**
  - Through changes in the farming systems
  - Make relevant technological innovations for some
- **Best option for small scale farmers;**
  - **Adopt BMPs**
  - **Adopt cluster approach**
  - **By implication will be able to meet certification and all standards**
- **Aquaculture may also be an option to millions of other primary producers whose livelihoods are at risk**
- **In the foreseeable future:**
  - The world will look up to small scale farmers
  - Small scale systems will likely produce the least amount of GHG

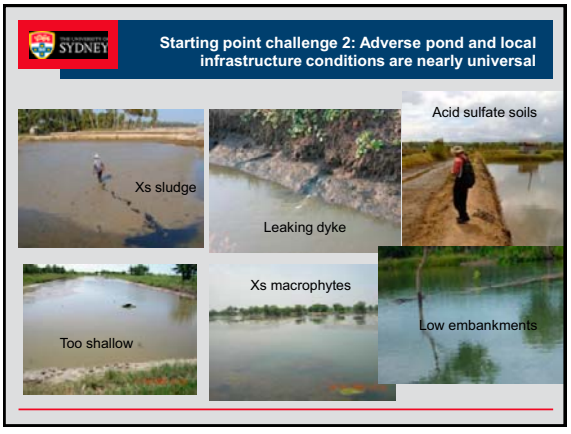



Better management practices for smallholder shrimp farmers in Indonesia
Real-world lessons learned (2008-2011)
Richard Callinan, Ageng S Herianto, Mardiana E Fachri, Joanne Millar, Arief Taslihan
SYDNEY
Australian Government
Australian Centre for International Agricultural Research


Based on findings to date from
The 'BMP Project' (2007-2011)
'Improving productivity and profitability of smallholder shrimp aquaculture and related agribusinesses in Indonesia'
&
The Small Research Activity 'SRA' (2009-2011)
'Determinants for WSD outbreaks in Indonesian smallholder shrimp ponds– a pilot study of locality factors, WSSV genotype distributions and pond factors'
SYDNEY
Australian Government
Australian Centre for International Agricultural Research


Background to the BMP project
• Over 90% of Indonesia's ~600,000 ha of brackishwater ponds are operated by smallholder farmers using traditional polyculture methods (1-2 shrimp/m² + milkfish).
• These ponds produce <50% (estimated; and declining) of Indonesia's farmed shrimp, mainly monodon
• A major national initiative calls for substantial increases in farmed shrimp production by 2014 (a further 60% for monodon, 120% for vannamei)
• Provincial and district governments are committed, via assistance programs, to re-vitalising the traditional shrimp sector
• To help meet these targets, significant numbers or smallholder farmers will need to overcome serious constraints and produce a lot more shrimp.
• The project and its BMP programs aimed to validate real-world ways of enabling this.
• We know very little about the medium to longer term aspirations of the target farmers


Starting point challenge 1: WSD is rampant in smallholder farming areas
WSD outbreaks can occur at any stage of the crop. They usually kill all shrimp in the pond within days and spread quickly to neighbouring ponds
Most traditional farming areas in Indonesia are now 'saturated' with WSSV. Many farmers now stock shrimp speculatively at low densities in milkfish ponds. Many other ponds remain idle.


Starting point challenge 2: Adverse pond and local infrastructure conditions are nearly universal
Xs sludge
Leaking dyke
Acid sulfate soils
Too shallow
Xs macrophytes
Low embankments


Starting point challenge 3: Farmers are very conservative and resource-poor
Farmers using traditional systems are (understandably) very conservative.
They need solid proof, usually from other farmers they know and trust, that a new practice is consistently profitable before they will put their livelihoods at risk.
Most will need to spend money to comply with BMP programs.
Credit providers are well aware that shrimp farming in traditional systems is a high risk activity.

Evidence-based advocacy

Before we advocate widespread BMP program adoption by Indonesian smallholder farmers we must have firm scientific evidence that programs can, in representative suitable settings, consistently and significantly improve productivity and profitability.

Project objectives

1. **Prove that BMP programs can deliver profitable crops in most cases (= 'proof of concept')**
2. **Prove that farmers will adopt the programs (= 'proof of delivery')**

Project partners and their roles

University of Sydney, Australia

- Overall project design, implementation and coordination
- Design of outcomes study and compliance study
- Data recording systems and data analysis
- Training of project staff (in Indonesia and Australia)
- Supervision of DGA's project-funded doctoral candidate (outcomes study, SRA)
- Oversight of compliance/productivity/profitability study

Directorate General Aquaculture, Ministry of Marine Affairs and Fisheries, Indonesia

- Coordination of project activities in Indonesia (2007-2008)
- Implementation of outcomes study and compliance study
- Assistance with training of project technical staff and extensionists
- Conduct of project-funded doctoral program and 2 masters' programs

Project partners and their roles

Marine Affairs and Fisheries, Central Java

- Assistance with coordination and support of program implementations in CJ

Marine Affairs and Fisheries, South Sulawesi

- Assistance with coordination and support of program implementations in SS

Fish Product Processing and Marketing, Ministry of Marine Affairs and Fisheries, Indonesia

- Provision of information and advice on markets for smallholder shrimp (2007-2008)

Project partners/consultants and their roles

Gadjah Mada University, Yogyakarta

- Coordination of project activities in Indonesia (2009-2011)
- Training of extensionists
- Conduct of socio-economic pilot study and extension impact study in CJ

Hasanuddin University, South Sulawesi

- Conduct of socio-economic pilot study and extension impact study in SS
- Assistance with training of extensionists

Charles Sturt University, Australia

- Provision of advice on extension training and scale out approaches

University of Adelaide, Australia

- Conduct of CJ and SS supply chain studies, in collaboration with ADP2005/066

Advanced Choice Economics Pty Ltd, Australia

- Provision of advice and data analysis re compliance study (2010)

Our research approach

ACIAR is a research-for-development agency.

ACIAR projects must address clear researchable issues which, if solved, will lead to development outcomes.

We adopted a 3-step approach, with steps 1 and 2 running in parallel.

1. **Proof of concept**

   Do our BMP programs significantly improve productivity and profitability?

   - ❑ **Outcomes study**
   - ❑ **Compliance – productivity – profitability study**

2. **Proof of delivery**

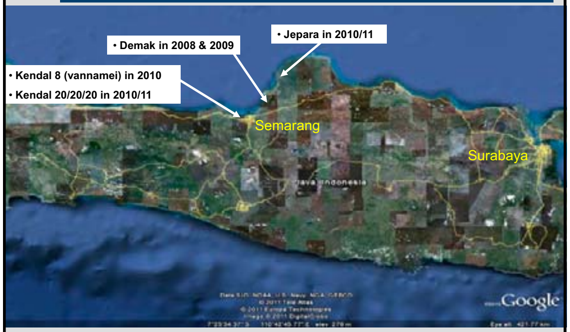
   Does our extension approach enable program adoption by farmers?

   - ❑ **Extension impact study**
   - ❑ **Value chain study**

3. **Pilot rollout**

   We aimed to have ~300 farmers adopting by project's end.

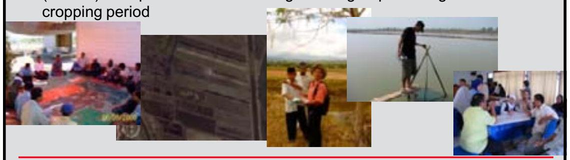
BMP program implementations in Central Java



BMP program implementations in South Sulawesi

Our basic 'demonstration pond' approach (2008 onwards)

1. Identify an 'active', well-led, farmer 'group', willing to 'cooperate';
2. Confirm site 'suitability' – based on simple soil testing, pond structure/layout assessment, farming practice, potential for biosecurity;
3. Provide agreed 'inputs' to participating farmers;
4. Provide continuous on-site technical support across the cropping period;
5. Provide training and resourcing to district government extensionists ('Dinas') – responsible for facilitating farmer group meetings across the cropping period



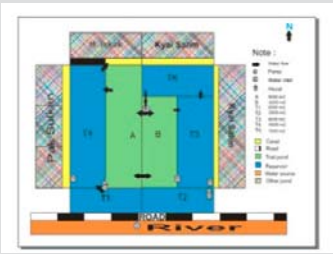
Starting point BMP program (2008)

The 4 mandatory BMPs we applied in 2008 were based on the 2001 risk ... studies, first principles

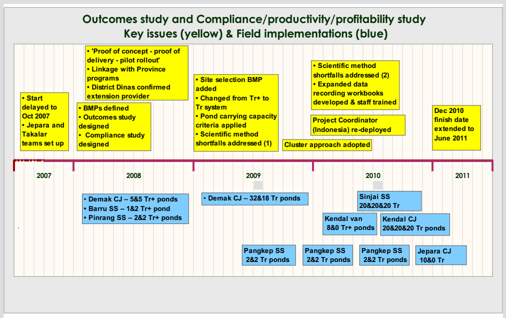
1. Maintain a unified and disciplined farmer group
2. Maximise pond biosecurity
3. Maintain optimal pond conditions
4. Maximise profitability (and food safety, product quality)

Our 2008 proof of concept start point – growout pond and biofilter system (schematic)

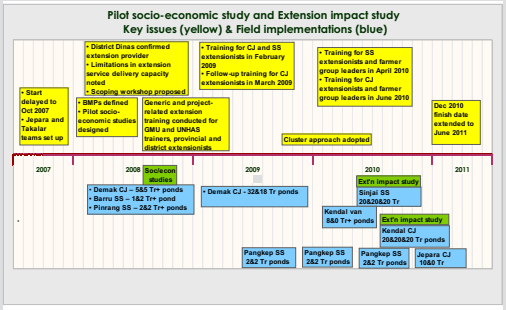
We used 'traditional-plus' growout systems (SD 5/m²) with crustacean-free reservoir/biofilter ponds in 2008/9 in South Sulawesi and Central Java



Time line for 'proof of concept'



Time line for 'proof of delivery'



Partnership with government programs

To expand adoption, we embedded our BMP program implementations within provincial and district government assistance programs to shrimp farmers

After 4 years, what were the outcomes?

Proof of concept

We have not yet validated the BMP programs.

Proof of delivery

We did not reach our target of >300 farmers adopting validated programs.

Severe, unseasonal flooding at our definitive (2 x 60 pond) study sites in 2010/2011 was a major factor in this shortfall

HOWEVER

Many of our pre-project assumptions proved false

AND

During the project we learned many important lessons.

Information from India (and Aceh) has been very important

Factors behind the success of this group approach

Sustainability of group & shrimp farming ←

1. Complete membership of all farms
2. Economic deliverability through continued success
3. Compulsory technical consultancy
4. Community linked social cohesiveness
5. Conviction that group action is indispensable
6. Accountability – payment of compensation and auditing
7. Collective and compulsory compliance of BMPs
8. Dynamic leadership
9. Equality of all irrespective every factor

Our starting assumptions were too simplistic

The real world operating environment of smallholder shrimp farming in Indonesia is much more complex and dynamic than we expected.

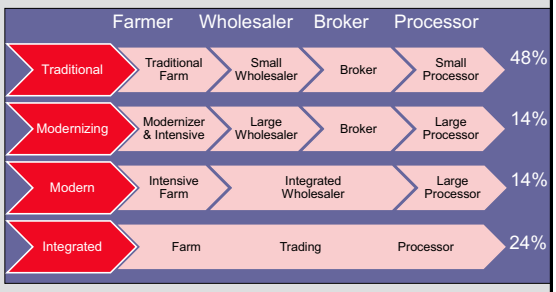
Lesson 1 – We don't yet know enough about target farmers, their activities and aspirations

Shrimp BMP program implementations in Indonesia will not progress unless we better understand the socioeconomic factors driving smallholder farmers and their groups

What have we learned about farmers and their groups?

- All groups are different and internally diverse;
- Most are village-based, comprising ~30 members;
- Many convene temporarily, mainly to access government assistance programs, then quickly disband;
- Leaders are often driven by self-interest rather than by concern for wider group welfare;
- Some farmers have off-farm jobs and pay little attention to their ponds between stocking and harvest – a 'set and forget' lottery;
- Some farmers rent ponds; they are relatively resource-poor and often reluctant to implement BMP program components which may threaten their income stream, e.g., biofilter pond, growout pond preparation, wild shrimp exclusion;
- Some farmers may publicly agree to comply with BMPs, but privately do not.

Their world is changing: South Sulawesi shrimp supply chain study findings



South Sulawesi shrimp supply chain study findings

	Traditional	Modernizer	Intensive
Land (ha)	2.5	2.5	15
Variety	Monodon	Vannamei	Vannamei
Output /ha/year	450kg 800 kg milkfish	4 MT	30 MT
Population	10,000	300	11
Production Share	48% (was 95%, still declining)	14%	14%

Plus Bomar (integrated) farmers who produce 24% of vannamei in SS

South Sulawesi shrimp supply chain study findings

Annual	Traditional	Modernizer	Intensive
Product Differentiation	Organic (processor)	None	None
Cost (per ha)	$800	$8,400	$93,000
Cost / kg	$1.80 (?)	$2.10	$3.10
Profits (per ha)	$2,000	$5,500	$15,000

South Sulawesi supply chain study findings

Threshold Investments

	Traditional → Modernizer	Modernizer → Intensive
Investments	Construction, aerators, generator, electricity infrastructure	Construction, aerators, large generator
Total / ha	$2,800	$4,500

The hard choices facing traditional farmers

To "play the modernizing game", farmers need both market sophistication and scale.

Smallholder shrimp farmers can participate in modernizing chains, and increase their profits, either by entering into contract schemes or by starting cooperatives and by investing in production and traceability capacity.

Currently, this has involved shifting to vannamei.

Is there a way to significantly increase profits by growing monodon?

Lesson 2 – Our BMP programs are probably more complex than they need to be

To facilitate widespread adoption, we must simplify the programs, especially the biosecurity component

Targeted molecular epidemiological research needed

We need to simplify BMP programs to better match existing/evolving farming practices.

To do this, we need to better understand the main causal pathways for WSD in traditional/traditional plus polyculture ponds.

Further molecular epidemiology research on WSD causal pathways urgently required

Lesson 3 – Careful pre-implementation site assessment is essential

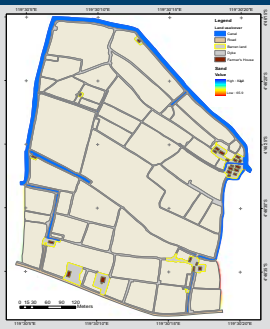
Simple physical site assessment (basic soil testing, pond structure/layout, potential for biosecurity) is not enough - a site must have:

1. Adequate, functional canal system (broad-scale remediation cost-effective?)
2. Ponds physically suitable (pond bottom, embankments, depth)
3. Suitable soil across the site (pH >6.5, seepage loss <10% per week)
4. Participating growout ponds in tight, biosecure cluster
5. Adequate biofilter ponds available (≥ 30% growout pond volume)
6. Tested seed available, < 6 hrs transport time to ponds
7. Herbivorous and carnivorous finfish fingerlings available as needed
8. Farmers skilled in preparing ponds and maintaining good pond conditions during growout
9. Effective market chain

Some physical site issues – soil types

High variability in soil types e.g., proportion of sand

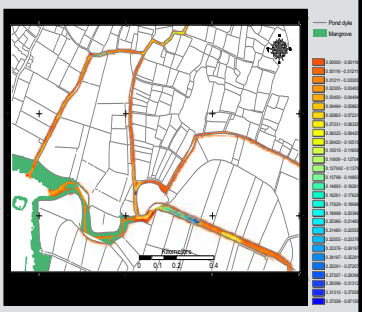
Evidence suggests that particular soil types may influence outbreak occurrence within a pond (e.g. acid sulfate soil) and between ponds (pond-to-pond transmission) via seepage through embankments.



Some physical site issues – canal function

Poorly flushed canals hamper water quality management and may facilitate spread of infection

e.g., dysfunctional canal system at our 2008 Barru, SS, implementation site



Lesson 4 – The district-level extension system is often seriously dysfunctional

Despite considerable training and resourcing by the project, many District-level extensionists remained unwilling to facilitate BMP program adoption

They cite 'lack of confidence'. Systemic institutional factors also appear to be involved.

Widespread deficit in extension capacity

Leta et al (2005), in a study of the Indonesian agricultural extension system, noted:

1. Agricultural extension workers receive very little training.
2. Other major constraints to effective service delivery included:
   - poor remuneration
   - inadequate infrastructure
   - unclear job direction

They concluded:

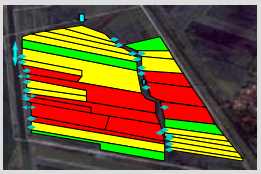
"Unless these constraints are addressed, the system will remain unable to deliver the information and skills necessary for farmers to overcome poverty."

In 2009, in response to our emerging concerns re proof of delivery, ACIAR agreed to fund a 'constraints to adoption workshop', but this offer was later withdrawn.

The consequences of this deficit for our implementations

e.g., Sidorejo, Central Java 2009

9/24 BMP ponds were lost to WSD following covert supplementary stocking of untested PLs in some ponds. Most remaining BMP ponds produced, for the first time ever, profitable crops of large shrimp.



We attribute the WSD outbreaks to failure by the farmer group leader and the extensionist to foster group unity and discipline.

Lesson 5 – Training in field study methodology, particularly systematic data collection/recording, urgently needed

Despite remedial interventions, major data collection/recording shortfalls by technical staff seriously reduced the value of our 2008 and 2009 implementations

Partial remedy - Data recording workbooks in Bahasa Indonesia

The way forward in Indonesia – Step 1

A multidisciplinary systems approach is essential

1. **Conduct 'hard-headed/real world' situation analyses -**

- Characterise Indonesian smallholder brackishwater systems, with a focus on current and evolving shrimp farming practices
- Characterise representative target shrimp farmer groups – demography, socioeconomics, aspirations
- With national production targets in mind, identify physically suitable sites for smallholder monodon farming – include assessment of cost-effectiveness of infrastructure remediation
- Identify constraints to extension service delivery – public and private sector

The way forward in Indonesia – Step 2

Only if it is realistic to proceed, and using a multidisciplinary systems approach:

- Clarify the main causal pathways for WSD in representative systems and sites
- In collaboration with farmers, simplify BMP programs to better fit existing/evolving farming systems
- Build scientific capacity within DGA
- Build extension capacity within Dinas (and private sector as necessary)
- Achieve 'proof of concept' and 'proof of delivery' for programs in representative farming systems and sites
- Work closely with the private sector and (where appropriate) all levels of government in intensification and scale-out

Where to from here?

- Recognising the 'degree of difficulty', the project has been favourably reviewed and further work recommended.
- There is strong commitment from the Indonesian side.
- We are currently exploring funding options, starting with ACIAR.

Thank you

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INVISIBLE HAND IN BMP ADOPTION: MALAYSIAN EXPERIENCE

WP7 TEAM o
Zumilah Zainalaludin, Ph.D
Tengku Aizan T.A.Hamid, Ph.D,
Jariah Masud, Ph.D
Mohamed Shariff, Ph.D,
Ismail Abd Latif, Ph. D.
University Putra Malaysia.

Institute of Gerontology

WP7: Empowering Vulnerable Stakeholder Groups Workshop

About the EU-FP7 Project

The European Commission, under the 7th frame work programme (FP7) Cooperation Theme: Food, Agriculture, Fisheries and Biotechnologies is supporting a project "ASEM Aquaculture Platform", coordinated by Ghent University, and involves nine participating European and Asian institutions/ organizations. The project's major aim is to develop a strong 'Community of Practice' to reconcile ecosystem and economic system demands to promote and consolidate sustainability in aquaculture development in both regions.

zumilah70@gmail.com

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Outline of presentation

- The policy: Third Agriculture Policy and Agro Food Policy
- The development of "Keropok Lekor" - Fish Sausage industry
- Lessons learned
- Issues and challenges in scaling up

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The Policy:

- To eradicate poverty
- To develop the down stream industry for employment opportunities
- Entrepreneurial development for local and export consumption (GMP, IMP, HACCP)
- Improve traditional production processes through best practices.

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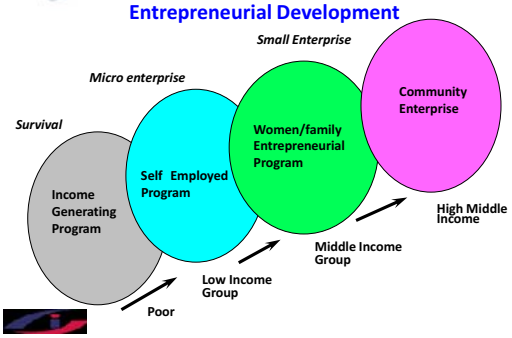
Entrepreneurial Development



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Keropok Lekor (Fish Sausage)

Traditional food of Terengganu on the East Coast of Peninsular Malaysia

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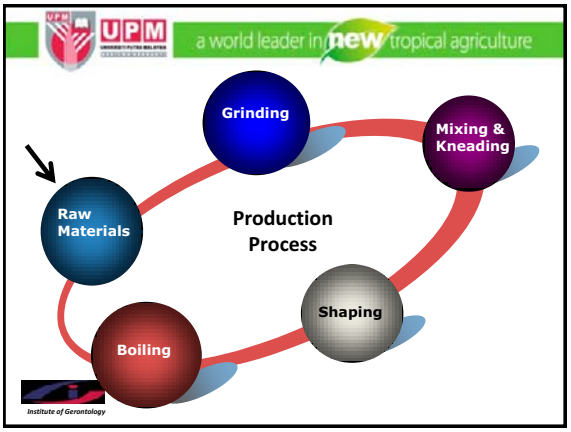
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Grinding
Mixing & Kneading
Raw Materials
Production Process
Shaping
Boiling
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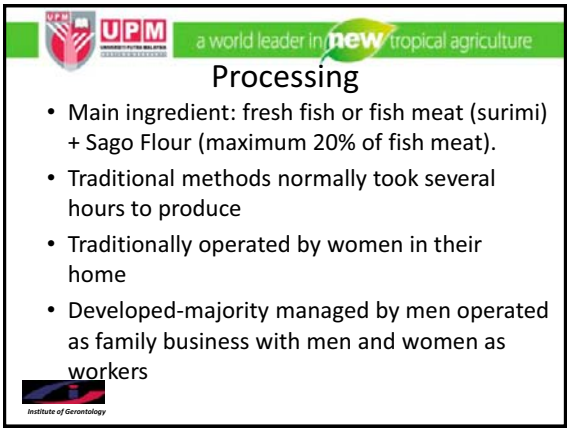
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Processing
• Main ingredient: fresh fish or fish meat (surimi) + Sago Flour (maximum 20% of fish meat).
• Traditional methods normally took several hours to produce
• Traditionally operated by women in their home
• Developed-majority managed by men operated as family business with men and women as workers
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Raw Materials
Institute of Gerontology


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Grinding
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Mixing & Kneading
Institute of Gerontology


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Shaping


UPM
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Boiling
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UPM
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Drying & Packaging
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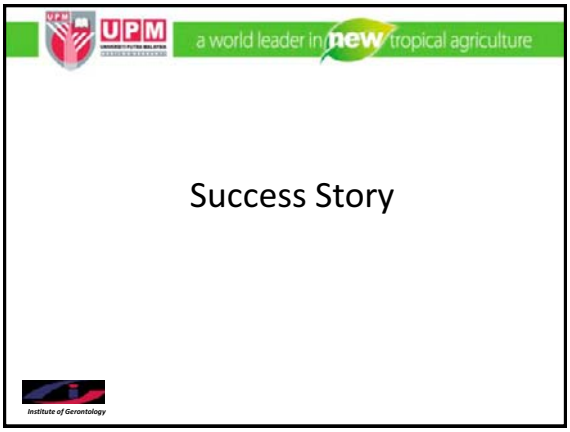
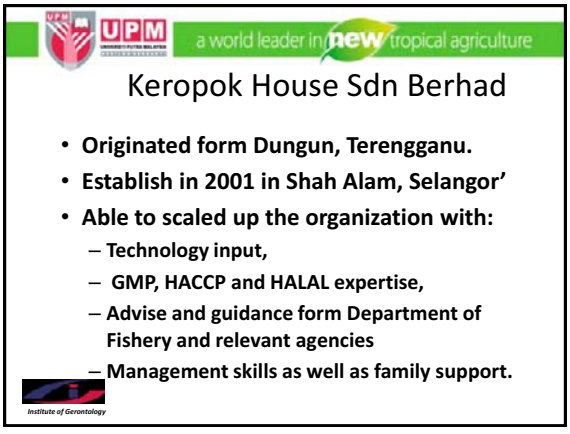

UPM
a world leader in new tropical agriculture
Success Story
Institute of Gerontology


UPM
a world leader in new tropical agriculture
Keropok House Sdn Berhad
• Owner: En ZAINAL (owner)
• Manager: PUTERI (daughter)
• Supervisor: Anis (daughter)
• Workers: 36 with 10 males.
• Males in the red zone (slippery, wet, lifting heavy things, hot area)
• Women in green zone: shaping and packaging
Institute of Gerontology


UPM
a world leader in new tropical agriculture
Keropok House Sdn Berhad
• Originated form Dungun, Terengganu.
• Establish in 2001 in Shah Alam, Selangor'
• Able to scaled up the organization with:
– Technology input,
– GMP, HACCP and HALAL expertise,
– Advise and guidance form Department of Fishery and relevant agencies
– Management skills as well as family support.
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Agencies Inputs

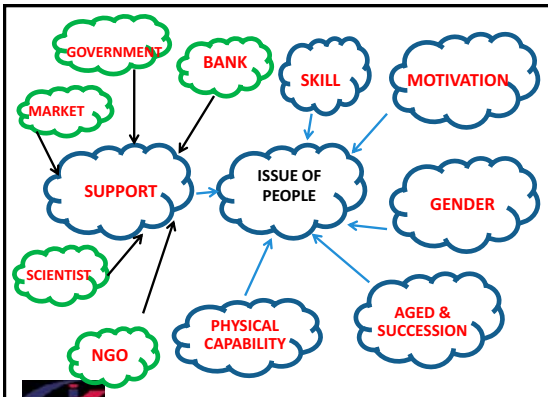
- Economic Planning Unit
- Inter Agency Coordinating Unit (ICU)
- Ministry of Agriculture.....
  - Department of Fisheries: Federal and State level
  - Fisheries Development Authority of Malaysia
  - Federal Agriculture Marketing Authority
- Ministry of Rural and Regional Development

Non Government

- Fishermen's Association (NEKMAT)
- Amanah Ikhtiar Malaysia (Micro Credit NGO)
- Religious based group
- Sejahtera Foundation

The key issues in a scaling up strategy

- Holistic plan
- Stakeholders involvement
- Appropriate technology
- Understanding the target group
- Readiness of the producers (**THE PEOPLE**)
- Financial support
- People friendly standard



Thank you

Aquaculture Certification: Opportunity or bottleneck for small scale farmers?

CV Mohan
NACA

EU-ASEM Workshop Chennai 16-18 May 2011

Background

- Certification is seen as a tool by consumers, importers and traders to ensure compliance by primary producers to responsible aquaculture
- Responsible aquaculture is compliance to mandatory and voluntary standards
- Mandatory and voluntary standards cover food safety, animal health and welfare, environmental, social, ethical, and legal concerns

Rationale on Certification

- Society looks for Sustainability, Safety, Quality and Equity of products and Production Process
- Compliance to National and international standards are seen as approaches to mitigate the negative impacts of aquaculture
- Markets look for an **endorsement** declaring compliance or conformity to standards
- Certification is seen as an endorsement

Certification Schemes

1) Governmental schemes

- Thai Quality Shrimp – Thailand
  - Codes of Conduct (CoC) and Good Aquaculture Practice (GAP)
  - Upgraded to GAP (TAS 7401-2552) and strengthen Environmental standards and mechanism (DoF and ACFS) through ISO65 and FAO Technical Guidelines.
- SSoQ – Bangladesh
  - Certification Standards for shrimp operators (hatcheries, farmers, depots or transporters, processors)
  - Voluntary process certification
- China PR
  - ChinaGAP – pilot stage for Aquaculture
  - Green Food Standard
- Accredited Fish Farm Scheme – Hong Kong SAR
  - Voluntary governmental scheme developed by the Agriculture, Fisheries and Conservation Department (AFCD) . 22 marine fish certified.

Certification Schemes

2) Private schemes

- GAA (ACC)
  - GAA :standard setting, ACC: certifier
  - US: Wal-Mart & Darden, UK: Lyons Seafood Ltd
  - Shrimp, Catfish, Tilapia
  - Hatchery, Farm, Processing plant, Feed mills
- GlobalGAP
  - A pre-farm-gate-standard
  - Shrimp, Salmon, Pangasius , Tilapia
  - Global GAP launches Compound Feed Manufacturing Standard 2.0 (March 2010)
- Aquaculture Dialogues
  - Coordinated by WWF
  - Salmon, Shrimp, Tilapia, Mollusks, Trout, Barramundi, Pangasius
  - Aquaculture Stewardship Council (ASC)

Certification Schemes

3) Organic

- Euro-leaf
  - Launched 1 July 2010
  - Organic aquaculture production of fish, shellfish and seaweed
- Naturland (Germany)
  - Certifying organic aquaculture across the globe, from Asia to Europe to Latin America.
  - Species-specific standards (e.g. salmon, Trout, Tilapia, Shrimp)
- Soil Association (UK)
  - The soil association has prepared general standards for aquaculture, mainly focused on salmon trout and shrimp farming
- Thailand
  - Voluntary governmental scheme,
  - Organic Aquaculture Farm & Product Certificaiton Center (OAPC)
  - 10+ farms for shrimp, fish

Certification Schemes

And More …

Issues and Concerns

- Emergence of a wide range of certification schemes
- Cost/benefit value for producer still not clear
- Confusion in the minds of producers and consumers
- Need for improved harmonization of standards
- Need for mutual recognition and equivalence

FAO Technical Guidelines on Aquaculture Certification

- To address the concerns, FAO set up a process to develop guidelines on aquaculture certification
- NACA played a major role
- The ACG deal with an aquatic animal production system and has identified 4 minimum criteria :
  - Food safety (consumer protection),
  - animal health and welfare,
  - environmental integrity and
  - social responsibility

The process

- COFI-SC: AQ/III – 8-12 September 2006 – New Delhi, India
- January 2007: Secretariat, Advisory Group, E-mail recipient list, Website
- Bangkok Workshop – February 2007 **Guidelines - Draft 1**
- Fortaleza Workshop – September 2007 **Guidelines - Draft 2**
- Cochin, India meeting – November 2007
- London meeting – February 2008 **Guidelines - Draft 3**
- Silver Spring, Washington D.C meeting – May 2008
- Beijing meeting – May 2008 **Guidelines - Draft 4**
- COFI/AQ/IV – 6-10 October 2008 – Puerta Varas, Chile
- 28th Session of COFI, 2 – 6 March 2009, Rome, Italy
- Comments by members - January 2009 **Guidelines Draft 5**
- Technical consultation, Rome Italy, March 2010
- 5th Session of COFI: SC on Aquaculture, Phuket, Thailand, September 2010
- 28th Session of COFI: 31 January – 4 February 2011: Endorsed

Certification: Definition

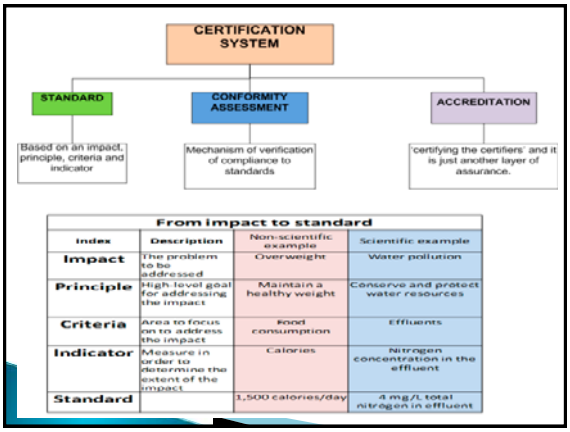
- Certification: "Procedure by which a Certification body gives written or equivalent assurance that a product, process or service conforms to specified requirements (**standards**).
- Certification body: Competent and recognized body that conducts certification (conformity assessment)
- Accreditation body: Accredits the certification body

Three entities of Certification

- Standard setting process and owners of standards (e.g. Thai GAP)
  - Mandatory standards or technical regulations (e.g. Food safety–Codex, Animal Health–OIE)
  - Voluntary standards (e.g. environmental, social, ethical)
- Certification Body (e.g. ADCC in Thailand)
- Accreditation body (e.g. ACFS in Thailand)

Institutional and procedural requirements

- Governance
  - Transparent, credible, robust
  - Clear responsibilities
- Standard setting
  - Transparent, technically sound, participation
- Accreditation
  - Independent and impartial
- Certification body
  - Separate from scheme owner



From impact to standard

Index	Description	Non-scientific example	Scientific example
Impact	The problem to be addressed	Overweight	Water pollution
Principle	High-level goal for addressing the impact	Maintain a healthy weight	Conserve and protect water resources
Criteria	Area to focus on to address the impact	Food consumption	Effluents
Indicator	Measure in order to determine the extent of the impact	Calories	Nitrogen concentration in the effluent
Standard		1,500 calories/day	4 mg/L total nitrogen in effluent

Certification for all or some standards?

- Various markets with varying requirements
- Certification required:
  - by all markets and buyers for food safety
  - by many markets for animal health
  - by few buyers for animal welfare or social responsibility

Private standards and WTO

- For some WTO members, the use of private standards to:
  - encourage the use of responsible practices
  - thus helping suppliers to improve quality and gain access to markets
- Other WTO members question whether:
  - private standards and certification schemes duplicate or complement government work (e.g. food safety, animal health)
  - they improve sustainability, consumer and environmental protection or only add another cost of compliance
  - they comply with the disciplines of the SPS and TBT Agreements (e.g. transparency, scientific basis,...)
  - How to define boundaries between public regulations on the one hand and private market standards on the other?
  - What mechanism to use to challenge the use of private standards as TBT?

ISSUES ON CERTIFICATION for SMALL FARMERS

PHYSICAL:
- Small size and large numbers of farmers
- Small volumes and value of product from individual

LEGAL:
- Some / Many farms may not be formally registered

OPERATIONS / PROCEDURAL:
- Efficiency in adopting BMPs (especially BIO SECURITY)
- Traceability
- Food safety
- Recording keeping

FINANCIAL:
- Cost of certification :being small , farms may not cover the costs of certification
- Low or no market incentives

MARKETING:
- Complex marketing channels make trace-ability difficult
- Middlemen or direct to a local market
- Trader credit relations

CERTIFICATION PROGRAMME:
- No certification Programme targeted for small scale farmers

Cost of Certification

- Cost of compliance
  - Changes needed to the physical facilities to comply with the standards (e.g. effluent treatment, sedimentation tanks)
  - Changes needed in management practices for compliance (e.g. crab fencing)
  - Additional services required for compliance (e.g. health management service)
  - Many others
- Cost of certification (registration fee, audit fee, logo use fee, etc)
- Cost-prohibitive for Individual small farmer

Group Certification

- Group Certification is intended for a group of farmers, normally considered for small-scale aquaculture farmers, for whom individual certification is cost prohibitive and who have key characteristics in common, e.g.
  - common marketing of the produce as a group,
  - homogeneity of members in terms of
    - Location and resource use
    - Species cultured,
    - production system,
    - products,

Cluster/group certification

- Achieve economy of scale
- Reduce cost & efforts of certification
- Enable small scale farmer to participate

Cluster

- Group of inter-dependent ponds, often situated in a specified geographical locality and in close proximity to each other form a cluster
- Share resources or infrastructure (e.g. water sources or effluent discharge system),
- Have the same production system
- Involve the same farmed species
- Come together for the purpose of marketing

Characteristics of Clusters

- Participatory approach
- Common goal
- Democratic process

Cluster Certification

- Functional Clusters (Phase I)
- Implementation of a cluster certification program (Phase II)
- Refer to MPEDA/NACA Cluster certification Guidelines (www.enaca.org)

Phase I: Functional Clusters

1. Selection and identification of cluster/groups of farms and mapping
2. Informal and formal meeting with farmers and generating consent for formation of aqua society
3. Development of SOPs for the society with rules and regulations (abiding agreement between society and its members)
4. Development of contexualized BMPs and GAPs for the commodity of the society, including traceability system for the society
5. Creation of functional entities of the society and formalizing registrations to meet all national government regulations
6. Developing agreements with other stakeholders along the supply chain (supply chain integration)
7. Operationalizing aqua societies (implementing SOPs, BMPs and traceability systems)

Phase II-Setting up and implementing a cluster/group/society certification program

1. Understanding the concept of society/group certification by society members and society executive committee-Training programs
2. Identification of certification program based on the needs of the importing country/processing/export house
3. Understanding the standards, indicators and criteria of the chosen certification program (Training program)
4. Assessment of the capacities of the society in relation to the standards of the certification program, identification of gaps and improvements required
5. Modifications/revisions to SOPs, BMPs and traceability system in order to conform to the standards of the chosen certification program
6. Setting up and operationalization of an efficient and effective **Internal control system (ICS)** to ensure compliance to standards of the chosen certification program, including an **Internal auditing system** in line with ICS
7. Setting up of cluster/society/group certification program by the society
8. Abiding by the requirements of the external inspection/audit of the chosen certification program
9. Outcome of the certification program (issuance of certificate or not)
10. Review of crop and certification program and decisions for renewal of certification program

RATIONALE OF ICS

- Group certification is probably the best means of covering small scale farmers under certification as individual certification is prohibitively expensive
- It is necessary for a body to vouch for all the members of the group regarding compliance to standard
- This function is done by ICS
- In other words, under group certification, the Certification programme evaluates the efficiency of ICS functioning to decide the issuance of group certification

WHAT IS ICS?

- ICS = Internal Control System
- ICS is the documented quality assurance system to ensure compliance to Certification programme standards both individually & collectively by members of aqua society
- In Group Certification, ICS is the conscious of the aqua society (think tank & task master) ; like a panchayat to a village
- The efficiency of ICS is the testimony to the extent of implementation (= compliance) of certification programme

"An Internal Control System (ICS) is the part of a documented quality assurance system, surveillance tool that assess periodically the extent of compliance in relation to Standards of the Certifying Programme, (to ensure food safety, maintain traceability) and disciplines the members towards compliance and to satisfy external requirements for certification". (Modified from IFOAM)

What needs to be done for small scale farmer inclusive group/cluster certification to become a reality?

How to choose a certification program?

- Access to information
- Role of processors
- Role of buyers/importers
- Role of intermediaries (agents for responsible sourcing: act as a link between farmers/processors/importers)
- Role of certification schemes

Benchmarking

- Benchmarking of different certification programs (government and private) using the FAO ACG
  - Facilitate to identify certification schemes that conform to the FAO ACG
  - Facilitate equivalence (e.g. exceptions possible)
  - Once equivalence is established it would be easy for small scale farmers to make informed decisions and choices
  - Also easy for various certification schemes to come to agreements and mutual recognition schemes
- Who will do the benchmarking?

Who provides the service?

- Capacity building of farmers and clusters on concepts and approaches for participating in certification programs
- Carrying out technical and financial analysis of compliance
- Supporting farmers/clusters to comply to standards of chosen certification program
  - Governments?
  - Technical arm of certification schemes?
  - Private consulting groups?
  - NGOs?

Who pays?

- Need for well thought out strategies
- Need for supply chain integration
- All the actors along the supply chain should take responsibilities
  - This will enable sharing the cost of certification
  - Also enable sharing the benefits of certification

Relevance to scaling up

- Certification should not be a burden to farmers but an enabling mechanism
  - To ensure compliance to mandatory and voluntary standards,
  - To access markets
  - For maximizing returns
- When this happens, scaling up of BMPs and cluster management approach will automatically follow
- Certification should be used to support small farmer inclusive scaling up and not marginalization of small farmers

Some Case Studies

Example from Thailand

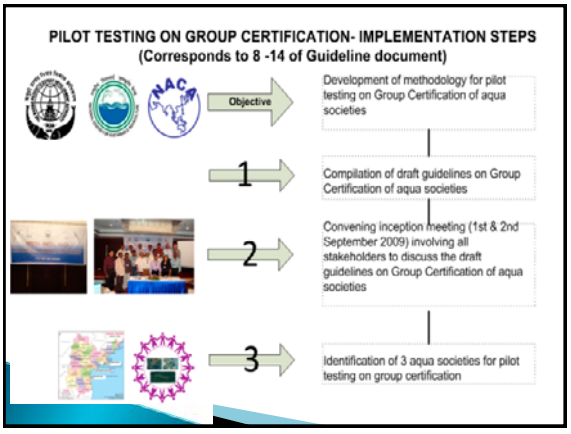
Shrimp farming cooperative

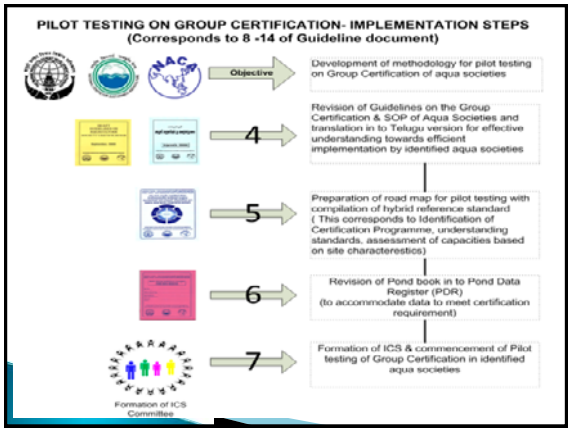
- Registered to Ministry of Agriculture and Cooperatives
- Monthly committee meeting, General assembly twice a year, voted president and committee
- Financial Audit by the government
- GAP + industry requirements
- Internal Control System
- Record keeping
- Product sold and exported to EU (better price than a central market)
- Started discussion with Social oriented Scheme (e.g. Fair trade)

Example from India

Indian Aquaculture Society

- Coordinated by NaCSA
- 5 coastal states, 500+ Societies, 12,000+ Farmers
- Promoting BMPs
- Capacity-building of small scale farmers
- Accessing services
- Facilitating market access
- Facilitating interaction among stakeholders





FAO TCP Project in Thailand

- Established 4 functional clusters
- Built capacity of farmers
- Promoted implementation of Thai GAP (standards)
- Established ICS
- Monitored compliance to Thai GAP
- Monitored functioning of ICS
- Conducted internal audit by ICS
- 4 Clusters subjected to external auditing
- (??) clusters certified by ADCC for Thai GAP

EU-ASEM Project in Vietnam

- Catfish BMPs developed and finalized (CARD-NACA project)
- 11 clusters set up
- Facilitating operation of clusters
- Aim is to minimize risks and maximize returns
- Enable participation in group certification
- Enable market access

Conclusions

- For small scale farmers group/cluster certification is the way forward
- Organization of Small scale farmers is vital (aquaclubs/societies/groups/clusters)
- Adoption of SOPs and BMPs very critical for successful functioning of farmer groups
- Functioning of an effective ICS vital for ensuring compliance to standards of the chosen certification system

Conclusion

- Small-scale farmers make up the majority of Asian aquaculture farmers
- Participation in certification programs will be essential for better market access in future
- Cluster approach is one way forward
- However, substantial investment and policy support for the small-scale sector will be required

Cluster certification – the next steps

- Preparing clusters to participate in future certification programs of their choice
- Connecting clusters to markets to receive a better price for quality product (non-certified and certified)

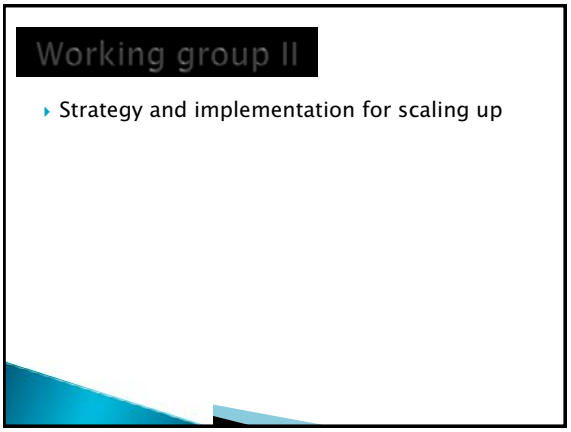
Thank you

Working Groups

- Two working groups
- To have representation from all stakeholder groups
- Elect a chair to moderate/facilitate the discussions
- Elect a raporteur for notes taking
- Chair and rapporteur to prepare the presentation

Working Group I

- Issues and constraints related to scaling up


Working group II
Strategy and implementation for scaling up

Fairtrade
Development of Certification and Empowerment of small scale aqua farmers

ASEM Aquaculture Platform, Chennai 2011

Team:
Ken Boyce, Fairtrade Foundation, UK
Sureel Singh, Fairtrade International, Germany
Kalyanaraman

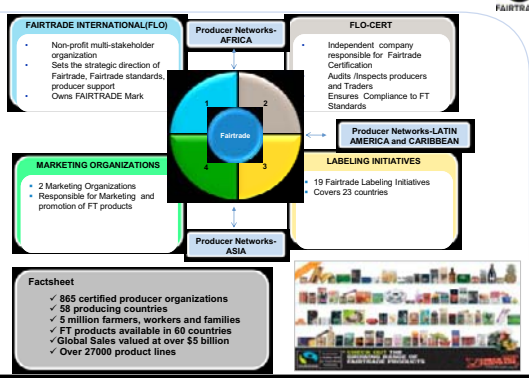
1

Agenda

1. Fairtrade and Fairtrade Certification
2. Shrimp Producer Communities –Issues and Challenges
3. Fairtrade – Addressing the issues of Aqua farmers
4. Questions

2

Who are We?

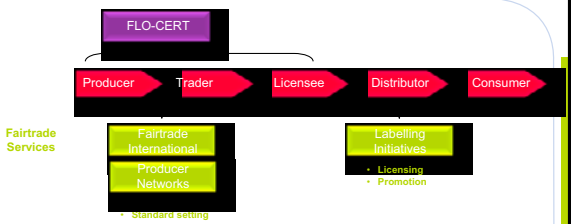


Factsheet

- ✓ 865 certified producer organizations
- ✓ 58 producing countries
- ✓ 5 million farmers, workers and families
- ✓ FT products available in 60 countries
- ✓ Global Sales valued at over $5 billion
- ✓ Over 27000 product lines

3

Fairtrade System/ Mechanism



Our Vision

A world in which all producers can enjoy secure and sustainable livelihoods, fulfill their potential and decide on their future.

Our Mission

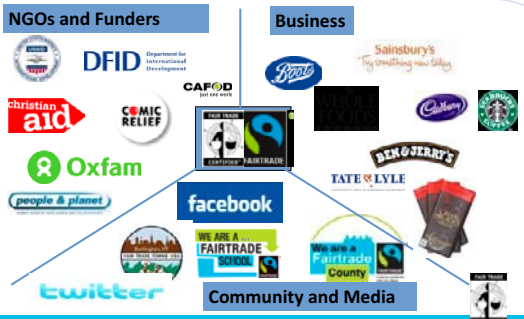
To connect disadvantaged producers and consumers, promote fairer trading conditions and empower producers to combat poverty, strengthen their position and take more control over their lives.

Why Fairtrade Certification?

- Quality products
- Improving lives
- Protecting the planet

The Fair Trade Certified™ / Fairtrade ™ label is the guarantee that a product was traded in a socially responsible manner.

Fairtrade Movement- Key Stakeholders



The Fair Trade Certified™ / Fairtrade ™ label is the most widely recognized ethical label in the world

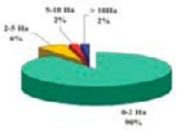
Agenda

1. Fairtrade and Fairtrade Certification
2. Shrimp Producer Communities –Issues and Challenges
3. Fairtrade – Addressing the issues of Aqua farmers
4. Questions

7

Aquaculture Characteristics in Asia

- Shrimp is an export oriented commodity accounting 17% (US$ 12 billion) of the value of fishery products
- Around 50% of the shrimps are farm produced
- 90% aquaculture production from Asia by over 8 million farmers (dominated by small scale farmers)
- 90% of the farmers with land holding < 2 Ha



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Key Issues and Challenges

Issues and Challenges

- Poverty
- Legal issues (e.g. Registration formalities)
- Maintaining Sustainable development of livelihoods
- Regional variations in production process and input costs in Developing Countries
- Knowledge and Capabilities
- Capacities and Organisation of Farmers
- Sanitary and Food-Safety Compliance
- Vulnerability in the Supply and Value Chain
- Financial Means and Access to Capital
- Quality of produce and accessibility to Market
- Exploitation from Middleman

Food Security:
Undue conversion of excess of land for shrimp culture leads to reduction of food supply of the region

Environmental impact:
Improper shrimp culture influence the deterioration of environment

Social issues:
Wages, working hours, living conditions of the labours

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Agenda

1. About Fairtrade and Fairtrade Certification
2. Shrimp Producer Communities –Issues and Challenges
3. Fairtrade – Addressing the issues of Aqua farmers
4. Questions

11

Possible Solutions and Success Factors

Possible Solutions

- Organisation of Farmers (Groups, Clusters, ICS)
- Support for implementation of BMP's
- Access to Services (Field Extension)
- Access to Capital (e.g. Micro-Credits)
- Commitment by Processors cum exporters to producers
- Arrangement with Importers and Retailers

Success Factors

- Long term engagement beyond fixed term projects
- Room for dynamic process towards improvement
- Engagement of market actors by offering consumer-facing label
- Development of producer initiatives that can be scaled-up to larger volu mes

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Fairtrade Solution- FT Standards for Shrimp

ECONOMIC	✓ Organisation into small producer groups to become certified ✓ Fair Trade standards create security for long term development ✓ Sustainable Pricing Model ✓ Development premium paid for communal projects
DEVELOPMENT	✓ Entry and progress criteria for certified groups. ✓ Groups create a roadmap for their certification outlining their goals ✓ Implementation of Internal Control System (ICS) ✓ Resources for environmental improvements
GLOBAL LINKAGE	✓ Each producer Group becomes a member of their Producer Network ✓ Representatives of our producer networks on all our governance committees ✓ Fairtrade Liaison Officer's provide advice and support on the ground ✓ Market access to buyers and consumer

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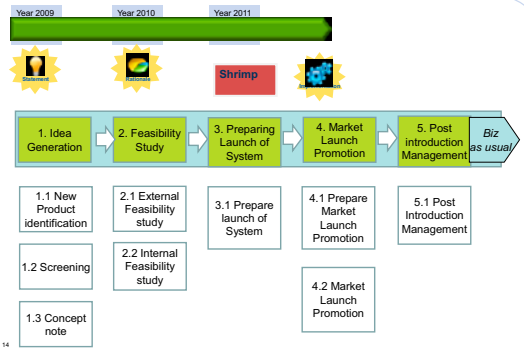
Fairtrade Shrimp Standard Journey



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Draft Fairtrade Standard for Shrimp includes

- Fairtrade Shrimp Producer Organizations
- Factories processing Fairtrade Shrimps
- Fairtrade prohibited material List
- Fairtrade Geographical scope of producers` certification
- Fairtrade Generic Trade Standards
- Information on proposed Equivalent for factories

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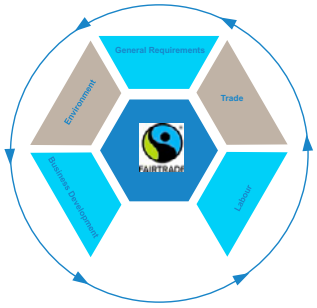
Draft Fairtrade Standard for Shrimp (SPO)



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FT Standard General Requirements

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FT Standard Trade Requirements

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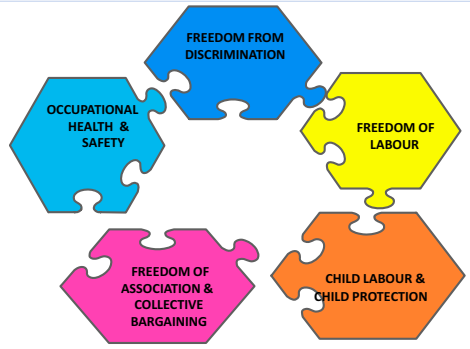
FT Standard Labour Requirements



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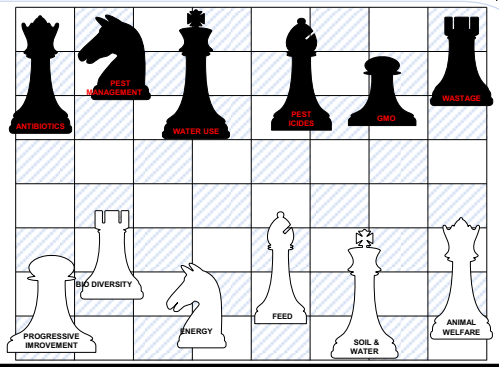
FT Standard Environment Requirements



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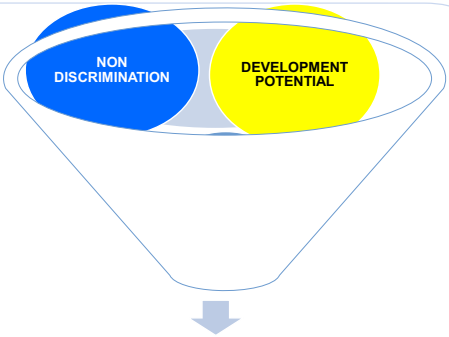
FT Standard Business Development Requirements



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Fairtrade Value Propositions

- Partnering with small producers forming producer groups to encourage responsible aquaculture practices enabling practical approach to scaling up
- Partnering with societies established by MPEDA/NaCSA, processors and other stakeholders to provide a robust platform for sustainable growth
- By requiring companies to pay sustainable prices (which must never fall below the market price), Fairtrade addresses the injustices of conventional trade, which traditionally discriminates against the poorest, weakest producers.
- "Fairtrade" is a trading partnership, based on dialogue, transparency and respect, that seeks greater equity in international trade
- Fairtrade is about better prices, decent working conditions, local sustainability, and fair terms of trade for farmers and workers in the developing world
- It enables disadvantaged groups to improve their position and have more control over their lives

22

When will you make me a Fairtrade Shrimp?

23

Thank you!

FAIRTRADE

24

Farmer organization as models for promoting adoption of BMPs and accessing markets

National Center for Sustainable Aquaculture (NaCSA)

(MPEDA, Ministry of Commerce and Industry)

Outline

1. Introduction
2. Societies status
3. Better Management Practices (BMPs)
4. Dissemination of BMPs
5. Implementation of BMPs through group approach
6. Linking farmer societies to market

Societies Update

State	*No. of Societies*	*No. of Farmers*	*Total Area (Ha)*
Andhra Pradesh	605	13228	11815
Karnataka	20	363	374
Kerala	1	21	36
Orissa	54	1168	786
Tamilnadu	42	1013	1796
West Bengal	50	1137	361
Grand Total	772	16930	15168

Introduction

The ability of farmers to deal with disease problems depends not only on technical factors, but also on socio-economic factors such as access to technology, better inputs, information and finances. To understand aquatic animal diseases and reduce the risks of their occurrence, a systems approach should be adopted so that the whole aquatic system, including its ecological processes and social, economic and institutional factors, is considered. The key to putting the BMPs into sustained practice is the farmers being associated and motivated. Thus the process commenced with the organization of small scale farmers into groups.

Better Management Practices (BMPs)

1. Good pond preparation
2. Biosecurity
3. Sourcing Good quality seed
4. Water quality management
5. Feed management
6. Health management
7. Food safety
8. Traceability
9. Better Harvest and post-harvest Practices
10. Environmental awareness and Management

BMPS dissemination

- Daily field visit by the NaCSA staff
  - Trained in communication and interpersonal skills
- Farmers meetings
  - Meeting details and decisions are recorded in society minute book
- Farmers field days
- Farmers as trainers- Mainly the farmer leaders
- BMP Brochures, Video
- Toll free telephone-18004252374

Farmer meetings-Key for dissemination of BMPS

Crop Planning

- Meeting is organized among all society farmers
- Preparation of Crop calendar- 2 months before stocking
- Farmers note the decisions in minute book and everyone signs it as sign of agreement.

Monitoring through societies is key

Give Responsibilities to all so that Regular monitoring will help in Increased success rate of Crop.

Plan to Have Sub- Committees with 2-3 farmers with clear responsibilities and powers to control Society Management.

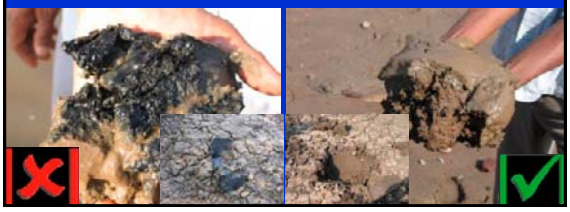
1. Pond Preparation

All the society farmers plan to prepare pond as per crop planning schedule. Wherever possible the machineries like tractors and earth moving equipments are hired on contract basis for the whole society thus reducing cost and making it possible for all farmers to prepare the ponds and repair intake and drain canals in time for the crop.

Good Pond Preparation

Pond Preparation Practices

- Complete draining out the water from the ponds;
- Removal of the organic waste from pond bottom;
- Drying the pond bottom;
- 4. Plowing , apply lime/gypsum according to soil pH



2. Biosecurity

Common biosecurity measures in society farms include,

- **Water screening** - Double layer of fine mesh filter net (300 micron mesh size) to filter intake water.
- Stocking disease free seed
- Crab Fencing- for ponds on all four sides to prevent entry of crabs in to ponds
- Non lethal Bird fencing- tying of nylon ropes at 6 inch interval horizontally above the pond to prevent birds picking sick/dead shrimp and contaminate other ponds.

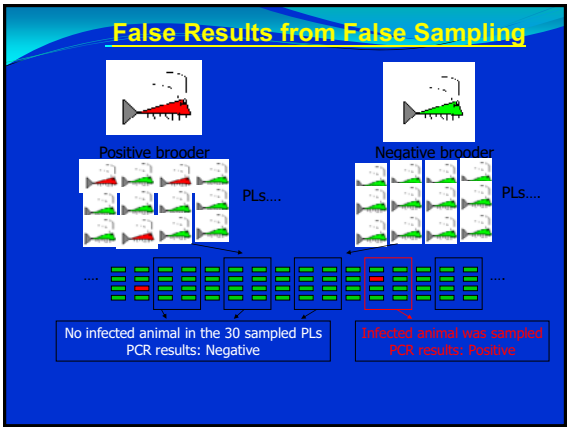
3. Disease free shrimp seed selection

- Seed purchase through contract hatchery system
  - -Under this system, Society farmers place bulk orders to a Government registered hatchery, 45 days in advance of the planned stocking date, for production of required quantity and quality of seeds.
  - -Brood stock and seed are screened for WSSV and MBV
- Synchronised cropping (within a period of one to two weeks)
- Uniform stocking density for each society (max.10 pcs/m^2) for minimizing stress and reducing disease risks.

Month-wise prevalence of WSSV in *P. monodon* Broodstock (%)

Month	2008	2007	2006
January	44	35	28
February	38	36	23
March	16	19	20
April	8	8	13
May	14	7	12
June	7	25	8
July	7	17	14
August	8	16	5
September	3	5	15
October	1	10	10
November	N/A	30	12
December	NA	38	33
Total no. of samples-analysed	10,086	23,266	25,603

Courtesy Mr. Ramraj, Padmanabha labs, India



Improved shrimp seed quality

All the society farmers were trained in contract hatchery system so that they can carry this on their during coming crops

Non Contract Hatchery	Contract Hatchery
Risk of diseased seed	Disease free seed
Multi spawner	Single spawner
Size variation	No size variation
Fed with artificial feeds	Fed with Artemia (10kg/m)
Poor growth	Good growth
More DOC	Less DOC
Smaller harvest size	Good count at harvest

4. Water quality management

- Water quality lab is being set up in each society.
- Easy to use water quality test kits are purchased
- Trained society coordinator monitors the water quality for the whole society
- Water quality should be tested on site

Stocking into green water and avoiding transparent water during stocking

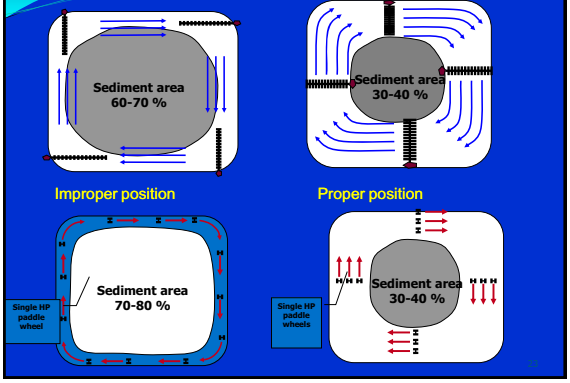
- No use of poultry manure or any other animal manure
- Use of fermentation of bran, MOLASSES and yeast
- Water colour should be green / brown colour one week before stocking
  - Not turbid.
  - Not transparent.
  - Not dark green/ dark brown colour (heavy plankton bloom).

Circulation of water very Important

Placement of aerators to minimize the area of sludge deposition

Poor aerator placement results in large areas of sludge deposition- poor growth

Aerator Positioning



5. Feed Management

- Commercial feed from reliable (ISO certified) company
- Max. of one or two feed brands are used in society
- Expiry period is inspected on each bag and expired feed bag is rejected.
- Feeding table is used and feeding rate is adjusted based on the observation of feed tray
- In most cases middle feeding is given after 30 days
- Record is maintained for feed consumption for the crop.

Chain dragging

6. Disease Management

- Sharing of information during disease outbreak and implementation of the planned arrangement in quick time
- Routine monitoring of shrimp health by farmers
- Working with Research institutes in providing immediate information from the field regarding any new disease outbreak, networking with concerned institutes to find solutions for emerging disease problems
- Disseminating the findings to the stakeholders.

7. Food safety

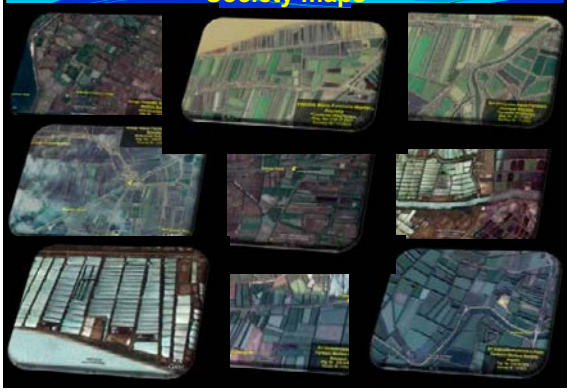
- Increased awareness among society farmers about food safety issues.
- Reduced disease incidents leading to reduced chemical use in societies.
- Seed, Feed and other farm inputs used in society are screened for antibiotic traces
- Screening of all shrimp ponds for banned antibiotic residues is mandatory.
- Quick awareness through societies made this possible.

8. Traceability

- A fully integrated supply
- Complete traceability
- Processed product never leaves custody of supplier at any time - no brokers or third party involvement.
- Every case can be traced from restaurant table all the way back to Hatchery
- Highly motivated sales team available in US to assist with any questions

Courtesy- OPSMART

Society maps



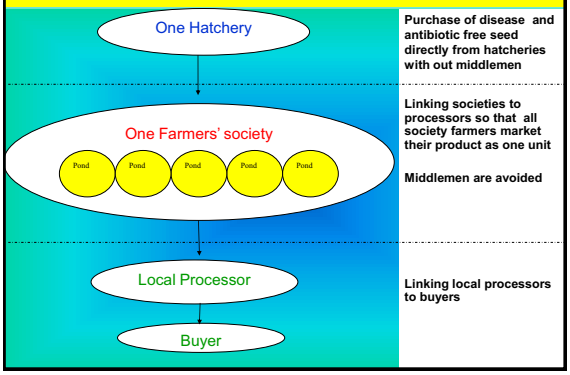
Record Keeping

- Record for farm management practices, including feeding, water quality, chemical use, disease incidents and any other relevant activities are recorded as routine practice to provide up to date information.
- The stocking and harvest information also recorded
- Farmers themselves are keeping the records, where they cannot society coordinators assist farmers

9. Quality improvement

- Improved quality through better harvest and post harvest practices like
  - harvesting during early morning hours
  - Chill killing of harvested shrimp
  - Use of sufficient quantity of good quality ice
  - Separate packing of handpicked shrimp
  - Quick transport of packed shrimp to plants
- Cooperation between farmers and Processors.

Forward integration with Processors



Purchase of disease and antibiotic free seed directly from hatcheries with out middlemen

Linking societies to processors so that all society farmers market their product as one unit

Middlemen are avoided

Linking local processors to buyers

10. Creating Environmental awareness

- Working with NGOs to plant mangroves in society area
- NaCSA taking up "Carbon Foot Print" study in societies to demonstrate eco-friendly farming practices followed in society farms.
- Process of electrification of society farms has started.

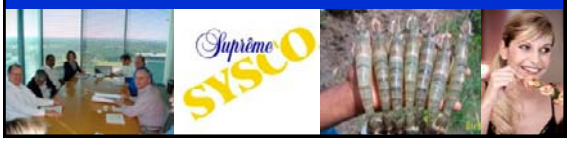
Better Market access

- Legality of the farm operation
- Food safety
- Traceability-Farm to Fork
- Environmental sustainability
- Social Responsibility
- Cluster certification
- Mechanism to link with small farmers

Branded Shrimp

Better Market access for Society Shrimp

- Creating awareness among buyers
- Working with Sustainability conscious buyers.
- They are keen to procure Shrimp produced by Society farmers and planning to sell under premium brand.
- Investing in brand promotion
- Chemical free shrimp from societies will not be treated with any chemicals during the processing either.
- Ensuring safe shrimp to consumers.



Lessons learnt

- Farmers unity and cooperation is the key for success of BMPs
- BMPs provide strong incentive for positive change.
- Provision of technical services should be independent and without conflict of interest to secure the confidence of farmers
- Cluster certification is possible

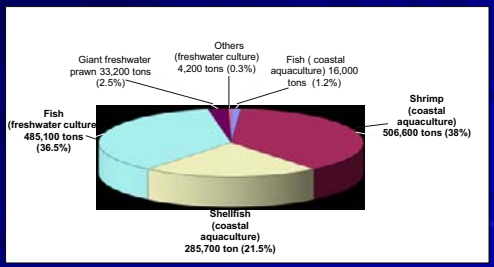
Way Forward

Revival of shrimp farming	Targeting 1000 societies this year	Involve all the stakeholders
Responsible introduction of exotic species	Assist Regulatory authorities	Ensure implementation of guidelines
Reduce Cost of Production	Electricity	Bank Credit and insurance
Cluster Certification	Pilot Projects	Expand to all societies
Link Farmers to Policy makers	Influence Local Govt. policies	Influence Central Govt. policies

Outline of the presentation

- Shrimp industry profile in Thailand
- Why we need COC and GAP for shrimp
- How to control on food safety
- How COC and GAP are developed
- Some details of the standard
- How to make it internationally accepted and what they are applied

Thailand Aquaculture Production (MT)

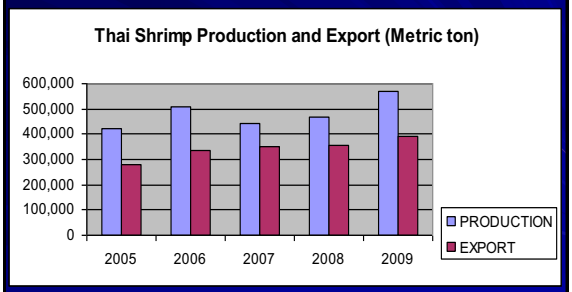


Shrimp industry profile of Thailand

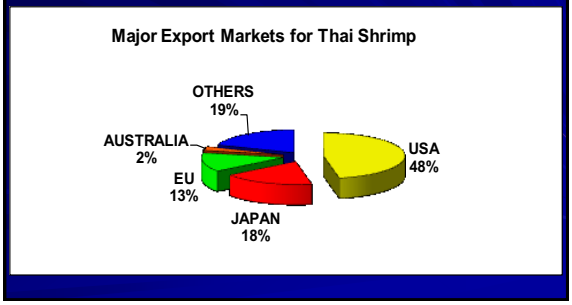
- Production area : 70,000 ha
- Approx 22,000 shrimp farms of which 75% are small scale operation
- 2 shrimp species are produced; White shrimp 99%, Black tiger shrimp 1%,
- 350 processing plants are HACCP certified
- Productivity 5 - 600,000 ton/yr.
- Approx. 1 million people involved in shrimp sector

Production area

Thai Shrimp Production and Export 2005-2009



Major Export Markets for Thai Shrimp



Why COC and GAP are established and reviewed

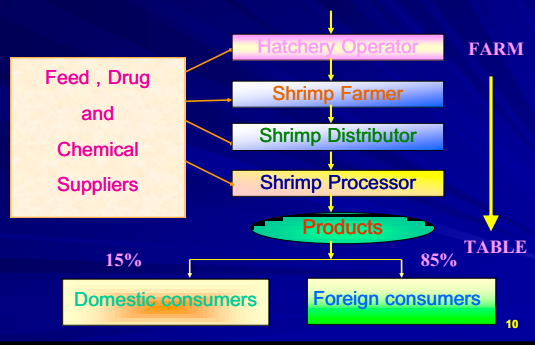
1. Shrimp are produced mainly for export
2. Food safety need to be controlled
3. Sustainability need to be maintained
4. Good practice need to be distinguished
5. Prevent unnecessary private standard to take advantage as it is one of the market demand

8

How food safety are controlled

9

Production Process for Marine Shrimp Farming Industry



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Monitoring of Antibiotics Contamination in Shrimp Products

- Control importation of prohibited antibiotics
- Control and Monitor the use of antibiotic at shrimp farm and from shrimp products

11

Monitoring of Antibiotics Contamination in Shrimp Products

Screening Test
Test Kit for Farmers' Use

12

Monitoring of Antibiotics Contamination in Shrimp Products

LC/MS/MS

Monitoring and Inspection Program

- Farm/Hatchery: water quality, diseases, antibiotics
- Processing Plant: GMP/HACCP
- Products: microbiological, physical, chemical--antibiotics

Thai Quality Shrimp Development Process

1997-9 Developed CoC Guidelines
2000 Developed GAP Guidelines
2001- 6 Developed certification system (under Thai-French Cooperation)

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Thai Quality Shrimp Development Process (cont')

2003: Implementation of Manual Traceability using MD and FMD
2004: Development of national labeling program (Q mark)
2005-7: Development of Computerized Traceability System: TraceShrimp

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Thai Quality Shrimp Development Process (cont')

2008-10

- Revised National Shrimp GAP based on international instruments and FAO Aquaculture Certification Guidelines
- Assurance of transparency in the certification system by applying ISO/IEC Guide 65, DOF would apply for the accreditation by November 2010
- Develop group certification system under DOF- FAO Cooperation Project

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How does Thai Culture Shrimp COC and GAP be established and meet global demand

- The FAO code of conduct was studied and all fisheries biologist were called to set the primary standard
- The stakeholder s were discussed and the standard was reviewed and set
- Provision of strong technical support to farmers i.e. farm and environmental monitoring, shrimp diseases and antibiotics test services

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Revised Shrimp Farm and Hatchery Guidelines: GAP & CoC

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Five Keys Elements for GAP/CoC Guidelines

- Food Safety and Quality
- Environmentally friendly
- Social responsibility
- Animal Heath and Welfare
- Traceability

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References for the Development of Thailand GAP/CoC standard

- **FAO**: Code of Conduct for Responsible Fisheries
- **FAO/NACA/UNEP/WB/WWF**: International Principles for Responsible Shrimp Farming
- **CODEX**: on Aquaculture and Principles for Food Import and Export Certification and Inspection; on Aquaculture
- **OIE**: Aquatic Animal Health Code
- **ISEAL**: Code of Good Practice for Setting Social and Environmental Standards
- **ISO/IEC Guide 59**: Code of Good Practice for Standardization
- **ISO 14001**: Environmental Management System
- **FAO Aquaculture Certification Guidelines (new !!)**

GAP / CoC Requirements

Concerned Issues	List of Relevant Requirements
Food Safety	• Use drugs and chemicals in an appropriate manner (non use of prohibited antibiotics) • Manage farm sanitary in a responsible manner • Harvest with well plan, avoid drug and chemical residue and practice in a good manner
Environmental Friendly	• Locate in an area that is legal and suitable for farming • Effluent and sediment are treated properly without causing environmental deterioration • Provided adequate safety instruction and store/dispose fuel and lubricant in a responsible manner • Prevent environmental deterioration and support to mangrove/forest re-plantation program

GAP / CoC Requirements

Concerned Issues	List of Relevant Requirements
Social Responsibility	• Locate in an area that is legal and suitable for farming • Comply to national labor law and regulations for employee/worker safety and welfare • Aware of the impact of shrimp culture to the community and society
Animal Health and Welfare	• Manage in a sustainable manner and address shrimp health and welfare
Traceability	• Practice routinely data recording/collection • Traceability of shrimp products

Certification Program

Thai-French Cooperation on Certification Program (2001-2006)

Auditor Training

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Existing Status on CoC and GAP Shrimp Farm Certified (as of March 2010)

Shrimp Farm Status	CoC Certified	GAP Certified	TOTAL
Valid Certified Farm	161	18,969	19,130

How does Thai Culture Shrimp Industry be sustainable

- Good infrastructure in supporting farming and processing system i.e. sea water irrigation system, zero-water exchange system, electricity, road, HACCP processing plants

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Sustainable Marine Shrimp Production

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How does Thai Culture Shrimp Industry be sustainable

- Sustainable shrimp farming practice—application of GAP and CoC farm standards for more than a decade

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How does Thai Culture Shrimp Industry be sustainable

- Continuing Technology Development e.g. Biosecured shrimp (i.e. Specific Pathogen Free or SPF shrimp), water recirculation system and etc

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Corporate Social Responsibility: CSR

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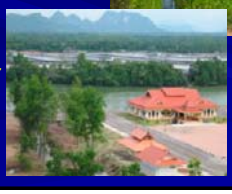
CSR Activities: Crop Production in Surathani Province

Crop Production, Using Farm Sediments as Fertilizer

CSR Activities: Mangrove Plantation by Shrimp Farm, Surathani Province



Mangrove Plantation for conservation

Corporate Social Responsibility: CSR

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Thai Shrimp Traceability

towards Computerized Traceability: "TraceShrimp"

Implement the traceability system for whole supply chain--feed, hatchery, farm, distributor, processor:

- Manual Traceability (i.e. FMD, MD)
- Computerized Traceability System: Thai-EU Partnership Program

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Quality Assurance

35

For transparency assurance the ISO/IEC Guide 65 is applied

- Establishment of Farm Certification Center incl. Certification Committee
- Establishment of Board of Director for Certification (on-going): comprised of government and private representatives
- six provinces have been included in the Pilot certification starting in April 2010
- Nationwide implementation has started since August 2010

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Personnel concerned

- More than 500 Trainers, Auditors for Farms and Hatcheries, Shrimp Distributor
- More than 100 Inspectors involved in control of Processing Plants

Shrimp Biosecurity for Sustainable and Healthy Aquaculture

Thailand has successfully produced Specific Pathogen Free (SPF) seeds of 3 shrimp species:

1. Black tiger shrimp
2. Pacific white shrimp
3. Giant freshwater prawn

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Better Understanding BMPs &cluster management in India: ideas for next steps

Chennai May 2011
FB Davy & C V Mohan

Ponds of Sri Gowri Society

Small Farmer Challenges in a global market place

- Access to credit and insurance.
- Lack of enabling government policies &programs.
- Compliance to food safety standards.
- Minimising disease related losses.
- Meeting stringent market requirements, including certification.
- Meeting environmental and ethical standards, meeting wildlife and biodiversity requirements.
- Access to technical knowledge.

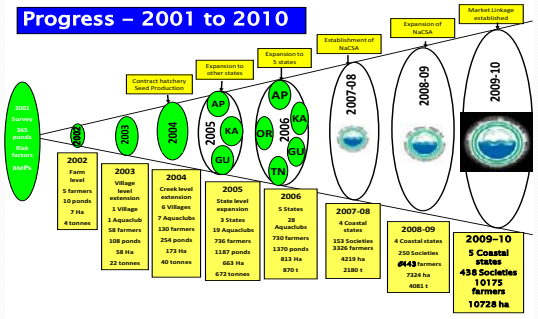
Initial observations in AP India

- **Good progress to date:** farmers/clusters showing good success in BMP implementation; farmers do change in response to well thought out solutions..... usually co-developed.
- **Key people/organizations developing**: build on this foundation, develop & support innovators (eg more Murthy's) and strengthened organizations (eg local: societies), state (?) and national level (NaCSA).
- **Strengthen lesson learning/knowledge sharing approaches** eg wider use of collaborative partnerships eg....Communities of practice, knowledge platforms, ... others?
- **Market Trials**: more effort eg better understanding of markets & actor links and drivers/impacts more generally. Review organic scampi case; revisit SYSCO trial and links to similar opportunities. More documenting/sharing lessons learned.
- **Clustering, ICTs & K access**: continue to focus on improved support to small scale producer, better understanding of what is working; wider dissemination & comparative evaluation.

Key People: eg using lead farmers Mr Murthy

- Expand use of **innovative farmers** eg via workshops, exchanges, fairs etc; encourage innovation & learn from "positive deviants".
- Use lead farmers to experiment with cluster to market links; eg via producer-processor partnerships in new markets.
- Learning from **other sectors**, countries, regions (eg: milk case; VN farmers to India; what next?)
- **Knowledge access**: Explore new technologies (eg Nokia and other ICT options) to lessen some small farmer constraints
- **Economics**: Seek to better understand economies of scale tradeoffs eg feed purchase
- **Other farmer constraints**: infrastructure support, insurance, traceability & documentation demands more generally. **Document & share!**

Organizations: NaCSA snapshot



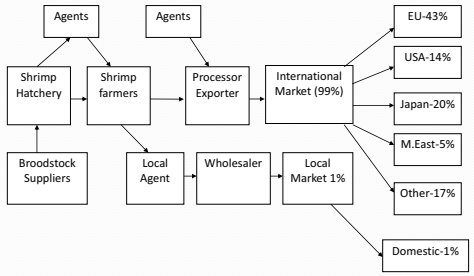
Organizational Lesson Sharing: NaCSA & others

- NaCSA scaling up: now 700+ clusters; more cluster sharing/collective action lessons; innovative clusters.
- NaCSA cross linking with organizations in other sectors in India (milk, pineapple/other fruit)
- in Asia (eg Thailand, VN and Indonesia)
- Cluster + Processor exp'ts & targeted markets; credit links, certification, others?
- More in house applied research? ID priority issues?

Small scale farmer innovation: market lessons learned in other sectors

- **Markets are restructuring!**; value chain actors need to adopt a stronger proactive strategy; egs from these studies:
- Adopt pro poor &pro market policies (not subsidies!)
- More/better use of private sector..... as a partner
- Clusters/collective action important; but not always via formal FOs (eg quasi memberships; don't always assume FO entry points most appropriate; eg concerns re long term dependency);more use of specialized partnership facilitators.
- Few proven models so need for best practice models.
- *Adapted from Berdeque et al 2008 Regoverning markets*

Value chain analysis: opportunities, constraints analysis



Lessons learned in the Dairy case

- Value chain actors were not prepared for change
- Actors need to agree to renewed vision (eg pro market small farmer approach; on a need to better compete)
- Restructuring support: eg different parts of the value chain restructure at different rates.
- Value chain actor cooperation needs to be demonstrated

Potential Research opportunities 1

- Sector ill prepared for impending changes around markets & effective small farmer participation
- Move our discussion from BMPs/disease to small farmer success/innovation around effective (global?) market participation, policy development etc.
- Sustainability & Image: shrimp farming "big and bad"
- Weak institutions; & poor visibility to date
- Private sector links; few strong & innovative partnerships
- Confusion: Links to certification and related processes
- Limited understanding of success: action research and learning (eg around drivers & change) other links that continue to capture LL from this and other sectors.

Potential Research 2

- Market and farmer production economic analyses
- Traceability program review & analysis
- Social analysis on clustering & related processes.
- "Deeper "ICTs & improved connectivity studies (options, costs & needs analysis.....).
- Stronger small scale farmer "voice"; "selling the local production ecosystem".
- Carrying capacity studies esp in some of the more intensively farmed coastal zones.

Outcome mapping.....Impacts

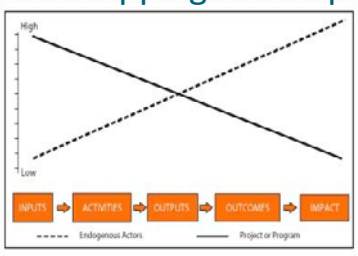


Figure 2. Relative Influence Along the Results Chain
(source: Smutylo 2001)

Some take home messages

- Continue/build on the on going work of NaCSA/MPEDA and partners with a small farmer-cluster focus
- Develop an agenda for followup including action research; continue to refine and adapt BMPs
- Wider network of interested partners around cluster support and analysis via quality research, policy links.
- Move to stronger pro market linked BMPs? Prove the point; small scale producers can effectively participate in new global aquaculture markets
- Evaluation and outcome/impact thinking

Wider scaling out

- BMP networking & stronger organizational links; eg MPEDA/NaCSA, NACA, FAO, CGIAR WFC work
- Stronger market analysis; eg www.regoverningmarkets
- Social analysis; clustering, gender, governance etc
- Policy support
- Lessons from other sectors: milk, fruit, coffee, wine.....
- Certification
- Changing trade paradigm (eg ISEAL & related thinking)
- ?????

Thank you

Pilots& Pineapples 1960s-2000s

- Shifting global sites of prod'n & product innovation
- Initially global retailers played almost no role in the market changes but took over in mid 2000s under new food safety paradigm.
- Innovation dominated by MNC eg varietals , logistics eg shipping, quality standards & codes of conduct, products.
- Policy: eg investment in infrastructure (roads, ports ICT etc) showed positive returns. Support FOs to access market & understand/co-develop its rules(eg credit/certification, PPP/new governance etc).
- See *Vagneron et al 2009*

Pineapple VC History: CI & CR

Vagneron et al. / Food Policy 34 (2009) 437–446

	1950s–mid 1980s	Mid 1980s–mid 1990s		Mid 1990s–early 2000s	Early–mid 2000s
Geography of production	Highly concentrated (CI)	Highly concentrated (CI)	Concentrated (CI, CR)	Concentrated (CI, CR)	Concentrated (CI, CR)
Entry barriers (production)	Low	Low	Medium	High	High
Type of actors	Smallholders	Smallholders and large plantations	Smallholders and large plantations	Large and medium sized plantations	Large and medium sized plantations
Variety	*Smooth Cayenne*	*Smooth Cayenne*	*Champaka*	MD-2	MD-2
Types of product	Whole pineapples	Whole pineapples	Whole pineapples	Whole pineapples	Variety of forms (diced, salad, whole), packagings and standards (organic, fa trade, EurepGap, etc)
Entry barriers (trade)	High export quotas and access to freight	High access to freight	High logistics and commercial innovations	High logistics and commercial innovations	High standards and brands
Level of drivenness	Low	Low	Medium	High	High
Pilot	Cooperatives and maritime transporters	OCAB	Large agro-food companies	Transnationals	Transnationals and retailer
Vertical integration	Low	Low	Low–medium	Strong	Strong
Institutional framework	Maritime parastatals and public producer organisations (horisation)	State withdrawal in CR and CI (SAPs), CIRAD I (CR)	CIRAD II, Agricultura de Cambio (CR); Organization of the market in Bananas(CI)	Private retailer standards (EurepGap)	Explosion of private standards and other product differentiation strategies

Success Ingredients? Ideas for future directions

- Prove the point: continue/expand the BMP & clustering work; develop/analyze more success cases to show/build on positive change.
- also examine/understand deviant cases &"positives" suggested by such cases
- examine drivers; eg move from cluster disease focus to broader understanding of assistance to small farmer more generally.
- knowledge access (ICT), organizational support, global market access & value chain trials more generally

Approaches to scaling up

- expand the coverage & size of an organization; eg NaCSA case mostly this focus.
- increase the number or diversity of its activities
- influence the behaviour of other organizations
- enhance the sustainability of the organization (eg human & financial resources)

Scaling up/out next steps

- Develop a shared Vision (cf other sector experiences milk, coffee, wine etc) and linked action research network, organizational structure; eg communities of practice (CoPs)
- Action plan
- Raise Resources ($$$, partners/people)
- Evaluation plan, indicator development

Projections on Nat'l Level Impacts

What is scaling up

- More quality benefits to more people over wider area.....eg BMPs for shrimp
- And .....more quickly, more equitably & lastingly
- Including building local institutional capacity for planning, implementing & evaluating a broad range of development activities.
- *(from Carter & Currie-Alder 2006)*

How to scale up: 5 components

- framing the context
- promoting participation
- fostering learning
- strengthening institutions
- disseminating successful experiences

Why scale up

- to expand the spatial and temporal extent of management practices (BMPs)

What to scale up 4

- Technology
- Concepts
- Institutions

To develop scaling up strategies for use by national institutions, regional organisations and potential donors.

Some specific options: ICTs

- Nokia in Agriculture

Outcomes impacts and evaluation and change processes

- IDRC Outcome Mapping

Other cases "Models of success"??

- Indian dairy sector
- Global: Regoverning markets program
- Wine
- Small farmer coffee (organic, fair trade…?)

Ingredients for success

- Vision and goals around likely market restructuring
- Knowledge sharing-Learning approach
- Key partners
- Resources
- Evaluation plan

Sample working groups

- BMPs, innovation and sharing lessons learned around success for small scale shrimp farmers;
- focus on this issue with 2 replicate groups
- or consider another group looking at Understanding Markets & Value Chain links
- Develop a Future vision, goals and action plan?

Ideas on future directions

Communities of Practice (CoPs)

- ASEM seeks to promote CoPs
- Our group might examine CoPs as a possible way forward for BMP-clustering groups

What are CoPs

Groups of people ("communities") who have:

- a common interest/passion for some issue
- are engaged in a shared enterprise through which they both have *and* further develop a repertoire of knowledge, skills and practices
- many forms/heterogeneous group; eg usual forms of community association thro to work clusters etc (Wenger 1998)
- Contested process where knowledge production takes place w/i complex social processes (Johnson 2007); link to questions of heterogeneity and CoP design?

Community

- Not necessarily geographical (spatial) community; many forms/types across and within organizations and space
- Can be face to face or virtual
- Strong links to learning (apprenticeship origins)
- Increasing interest in use in international development; few in aquatics

Shared repertoire

- Includes routines, words, tools, ways of doing things, stories, gestures, symbols, genres, actions or concepts that the community has produced or adopted in the course of its existence and which become part of its practice (Wenger 1998)
- It is as much ways of being in the community as material objects

Uses/forms

- Business moving ahead around "knowledge society"
- international development (just starting)
- Learning and social change
- ???not much info on constellations of CoPs/networking; why so few linkages….are there barriers?

CoPs & Knowledge and its Management Waves in Business

- 1st Wave: business with technology focus
- 2nd Wave: behaviour, culture, tacit knowledge
- 3rd Wave and on going: The Knowledge Economy; CoPs as a practical frame for managing knowledge via learning organizations
- 4th:Knowledge swamping/half life of knowledge, "Connectivism" *(Siemens, 2005)*

Knowledge Gaps

- Limited knowledge examination in general in aquaculture.
- Other forms of knowledge:Traditional knowledge (TEK) studies related to aquaculture seem relatively few; in fact social analysis and social science seems a relative gap. Not clear why this is so.
- Regional disparities in knowledge collection, sharing and management.

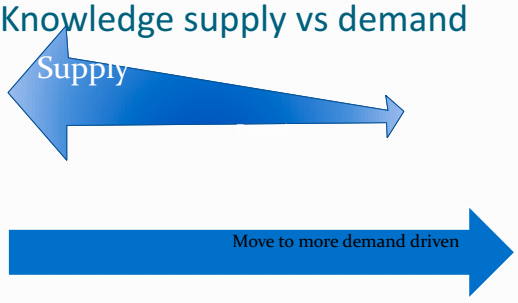
NACA report outline

- Approach
- Methodology
- Observations and success stories
- Lessons learned
- Scaling up and out
- Outcomes impacts and evaluation
- Success and what seems to be working
- Our suggested future directions

Research &Knowledge Production: some supply side estimates

- 42 "aquaculture journals"
http://ag.arizona.edu/azaqua/extension/journals.htm
- 24,000 "science journals" & 1,350,000 articles published annually(2006 data) **and numbers growing very rapidly** Bjork, B-C., Roos, A. and Lauri, M 2009

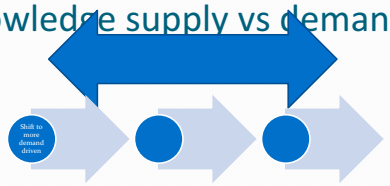
Knowledge supply vs demand



Ideas on future

- Main interest is capacity development but it falls into a number of categories: "different ways of working"
- People: develop new generation, key change agents, players
- Organizations "CoE": NaCSA/MPEDA. as new breed organizations
- Sustainability & Governance: around change Certification and Phuket Consensus
- Change and adaptation: CoPs or other change agents/networks are key

Knowledge supply vs demand



- K supply estimated at
- Half life of this knowledge

Terminology & Concepts Qs

- CoP=networking=spheres of influence?: Debates about use of word community: affinity space,action learning spaces as alternatives (Johnson 2007); epistemic and shadow networks.... in connecting people, trust building, sense making *Olsson et al 2006, Shooting the Rapids E&S 11(1)18*
- Governance-Mgmt: complexity & SS NS Paradigm; phronetics *Jentoft 2006*

Mutual engagement & Legitimacy are key

- Negotiated mutual engagement (participation and partnership) is the driving force (solving problems....)
- Both practicioners and learners have to be accepted as legitimate participants
- Recognition that learning is embedded in practice
- Changes in practice require understanding learning processes

Challenges/Research Issues?

- CoP Stages: history of engagement between actors changes over time and changes within different settings; understanding fluid/shifting boundaries & shared purpose (over time?) and effects on outcomes and processes
- Heterogeneity/contestation are key contributors to learning; understand changes, limits and costs. Negotiating mutual engagement (contested issues; eg life phase-main source of new knowledge)

Knowledge & Communications (K&C)

- K & C & governance: scales & levels, stakeholder participation.....processes; Knowledge sender-receiver issues; eg unease/lack of familiarity of actors (scientists in communication role?...the "multiple caveats" concern).
- Learning & "connectivism" Siemens 2006

Challenges of shared learning

- Tacit knowledge needs to be transmitted (face to face exchanges, study tours, cross-training, twinning, apprenticeships, secondments, imitation, guided learning by doing.....participation, interaction, engagement) *GDN, Stiglitz 1999, Gaventa 1999*

People: eg via lead farmers Mr Murthy

- Expand use of lead farmers in evolving processes; continue to promote sharing of lessons learned via workshops, exchanges, fairs etc; encourage innovation & learn from "positive deviants" among clusters at various scales/levels (state, national & Asia regional).
- Experiment with cluster to market links; eg via producer-processor partnerships in new markets. Review organic scampi case; revisit SYSCO trial and links to similar opportunities
- Learning from other sectors, countries, regions (eg: milk case; VN farmers to India)
- Knowledge access: Explore new technologies (eg Nokia and other ICT options) to lessen some small farmer constraints
- Economics: Seek to better understand economies of scale tradeoffs eg feed purchase
- Farmer constraints: infrastructure support, insurance, traceability & documentation demands more generally

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Theory and Practice of Scaling Up Better Management Practices for Smallholder Farmers

Dr Joanne Millar

Social Researcher, Agricultural Extension
Charles Sturt University

Australian Government
Australian Centre for International Agricultural Research

CHARLES STURT UNIVERSITY

Presentation Outline

- What is scaling up and out?
- How does it work or not work, and why?
- Understanding farmer learning and extension
- Key success factors to scaling up
- Case study from Laos
- Take home messages (digital story)

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What is scaling up and out?

- **Scaling out:** geographical spread of a technology, practice or systems change over time
- **Scaling up:** expanding beneficial initiatives and practices within and across institutions, networks and organisations from local to international levels

The aim of scaling up and scaling out: to enable equitable and sustainable benefits to more people over a wide area by building capacity at all levels.

CGIAR (2000)

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'Scaling up is not just replication (of technologies) but adaptation and learning that is flexible and interactive ... Scaling up is really about people—of communicating options to people, of a balance between introducing options and farmers' ability to adapt to changing contexts.'

(CGIAR 2000).

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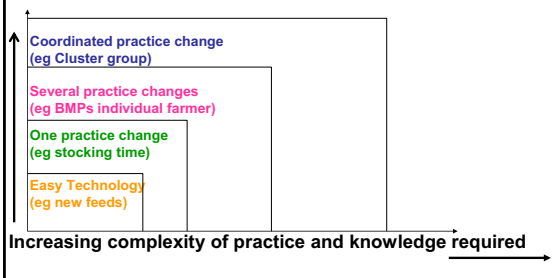
Increasing level of social skills and extension required



Increasing complexity of practice and knowledge required

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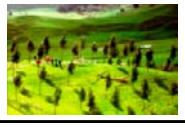
Negative impacts of scaling up



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Understanding farmer learning and extension

- Not adoption! Trialling and adapting!
- Farmers need help to keep learning and improving over long time
- Complex practice change can take many years (5-10 years average)
- Incentives are not enough
- Farmers mostly learn from experience and each other
- Some farmers prefer to watch others first
- Farmers have different ways they like to learn (eg in the field, talking, reading, radio, TV, stories, music)



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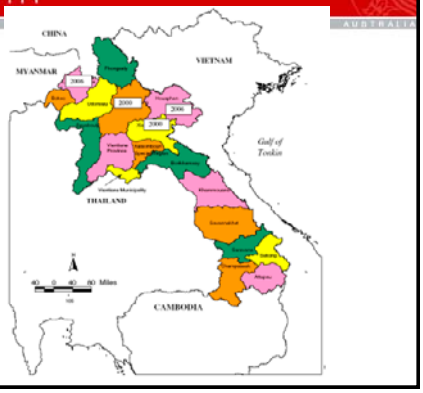
Key Success Factors to Scaling Up

1. Clear and tangible benefits for farmers and target groups
2. Strong leadership and facilitation over the long term
3. Peer to peer learning
4. Support from officials and donors
5. Presence of market drivers
6. Availability of credit and security of land tenure
7. A strong civil society
8. A history of relevant experience in the country

(CGIAR 2000)



CHARLES STURT UNIVERSITY The Forage and Livestock Systems Project



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Scaling Up Livestock BMP in Laos






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Clear and tangible benefits to farmers

- Save time and labour in collecting forages
- Able to keep near the house (security)
- Easier to manage (labour)
- Able to fatten quickly
- Better survival
- More cash income
- Able to buy rice and goods
- Able to diversify
- Children can go to school


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2001	2002	2003-4-5
(18)	(38-2)	(54)
(200 farmers)	(480) (-15)	(860) (-32)
12 district extension staff, 2 provincial staff	(50)	106 villages, 1300 farmers
	26 district staff, 2 provincial staff	

Key Extension Activities

➢Forage Group (within village)	➢Forage Group discuss and plan	➢Large+small animal groups formed and make plans
➢1:1 follow up advice	➢Cross Visits (between villages)	➢Cross Visits across districts and provinces
➢Staff reflection and planning	➢Case Studies	➢Used case studies and champion farmers

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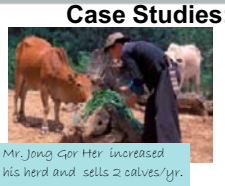
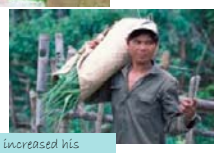
Case Studies: Impacts from forages



Mr. Jong Gor Her increased his herd and sells 2 calves/yr.

Mrs Boua Chan cuts and dries stylo for pigs- from 10 to 30 pigs sold/year

Mr. Neng Lao Lee, now fattens and sells buffalo every 2 mths



Mr. Sing increased his carrying capacity from 3 to 5 cattle

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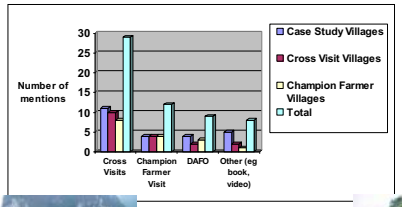
Value of cross visits



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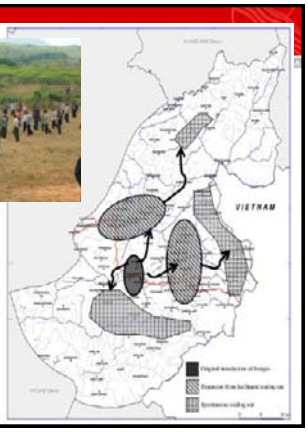

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Importance of staff capacity building

Go to the EASLP website at
www.csu.edu.au/research/international/EASLP/index_easlp.htm

Photo courtesy of CIAT

MOBIAQUA

(www.aqua.mobidrive.in)

BUY, SELL, OR TRADE THRO MOBILE.

SMS SERVICE FOR AQUACULTURE

How Mobi Aqua works :

- A Customer intending to Sell, Buy or Trade Products, Would need to send an sms (based on the keyword)to the number 95662 95662.
- The registered client who receives the message on his mail or his mobile would then contact the customer.
- For example if farmer wants To buy seed he needs to type seed buy and text (if required) and send to 95662 95662.

The hatchery would contact the farmer.

MOBIAQUA

(www.aqua.mobidrive.in)

KEYWORD

SHRIMP BUY : A Processing house, a large outlet interested to buy shrimps, scampi.

SHRIMP SELL : Any Company / person desirous of selling shrimps in India.

FISH BUY : A Processing house, a large outlet interested to buy any type of marine of fresh water fish.

FISH SELL : Any company / person desirous of selling fish (marine or fresh water) fish.

PRODUCT BUY : All aquaculture inputs, like chemicals, ingredients, Probiotics.

PRODUCT SELL : All Aquaculture items, like lime, probiotics, zeolite, nets, feed additive

MOBIAQUA

(www.aqua.mobidrive.in)

KEYWORD

SEED BUY : Any large corporate or farmer desirous of buying shrimp seeds, scampi seeds, marine and freshwater finish seeds, crab etc.

SEED SELL : Any shrimp, scampi, fish hatchery, crab hatchery desirous of selling their seeds .

EQUIPMENT BUY : Any large operator desirous of purchasing equipments like aerators, pumps, blowers, generators etc .,

EQUIPMENT SELL : Manufacturers, distributors, lab equipments, pumps, blowers, aerators etc .,

FEED BUY : A large farm or group of farmers desirous of purchasing feed for fish, shrimp or scampi.

FEED SELL : Manufacturers, distributors, agents if shrimp, scampi and fish feed.

AQUARIUM BUY : Any aquarium operators desirous of buying fishes, products etc.

AQUARIUM SELL : Any aquarium farms, operators etc desirous of selling their fishes, products

MOBIAQUA

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MOBIAQUA

(www.aqua.mobidrive.in)

BUY, SELL, OR TRADE THRO MOBILE.

SMS SERVICE FOR AQUACULTURE

OBIDRIVE - No : 16/1, 48th street, 9th Avenue, Ashok Nagar, Chennai - 600 083.
ONE - 044 2371 7441
X - 044 4203 3441
OBILE - 98400 47134
MAIL - support@mobidrive.in

Codifying BMP for Pangas Culture in India by Translating Existing Management Practices

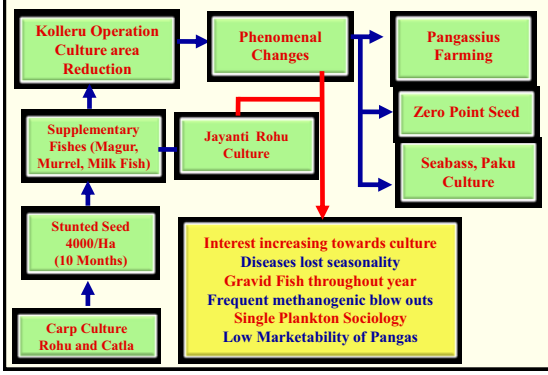
Dr. Ambekar E. Eknath Ph.D.
Principal Investigator and Director
and
Bandla Seshagiri
Co-Investigator

Central Institute of Freshwater Aquaculture
Kausalyaganga, Bhubaneswar 751002, Odisha, India

Freshwater Aquaculture Operational Area in Krishna-Godavari Delta

Area under Fish culture	1,00,000 Ha
Area under Shrimp culture in Freshwater	4,000 Ha
Area under Milk Fish culture	250 Ha
Area under Pangas culture	30,000 Ha
Area under Venamii culture	4,000 Ha
Area under Paku culture	Establishing

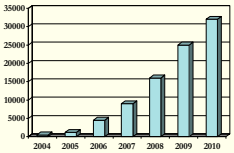
Aquaculture shifts in Krishna Godavari Delta



PANGASIUS FARMING IN ANDHRA PRADESH

- 32000 Ha area under cultivation
- Krishna, West Godavari, Guntur and Nellore
- Culture in Newly constructed Ponds, Low saline ponds, Shift from IMC culture

Increasing Trend in Pangassius culture area



- Monoculture of Pangassius is preferred at stocking rates of 15,000 to 50,000 per hectare

Phenomenal growth in Pangassius Farming

Year	Production MT/ha/ crop	Total production (MT)	Annual Increase %
2008	5-9	1,52,000	
2009	10-12	2,60,000	170
2010	15-60	5,50,000	110

- Pangassius farming in Andhra Pradesh represents the fastest growing single species aquacultre practice in India

Challenges and Sustainability Issues : Existing Management Practices

- Lack of proper pond preparation methods
- Stocking densities range from 25,000 to 50,000 /Ha
- Limited water availability for water exchange
- Water recycling/treatment mechanisms are not familiar
- Disease (HS) outbreaks not uncommon
- Methanogenic problems are frequently encountered
- Limited market centres within India
- Export avenues are not explored
- Value added products and Post Harvest Technologies yet to be standardized

Challenges and Sustainability Issues : Seed

Entirely Dependant on seed import from West Bengal (Bangladesh ?)

Seed Transported under stress and unhygienic conditions

Total requirement of the state as on date is 200 Million Seed

Prone to diseases from seed stage

Seed Transport not technical unlike carp seed

Challenges and Sustainability Issues : Hatcheries

- Hatchery Technology not available in Andhra Pradesh
- Local hatcheries in Govt. and Private sector can be modified
- As a policy matter GoI is encouraging establishment of New hatcheries in Andhra Pradesh
- HRD programmes and OFT and HOTs to Hatchery technicians in breeding technology and Larval rearing mechanism
- Restriction of unauthorized seed entry into Andhra Pradesh through Seed Act, Entry Tax and Excise Duty

Challenges and Sustainability Issues : Cost of Production and Farm Gate Price

- Sharp decline in the Farm Gate Price by more than 100% led to severe crisis
- Estimated Loss to the Farmers Rs. 500 Crores
- Over Production
- Limited Market Centres
- Technology drive by Floating Feed Plants
- Ignorance of the Government Guidelines (Stocking should not exceed 15,000-20,000 per Ha)

Challenges and Sustainability Issues : Better Management Practices

- GoI decision to develop Better Management Practices basing on the Farmers experience and International terms of reference (ToR)
- Technical issues (Sedimentation Ponds, Removal of sludge)
- Input issues (Fertilizers, Probiotics and Feed additives)
- Prophylactic issues (Sanitizers, Pharmaceuticals and chemicals)
- Formation of Matsya Mitra Groups, Internal Controlling Systems as promoted by GoI for crops in Aquaculture and Agriculture systems
- Dynamic document which is subjected to constant improvement till such time it is standardized

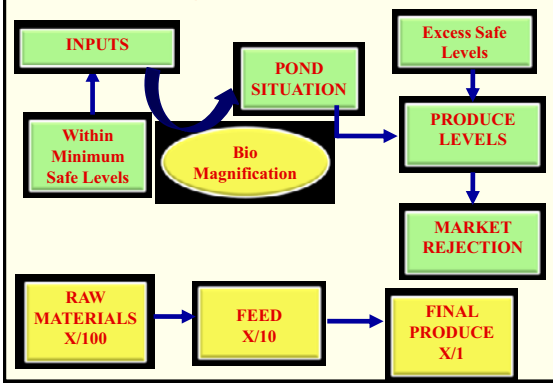
Challenges and Sustainability Issues : Role of R&D Institutes

- GoI approved Pangassius farming in India in 2010
- Initiation of research studies by Central Institutes and Fisheries Universities
- Guidelines of GoI suggest CIFA to develop Hatchery Technology and establishment of hatcheries for commercial seed production of Pangassius
- Research on seed quality standards, Pond environment, epidemiological studies and production dynamics to be initiated

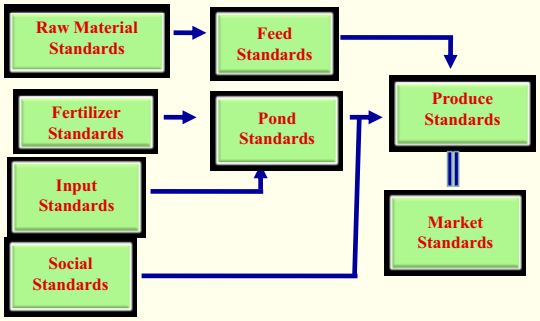
GoIs Initiatives and Future Perspectives

- Total Species Research and Development
- Entrusting CIFA for development of BMPs
- Establishment of Pangasius hatcheries in Andhra Pradesh and Odisha by CIFA
- Development value added products and Post Harvest Technology and Pangasius Food Parks by CIFT and other similar institutes
- Organizing Pangas Food Festivals as frequently as possible

Bio-magnification Phenomenon



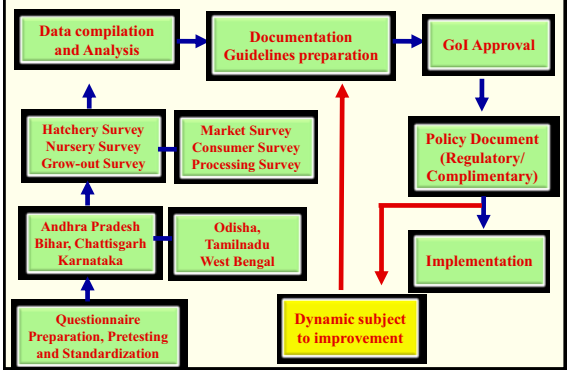
Stratified differential standards



Limiting Factors Unlike in Agriculture

- Bio-Secuirty (Boarder Crops, Trap Crops and Crop Rotation, Inter Cropping)
- Residue Security
- Inadequate Policies
- Irrational Taxes
- Pesticide use in Agriculture
- Antibiotic use in Animal Husbandry

Project Approach



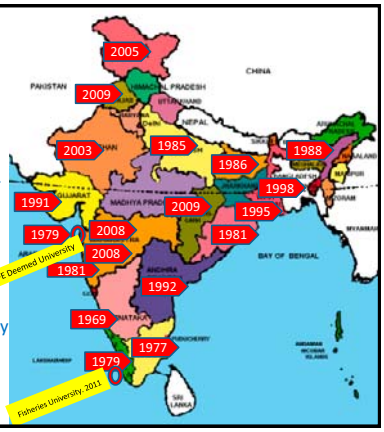
Eat Fish For Health - Grow Fish for Wealth

SCALING UP BMPs IN INDIA – OPPORTUNITIES FOR PROFESSIONAL FISHERIES EDUCATIONAL INSTITUTIONS

M.C.Nandeesha
Fisheries College and Research Institute
Thoothukudi
Tamilnadu

PROFESIONAL FISHERIES COLLEGES IN INDIA

18 Fisheries Colleges & 1 Deemed University



IPM

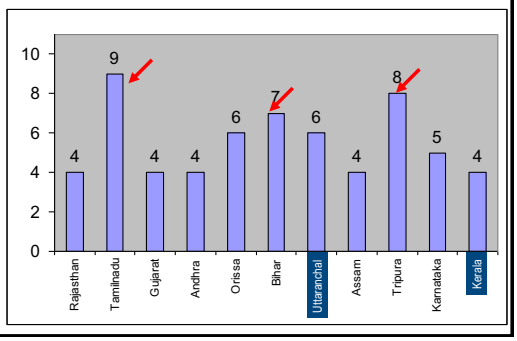
- Farmer field schools
- Seed to seed
- Experiential learning
- Farmers innovation
- Farmers as scientists
- Indonesian experience
- Attitude – can it be changed
- What is the right age

Infrastructure Status

Facilities	Rajasthan	Tamilnadu	Gujarat	Andhra	Orissa	Bihar	Panthagar	Assam	Tripura	Karnataka	Kochi	Total
Adequate faculty position												1
Competent faculty for teaching												9
Updated laboratories												5
computer facilities												6
Library with internet & LAN connectivity												5
Adequate number of classrooms												8
Classrooms are equiped with AV aids												7
Vehicles												7
Adequate budget												4
Adequate support from ICAR												5
Adequate support from state govt.												4
Total	4	9	4	4	6	7	6	4	8	5	4	

Present

Infrastructure in colleges on 11 point scale



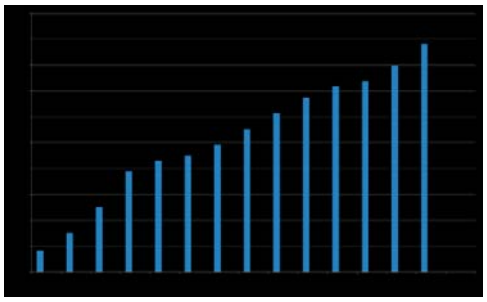
PG Courses Offered

- 9 of the 18 colleges+1 DU offer MFSc program
  - Karnataka
  - Tamil Nadu
  - Kerala
  - Maharashtra
  - CIFE (DU)
  - Orissa
  - Uttranchal
  - Andhra Pradesh
  - West Bengal
- 7 of the 18 colleges +1 DU offer PhD program
  - Karnataka
  - Tamil Nadu
  - Kerala (University)
  - CIFE (Deemed Univ.)
  - Maharashtra
  - Orissa
  - Uttranchal

Masters Degree Specializations

- A total of 16 MFSc specializations are offered in fisheries colleges
- 6 Specializations are offered in more than one college:
  - Aquaculture
  - FRM / Fishery Biology
  - Fish Processing Technology
  - Fisheries Extension
- 10 specializations are offered only in any ONE college.
- Similar specializations in different names
  - Fishery Microbiology / Fish Pathology and Microbiology
  - Fisheries Engineering / Fishery Technology and Engineering
  - Fisheries Environment and Ecology / Fisheries Environment / Aquatic Environment

Professional Fisheries Graduates Supply from State Agricultural Universities



Annual Demand - Supply of Scientific Manpower (Estimates)

Demand	Supply
2300 (Chidambaram, 1985)	440 B.F.Sc (4yr)
8000 (Singh & Sontakki, 1977) - Only for extension activities	110 (2yrM.F.Sc and 3 year Ph.D)
2000 (Ghosh, 1997)	Total = 550 (Annual turnout from Fisheries Colleges and Deemed University)
1950 (Diwan & Suseelan,1997)	

Unified syllabus recommended by the 4th Deans' Committee on Agricultural Education

4 year B.Tech (Fisheries) 8 semesters,135 credits

- **AQUACULTURE (32 Credits)**: PRINCIPLES OF AQUACULTURE, FRESHWATER AQUACULTURE, FISH NUTRITION& FEED TECHNOLOGY, CULTURE OF FISH FOOD ORGANISMS, AQUACULTURE ENGINEERING, ORNAMENTAL FISH PRODUCTION& MANAGEMENT, COASTA AQUACULTURE & MARICULTURE, FINFISH BREEDING & HATCHERYMANAGMENT, SHELLFISH BREEDING 7 HATCHERY MANAGEMENT, FISH DISEASES & MANAGEMENT, BIOTECHNOLOGY & INFORMATICS, GENETICS & BREEDING
- **FISHERIES RESOURCE MANAGEMENT (24 Credits)** : TAXONOMY OF FINFISH, TAXONOMYOF SHELLFISH, ANATOMY OF FINFISH & SHELLFISH, BIOLOGY OF FINFISH & SHELLFISH, INLAND FISHERIES, PHYSIOLOGY OF FINFISH & SHELLFISH, MARINE FISHERIES, FISH POPULATION DYNAMICS & STOCK ASSESSMENT
- **AQUATIC ENVIRONMENT (20 Credits):** METEROLOGY & GEOGRAPHY,SOIL &WATER CHEMISTRY, LIMNOLOGY,OCEANOGRAPHY, MARINE BIOLOGY, AQUATIC ECOLOGY & BIODIVERSITY, AQUATIC POLLUTION & COASTAL ZONE MANAGEMENT
- **HARVEST & POSTHARVST TECHNOLOGY (26 Credits):** FOOD CHEMISTRY& FISHNUTRITION, REFRIGEAION7 EQUIPMENT ENGINEERING, FREEZING TECHNOLOGY, FISHING CRAFT TECHNOLOGY, CANNING & FISH PACKAGING TECHNOLOGY, NAVIGATION& SEAMANSHIP, FISHING & GEAR TECHNOLOGY, FISH PRODUCTS & BYPRODUCTS TECHNOLOGY, FISH MICROBIOLOGY & QUALITY ASSURANCE
- **BASIC SCIENCES AND HUMANITIES (28 Credits)** INFORMATION& COMMUNICATION TECHNOLOGY, STATISTICALMETHODS, FISHERIES ECONOMICS, FISHERIES EXTENSION EDUCATION, FISHERIES ADMINISTRATION & LEGISLATION, DISASTER MANAGEMENT IN FISHERIES, FINANCING & MARKETING MANAGEMENT, ENTREPRENEURSHIP DEVELOPMENT & COMMUNICATION SKILLS,PRINCIPLES OF BIOCHEMISTRY, FUNDAMENTALS OF MICROBIOLOGY, BIOCHEMICAL TECHNIQUES & INSTRUMENTATION
- **ADDITIONAL COURSES (5 Credits):** FISH IMMUNOLOGY, RURAL SOCIOLOGY & PSYCHOLOGY, ELEMENTARY STATISTICS
- **NON CREDIT COURSES:** COMMUNICATIONSKILLS, PHYSICAL EDUCATION / NSS, SWIMMING, FIRST AID TRAINING.

Concerns in manpower planning

Quantity vs. Quality

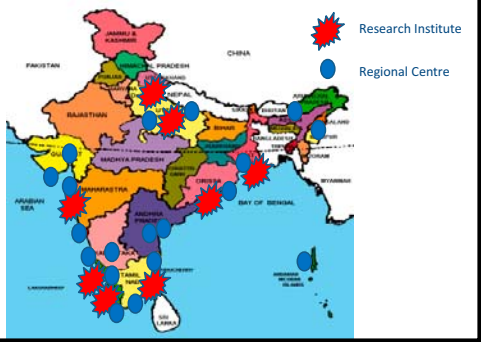
Generalist vs. Specialist

Current needs vs. Future needs

Reactive curricula vs. Proactive curricula

Domestic capability vs. Global competence

Exclusive Fisheries Research Institutions in India



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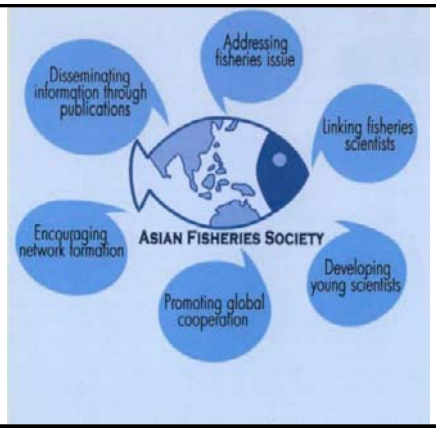


Journal of Asian Fisheries Science

Studies on BMPs in shrimp farming CIBA

CENTRAL INSTITUTE OF BRACKISHWATER AQUACULTURE
CHENNAI- 600028

Study Group: P. Ravichandran, M. Muralidhar, M. Kumaran , C. Gopal, D. Vimala, and A. Panigrahi

OUTLINE

1. Historical background
2. Definitions and role of BMPs
3. Refining of BMPs – CIBA's role
4. Biosecurity to prevent horizontal transmission
5. Researchable issues in BMPs
6. Issues in BMPs
7. Issues in cluster based management of BMPs
8. Scaling up – role of CIBA

HISTORICAL BACKGROUND

CODES OF CONDUCT AND GUIDELINES ARE THE FORERUNNER OF GMPS AND BMPS.

CIBA PROVIDED TECHNICAL BACK STOPPING FOR THE PREPARATAION OF THESE TWO GUIDELINES

MINISTRY'S GUIDELINES

Guidelines for Sustainable Development and Management of Brackishwater Aquaculture issued by the Ministry of Agriculture (Department of Agriculture and Cooperation), Government of India (GoI) in August 1995.

GUIDELINES ISSUED BY AQUACULTURE AUTHORITY

Guidelines – Adopting Improved Technology for Production and Productivity in Traditional and Improved Traditional System of Shrimp Farming – Aquaculture Authority, 1999.

WORLD BANK-NACA- CIBA PROJECT

CASE STUDIES IN INDIA ON THE ROLE OF SMALL FARMER GROUPS AND ASSOCIATIONS IN SUSTAINABLE SHRIMP AQUACULTURE MANAGEMENT (2000-2001)

CONSULTANTS : Prof. M. N. Kutty, WB and Dr. M. Philips, NACA
CIBA: P.Ravichandran, M. Krishnan, M. Kumaran, C.P. Balasubramanian, M. Muralidhar, C. Gopal

Case study location/geographical area:

- Dighirpar, West Bengal – World Bank Project Shrimp farm
- Kandleru creek, Andhra Pradesh – cluster of shrimp farms on an enclosed creek area.
- Brahmagiri, Orissa – ERRP Project shrimp farms.
- Bhiravapalem, Andhra Pradesh – World Bank Project site (if sufficient time is available).

METHODOLOGY: QUESTIONNAIRE SURVEY (n= 125), MEETING WITH STATE OFFICIALS AND STAKEHOLDERS' MEETING -4 (200 PARTICIPANTS)

WORLD BANK-NACA- CIBA PROJECT

OUTCOME OF THE PROJECT

- Social and economic profile of communities involved in small scale shrimp aquaculture in the study area.
- Issues to be addressed in sustainable shrimp aquaculture within the selected farming community.
- Nature of formal and informal associations in the community
- Identification of appropriate management strategies (BMPs) to address the identified issues

CASE STUDY OF SUSTAINABLE SHRIMP FARMING THROUGH INFORMAL FARMER GROUPS IN TAMIL NADU

M. Kumaran et al., 2001. A case of informal shrimp farmers Association and its role in sustainable shrimp farming in Tamil Nadu, India

Farmers Association in Tambikottai-Vadakadu, Pattukottai, Tamil Nadu had been functioning from 1998 with disease free shrimp crops.

160 ha owned by 26 farmers

- Membership compulsory (Strong leadership - community/political)
- Common infrastructure development and maintenance by the Association.
- Strict rules on farming practices including water intake and input procurement
- Compensation to the disease affected farmer, if no harvest was permitted.

CONSTITUTION OF AN EXPERT GROUP BY AQUACULTURE AUTHORITY FOR DEVELOPING GOOD MANAGEMENT PRACTICES (GMP) IN SHRIMP FARMING (2003)

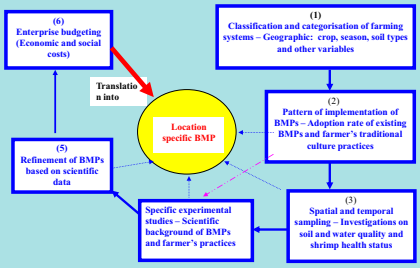
- Under the chairmanship of Prof. M. N. Kutty
- Members included representatives from Ministry, AA, CIBA, MPEDA, SAP, Shrimp hatchery operators and farmers
- Guidelines included as a part of Rule 3, Coastal Aquaculture Authority Act 2005

Better Management Practices

- **BMPs are practices that target:**
  - **Improved shrimp health**
  - **Profitable farming**
  - Environment protection
  - Improved food safety
  - Socio-economic sustainability

CIBA'S ROLE

DEVELOPMENT OF LOCATION SPECIFIC BMPS



Performance details of BMP Demo and Non-demo ponds

Particulars	Cluster 1		Cluster 2		Cluster 3		Cluster 4*	
	Demo ponds ** 5	Non-demo ponds **	Demo ponds	Non-demo ponds	Demo ponds	Non-demo ponds	Demo ponds	Non-demo ponds
Location (Village)	Kundran Valley	Mudaliappan-Kandi	Chinna-thumbur	Paravai	Ullipalem	Salimpalem, Pittalanka, Badevaripalem	Matsyapuri	Matsyapuri
Av. Pond area (ha)	0.5-0.8	0.45-0.7	0.5-0.6	0.5-1	0.45	0.4-0.6	0.45-0.9	0.68-0.9
Stocking density/ha	50,000-55,000	44,000-66,000	50,000-1,20,000	31,000-1,00,000	6,600-26,600	11,100-75,000	Scampi - 11,000 Tiger – 11,760	Scampi – 7,300-8,900 Tiger – 11,100
DOC at the time of first sampling	1-40	56-57	34-95	27-35	6-44	10-150	30-80	7-60
Remarks	All ponds except one (40 count) affected with the disease.	All ponds affected with the disease.	Ponds are harvested with 30-40 counts	Two ponds with loose shell. (30-40 count)	No inputs into pond other than seed.	All ponds harvested with disease. (50-30 count)	Crop successful	One non-demo pond was affected with white spot disease.

* Scampi & tiger single and poly culture
**Demo ponds - Ponds in the cluster following the BMPs suggested by NaCSA
Non-Demo ponds – Ponds not from the cluster but located on the same source water following their own management practices.

Implementation of BMPs

Adoption rate (%) of commonly used BMPs

S.No.	Particulars	Tamil Nadu (n=20)				Andhra Pradesh (n=20)			
		S1		S2		S3		S4	
		C	I	C	I	C	I	C	I
1	Pond drying before summer crop	100	100	100	100	100	100	40*	50*
2	Scrapping of pond bottom	100	100	100	100	100	100	40*	50*
3	Ploughing	100	100	100	100	100	100	100	100
4	Liming	100	100	100	100	100	100	100	100
5	Filtration	100	100	100	100	100	100	100	100
6	Shrimp seed quality	100	100	100	100	80	100	100	100
7	Feeds management (check tray)	100	100	100	100	100	100	100	100
8	Liming during culture	100	100	100	100	100	100	100	100
9	Water exchange	100	100	100	100	100	100	100	100
10	Aeration	50	80	100	100	40	100	30	30
11	Health monitoring	100	100	100	100	100	100	100	100
12	drying after summer crop	100	100	100	100	100	100	60	60

- Chemicals and probiotics were not used in both cluster and non-cluster ponds in AP whereas in TN used to some extent.
- The adoption rate of BMPs was better in summer crop compared to winter crop.
- Cluster farmers at S2 have minimized the water exchange in the ponds and restricted only to topping up of water.
- Few farmers followed application of yeast based fermentation products during culture period.

Investigations on soil and water quality – Temporal and spatial monthly sampling

Parameter		Tamil Nadu				Andhra Pradesh			
		S-1		S-2		S-3		S-4	
		C	I	C	I	C	I	C	I
Water quality	pH	7.03-8.32 (7.75±0.36)	7.03-8.02 (7.68±0.33)	7.19-8.07 (7.62±0.22)	7.42-7.95 (7.74 ±0.20)	6.69-8.02 (7.49 ±0.39)	6.75-8.48 (7.50 ±0.42)	6.83-8.36 (7.56 ±0.36)	6.84-8.14 (7.49 ±0.38)
	Salinity (ppt)	6-29 (17.4±8.88)	5-29 (17.5 ±11.35)	5-27 (14.8±8.46)	7-27 (13.85±7.78)	5-48 (18.19 ±12.79)	7-35 (18.84 ±7.39)	0-18 (6.48 ±5.17)	0-18 (6.42 ±5.96)
	Alkalinity (ppm as CaCO3)	56-372 (114±43)	88-180 (131±33)	64-225 (132±49)	76-230 (147±52)	64-312 (141 ±43)	72-384 (160±55)	56-236 (164 ±49)	52-256 (158.89 ±49)
	Hardness (ppm as CaCO3)	1100-12750 (5956±4056)	700-15250 (5596±5818)	600-13500 (4723±4393)	850-15250 (4363±5134)	300-19350 (5516±5452)	850-11950 (5551±3264)	400-11500 (4309 ±4214)	200-14500 (4894 ±5100)
	Total Ammonia N (ppm)	0.015-1.28 (0.574±0.361)	0.155-0.74 (0.361±0.23)	0.068-0.78 (0.334±0.23)	0.065-0.95 (0.359±0.378)	0.007-1.203 (0.279 ±0.369)	0.0328-0.87 (0.301 ±0.237)	0.034-1.20 (0.4573 ±0.328)	0.028-1.191 (0.482 ±0.334)
	Nitrite N (ppm)	0.002-0.136 (0.047±0.045)	0.0088-0.125 (0.041±0.043)	0.006-0.176 (0.032±0.039)	0.014-0.087 (0.046±0.035)	0.002-0.045 (0.014 ±0.012)	0.004-0.193 (0.048 ±0.057)	0.001-0.532 (0.0534 ±0.112)	0.001-0.346 (0.049 ±0.086)
Soil quality	pH	7.42-7.99 (7.69±0.18)	7.38-7.98 (7.70±0.23)	7.28-8.03 (7.72±0.22)	7.38-8.14 (7.81±1.36)	7.01-8.14 (7.67 ±0.26)	7.13-8.07 (7.69 ±0.24)	7.03-8.14 (7.59 ±0.25)	7.44-7.92 (7.66 ±0.17)
	Electrical conductivity (dS/m)	1.05-6.80 (2.67±1.93)	1.6-3.1 (2.18±0.48)	0.8-7.8 (2.38±1.49)	0.94-4.5 (2.41±1.36)	0.9-37.5 (9.97 ±9.84)	0.092-26.2 (6.81 ±8.21)	0.076-4.2 (1.79 ±0.94)	0.962-4.2 (2.22 ±0.89)
	Organic carbon (%)	0.86-0.9 (6.47±0.26)	0.33-1.08 (0.65±0.24)	0.09-1.14 (0.48±0.28)	0.24-0.66 (0.47±0.16)	0.095-1.15 (0.66 ±0.27)	0.86-1.47 (0.53 ±0.32)	0.12-1.08 (0.54 ±0.25)	0.06-1.02 (0.36 ±0.22)

- Not much difference between cluster and independent farmer's ponds for overall water and soil quality.
- With respect to ammonia values in water, independent farmers ponds were better than the cluster ponds at site 1 in TN and site 3 in AP due to use of aerators and other management practices, whereas it was opposite at site 2 in TN, where cluster ponds were better.
- The values of nitrite a site 4 were generally high due to use of freshwater/low saline water for the culture.

BIOSECURITY AND PREVENTION OF HORIZONTAL TRANSMISSION

S 1

- Many farms that have taken the water during water exchange have been affected with the disease.
- Even the farms at a distance of 3 km on the same water source water were affected with the disease within 10 days.
- Ponds not drawn the water during water exchange were protected from the disease, though the growth was poor.
- The ponds not stocked at the same time and delayed stocking were affected with the disease.
- The disease incidence in cluster ponds of 50-60 DOC at S1-C, coincided with the stocking time of S1-I ponds and immediately affected with the disease.

BIOSECURITY AND PREVENTION OF HORIZONTAL TRANSMISSION

Chinnathumbur

- Few cluster ponds at S2 were affected with the disease through birds within 5 days. The ponds having fencing for the birds protection were not affected with the disease.

BMP meeting 16-18th May 2011

Adoption rate (in %) of bio-security BMPs

Study area (Cluster/Independent farms on the same source water)	S1 (Tamil Nadu)		S2 (Tamil Nadu)		S3 (Andhra Pradesh)		S4 (Andhra Pradesh)	
	2007 Winter crop	2008 summer crop	2007 Winter crop	2008 summer crop	2007 Winter crop	2008 summer crop	2007 Winter crop	2008 summer crop
Reservoir	25	25	45	50	30	40	0	5
Crab fencing	10	25	40	50	0	25	0	20
Fencing for the protection from birds	32.5	32.5	70	70	25	25	20	30
Washing of implements and personnel (at the time of disease occurrence in the area)	0	30	60	80	20	25	15	20

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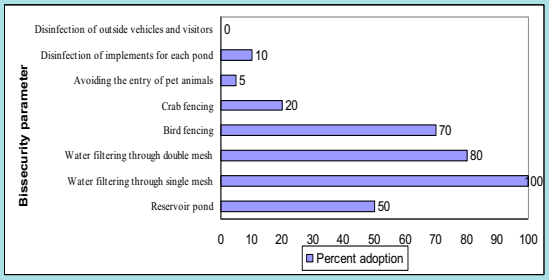
Adoption rate of biosecurity BMPs in the study area (n = 50)



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Efficiency of Chlorination in reservoir ponds

Study area: Six farms (3 with reservoir and 3 without reservoir) on Vellaiyar River in Gramathumedu, Kriyathmathumedu and Chinnathumbur villages of Nagapattinam District, Tamil Nadu.

Production Details of farms with and without reservoir

Particulars	Area (ha)	No. of ponds	Reservoir area (ha)	Bleaching powder application in Reservoir (kg/ha)	Production (t/ha)	
					Summer crop 2009 (Av. Stocking density - 6/m²)	Winter crop 2009 (Av. Stocking density - 8/m²)
Farm 1 (Reservoir)	11	17	1	150	0.914	1.115
Farm 2 (Reservoir)	1.0	2	0.2	250	1.70	1.40
Farm 3 (Reservoir)	1.5	3	0.5	150	0.914	0.980
Farm 4	0.5	1	-	-	1.62	0.720
Farm 5	1.2	3	-	-	1.145	0.945
Farm 6	1.2	3	-	-	1.142	0.850

- All the farms with reservoir pond have shown high production during winter crop but with a slight variation in summer crop.
- Water samples were analysed in all the farms and also from reservoir ponds for physico-chemical parameters, bacteria and *Vibrio* content.

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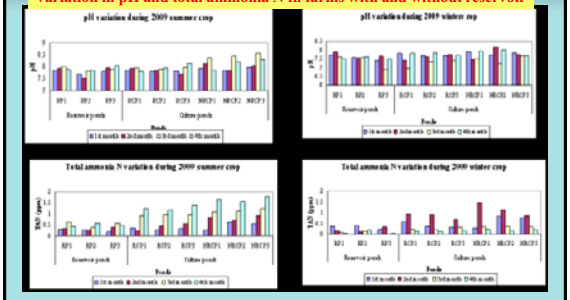
Variation in pH and total ammonia N in farms with and without reservoir



RP – Reservoir pond; RCP – Culture pond with reservoir; NRCP – Culture ponds with no reservoir

- No trend was observed in most of the parameters.
- pH and total ammonia N values were high in culture ponds with non-reservoir and this might have created stress (more un-ionised ammonia N).

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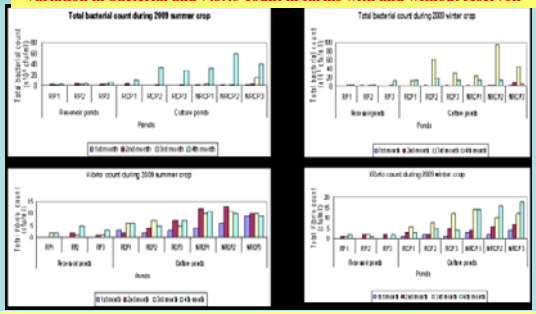
Variation in bacterial and *Vibrio* count in farms with and without reservoir



RP – Reservoir pond; RCP – Culture pond with reservoir; NRCP – Culture ponds with no reservoir

- Variation in *Vibrio* count was conspicuous compared to bacterial count in cultured ponds with reservoir and non-reservoir ponds.

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RESEARCHABLE ISSUES IN BMPS

BMPs are too generic and need to take into consideration the following

- **The site-specific variations in soil and water quality**
- **System specific variations (tide-fed, pump-fed, rain-fed, traditional, improved traditional, extensive, semi-intensive)**
- **Season specific variations (salinity, temperature etc.,)**
- **Required at all levels of shrimp farming operation from collection of broodstock to processing and marketing and also at policy level (iczmp, buffer zone)**

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RESEARCHABLE ISSUES IN BMPS

- BMPs are dynamic. For example biosecurity protocols have become a major requirement for disease free culture which was not originally included in the BMPs addressing disease prevention.
- Pond preparation methods need to be standardized in relation to Soil and water quality criteria (scrapping of top soil, drying, tilling, liming, chlorination and fertilization)
- Monitoring of the efficiency of the BMPs in addressing the issues for which they were advocated in comparison to control ponds where such BMPs are not followed. ('Proof of concept')
- Evaluation of the efficiency of Shrimp farm waste treatment system and development of ***cost effective*** methods.
- Development of BMPs for the entire supply chain.

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ISSUES IN BMPS AND THEIR ADOPTION

- Profit is ultimate aim for adoption of any farm management practice by the farmers. Since BMPs are "voluntary", farmers adopt practices which are of immediate monetary benefit to them.
- BMPs related to improved production and diseae prevention is adopted by most of the farmers depending on the availability of land and capital investment.
- BMPs related to environment safety and food safety are not being adopted since it does not have any immediate benefit to the farmers.
- Such BMPs need to be made "mandatory" to ensure adoption.
- Enforcement of such practices is one of the most difficult task for the Agencies involved
- Shrimp farmers' Attitude towards environment safety and food safety issues

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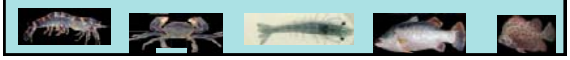
ISSUES IN CLUSTER BASED MANAGEMENT OF BMPS

Factors behind the success of cluster based management (Pattukottai and Thiruvarur model)

- Complete membership of all farms in a particular creek
- Economic deliverability through continued success
- Compulsory technical consultancy
- Community linked social cohesiveness
- Conviction that group action is indispensable
- Accountability
- Payment of compensation and auditing
- Collective and compulsory compliance of BMPs
- Dynamic leadership
- Equality of all the members



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ISSUES IN CLUSTER BASED MANAGEMENT OF BMPS

- Overcrowding of farms is one of the main issue and the need for common reservoir and waste water treatment systems is generally not fulfilled
- Not all the farms in the cluster follow the BMPs and biosecurity protocol strictly and failure of one farm may affect all the farms seriously.
- The need for informal or formal groups – not clearly shown
- Resource poor small farmers are not able to invest additional funds required for adopting BMPs for environment and food safety issues.
- BMPs are not standards. **So certification for cluster based BMP adoption is not possible.**
- **Certification should be for some other specific standards and as per the requirements of the certifying agency cluster based certification could be obtained**

SCALING UP – CIBA'S ROLE

- Refining of BMPs for site and system specific conditions.
- Capacity building and creation of awareness among the different stakeholders
- Policy level facilitation of integration of Aquaculture in ICZMP (Lease policies, regularisation of illegal occupations etc.,)
- Identifying mechanisms for total extension support to farmers

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Annex 6

Group 1-
Scaling up of Shrimp BMP program at National level

A. Issues and constraints

1. **Scientific evaluation /documentation & success/failure stories of decade of progress of implementation of BMPs in India also look into other BMP programmes**
2. **BMP Project sustainability – e.g FAO TCP in Andhra Pradesh - plan for ensuring continuity of BMPs**
3. **As incentives cannot go on forever, Agriclinic/Aquaclubs financed by NABARD need to be promoted**
4. **Contract farming – Surat, Gujarat- BMPs followed; Orissa with exporters tie up**

A. Issues and constraints (contd)

5. Awareness & capacity building programmes on concepts of BMP and cluster approach
6. Finance- grass root level changes /buy back arrangements
7. Consider market issues – Domestic and Export- (Cluster certification issues) markets
8. Brand value creation for BMP shrimps sans certification & BMP- social responsibility
9. Labeling issues of BMP shrimps- rigid standards may put off people from adopting BMPs
10. Farmers perception/understanding on BMPs and Feedback system and adoption – (Research issue)

A. Issues and constraints (contd)

11. New area development– BMPs should start from site selection/planning -policy level changes for Maharashtra, Gujarat
12. Policy changes for supporting clusters/ farmers group as Joint Liability Groups- financial institution's need of collateral security - Change society's structure or influence bank policies
13. The potential of BMPs is to improve production and thereby socio economic improvement including employment generation
14. Location specific BMPs to be developed-needs more research efforts. Some areas may have limitations/constraints in BMP adoption as per geographical conditions. Society's can make minor modifications as required, which could be scientifically evaluated and accepted (research issue)
15. Documentation of modifications done by societies may lay the foundation for further development for refinement of BMPs

A. Issues and constraints (contd)

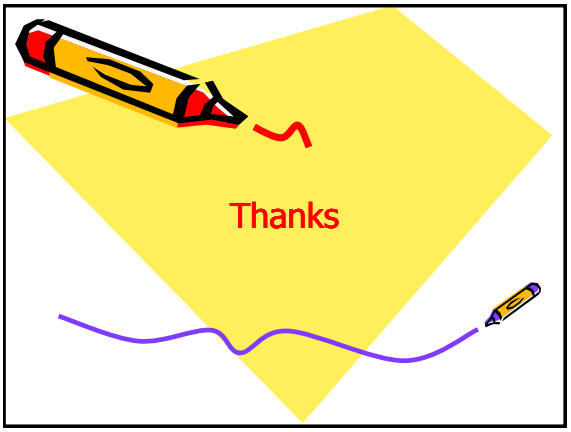
16. Non compliance to BMPs by some members of a society/ society as a whole – develop mechanisms for compliance monitoring and tackling.
17. Current list of BMPs need to be refined with advances in science- Revision of BMPs (research/development issue)
18. Federation of clusters and creation of own infrastructure like hatcheries/ advanced lab facilities by federation- Documentation of success of Thambikottai Maravangadu and Jambavonadai cluster of Tamil Nadu

B. Institutional constraints

1. Lack of human resources in development departments
2. NacSA need to be strengthened with increased financial support mechanisms & human resources
3. Linkages with Institutions /other agencies should be developed - like ATMA- single window delivery of extension services
4. Policy arrangements on financial assistance/ institutional support for infrastructure of drainage systems, electricity, roads, etc in areas of BMP shrimp clusters
5. Collaboration between Institutions/ exchange mechanisms to understand BMPs & clusters and lessons learnt- with a definite time frame like a review/appraisal workshop or meeting after the harvest of a crop with participation of all stakeholders ; annual national workshop, etc

B. Institutional constraints (contd)

6. Compensating farmers whose crop failed within society and for the society.
7. Studies on successful clusters for replication; dealing with noncompliant farmers- intervention by influential leaders/ strong internal control systems/ compensation or incentive mechanisms linked with adherence to BMPs.
8. Governance issues related to land use & lease holds operators – problems in getting CAA registration/license & becoming members of clusters and difficult to make them adhere to cluster's directions. Reclassification of land use
9. Crop insurance for BMP shrimp clusters
10. User conflicts-mix up of species and systems – brackishwater species in freshwater systems etc to be regulated. E.g. Water User Associations in irrigation systems in India


Thanks

Strategies for Scaling up of BMP Programme at National Level

Group - II

Themes

1. Policy and Planning
2. Extension Education and Capacity Building
3. Research linkage to BMPs
4. Market linkage to BMPs adoption and scaling out

Policy and Planning

- "BMP based shrimp farming" instead of 'improved extensive" (CAA).
- Coastal Management Plan should focus more on shrimp farming.
- Include aquaculture in the water budgeting of the command area to improve the BMPs. (Govt.)
- Shared vision/conviction on adoption of BMPs among the institutions and key stakeholders and collective effort at every one's level.
- Local administration need to be involved in locating the site for shrimp farming – land and water quality (coordination among the departments).
- If Govt/common land is there in the cluster – permit for common facilities like reservoir and ETPs. (DoF)

- Identify location specific BMPs and demonstrate them and disseminate for wider adoption. Identify the key problem of the location and concentrate those BMPs. (Research, DoF)
- Adoption of BMPs across the value chain – hatchery, feeds & inputs, farming, post harvest etc. should be enforced. BMPs for feed also.
- Regulate the farmers who do not follow the BMPs in the cluster by freezing their farming – de-registration of farms who do not comply to BMPs. (CAA)
- Collective planning in every cluster– as per the carrying capacity and water availability & quality - fix the stocking density in a cluster (DoF)

Extension Education and Capacity Building

•Educating the farmers on BMPs – awareness and training – more farmer to farmer visits

•Success stories of BMPs and dissemination to other areas to convince

•Scaling out through – NGOs institutions Develop video films on location language about BMPs – success stories – given to farmer groups. (NACSA)

•'National Mission on BMP'- empower the extension machinery – organizational, manpower, budget, content and extension orientation. (Govt. policy). Extension approach and methodology – success stories video, vernacular language, exposure visits.

•Gender role in shrimp farming and capacity building of women in farming activities and BMP scaling up.

•Capacity building of diagnostics – PCR labs, need more ring tests among the hatchery PCR labs. Consistency and better interpretation of results.

- Aquaculture should be linked to KVKs for wider dissemination of BMPs to the farmers.
- Use visual meia - Flow charts on BMPs in local language to give better understanding on the if you adopt and if you don't adopt what will happen in each step of the shrimp farming (Research institutions).
- ICT – video films, use of mobile technology, separate website on BMPs for wider dissemination (Research). Use role plays, dramas,
- Educate the next generation through web site

Research linkage to BMPs

- Involve the research institutes (antibiotics, environment parameters) – to research on BMPs institutional partnership
- Need more monitoring to develop location specific BMPs (Research institutions, NaCSA)
- Evidence based information on how and why there has been success (all factors), – analysis of data existing with NaCSA and documented by the researchers to refine the BMPs periodically (Research institutions).
- Document and analyze the farmer innovations to refine the BMPs (Research)
- Probiotic based shrimp seed production need to be adopted at the hatchery level – research institutions should come up with concrete technology on this (Research institutions). Need more research on use of probiotics in seed production. Hatcheries need to be educated to adopt SOPs –

Market linkage to BMPs adoption and scaling out

- Govt should include shrimp support price for shrimp like rice, wheat (Govt)
- Provide incentive in the price of the shrimp produced by adopting BMPs – Incentive for common facilities like electricity, source canal dredging, etc (MPEDA)
- Market linkage need to be created for the clusters – market intelligence (domestic/export) need to be given to clusters – Buyers/processors need to be involved in the functioning of clusters and adoption of BMPs. Include specific certification standards may be part of the market intelligence. Farmers need to be informed about what is happening in the abroad to have their own strategy (MPEDA).
- Focus on market demand on different sizes and plan accordingly the stocking program
- Contract farming - credit assistance, insurance

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List of Selected Partner/NACA BMP projects

1. Shrimp BMP work in India (MPEDA/NACA/NaCSA project from 2000 till present and ongoing)

- 2000-risk factor study and identification of key risk factors
- 2001-development of interventions in the form of BMPs to address the key risks, use of FAO/NACA/WWF international shrimp principles to develop BMPs
- 2002-pilot demonstrations to validate the BMPs, contextualization of BMPs (location and area specific)
- 2003-expansion of the demonstrations to village and creek level; introduction of cluster/group approach in promoting BMPs
- 2004-2007: supporting farmer group formation and cluster management approach to promote BMP adoption

- 2007-Instutitonalization of the project and establishment of NaCSA as an outreach organization of MPEDA to promote BMP adoption through group/cluster approach
- 2008-2010 and ongoing: consolidation of the program and expansion of the program to national level. At present NaCSA is working with over 10,000 farmers in 5 states of India and presently there are over 450 farmer groups
- 2008-2010 and ongoing: supporting clusters to access markets through certification programs. development of cluster certification guidelines
- several presentations and peer reviewed publications (7) from the above work available.

2. Shrimp BMP work in Aceh under the ADB/ETESP project (2005 till June 2009)

- using India lessons, development and promotion of BMPs to support rehabilitation of shrimp farming in Tsunami affected Aceh. Worked in close collaboration with FAO, OISCA, WFC, ACIAR and other partners
- established farmer groups, one Aceh aquaculture communication centre (AACC) and 4 Aceh Livelihoods service centres (ALSCs).
- farmer groups established around ALSCs
- concept of BMP and cluster management approach being widely promoted
- ADB reports and couple of publications available

3. Marine finfish BMP work for key commodities (2005-ongoing)

- Marine finfish network established under the ACIAR project and the network is presently used to develop and validate BMPs for key aquaculture commodities mainly targetting small scale farmers

4. Mekong catfish BMPs (2008-2010) with funding support from AusAid

- Risk factor study
- development of interventions as BMPs
- stakeholder workshops and refinement of BMPs
- pilot testing of BMPs
- promotion of farmer groups and cluster management concept
- several publications available

5. Capacity building of small scale farmers to access markets-supported by ASEAN Foundation (2007-2010)

- 5 key commodities in 5 ASEAN countries (shrimp-Vietnam, Tilapia-Thailand, snakehead-Cambodia, seaweeds-Philippines and marine finfish-Indonesia)
- training needs assessment
- implementation of TOT (training of trainers program)
- development of commodity specific BMP manuals
- conduct of national farmer training programs
- supporting farmer group formation and promotion of BMPs

6. WWF supported project (2008-2010)

contribution to shrimp standards development dialogues-perspectives of small scale farmers

supporting small scale farmers in India and Thailand to comply with WWF shrimp standards and access better markets

7. ACIAR supported project: strengthening regional mechanisms to maximize benefits to small scale farmers adopting BMPs (2007-2009)

- In operation in 4 countries
- supporting networking and communication amongst key BMP project implementers in the Asia Pacific region

8. EU-7 framework project (April 2010-2013)

NACA coordinating 2 work packages dealing with BMPs

To promote wider adoption of BMPs for key aquaculture commodities in NACA member countries, thereby ensuring sustainability of this important food production sector and improving the livelihoods of the stakeholders. This package will have two facets:

  - Commodities for which BMPs are already developed and being implemented (e.g. shrimp) where the focus will be to assess the impacts of BMP implementation and developing strategies for scaling up at the national and regional levels, and
  - Commodities for which BMPs are presently being developed (e.g. striped catfish, marine finfish) where the focus will be on validation and implementation of BMPs.