

Shrimp GAP and BMP in Vietnam: Policy, current status and future direction

Abstract:

This paper summarizes the resources (natural, climatic, environmental and physical) available for shrimp culture in Vietnam and details the different shrimp production systems currently practiced for grow-out in Vietnam. Data are given on the rapid increase in Vietnamese shrimp production over the last decade and the progress and current status of implementing Good Aquaculture Practices (GAP) and Better Management Practices (BMP) in Vietnam is also compared and contrasted with other countries in the Asian region. Issues and constraints to the implementation of GAP and BMP in Vietnam are discussed. Specific recommendations are given for future direction to facilitate GAP and BMP in Vietnam and specific activities to be initiated by government institutions, donor funded initiatives and the private sector to promote shrimp GAP and BMP implementation in Vietnam.

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1. The importance of the fishery sector:

The fishery sector of Vietnam contributes significantly to rural household food security, nutrition, livelihoods, income generation and employment.

Food consumption surveys estimate that aquatic products provide 50% of the dietary protein intake of the Vietnamese people. Per capita consumption of aquatic products has increased from 13.2 kg in 1990 to 18.7 kg in 2000 and 19.4 kg in 2002. However there are large geographical differences in estimated fish consumption in Vietnam from as low as 12 kg capita⁻¹ year⁻¹ in the north, an average of

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30 kg capita⁻¹ year⁻¹ in the Mekong Delta region in the south, up to as high as 60 kg capita⁻¹ year⁻¹ in Long An province, according to a Mekong River Commission survey.

Approximately four million people are employed full time in the Vietnamese fisheries sector, while an estimated 8.5 million people (10% of the total population) derive their main proportion of their income either directly or indirectly from the fishery sector. In addition at least 10 million Vietnamese capture aquatic products at least seasonally from marine, and inland fisheries, and rice fields.

The fishery sector is a significant and fast growing component of the Vietnamese economy. The fishery sector contributes approximately 4% of GDP, 8% of export value and 10% of total employment.

From 2005 to 2008 Vietnam's aquatic production volume increased from 3,465,900 to 4,574,9003 tonnes (See **Table 1** below). The Mekong Delta region provinces alone, contributed 50% of the total aquatic production. In 2007 Vietnamese aquaculture production at 2,085,200 tonnes was greater for the first time, than marine capture fisheries at 2,063,800 tonnes. The fishery sector is the fourth most important export sector, after oil, garments and footwear. Fishery sector exports have expanded at an average growth rate of 18% annually for the last decade. In 2008 the fishery sector of Vietnam exported 1,236,289 tonnes of aquatic products with a value of US\$ 4.509 billion. This was a 51% increase in volume and a 61% increase in value from 2005 when 626,991 tonnes of aquatic products, worth USD 2.738 billion were exported³.

From 2005 to 2007 the total area of land in Vietnam used for aquaculture area increased 5.8% from 952,600 to 1,008,000 hectares. **Table 2** below shows that in 2008 marine and brackish water aquaculture systems comprised 702,500 hectares (70%) and freshwater aquaculture systems 305,500 hectares (30%). Of the 702,500 hectares of marine and brackish water 625,600 hectares, equivalent to 89% was used for the culture of shrimp. Only 4,700 hectares, equivalent to 1.5% of the total 305,500 hectares of freshwater area under culture in Vietnam in 2008, was used for prawn (freshwater shrimp) culture.

Between 2004 and 2008 total Vietnamese aquaculture production increased by 102% from 1,202,500 to 2,430,944 tonnes, of which 381,728 tonnes (15.7%) were cultured shrimp (See Table 3). The Mekong River delta provinces (see Figure 1) currently produce approximately 74% of the total aquaculture production of Vietnam.

³ Production figures in this report is primarily from MARD's Centre for Information and Statistics (CIS) which collates the data from provincial authority reports. Export statistics are from VASEP publications.

FIGURE 1. MAP OF VIETNAM AND ITS 63 PROVINCES (NAMES OF COASTAL PROVINCES ARE SHOWN ONLY).

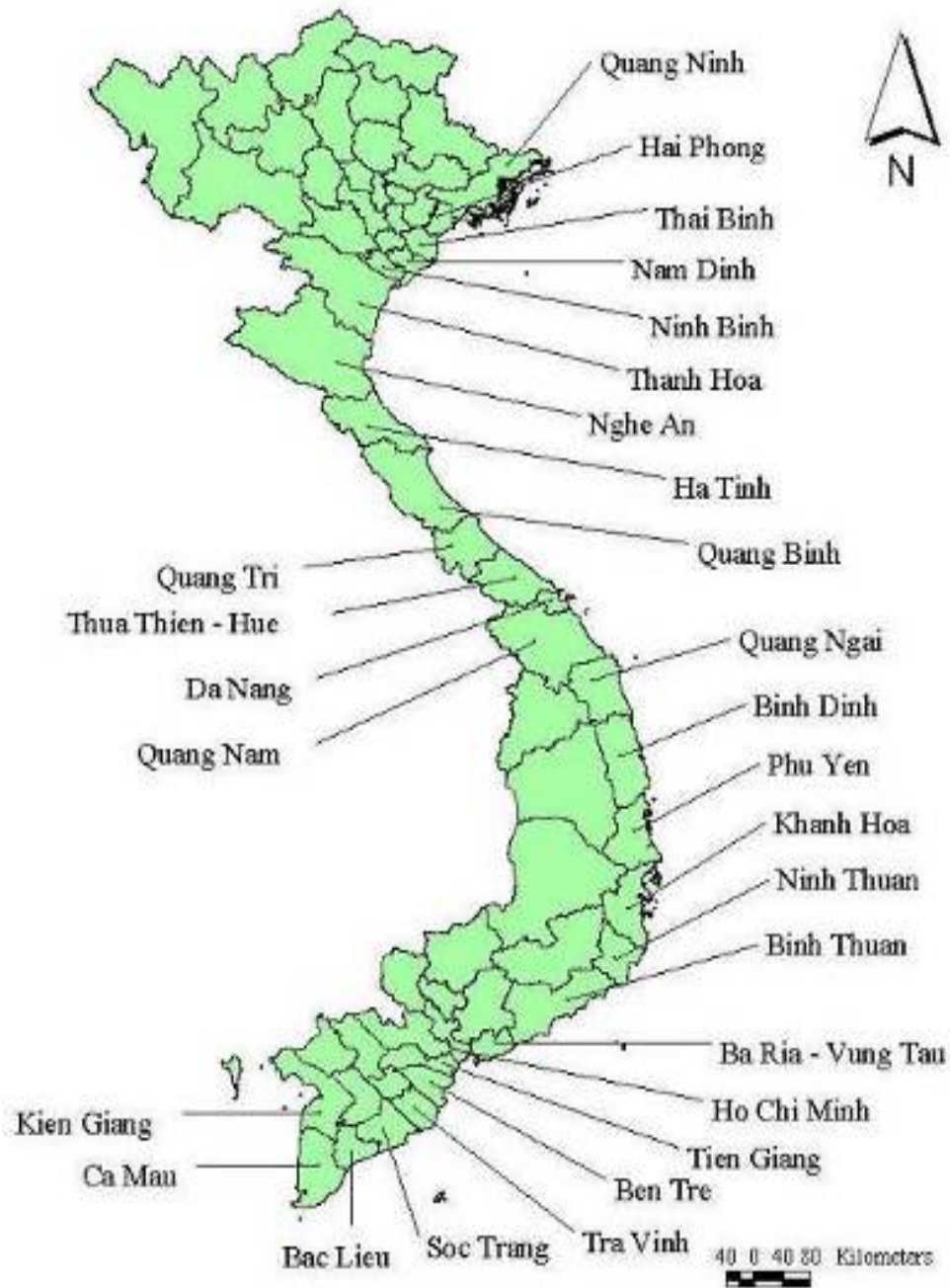


Table 4 shows that since 2000, exports of Vietnamese aquatic products to international markets has been dominated by cultured species, particularly black tiger shrimp (*Penaeus monodon*) and white leg shrimp (*Penaeus vannamei*), which are the most important brackish water species grown in Vietnam, both in volume and value terms. In 2008, Vietnam exported a total of 191,553 tonnes of shrimp products, worth US\$ 1.625 billion (VIFEP), making shrimp the most valuable aquatic product exported by Vietnam. This was an 18.8% increase in volume and 7.7% in value over 2007. **Table 5** shows that the main export market for Vietnamese shrimp is Japan which took 31% by volume, and 31% by value in 2008. The USA (24% by volume, 29% by value) and the EU (17% by volume and 14% by value) were the next biggest buyers of Vietnamese shrimp products in 2008. However the Japanese market has been fairly static in recent years, while the EU and Russia markets are important expanding markets which offer significant potential for further growth.

2. Shrimp production systems in Vietnam

Monoculture of the giant freshwater prawn (*Macrobrachium rosenbergii*) in rice fields is extensively practiced in the Mekong Delta region of Vietnam. The production in 2008 was estimated to be approximately 10,000 tonnes, most of which was consumed on the domestic market.

Between 2004 and 2008 *Penaeid* shrimp production increased from 281,800 to 381,728 tonnes (see **Table 3** below). **Table 6** below shows that the top five shrimp producing provinces of Vietnam in 2008 in order of importance in 2008 were Ca Mau (93,920 tonnes), Bac Lieu (63,984 tonnes), Soc Trang (54,250 tonnes), Kien Giang (28,601 tonnes) and Ben Tre (23,950 tonnes). All five of the aforementioned provinces are in the Mekong Delta region of Vietnam (see **Figure 1** above). The Mekong Delta provinces accounted for 82% of Vietnam's total cultured shrimp production in 2008.

Table 7 below summarizes some the main geographic and climatic characteristics of Vietnam. The Mekong Delta region of Vietnam has temperatures typically ranging from 20 – 35⁰ Celsius, which enables farmers to culture two crops of shrimp annually. Ca Mau province, which has over 250,000 hectares of shrimp ponds and is the country's principal shrimp producing province, specializes in black tiger shrimp production. In the northern region of Vietnam there is a distinct cold season from November to March, with temperatures ranging from 9 – 39⁰ Celsius, so farmers are usually only able to culture one crop of shrimp annually.

The Ministry of Fisheries (MOFI), which in 2007 was integrated into the Ministry of Agriculture and Rural Development (MARD), classifies shrimp culture systems in Vietnam into three different levels based on inputs and production intensity:

- Extensive black tiger shrimp production up to 0.5 tonnes hectare⁻¹ year⁻¹ – no pond inputs are supplied and there is only tidal water exchange;
- Semi intensive, 1-2 tonnes hectare⁻¹ year⁻¹;
- Intensive black tiger shrimp production at 5-6 tonnes hectare⁻¹ year⁻¹; and,
- Intensive white leg shrimp production at 15-20 tonnes hectare⁻¹ year⁻¹.

Currently extensive pond shrimp production systems still produce the major proportion of cultured shrimp and black tiger shrimp in particular. 90% of cultured shrimp pond area is still extensive. However the trend, which is actively being promoted by Government institutions and provincial authorities and their extension staff, is towards increasing intensification of shrimp production systems.

Unlike most neighbouring Asian countries which are now producing primarily white leg shrimp, production of black tiger shrimp still accounts for 80-90% of total cultured shrimp production in Vietnam. This is primarily because the main shrimp production areas are in the south, where water temperatures allow two crops annually, and because extensive production systems still predominate. As a result Vietnam is one of few countries still producing large sized, high quality, black tiger shrimp, and it has few direct competitors except India and Bangladesh. However, this situation may be about to change, as discussed below.

The exotic South American White leg shrimp (*Penaeus vannamei*) was first introduced into Vietnam between 1997 – 2000. Since then the production of white leg shrimp has increased rapidly, mainly in the central and northern provinces of Vietnam. Reasons for the increasing popularity of white leg shrimp include 1) ease of breeding and domestication, 2) ease of high density culture, 3) lower protein feed requirement than black tiger shrimp, 4) tolerance of low water temperatures and 5) tolerance of poorer water quality than black tiger shrimp.

After the introduction of white leg shrimp, its culture in the Mekong Delta of Vietnam was controlled strictly by the Ministry of Fisheries. However on January 25, 2008 the culture of white leg shrimp in the Mekong Delta region of Vietnam was approved⁴ if conducted in intensive pond systems in safe aquaculture zone areas approved by provincial authorities. As a result there has been a dramatic increase in the production of white leg shrimp production in the Mekong Delta region of Vietnam, which production figures have yet to capture.

There are some constraints to the shrimp culture industry in Vietnam including the negative impacts of a rapid, large-scale and often unplanned increase in brackish water shrimp production ponds, even up to 10 km from the coast, which is causing salinization of groundwater in some areas, silting up of inland areas, and a reduction in mangrove forest areas. Today the black tiger shrimp industry in Vietnam is still reliant on the capture of live gravid female broodstock for the production of post-larvae for stocking. Increased demand for, and a decline in the availability of, gravid female black tiger shrimp broodstock has pushed the price of a single gravid female up to as much as US\$ 600 each. In addition there are concerns that the introduction of white leg shrimp into the Mekong River delta may result in populations of white leg shrimp becoming established in the wild as a result of escapees, and also that diseases may be transferred between white leg shrimp and black tiger shrimp, especially white-spot syndrome virus (WSSV).

⁴ Ministerial directive 228/CT-BNN-NTTS dated Jan 25, 2008.

3. Development of shrimp GAP and BMP in Vietnam

In addition to the above constraints the major importers of shrimp and particularly the EU, the USA and Japan, are now demanding more stringent requirements for traceability (a ‘farm to fork’ approach), standard certification for example GLOBALGAP-shrimp, and environmental protection and social responsibility. The Dutch retailers’ federation and Heiploeg BV, the largest shrimp importer in Europe have both announced that they will require all suppliers to be GLOBALGAP certified by January 2011. At the 2008 GLOBALGAP meeting retailer members were united in calling for all aquaculture suppliers to be GLOBALGAP certified by 2012. Walmart, the world’s largest retailer, is backing the Global Aquaculture Alliance and wants all its fisheries suppliers to be the Best Aquaculture Practices (BAP) certified.

Increasingly stringent market requirements are driving the Vietnamese aquaculture sector towards the implementation of GAP⁵/BMP⁶ for the production of a whole range of commodities including shrimp and marine fish. This presents 2 major challenges:

1. How to encourage hundreds of thousands of aquaculture producers in Vietnam to implement GAP/BMP; and
2. How to involve small-scale rural producers with few resources in this process, so they are not excluded from the social benefits of aquaculture.

If Vietnam is to maintain or even increase its export shrimp market share it needs to be proactive and responsive to the demands of importing countries.

To date the National Fisheries Quality Assurance Veterinary Directorate (NAFIQAVED of the Ministry of Fisheries) has been the most active institution promoting GAP in Vietnam through pilot studies, training and extension activities. With initial support from United States Department of Agriculture, in 2003 NAFIQAVED initiated a GAP Pilot Project (here after called the project) aimed at improving the quality of Vietnamese shrimp, as well as promoting environmental and social sustainability.

Taking into account experiences from other countries in the region on methodologies for the implementation of the FAO Code of Conduct for Responsible Fisheries (CCRF), including the Thailand GAP/COC system, and the existing shrimp aquaculture infrastructure in Vietnam, NAFIQAVED decided that better management practices (BMP) were more appropriate for small-scale production units with few resources, including investment finance, at their disposal, while good aquaculture practices (GAP) and Code of Conduct for Responsible Aquaculture (COC) were more

⁵ The international interpretation of Good Aquaculture Practices (GAP) are farm management practices or guidelines prepared to minimize the potential for farm-raised fishery products to be contaminated with pathogens, chemicals, filth, and unapproved or misused animal drugs. GAP’s can be defined as those practices necessary to produce high-quality products conforming to food safety requirements.

⁶ The international interpretation of Better Management Practices (BMP) are management principles for aquaculture development that may be used as a basis for a COC. The term “better” is preferred rather than “best” because aquaculture practices are continually improving.

appropriate for intensive operations, which require more investment in infrastructure and running costs.

In 2004, the project was expanded with MOFI funds to include a total of five coastal provinces (Thanh Hoa, Khanh Hoa, Bac Lieu, Soc Trang, Ca Mau provinces), although activities were also conducted in other provinces less intensively. Similar to certification activities conducted in Thailand, the Vietnamese scheme was initially based on two levels: (1) a GAP level focused on food safety and environmental protection; and (2) a COC level addressing the quality of the inputs to the farming system and social responsibility. Materials/lectures on GAP Standards were developed by NAFIQAVED in consultation with a range of national and international shrimp experts and with representatives of the shrimp industry.

BMP/GAP/COC promotion activities with shrimp were also conducted by NAFIQAVED with SUMA support from 2004 in various provinces of Vietnam:

- In Thanh Hoa and Khanh Hoa provinces, the project was promoted at 1 medium scale farm with a total area of 18 ha and one cooperative with a total area of 106 ha.
- In Soc Trang, Bac Lieu and Ca Mau, the project was promoted by 3 enterprises. There were 20 small-scale intensive black tiger shrimp production units within 2 farm areas of 23 ha, and 37 ha respectively and 1 shrimp farming zone with a total area of 74 ha in Ben Tre conducting GAP and which were initially certified.
- SUMA promoted GAP for small scale farms in Nghe An and Ha Tinh provinces and hatcheries in Ca Mau and Khanh Hoa provinces during 2005.

The promotion activities conducted under these various projects have included:

- Training on GAP/COC for farmers and local staff for checking and inspection.
- Equipment support for supporting institutions, for example PCR and Elisa equipment was provided to Ben Tre DOFI (now DARD).
- Pilot projects for GAP certification in 2006 for 8 enterprises and farming zones in Ben Tre, Soc Trang, Bac Lieu, and Ca Mau provinces.

In 2006, with support from NORAD and the Fisheries Law project, NAFIQAVED started pilot projects on the implementation of Good Aquaculture Practices in collaboration with farmer groups in Tra Vinh (farmer group organization) and in shrimp hatcheries in Binh Thuan (shrimp hatchery seed production). The purpose of “The application of Good Aquaculture Practices (GAP) to shrimp farming project was to test group approaches to implementation of GAP and certification. NAFIQAVED data from 2006 suggest productivity of GAP produced shrimp was 20 – 30% higher than non-GAP farms.

In 2007, shrimp and non-shrimp GAP promotion activities were expanded by NAFIQAVED to 15 provinces, and especially provinces close to the five original pilot provinces. These provinces included Ninh Binh, Thanh Hoa expansion, Thua Thien Hue, Ninh Thuan, Binh Thuan, Tien Giang,

Tra Vinh, Kien Giang, Long An, Dong Thap, An Giang, Ca Mau expansion, Bac Lieu expansion, Soc Trang expansion, Dien Bien and Bac Giang provinces. This was mainly through the delivery of training and dissemination of GAP extension materials. The total number of farms involved was reported by NAFIQAD as 160 households in 2007, with a total of 650 trainees in Ca Mau, Soc Trang, and Bac Lieu provinces.

NAFIQVED gave GAP training courses to 175 farmers from three shrimp farming zones, and a further 120 farmers received GAP training to replicate GAP in other shrimp farming zones of Ben Tre and Kien Giang provinces.

In September 2006, NAFIQAVED and regional centers No 4, 5, and 6 field-tested and drafted Technical Standards of Good Aquaculture Practices for intensive and semi-intensive black tiger shrimp and produced a second draft of a Regulation for inspection, certification for safety shrimp farms and safe shrimp products on chemicals and antibiotics residues. These activities resulted in the 3 farms meeting the requirements for certification for safe shrimp farming, but they were not certified because of the lack of a legislative framework. NAFIQAVED and subsequently NAFIQAD worked on the regulations for certification that were approved by MARD in April 2008.

Under the Support to Brackish water and Marine Aquaculture (SUMA) component of the Fishery Sector Programme Support Phase I, an agreement⁷ was signed on November 2003 for SUMA and the Network of Aquaculture Centre in the Asia-Pacific (NACA) to work collaboratively. Work, in close collaboration with NAFIQAVED, was conducted in Quang Ninh, Khanh Hoa, Nghe An, Ha Tinh and Ca Mau provinces. Key SUMA/NACA aquatic animal health (AAH) activities included development and dissemination of extension materials on good aquaculture practices (GAP) and better management practices (BMP) for all stages in the shrimp production chain, i.e. broodstock traders, hatcheries, seed traders and grow-out farmers. Topics covered included shrimp seed quality, pond preparation, pond management and health management. BMP extension materials and a shrimp BMP booklet were developed in collaboration with NAFIQAVED, the Research Institutes for Aquaculture (RIA), Nha Trang Fisheries University (now Nha Trang University) and Departments of Fisheries (DOFI) and was widely disseminated. BMPs developed by SUMA/NACA were also included into draft standards developed for the production of organic shrimp seed with the Swiss Import Promotion Programme (SIPPO).

SUMA/NACA supported the implementation of BMP in 6 hatcheries and it resulted in both increased seed production and higher prices for post larvae than from non-BMP hatcheries.

In addition BMP implementation was supported by SUMA/NACA in 7 pilot farming communities (655 direct beneficiaries). Farmers who stocked seed from BMP hatcheries following disease testing were 7 times more likely to make a profit than farmers who stocked post larvae from non BMP hatcheries, without disease testing.

⁷ SUMA Output 7 *Reducing risks of aquatic animal disease outbreak.*

Also under the SUMA component of FSPS I, several key documents relevant shrimp GAP and BMP were produced. These include:

- 1) Sustainable Coastal Aquaculture Planning (SCAP) Guidelines (finalised by SUDA Component of FSPS II, approved and issued by MOFI, 2007);
- 2) Environmental Impact Assessment (EIA) Guidelines (finalised by SUDA Component of FSPS II, approved and issued by MOFI, 2007);
- 3) Manual to Assess Environment Capacity and Carrying Capacity of Coastal Ecosystems in Vietnam; and
- 4) Brackish water and marine aquaculture development plans for several districts.

Following national consultancy input under the Sustainable Development of Aquaculture (SUDA) component of FSPS II, activity 1.2.4.2 (2006) *Finalise Vietnamese version of guidelines for sustainable coastal aquaculture planning and submit for approval* the SCAP was revised and submitted to MOFI for final approval. The SCAP received MOFI approval on 03/04/07 (447/QD-BTS) and a letter has since been distributed to all coastal provinces of Vietnam, notifying them of the SCAP approval by MOFI.

Similarly under SUDA activity 1.4.1 (2006) *Completion of the Vietnamese version of the Environmental Impact Assessment guidelines and submit for approval* national consultancy input was used to revise the EIA guidelines for coastal provinces. The EIA guidelines for coastal provinces received MOFI approval on 29/01/07 (133-QD-BTS) and since these are covered by MONRE circular 08/2006/TT-BTNMT, the EIA guidelines for coastal provinces have since been distributed to all coastal provinces of Vietnam for immediate implementation.

The Ministry of Fisheries promulgated Decision # 06/2006/QĐ-BTS to adopt administrative regulation entitled “Regulations on safe shrimp culture farms and zones”, on April 10th, 2006.

Regulation on inspection and recognition of sustainable-oriented aquaculture” which was promulgated by MARD **56/2008/QĐ-BNN** on 29/4/08 describes the aquaculture certification scheme.

NAFIQAVED has already produced draft technical standards⁸ and guidelines⁹ for semi-intensive and intensive shrimp culture, but as yet has not drafted technical standards and guidelines for extensive and improved extensive shrimp culture.

⁸ Standards are rules, regulations, or procedure specifying characteristics that must be met by a product. More and more, standards are expressed as measurements that can be used to show overall performance (results) toward achieving specific principles and criteria. Standards are used to assess the level of performance to measure whether a product can be certified.

The SUDA component of FSPS II funded NACA to provide regional consultancy for SUDA activity 3.5.5 (2007) on the *Promotion of BMP, GAP and COC, for shrimp aquaculture systems*. The SUDA component of FSPS II funded AquaMarine Limited to provide international consultancy for SUDA activity 1.4.3 (2008) on the *Start development of safe aquaculture areas in 2 communes*.

Following the merger of MOFI and MARD in August, 2007, and the related Law on Standards and Technical Regulations under the National Assembly that took effect on January 1, 2007 (*according to the Law, "Standard" means regulation on technical characteristics and management requirements used as standard for classifying and appraising products, goods, services, processes, the environment and other objects in socio-economic activities with a view to improving the quality and effectiveness of these objects. A standard shall be published in a written form by an organization for voluntary application; "Technical Regulation" means regulation on the limits of technical characteristics and management requirements which products, goods, services, processes, the environment and other objects in socio-economic activities must comply with in order to ensure safety, hygiene and human health; to protect animals, plants and the environment; to safeguard national interests and security, consumer interests and other essential requirements*), MARD has in response decided to make various changes in the existing standards for shrimp aquaculture.

There are a total of 75 existing sectoral standards for aquaculture. The MARD plans to delete twenty seven of the existing sectoral standards and will review and revise the remaining thirty nine sectoral standards making them into national standards. In addition MARD will review and revise nine sectoral standards which will be issued as technical regulations. Of these, the five sectoral standards for brackishwater or marine shrimp farming listed below will issued by MARD as compulsory technical regulations:

1. **28 TCN 92:2005** – Marine shrimp hatchery - technical and sanitary requirements.
2. **28 TCN 99-1996**- Marine shrimp – Black Tiger Brood stock – Technical requirements.
3. **28 TCN 100-1996** – Marine shrimp – Vanamei Broodstock – Technical requirements.
4. **28 TCN 190- 2004** – Shrimps culturing farm – Conditions for ensuring food hygiene and safety.
5. **28 TCN 191:2004** Shrimps culturing area – Conditions for ensuring food hygiene and safety.

⁹ Guidelines are documents that provide guidance on implementation of Codes of Conduct, Codes of Practice, certification principles, criteria and standards etc.

In addition to the work on conversion (not revision) of sectoral/technical standards, MARD is drafting a regulation for inspection, certification of sustainable aquaculture (revised) and regulations of culture conditions for aquatic species for certification, involving three levels of standards – BMP, GAP and COC¹⁰. These documents, which is ‘work in progress’ that should be finished and gazette by the end of 2009 is intended to provide the certification standards.

4. Current status of GAP, BMP and COC implementation:

The three main international standards currently being used for shrimp farming in Vietnam are:

- Global Aquaculture Alliance “Best Aquaculture Practices” (BAP) standards, with certification by the US-based Aquaculture Certification Council (ACC). This standard is being applied in the 74 ha shrimp farming zone by Ben Tre Forest and Fisheries Company in Ben Tre province.
- Naturland certified organic shrimp are produced from Forestry 184 enterprise in Ca Mau province.
- GLOBALGAP – EurepGAP standards have been applied as pilot programmes for fresh fruit and vegetables, and are now expanding to aquaculture products. Some pilot testing of GLOBALGAP shrimp standards is being conducted. Stakeholders involved in the GLOBALGAP programmes in Vietnam include the Department of Health, DARD, Bureau of Standards and Quality Measurement, Department of Trade, and Department of Science and Technology at Provincial levels.

Assuming a farmer’s pond is within an area with a separate water supply and drainage system, then at the very least, to meet BMP, GAP and COC the farmer will have to make additional investments in improved pond preparation procedures to kill potential disease pathogens, to rid ponds of potential disease carriers like crabs, to screen water intake and to treat water to ensure the pond is disease free, and also to pay extra for disease free and specifically especially white-spot syndrome virus (WSSV) certified post larvae. According to data from NAFIQAVED (2006), the added cost for GAP produced shrimp from a pilot in Ben Tre province was VND 2,352 kilogram⁻¹, consisting mainly of chemical and antibiotic residues analysis of the shrimp. However this study did not provide the additional costs for infrastructure investment for ponds sited in areas without separate water supply and drainage systems. Additional studies in GAP application in Khanh Hoa province (NAFIQAVED 2006) found the increased cost for GAP shrimp production was VND 13,700 VND kg⁻¹ when water supply and drainage systems were installed, training and analytical costs were included. This was equivalent to 20% of shrimp production cost at that time, and a much more substantial investment.

As a result, few farmers believe the additional returns will cover their additional costs and so there are very few certified shrimp production units, with only limited production area and production in Vietnam. To date an estimated 1,500 farmers have had GAP training courses (430 farmers – Ben Tre, 650 farmers from Ca Mau, Soc Trang, and Bac Lieu provinces in 2007, and 415 farmers from other

¹⁰ Draft Decision of “Regulation of conditions for Black Tiger shrimp and White Leg shrimp sustainable aquaculture”.

provinces). NAFIQAVED which became NAFIQAD, with the merger of MOFI and MARD in 2007, estimate around 7,000 farmers have registered to apply for GAP, of which 720 hectares of production area are currently under the registration process. Most of these farms are large-scale producers, rather than small-scale farms that dominate both farm numbers and production in Vietnam. A further 1,198 farmers have also been certified as organic shrimp farmers with a total of 4,000 hectares of production area. However these numbers are extremely small compared and cover only 1.1% of the total of 369,094 hectares of shrimp pond area in 2008.

Experience thus far has shown that when working with clusters of small-scale shrimp producer groups effective management and group cohesion are a much bigger challenge than technical issues to the implementation of shrimp GAP, BMP and COC.

To date, after 6 years of ad hoc and piecemeal piloting of GAP, BMP and COC, and drafting of GAP, BMP and COC legislative documents, funded with both Government of Vietnam and donor agency support, Vietnam still does not have a comprehensive easily understood set of standards, technical regulations etc. with which to successfully promote wide-scale implementation of GAP, BMP or COC.

The draft set of GAP, BMP and COC “standards” prepared by NAFIQAVED under MOFI, are now being reviewed for development as formal Technical Regulations by the DAQ, under MARD. However the interpretation of GAP, BMP and COC within the document developed by NAFIQAVED is not aligned with internationally accepted definitions for GAP, BMP and COC. If not changed this may lead to misunderstandings, confusion and mistrust in any certification schemes later promoted in Vietnam.

5. Future Direction for GAP, BMP and COC implementation:

1. All relevant MARD departments including DAQ, the Directorate of Processing and Trade (DPT), the Department of Animal Health (DAH), NAFIQAD and the National Centre for Agriculture, Forestry and Fisheries Extension (NCAFE) need to have a series of structured meetings to agree upon and produce an overall strategy for the implementation of GAP, BMP and COC, leading ultimately to GLOBALGAP and ACC standards for the EU and USA markets respectively. The final strategy requires MARD approval.
2. The present GAP requirements are too stringent and complicated for the small-scale farming sector and should be simplified down to key messages and practices, whilst retaining priority emphasis on hygienic and safe food, i.e. thereby bringing Vietnamese GAP more into alignment with international definitions of GAP.
3. DAQ, of MARD needs to demonstrate strong leadership and to lead a participatory process to develop and approve simple standards for certification which can easily be measured and which are more fully aligned to international accepted definitions of GAP, BMP and COC, for black tiger shrimp and white leg shrimp aquaculture in as short a time as possible.

4. Thereafter MARD and its key departments including DAQ, DPT, DAH, NAFIQAD and NCAFE and provincial DARD institutions and staff, with donor support including Danida, FSPS II, JICA, USAID, and the EU need to make a concerted effort to promote GAP, BMP and COC nationwide in Vietnam.
5. The GAP, BMP and COC developed in Vietnam should be benchmarked against GLOBALGAP for the EU market and ACC for the US market.
6. This will require that farmers be made aware of the reasons for following GAP, BMP and COC practices, that they understand the benefits from doing so and that the process is made as simple and as transparent as possible. Developing good websites and the establishment of a One-stop-shop will aid in facilitating this process.
7. GAP and BMP should be promoted through a widespread training and awareness raising programme, with SUDA working closely in supporting NCAFE to develop “Training of Trainer” (TOT) approaches and extension materials, covering simple food safety, environmental management and socially-oriented approaches (e.g. farmer groups).
8. Market access for GAP, BMP and COC farms should be promoted by building links between farmers, processors and large-scale retailers, to provide additional incentives for farmers to adopt better farming practices, and to develop longer-term partnerships and contracts.
9. Greater public and/or private sector investment in the provision of water quality, residue monitoring (pesticides and heavy metals), PCR laboratories for shrimp virus testing, and ELISA for veterinary drug residue analysis (chloramphenicol and nitrofurans) should be promoted.
10. Carefully designed pilot projects should also be implemented to test whether the group certification approach is feasible under local conditions and legislation. The findings of the pilots will thereafter be used to develop a strategy for bringing small-scale farmers into shrimp certification schemes or to identify alternative approaches for small-scale shrimp farmers.

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TABLE 1. TOTAL FISHERY PRODUCTION, BY YEAR

Unit: Tonnes

	Tổng số Total	Chia ra - Of which	
		Khai thác Catch	Nuôi trồng Aquaculture
2005	3,465,900	1,987,900	1,478,000
2006	3,720,500	2,026,600	1,693,900
2007	4,149,000	2,063,800	2,085,200
2008	4,574,900	2,143,900	2,430,944

Source: FiCEN/CIS.

TABLE 2. AQUACULTURE WATER SURFACE AREA

Unit: Hectares.

		2005	2006	2007
Tổng số - Total		952,600	976,500	1,008,000
Diện tích nước mặn, lợ Area of sea and brackish water		661,000	683,000	702,500
	Water for fish	10,100	17,200	26,400
	Water for shrimp	528,300	612,100	625,600
	Water for mixed and other aquatic products	1,22,200	53,400	50,200
	Water for breeding	400	300	300
Diện tích nước ngọt – Area of fresh water		291,600	293,500	305,500
	Water for fish	281,700	283,800	295,700
	Water for shrimp	4,900	4,600	4,700
	Water for mixed and other aquatic products	1,600	1,700	1,600
	Water for breeding	3,500	3,400	3,500

Source: FiCEN/CIS.

TABLE 3. CULTURED FISH AND SHRIMP PRODUCTION

Unit: Tonnes

	Total	Fish	Shrimp	Others
2004	1,202,500	761,600	281,800	
2005	1,478,000	971,200	327,200	
2006	1,693,900	1,157,100	354,500	
2007	2,085,200	1,494,800	386,600	
2008	2,430,944	1,828,068	381,728	221,148

Source: FiCEN/CIS.

TABLE 4. VOLUME AND VALUE OF EXPORTS, BY AQUATIC PRODUCT CATEGORY

	Volume (tonnes)	Value (US\$ 1,000)	Volume (tonnes)	Value (US\$ 1,000)	Volume (tonnes)	Value (US\$ 1,000)	Volume (tonnes)	Value (US\$ 1,000)	Volume % change 08/05	Value % change 08/05	Export category %, by volume 2008	Export category %, by value 2009
	2005		2006		2007		2008					
Frozen shrimp	159,191	1,371,600	158,447	1,460,586	161,267	1,508,959	191,553	1,625,707	83%	84%	15%	36%
Pangasius	140,707	328,153	286,600	736,872	386,870	979,036	640,829	1,453,098	22%	23%	52%	32%
Tunas					52,842	150,939	52,818	188,694			4%	4%
Other marine species	134,026	359,547	158,109	408,214	117,555	336,784	131,656	414,087	102%	87%	11%	9%
Frozen cephalopods	61,944	182,300	69,763	222,190	82,199	282,356	86,704	318,235	71%	57%	7%	7%
Dried seafood	35,910	130,400	35,479	142,195	35,366	146,947	32,676	145,762	110%	89%	3%	3%
Other products	95,214	367,200	103,112	378,234	88,848	357,645	100,107	363,835	95%	101%	8%	8%
Total	626,992	2,739,200	811,510	3,348,291	924,947	3,762,666	1,236,343	4,509,418	51%	61%	100%	100%

Source: Published VASEP statistics.

TABLE 5. SHRIMP EXPORTS 2005-2008, BY MARKET

	Volume (tonnes)	Value (US\$ 1,000)	Volume (tonnes)	Value (US\$ 1,000)	Volume (tonnes)	Value (US\$ 1,000)	Volume (tonnes)	Value (US\$ 1,000)	Volume % change 08/05	Value % change 08/05	Market share, volume 2008	Market share, value 2009
	2005		2006		2007		2008					
Japan	66,852	549,696	66,164	581,195	56,366	492,201	58,533	498,914	114%	110%	31%	31%
USA	41,443	434,079	35,414	422,921	40,425	481,693	46,629	467,279	89%	93%	24%	29%
EU	17,721	125,149	21,265	154,302	21,663	158,727	32,727	234,231	54%	53%	17%	14%
S Korea	3,263	20,929	5,131	37,558	10,388	81,710	12,187	84,997	27%	25%	6%	5%
Canada	4,898	47,632	5,279	55,621	5,672	65,430	7,205	72,225	68%	66%	4%	4%
Australia	7,313	56,161	8,584	76,743	6,270	60,367	7,654	70,615	96%	80%	4%	4%
Taiwan	7,195	52,743	5,818	39,392	7,702	54,146	10,132	65,684	71%	80%	5%	4%
China/Hong Kong	3,967	28,998	4,275	34,496	4,584	36,790	6,050	48,920	66%	59%	3%	3%
ASEAN	3,159	27,669	2,414	22,058	3,748	35,709	3,463	26,997	91%	102%	2%	2%
Switzerland	1,453	14,065	1,452	15,178	2,118	22,844	2,029	19,855	72%	71%	1%	1%
others	1,928	14,436	2,650	21,123	2,333	19,342	4,944	35,990	39%	40%	3%	2%
Total	159,192	1,371,557	158,446	1,460,587	161,269	1,508,959	191,553	1,625,707	83%	84%	100%	100%

Source: Published VASEP statistics.

TABLE 6. CULTURED SHRIMP PRODUCTION BY PROVINCE

Unit: Tonnes.

Province	2005	2006	2007	2008
Cả nước - Whole country	327,194	354,514	386,596	381,728
Đồng bằng sông Hồng - <i>Red River Delta</i>	8,283	8,774	9,904	8,479
Hà Nội	21	31	31	31
Vĩnh Phúc	6	2	6	2
Bắc Ninh	221	199	188	208
Hà Tây	4	8	11	-
Hải Dương	17	18	13	13
Hải Phòng	2,266	2,800	3,250	2,790
Hung Yên	269	192	200	250
Thái Bình	2,201	2,490	2,727	2,278
Hà Nam	129	162	180	208
Nam Định	1,904	2,008	2,243	1,900
Ninh Bình	1,245	864	1,055	799
Đông Bắc - <i>North East</i>	5,294	5,596	6,214	6,597
Hà Giang	4	4	4	6
Cao Bằng		1	6	5
Bắc Kạn	6	7	7	8
Tuyên Quang	13	12	13	14
Lào Cai	2	4	5	5
Yên Bái	6	6	6	7
Thái Nguyên	49	49	48	49
Lạng Sơn	4	3	3	4
Quảng Ninh	5,038	5,325	5,972	6,287
Phú Thọ	174	185	150	212
Tây Bắc - <i>North West</i>	56	84	88	67
Điện Biên	9	11	12	17
Lai Châu	7	7	8	4
Sơn La	11	26	27	1
Hòa Bình	30	40	41	45
Bắc Trung Bộ - <i>North Central Coast</i>	12,505	13,036	13,185	12,936
Thanh Hóa	2,208	1,934	2,142	1,965
Nghệ An	1,180	1,750	1,976	2,078
Hà Tĩnh	2,517	2,213	1,793	1,315
Quảng Bình	1,585	1,661	1,979	2,081
Quảng Trị	1,653	1,617	1,636	1,847
Thừa Thiên - Huế	3,362	3,861	3,659	3,651
Duyên hải Nam Trung Bộ -	16,315	18,843	19,996	26,772

Province	2005	2006	2007	2008
<i>South Central Coast</i>				
Đà Nẵng	505	203	256	272
Quảng Nam	3,151	2,930	2,950	5,127
Quảng Ngãi	3,005	4,160	4,950	5,690
Bình Định	1,709	2,310	2,599	4,000
Phú Yên	2,615	2,872	3,170	4,114
Khánh Hòa	5,330	6,368	6,071	7,569
Tây Nguyên - Central Highlands	64	62	57	71
Đắk Lắk	55	54	48	50
Đắk Nông	7	5	5	5
Lâm Đồng	2	3	4	16
<i>Đông Nam Bộ - South East</i>	18,917	21,283	21,717	22,800
Ninh Thuận	1,995	3,575	5,412	5,821
Bình Thuận	2,496	1,760	2,756	3,810
Tây Ninh	3	5	2	1
Bình Dương	2	18	19	1
Đồng Nai	1,531	1,262	1,496	2,326
Bà Rịa - Vũng Tàu	3,702	3,981	2,452	2,220
TP. Hồ Chí Minh	9,188	10,682	9,580	8,621
<i>Đồng bằng sông Cửu Long - Mekong River Delta</i>	265,761	286,837	315,435	304,006
Long An	6,014	7,190	7,085	5,683
Tiền Giang	7,998	8,273	9,381	10,118
Bến Tre	25,090	23,446	25,166	23,950
Trà Vinh	19,688	24,142	27,337	20,890
Vĩnh Long	47	34	34	26
Đồng Tháp	103	402	834	1,397
An Giang	698	815	917	1,080
Kiên Giang	18,461	22,847	27,843	28,601
Cần Thơ	75	124	133	81
Hậu Giang	34	25	33	27
Sóc Trăng	42,837	52,696	58,045	54,250
Bạc Liêu	63,616	58,400	63,751	63,984
Cà Mau	81,100	88,443	94,876	93,920

Source: FiCEN/CIS.

TABLE 7. GEOGRAPHIC AND CLIMATIC SUMMARY FOR VIETNAM

Parameter	Value for Vietnam
Land area	330,000 km ²
Coastline	3,444 km
EEZ	1,000,000 km ²
Climate:	North: 9-39 ⁰ Celsius South 20-35 ⁰ Celsius
Rainfall:	2,200 mm year ⁻¹
Ponds	160,000 hectares
Lakes and reservoirs	340,000 hectares
Rice fields	580,000 hectares
Coastal zone: mangrove forest, bays, lagoons, inter-tidal area	700,000 hectares
Rivers and canals	1000's of km in length
Major river systems	Mekong River, Red River and many smaller river systems