International Principles for Responsible Shrimp Farming

Draft Principles
for consideration by the Governing Council
of the Network of Aquaculture Centres in Asia-Pacific

February 2006

Section I: Background and Purpose

Introduction

Aquaculture production and trade in aquaculture products continues to grow at a fast pace, responding to increased global demand for fish, shrimp, mollusk and other aquatic products. In 2003, aquaculture production reached 55 million tonnes, with a farm gate value of $57 billion. Developing countries dominate aquaculture production and trade, contributing over 80% of production and 50% to the value of internationally traded aquatic products. Aquaculture is making an increasingly significant contribution to the global seafood trade, as well as to domestic consumption, and will continue to grow due to stagnating wild capture fisheries supplies.

With increasing volume of production, trade and consumption there is a concurrent and increasing demand for improved sustainability, social acceptability, and human health safety from the aquaculture sector. This is not only affecting the international trading environment and pressurizing producers to focus on production methods to address those issues, but also challenges producing countries to develop and implement adequate and appropriate policies and institutions that provide a conducive environment for responsible production and trade. To assist in achieve these objectives, the members of the Food and the Agriculture Organization of United Nations (FAO) in 1995 adopted the Code of Conduct for Responsible Fisheries, providing a framework for responsible development of aquaculture and fisheries.

Shrimp Farming

Shrimp farming has been one of the fastest growing aquaculture sectors in Asia and Latin America, and recently Africa, but also one of the most controversial. Rapid expansion of shrimp farming has generated income for many developing countries, as well as developed countries, but has been accompanied by rising concerns over environmental and social impacts of development. Major issues raised include the ecological consequences of conversion of natural ecosystem, particularly mangroves, for construction of shrimp ponds, the effects such as salination of groundwater and agricultural land, use of fish meal in shrimp diets, pollution of coastal waters due to pond effluents, biodiversity issues arising from collection of wild seed, and social conflicts in some coastal areas. The sustainability of shrimp aquaculture has been questioned by some in view of self-pollution in shrimp growing areas, combined with the introduction of pathogens, leading to major shrimp disease outbreaks, and significant economic losses in producing countries.

Due to the strong global interest in shrimp farming and the issues that have arisen from its development, a Consortium Program involving the World Bank, the Network of Aquaculture Centres in Asia-Pacific (NACA), the World Wildlife Fund (WWF), and the Food and Agriculture Organization of the United Nations (FAO) was initiated in 1999 to analyze and share experiences

on the environmental and social impacts, and management of sustainable shrimp farming. The development of the work program for the Consortium benefited from recommendations of the FAO Bangkok Technical Consultation on Policies for Sustainable Shrimp Culture (FAO, 1998), a World Bank review on Shrimp Farming and the Environment (World Bank, 1998) and an April 1999 meeting on shrimp aquaculture management practices hosted by NACA and WWF in Bangkok, Thailand. The FAO Sub-Committee on Aquaculture of the Committee on Fisheries in its meeting in Trondheim, Norway 2003 agreed that a set of "core" management principles should be developed to support sustainable development of aquaculture, with a priority to the shrimp farming requiring improved management. The Consortium was requested to undertake this responsibility. During this meeting UNEP/GPA expressed its interest to join this initiative and subsequently the Consortium formalized the partnership through signing a collaborative agreement with UNEP/GPA. This recommendation and partnership provides the basis for development of an internationally accepted set of principles that can be widely adopted.

Process

The *International Principles for Responsible Shrimp Farming* presented are synthesized from the outcome of the studies and consultations conducted by the Consortium, involving a wide range of stakeholders, from government, private and non-government organisations. The consultations include an international workshop on shrimp farming hosted by the Government of China, co-organized by FAO and NACA in Beijing during November 2004 and at the World Aquaculture Society (WAS) Conference hosted by the Government of Indonesia during May 2005. The *International Principles* have also been widely distributed for comment and inputs and available to the general public for comment through the internet since early 2005. The principles will presented to the NACA Governing Council and the FAO Committee on Fisheries, Sub-Committee on Aquaculture (COFI-AQ) the mandated global inter-governmental forum, for approval and agreement in mid to late 2006.

Purpose

The purpose of these *International Principles* as mandated by the members of FAO and NACA, is to provide principles for management of shrimp aquaculture that provide guidance in implementation of the FAO Code of Conduct for Responsible Fisheries in the shrimp aquaculture sector.

The *International Principles* presented here consider the technical, environmental, social and economic issues associated with shrimp farming and provide a basis for industry and government management to improve the overall sustainability of shrimp farming at national, regional and global levels. Each principle contains a justification, and some specific criteria to support their

implementation. The criteria may be used by States and the private sector for development of more specific Codes of Practice (CoP) or better management practices for shrimp farming adapted to local farming conditions, and social, economic and environmental contexts.

The *International Principles* provide the basis upon which stakeholders can collaborate for a more sustainable development of shrimp farming. For governments, they provides a basis for policy, administration and legal frameworks, that can be renewed (or formulated where there are none), adjusted, funded and implemented to address the specific characteristics and needs of the sector in order to protect and enhance the industry, the environment, other resource users and consumers. Typically, existing legislation and guidelines have been modified from those suitable for other industries and are not applicable to aquaculture. It is also crucial to strengthen institutional arrangements, capacity and partnerships (consultative frameworks) to ensure the cooperation and coordination of all relevant institutions with jurisdiction over natural resources, animal and public health. The *International Principles* could also provide the basis for development of certification standards and systems.

The *International Principles* presented here should be supported by other documents and educational and extension programs and other initiatives to ensure their implementation. The final section of the document gives further examples of responsibilities and options to support their practical implementation, together with selected guidance documents and references. Annexes with references, terminology and guidance on better management practice are also provided.

Section II: International Principles for Responsible Shrimp Farming

Principle 1: Locate shrimp farms according to national planning and legal frameworks in environmentally suitable locations, making efficient use of land and water resources and in ways that conserve biodiversity, ecologically sensitive habitats and ecosystem functions, recognizing that other land use, people and species depend upon these same ecosystems.

Justification: *It is clear from substantial worldwide experience that inappropriate and unplanned siting of shrimp farms has resulted in production failures, environmental degradation, land use conflicts and social injustice. Thus, it is imperative that, during establishing shrimp farms, due consideration is given to the environment, critical habitats, other land use in the vicinity, and the sustainability of the shrimp farming operations themselves.*

Criteria:

- Build new shrimp farms above the inter-tidal zone
- Ensure no net loss of mangroves or other sensitive wetland habitats
- Do not locate farms on sandy soils or other areas where seepage or discharge of salt water may affect agricultural land or freshwater supplies
- Do not locate new farms in areas that have already reached the carrying capacity
- Retain buffer zones and habitat corridors between farms and other users and habitats
- Farm location should obey land use and other planning laws and coastal management plans
- Improve existing shrimp farms in inter-tidal and mangrove areas through mangrove restoration, retiring unproductive ponds and intensifying remaining farm areas above the inter-tidal zone.

Principle 2: Design and construct shrimp farms in ways that minimize environmental damage.

Justification: *With the increasing intensity and expansion of shrimp farming operations evident in recent years, suitable design and construction techniques should be used when establishing new shrimp farms. Advantage should be taken of improved techniques for designing and constructing farms that take into account not only the requirements of the cultured shrimp and the management of the farm, but also integrate the farm into the local environment whilst causing the minimum possible disturbance to the surrounding ecosystems.*

Criteria**:**

- Incorporate buffer areas and techniques and engineering practices that minimize erosion and salinisation during construction and operation
- Minimize disturbance of acid-sulfate soils during construction and operation
- Conserve biodiversity and encourage re-establishment of natural habitats in farm design
- Minimize creation of degraded areas such as unused soil piles and borrow pits
- Design dykes, canals and infrastructure in ways that do not adversely affect hydrology
- Separate effluent discharge points from inlet canal to reduce self pollution and maintain biosecurity

Principle 3: Minimise the impact of water use for shrimp farming on water resources.

Justification: *Minimizing the use of new water is an essential part of modern, environmentally responsible shrimp farming. Reducing water exchange benefits the farmer by lowering pumping costs and reducing the chance of introducing toxic compounds, diseases, disease vectors or competitors into the farm. It also benefits the environment by reducing the discharge of nutrients and organic matter from the farms and by reducing the utilization of precious freshwater resources. Recent innovations have shown that proper management protocols can reduce water exchange requirements, even in highly intensive systems, with no loss in shrimp performance. This has benefits for all parties and should be encouraged at all levels.*

Criteria:

- Do not use fresh groundwater for salinity control
- Use water efficiently through minimizing water abstraction
- Minimize discharge of farm effluents and sediment to the environment
- Aim to return water with lower concentrations of nutrients, organic matter and solids to the ecosystem than that taken out
- Incorporate settlement and sedimentation ponds into the water inlet and outlet designs
- Manage water quality to maintain suitable water quality conditions in the growout pond
- Obey national laws and guidelines on water use and effluent discharge

Principle 4: Where possible, use domesticated selected stocks of disease free and/or resistant shrimp broodstock and post-larvae to enhance biosecurity, reduce disease incidence and increase production, whilst reducing the demand for wild stocks.

Justification: *Recent trends in shrimp farming have seen a change towards the use of domesticated stocks of animals, following the current agricultural paradigm. Elimination of the need to source broodstock and/or post-larvae from the wild has allowed the industry to develop successful programmes for the enhancement of their shrimp stocks, in terms of both their reproductive and production characteristics. It has also lead to the development of disease free and disease resistant stocks, which are currently available for a number of species. Concomitantly, these developments have lead to reduced demands for wild stocks and hence reductions in unwanted by-catch and habitat losses involved with their collection. However, further work is required to achieve these advances for all currently cultured species, and problems with transboundary movements of non-indigenous species has brought new threats of disease transmission and biodiversity reduction, which must be addressed.*

Criteria:

- Avoid potential negative impacts on local biodiversity
- Preference to local, indigenous species
- Avoid use of wild caught post-larvae
- Adopt on-farm quarantine and biosecurity measures to reduce disease incidence
- Use domesticated stocks wherever possible
- Stock good quality postlarvae to improve chances of successful harvest
- Comply with national, regional and international criteria controlling the movement and quarantine of animals

Principle 5: Utilize feeds and feed management practices that make efficient use of available feed resources, promote efficient shrimp growth, minimize production and discharge of waste nutrients

Justification: *Control and rationalization of feeds and feeding in modern shrimp farming is of critical importance in maintaining a cost-effective and environmentally sound industry. This is due to many factors including: Feeds and feeding account for 50-60% of the operational costs of semi- and intensive shrimp farming. Wasted (uneaten and unmetabolized) feed is also a major contributor to the discharge of nutrients and organic*

matter from shrimp farms leading to eutrophication of the environment. Increasing concern is also being expressed regarding the wasteful use of increasingly scarce resources of fishmeal going into shrimp diets for a net loss of protein resources and allied losses due to by-catch from the fishmeal industry. Formulation of cost-efficient and high quality, low polluting diets, and proper management of the feeding regime are thus crucial in attempting to optimize the efficient use of feeds in shrimp farming.

Criteria:

- Use good quality formulated feeds containing less fish meal and lower level of protein
- Make efficient use of resources
- Minimize feed wastage

Principle 6: Health management plans should be adopted that aim to reduce stress, minimize the risks of disease affecting both the cultured and wild stocks, and increase food safety.

Justification: *Maintenance of the health of shrimp stocks in farming situations should focus on maintenance of a healthy environment in the ponds at all phases of the culture cycle in order to prevent problems in the ponds before they occur and reduce the likelihood of disease transmission outside the farms. Attempting to limit the introduction of diseases through use of disease free stocks, thorough preparation of the ponds before stocking, maintenance of optimal environmental conditions through management of stocking densities, aeration, feeding, water exchange and phytoplankton bloom control etc., routine monitoring and recording of shrimp health to detect any developing problems, and maintenance of biosecurity in quarantining and treating any diseased ponds are all critical elements in any health management plan.*

Criteria:

- Implement health management protocols that are aimed at reducing stress and focus on disease prevention rather than treatment
- Maintain biosecurity and minimize disease transmission between broodstock, hatchery and growout
- Implement management strategies to avoid spreading shrimp diseases within and from the farm
- Improve the capacity of health and disease control among farmers and supporting agencies
- Ensure rational and responsible use of veterinary drugs and minimize the use of

(only) approved antibiotics

Principle 7: Ensure food safety and the quality of shrimp products, whilst reducing the risks to ecosystems and human health from chemical use.

Justification: *Increasing focus is being placed on the safety of foods being consumed in the worlds' markets. These concerns include not only ensuring that foods for human consumption are free from excesses of harmful or undesirable chemicals, but also that the workers producing these foods and the environment surrounding the production facility have been protected from negative effects of the use of these chemicals. Increasing calls for total traceability of food products are also affecting the food production industry such that consumers can be assured that the product has been produced without the use of transgenic technologies, without addition of undesirable or harmful chemicals or additives, and that all of the environments and ecosystems affected by the production facilities has not been compromised in any way.*

Criteria:

- Zero use of banned drugs and chemicals
- Appropriate use of permitted veterinary drugs and chemicals
- Apply quality control for healthful and clean products
- Harvest, handle and transport shrimp produced in sanitary manner
- Apply effective quality control systems

Principle 8: Develop and operate farms in a socially responsible way that benefits the farm, the local communities and the country, and that contributes effectively to rural development, and particularly poverty alleviation in coastal areas, without compromising the environment.

Justification: *There are increasing demands for products which are not only environmentally friendly (that have been produced through the adoption of environmentally sustainable practices), but that have been produced by employees who were treated fairly, and that the enterprise that produced the product is a respected and active component of the society. It should be the responsibility of a civilized society that the benefits derived from shrimp farming are shared equitably.*

Criteria:

- Minimize conflicts with local communities that may result from farm development and operation and ensure that the project is mutually beneficial

- Ensure benefits of shrimp culture accrue to the wider community
- Ensure worker welfare
- Minimize risks to smallholders
- Train farmers and staff in responsible shrimp farming practices

Annexes

Annex A: References

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Annex B: Terminology

Term	Examples / references
Accreditation is the procedure by which an authoritative body gives formal recognition that a body or person is competent to carry out specific tasks. In a certification system, an accreditation body will accredit – or, in simpler language, approve – a certification body as competent to carry out certification.	
Better Management Practice (BMP) refers to management practices aimed at increasing both quantity and quality of products taking into consideration food safety, animal health, environmental and socio-economical sustainability. BMPs have wider focus than Good Aquaculture Practice (GAP), which mainly target food safety issues. BMP implementation is generally voluntary. The term "better" is preferred rather than "best" because aquaculture practices are continuously improving (today's 'best' is tomorrows 'norm').	Description of shrimp farming BMPs by NACA and the Consortium "Shrimp Farming and the Environment" (www.enaca.org/shrimp)
Certification is a procedure through which recognized (or accredited) certification bodies provide written or equivalent assurance that a product conforms to certain principles, criteria or standards. It can be broken down into four broad categories based on who produces the guidelines and conducts the monitoring.	First Party Certification. A single company develops its own rules, analyzes its performance, and reports on its compliance. Second Party Certification. An industry or trade association fashions its own code of conduct and implements reporting mechanisms. This can be either voluntary or required for membership. Performance can be disclosed either for individual companies or for larger units of industry (e.g. type of product, country, global, etc.). Third Party Certification. An external, independent group, sometimes a non-governmental organization (NGO), is involved in creating and developing rules and compliance methods and measures for a particular firm or industry. Fourth Party Certification. This form of certification involves governmental or multi-national agencies. The UN Global Compact, for instance, lists environmental, labor, and human rights principles for companies to follow. Corporations are required to submit on-line updates for others to scrutinize.
Certification body is a body that is responsible for verifying that a product sold or labelled as a certified product is produced, processed, prepared, handled, and traded according to the certification standards. Certification bodies should be impartial third parties with necessary technical competence in certification.	
Certification criteria are the criteria established for certification. They should be precise, objective and verifiable.	
Certification systems are generally comprised of two key components: A set of principles (usually in the form of a code of conduct), criteria, standards and guidelines against which a product is certified A reporting or monitoring mechanism that assures the product has been produced according to the certification principles.	

Chain of custody (or traceability) is the channel through which certified products move from the production unit through processing, storage, and distribution. The chain of custody system should provide credible assurance that all certified products are derived from certified production systems.	
Code of Conduct (CoC) is usually an "overarching document" comprising a set of principles and criteria that may be used as the basis for certification.	The FAO Code of Conduct for Responsible Fisheries (CCRF) is an internationally accepted CoC for fisheries and aquaculture (www.fao.org/fi) Regional and National CoC based on the CCRF; Code of Conduct by Federation of European Aquaculture Producers (www.feap.org) Australian aquaculture Code of Conduct (www.pir.sa.gov.au) Thailand Code of Conduct for shrimp farming (www.thaiqualityshrimp.com)
Code of Practice (CoP) is usually "lower level" documents that provide guidance on management or other practices to be adopted in implementing the principles of the Codes of Conduct.	Global Aquaculture Alliance (GAA) "Codes of Practice for Responsible Shrimp Farming." (www.gaalliance.org) International council for the exploration of the sea (ICES) "Code of Practice on the Introductions and Transfers of Aquatic Organisms" (www.ices.dk) Malaysia government codes of practice for shrimp farming (www.agrolink.moa.my/dof/)
Eco-label (green marketing, green label) is a seal or label which shows that a certified product has been designed to do less harm to the environment than similar but un-labelled products	GAA Naturland Carrefour ISO 14,001
Fair trade or Ethical labeling is a certification or labeling scheme designed for products that meet more social and economic (rather than environmental) principles of fair and ethical trade. Fair trade is, however, linked to environmental aspects of resource management and some of the social issues associated with environmental certification.	
Good Aquaculture Practice (GAP) is a farm management practice and guideline prepared to minimize the potential for farm-raised fishery products to be contaminated with pathogens, chemicals, filth, and unapproved or misused animal drugs. GAP can be defined as those practices necessary to produce high-quality products conforming to food safety requirements.	GAP studies U.S. Food and Drug Administration's (FDA) (www.foodsafetymagazine.com/issues/0306/colask0306.htm) Thailand GAP program for farmed shrimp (www.thaiqualityshrimp.com) Malaysia GAP program (www.agrolink.moa.my/dof/)
Guidance/Technical Guidelines are documents that provide (technical) guidance on implementation of Codes of Conduct, Codes of Practice, certification principles, criteria and standards.	FAO has prepared a series of technical guidelines to assist in implementing the CCRF. (www.fao.org/fi) FAO technical guidelines for aquaculture. (ftp://ftp.fao.org/docrep/fao/003/W4493e/W4493e00.pdf) An example of regional technical guidelines is the FAO/NACA Asia Regional Technical Guidelines on Health Management for the Responsible

	Movement of Live Aquatic Animals and the Beijing Consensus and Implementation Strategy. (www.fao.org/DOCREP/005/X8485E/x8485e02.htm) Thailand has prepared "guidelines" to support implementation of the shrimp Code of Conduct. (www.thaiqualityshrimp.com)
Label is a piece of paper or other material which gives consumers information about the object to which it is fixed. It usually accompanies food, or is displayed near food, including that for the purpose of promoting its sale or disposal. There are numerous private label schemes established by producers and retailers. These vary in nature but usually try to convince consumers via an attached logo or label that the product meets certain standards.	
Label of origin is a label identifying the country/region of origin on products. Often it accompanies imported products. It is used to provide a minimum of information about a product. A label, or mark of origin, is sometimes seen as a preliminary step towards certification or eco-labeling.	
Manuals are more technical documents usually providing very practical advice on implementation of the above documents.	Shrimp health management extension manual (www.enaca.org/modules/mydownloads/singlefile.php?cid=23&lid=58) ASEAN: Manual on Good Shrimp Farm Management Practice (http://www.enaca.org/modules/mydownloads/singlefile.php?cid=163&lid=131)
Organic labeling signifies that the product have been produced following standards for organic production.	
Principles are the philosophical basis for production of the product, intended to guide producers towards sustainable production. Principles form the basis for more specific criteria or standards.	Code of Conduct (CoC) / Code of Practice (CoP) "The International Principles for Responsible Shrimp Farming" -Draft- (www.enaca.org/shrimp)
Standard is a rule, regulation, 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.	Many standards are issued, some of the examples are; GAA/Aquaculture Certification Council (ACC) (www.aquaculturecertification.org/) Safe Quality Food (SQF) (www.sqfi.com) Governmental programmes (Thailand, Vietnam, India, Indonesia) Retailers/Consumer associations
Traceability (chain of custody) is the indication of the product's origin, or the ability to recall the history, the use, or the localization of an entity by means of recorded identifications. Traceability makes it possible to track a product or a service along its chain of custody from production to consumption.	
Transparency refers to an open and publicly disclosed process in which a certification system is developed and operated. Consumers and other stakeholder confidence in certification are increased through transparency of the certification system and processes.	