

Shrimp Aquaculture Dialogue
Standards Development for Responsible
Shrimp Farming

MADAGASCAR

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The document was translated from French to English to the best of our ability.

Principles and criteria for shrimp farm certification in Madagascar, *P. monodon*

Introduction

Since 2004, the shrimp producers association of Madagascar (GAPCM) and WWF have collaborated on various issues. Since July 2006, GAPCM and WWF have worked together to develop criteria for shrimp farming standards development for *P. monodon* that are based on the “International Principles for Responsible Shrimp Farming.” The principles, which were approved in September 2006 by the Shrimp Farming and Environment Consortium (Food and Agriculture Organisation of the United Nations, Network of Aquaculture Centres in Asia-Pacific, United Nations Environmental Programme, World Bank and World Wildlife Fund) and adopted by the Committee of Fisheries Subcommittee on Aquaculture of the United Nations Food and Agriculture Organization, are:

1. Farm Siting
2. Farm Design
3. Water Use
4. Broodstock and Postlarvae
5. Feed Management
6. Health Management
7. Food Safety
8. Social Responsibility

Meetings were held in Paris (November 8-9, 2006) and Antananarivo (February 19, 2007) to prepare the first draft of principles and criteria for the farming of shrimp (*P. monodon*) in Madagascar. The draft was presented to stakeholders during a workshop held in Antananarivo April 12-13, 2007.

During breakout sessions at the April Antananarivo meeting, participants provided input on the draft principles and criteria, the process for continuing the Dialogue in Madagascar and what to include in the appendix.

At the request of GAPCM members, an appendix related to principle 6 has been added to this document. This document is not final and will be reviewed when indicators and standards are defined. The date and the number of the version of the report will be modified.

Preamble

The semi-intensive production method has proven to be efficient in Madagascar context. This intensity level appears compatible with the remote location of sites and the expansive areas of salt flats available in the littoral of Madagascar. In Madagascar, this type of shrimp farming allows for production with low technical and human risks, causes less stress on farmed animals than intensive systems and can have minimal environmental impact. This method allows producers to obtain shrimp of an average weight of 20-40 grams with high survival rates in 120 to 160 days of culture. Semi-intensive production methods in Madagascar rely on large ponds, water exchange, low density, and the use of endemic species.

Shrimp produced by aquaculture in Madagascar must be farmed within a framework of responsible aquaculture that is safe for the environment and surrounding communities, beneficial for society, and technically adapted to the needs of the species. This document also takes into account the Code of Conduct for the development of responsible shrimp aquaculture in Madagascar, October 2005.

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The framework includes:

- Respect for the environment, in the broadest sense of the term. Respect for biodiversity and, people and their cultural heritage.
- Establishment of a strong and fair social contract between farmers and their employees to ensure that the Malagasy shrimp aquaculture industry contributes to the economic and social development of the country.
- Produce an endemic species (*P. monodon*).
- Commitment to continual improvement towards excellence in the environmental, social and technical fields.

Principles and Criteria

1 Principle 1. Farm siting

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.

Criteria:

- 1.1 Shrimp farm siting will follow zoning requirements set forth by the “Survey of Development Scheme for Shrimp Aquaculture”.
- 1.2 Farms shall be sited in salt pans (“sira sira” in Malagasy), which are located behind the mangrove and devoid of vegetation.
- 1.3 Ponds shall not be constructed in areas with highly permeable soils under which freshwater aquifers can exist. Refer to appendix for the determination method for soil permeability (breakout session 2)
- 1.4 An Environmental Impact Assessment (EIA) shall be made for new farms or expansions of existing farms to identify possible negative environmental effects according to ONE (Environment National Office). The specifications based on the Environmental Management Plan proposed/ submitted by the producer to the ONE before any site modification, are the references.

2 Principle 2. Design and Construction

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

Criteria:

- 2.1 Farms shall be designed based on site specificities - taking into account the geomorphological and hydro-biological conditions to avoid negative impacts of the farm on the environment and vice versa.
- 2.2 Periodic Environmental Impact Assessments (EIA) during the farms’ activities shall be made to evaluate changes in marine environment according to ONE.
- 2.3 Producers must anticipate and show competency of direct and indirect effects from all farming activities on communities and natural resources.
- 2.4 An effective plan for the responsible use of natural resources will be developed to ensure resource conservation. *Suggestions for development of such a plan will be included in the appendix (Breakout session 1).*
- 2.5 Renovations of existing farms shall be made to correct deficiencies in design.

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- 2.6 Mangroves and other vegetation may be cleared with the agreement of the authority concerned. In no case must these areas with thin vegetation cover represent more than 10% of the surface area of the farm. This removal must be mitigated by the forestation of 1.5 times the area destroyed with mangroves or other suitable species in suitable areas.
- 2.7 Changes in water flow patterns and hydrology that affect salinity in coastal wetlands shall not be allowed.
- 2.8 Solids originating from construction will not be discarded in mangroves or other wetlands.
- 2.9 Solids originating from construction will be reclaimed and correctly disposed of to avoid negative ecological impacts in conformity with MECIE Decree¹, encouraging recycling.
- 2.10 Erosion control features must be included in design of earthwork.
- 2.11 Silt fences or other devices for trapping solids shall be installed to avoid turbid runoff while construction occurs.
- 2.12 Vegetative buffers should be planted around pumping stations and at other locations where there is high risk of erosion.
- 2.13 Farms shall not impede natural mass movements of wild animals.
- 2.14 Barrow pits and spoil piles must be reclaimed following completion of construction projects.

3 Principle 3. Water Use

Minimize the impact of water use for shrimp farming on water resources.

Criteria:

- 3.1 Freshwater from aquifers must not be used to dilute salinity in ponds.
- 3.2 Manage water to maintain optimal environmental conditions in shrimp ponds in ways that respect the well-being of the culture species and reduce waste production. Management protocol and definition of optimal environmental conditions will be included in the appendix (Breakout session 2). Water management is related to feed management and is strongly linked to Principle 5.
- 3.3 Farms shall calculate the average water exchange rate.
- 3.4 The production method will not be based on the need for mechanical aeration; however, the use of mechanical aeration in emergency situations (for example heavy rain) to complement pumping or to mitigate water quality deterioration is allowable.
- 3.5 Screens shall be installed to avoid impingement of large aquatic organisms on pumps. Filters must be present at the water inlet and the water outlet of the basin.
- 3.6 Farm effluents must be discharged into channel estuaries and not into areas of stagnant water.
- 3.7 The degree of treatment of effluents should be defined by EIA and feasibility study.
- 3.8 In accordance with the national environmental specifications, a water quality monitoring plan will be conducted to determine whether farm effluents are causing a negative impact on receiving waters. Guidelines are proposed based on ONE directive Fishery / Aquaculture sector for the monitoring of the farm environment. (Breakout session 2)
- 3.9 Each farm must implement an effective plan for pond water quality management and for bottom soil management between crops to improve pond water and effluent quality (also required under Principle 7). Monitoring protocol and guidance will be included in the appendix (Breakout session 2)

¹ MECIE Decree article number 95-377 on the compatibility of investments with the environment.

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- 3.10 Periodic assessment of monitoring results shall be made to optimize farm management practices and reduce or eliminate negative impacts.
- 3.11 Saline effluents shall not be discharged into freshwater.
- 3.12 Sediment from ponds shall not be transferred to freshwater areas.

4 Principle 4. Broodstock and Post-larvae

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.

Criteria:

- 4.1 Only native *P. monodon* from Madagascar is farmed
- 4.2 Wild caught postlarvae cannot be used
- 4.3 Only hatchery-reared post-larvae can be stocked.
- 4.4 Importation of post-larvae and broodstock is prohibited.
- 4.5 A countrywide effort by producers and other donors to develop domesticated strains of *P. monodon* will be encouraged to ensure the biosecurity of Madagascar's shrimp industry. Guidance on how to initiate this effort and possible funding opportunities will be included in the appendix (Breakout session 3)
- 4.6 Records must be maintained on the source of postlarvae for each pond. Guidelines on traceability of PLs will be included in the appendix (Breakout session 3)

5 Principle 5. Feed management

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

Criteria:

- 5.1 Use formulated feed from high quality agricultural material, free of contaminating residues and Genetically Modified Organisms (see Codex Alimentarius). See appendix for additional prohibitions for main ingredients incorporated into feeds. (Breakout session 4) Feed processing must produce fine crushing (<µm) and a homogenous mixing of ingredients.
- 5.2 Producers will investigate partnerships with feed suppliers to develop optimal feed formulations to decrease the need of fish meal (expect fish meal coming from fish plant filet waste) and increase digestibility.
- 5.3 Feed traceability shall be assured from agricultural materials used in the pond.
- 5.4 Promote natural productivity in ponds (Breakout session 2) to reduce the use of formulated feed (see, also, principle 3)
- 5.5 Feed Conversion Ratio (FCR) shall be maintained at a standard level according to shrimp size defined in appendix.
- 5.6 Fish meal utilization (expect fish meal coming from fish plant filet waste) can be monitored through an indicator "Wild Fish Conversion Ratio." Farmer shall monitor this indicator, for which calculation method will be included in appendix (Breakout session 4)

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6 Principle 6. Health management

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.

Criteria:

- 6.1 An effective, countrywide biosecurity plan shall be developed and implemented. See appendix for justification for and content of national biosecurity plan (Breakout session 3).
- 6.2 An effective plan for the evaluation of shrimp health shall be implemented at each farm in accordance with guidelines set by the countrywide biosecurity plan. See directive in appendix (Breakout session 3)
- 6.3 Prevention is the priority rule.
- 6.4 In growout phase, allopathic treatments are prohibited. In the event of treatment in a growout phase, batches must be identified and isolated in order not to be marketed with the reference of the certification.
- 6.5 For the possible treatments carried out before the phase of enlargement, the withdrawal period between the last administration and marketing are doubled compared to the legal withdrawal period.
- 6.6 Probiotics and other treatments utilizing natural organisms are permitted but must abide by Malagasy and importing country regulations.
- 6.7 Antibiotics and other therapeutants banned by one or more shrimp importing nations are prohibited.
- 6.8 Therapeutic agents shall only be used in hatcheries as a curative treatment of a diagnosed disease (and never for prophylactic purposes), and official veterinary control is necessary.
- 6.9 Following massive shrimp mortality, dead shrimp must be collected and incinerated or treated by other biosecure measures.
- 6.10 In the case of a first occurrence of a disease outbreak bound to compulsory declaration (OIE list), producers shall declare it to the relevant national and international authorities. OIE list will be included in appendix (Breakout session 3)
- 6.11 Detailed records must be kept on survival, number and extent of disease outbreaks, and the specific pathogen that caused the outbreak. Survival rates shall be maintained and shrimp in/out records shall be maintained. Protocol will be included in appendix (Breakout session 3)
- 6.12 Effective measures to prevent escapes will be implemented in accordance with the countrywide biosecurity plan.
- 6.13 Birds acting as vectors of diseases can be controlled by lethal method, provided that method is permitted by the appropriate authorities and in accordance with the national laws. Appropriate conditions for lethal methods will be included in the appendix (Breakout session 3)

APPENDIX - Veterinary disease prevention and care

1. Prevention is the priority rule. Preventing disease requires having high-quality water, enough space for the animal to live and the availability of feed to avoid any major stress.

To decrease the risks of parasites and the development of diseases, preventive prophylactic measures must be implemented (e.g., installation of foot baths, area separation, material disinfection). When collecting broodstock from the wild, quarantine measures constitute an essential precondition to the continued existence of the breeding, according to the following methods:

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- During the first cycle of quarantine, an analysis of, at a minimum, all known and IOE list registered diseases of pathogenic agents will be carried out on each wild parent according to official methods. Also, elimination of broodstock carrier will be ensured.

- During the second quarantine of the animal, a complete follow-up of the medical state by anatomopathologic and molecular biology analyses of a significant part of the population under quarantine must be carried out to allow the detection and the elimination of emergent pathogenic agents.

The principle of precaution must prevail during the entire cycle. Vaccines, when authorized by regulation, should be used only when it is established by the veterinary surgeon that the diseases at issue are present in the environment. They are preferable with any anti-microbial curative treatment.

In the event that bacteria or viruses are propagated, animals must be immediately treated or eliminated. In case diseases considered legally contagious emerge, the legislation in force applies without reserve. When the course of the production allows it, a dryout period is recommended.

2. Veterinary care

Without infringing the veterinary surgeon freedom, within the limits provided by the regulation, the veterinary surgeon and the farmer must have recourse as much as possible of a prescription that has:

- Vegetable, animal or mineral substances with homeopathic dilution,
- Plants and their extracts,
- Substances such as trace elements, metals, natural immunostimulants; and
- European Union authorized probiotics.

Any prescription or any use of substances other than those mentioned above shall constitute an exception for which the nature of the product, the real duration of the treatment and the withdrawal period must be clearly indicated in the farm book.

All the emergency regulations implemented are mentioned in the farm book.

The veterinary surgeons prescriptions are preserved and presented to the certifying body.

Failure to maintain adequate records in the farm book can cause sanctions, such as exclusion from the certification program.

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7 Principle 7. Food Safety

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

Criteria:

- 7.1 Food safety requirements must be followed in accordance with the laws of Madagascar and the importing countries.
- 7.2 Shrimp harvest, handling and transport procedures are implemented based on appendix 1 of regulation 852/2004, provided in the appendix (Breakout session 5)
- 7.3 Records of the purchase, inventory, and use of chemical products shall be kept.
- 7.4 Chemical products will be stored in well-ventilated structures with roofs.
- 7.5 Warning signs must be posted at places where flammable or other hazardous products are stored.
- 7.6 Secondary containment structure around fuel storage tanks is required.
- 7.7 Workers shall be trained on proper methods for handling and using chemical products.
- 7.8 Pesticides are prohibited during all stages of production.
- 7.9 A country-wide action plan for the elimination or substitution of chemicals used throughout the production cycle will be implemented. Guidelines will be included in the appendix (Breakout session 5)

8 Principle 8. Social Responsibility

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.

Criteria:

- 8.1 National labour law shall be obeyed.
- 8.2 Throughout the production chain, the promotion, education, and utilization of recycled and sustainable sourced materials will be expected. Guidelines will be included in the appendix (Breakout session 6)
- 8.3 Farms will be good neighbours to nearby communities, respecting their traditions, their customs and their livelihoods.
- 8.4 Producers and local community leaders will work to develop solutions to avoid conflicts stemming from community access to traditional natural resources and right-of-ways.
- 8.5 Local workers shall be employed to the extent possible.
- 8.6 Farms shall assist with development in local communities by contributing to educational, health care, or other social programs, and making available annual financial balance [and technical] sheets of the development actions carried out.
- 8.7 Farm management shall organize regular meetings with community leaders to inform them of farm activities and to hear their concerns.
- 8.8 Farms shall contribute to the implementation of local or regional existing policies, such as the “Communal Development Plan” and/or the “Regional Development Plan”.
- 8.9 Farm management plans shall be integrated with conservation of natural resources in areas under control. Guidelines will be included in the appendix (Breakout session 1)
- 8.10 Farms shall offer fair wages and provide a safe, healthy work environment.
- 8.11 Workers shall be paid more than minimum wage and incentive pay should be provided for good performance.
- 8.12 Where workers are housed at farms, adequate living space, clean and sufficient food, sanitary conditions, and recreational facilities shall be provided.
- 8.13 Discrimination is forbidden.
- 8.14 Child labour is forbidden.

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- 8.15 Wastes resulting from human and production activity will be collected regularly for recycling, incineration or disposal in a landfill (*Breakout session 6*)
- 8.16 All workers shall be given instructions on safety and personal hygiene.
- 8.17 Safety apparel and equipment shall be required for dangerous operations.
- 8.18 Prompt medical attention shall be available to workers suffering from on-site illness or injuries, and records shall be kept on all injuries and deaths.

9 Actions proposed during breakout session

Breakout session n°1: Natural resource preservation and social responsibility

Participants

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Actions proposed

- Adapt ONE environmental specification according to the certification criteria.
- Make uniform all farmer specifications in order to standardize indicators for the certification.
- Check coherence of ONE indicator with the certification program to ensure it meets the expectations of the certification criteria.
- Create a commission that will develop within one month the relevant indicators for social responsibility, based on the following documents: MECIE decree, SAAC, New Guideline for EIA, Environmental specification, PCD, PRD.

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Breakout session n°2: On-farm environmental management in Madagascar (soil and water)

Participants

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Actions proposed

- Provide soil permeability method techniques.
- Set a water management guideline that defines optimal environmental conditions.
- Provide key indicators on animal welfare and waste production reduction.

Breakout session n°3: Pathology, health management and biosecurity

Participants

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Actions proposed

- Write a national biosecurity plan.
- Clarify Malagasy regulation on antibiotic use in the shrimp industry (to be discussed at minister level).
- Create an antibiotic use risk assessment for health management, environmental and market.

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Breakout session n°4: Feed

Participants

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Actions proposed

- Provide standards for the feed main raw material.
- Provide excluded ingredients list.
- Provide method to favour natural productivity
- Define how to calculate FCR
- Define how to calculate wild fish conversion ratio

Breakout session n°5: Food safety

Participants

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Actions proposed

- Define national standards references (OMH, other) for the oil tank bund wall.
- Initiate research to substitute sodium metabisulfite, chlorine and other chemical products.

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Breakout session n°6: Promote recycling

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Actions proposed

- Write guidelines to promote the use of recycled and/or sustainably sourced materials.
- Provide effluent processing and treatment plan (physical, chemical and biological treatment)

Breakout session n°7 : Certification process

Participants

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Actions proposed

- Have a GAPCM member in the FAO Guideline for Aquaculture certification meeting.
- Benchmark WWF's and other NGOs' positions on antibiotic use.
- Develop key indicators and standards.