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# Shrimp farming in Madagascar

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## Present status, future outlook



Above: Aqualma was Madagascar's first commercial farm. Right: Aquamen's processing facility prepares some of the country's signature black tiger shrimp.

Sometimes called a continent-island because of its unique fauna and flora, Madagascar is the fourth-largest island in the world. With an area of 587,000 square km and 4,800 km of coastline, it is located in the southwestern Indian Ocean about 400 km off eastern Africa. Several penaeid shrimp species are commercially caught in Madagascar waters, with *P. indicus* and *P. monodon* the most abundant. In addition, black tiger shrimp (*P. monodon*) are currently farmed in Madagascar.

Since 1987, several large areas – mostly in the northern part of the country – have been selected for shrimp farm development by experts from the Food and Agriculture Organization (FAO) of the United Nations. The local government, FAO, and PNB (a private company) started a pilot farm on the island of Nosy Be to evaluate the technical and economical feasibility of shrimp farming. Excellent results obtained there led to the construction of Aqualma, a commercial farm, in 1993.

There are now four fully operational shrimp farms in Madagascar, and two new ones will begin operations in 2002, bringing the total pond area to 1,660 ha. Production in 2001 was 5,580 mt, with future growth projected (Table 1). Shrimp farming is an important economic activity in Madagascar, providing employment to many people and vital hard currency through exports.

## Autrand, Shrimp farm area, Table 1

Farm	Surface 2001 (ha)	Production 2001 (mt)	Surface 2005 (ha)*	Production 2005 (mt)*
Aqualma 1	675	3,200	675	3,200
Aqualma 2	260 (new)	0	1,000	4,600
Aquamen	183	1,200	250	1,500
Aquamas	250	900	500	3,000
Somaqua	112	580	200	1,000
LGA	180 (new)	0	1,040	4,800
Biomad	0	0	200	600
Total	1,660	5,880	3,725	18,700

\* Estimated

Table 1. Shrimp farm area, production in Madagascar.

## Farm locations

Most potential sites for future shrimp farming are located on the western coast of Madagascar, on large, flat, and relatively bare salt marshes called “tannes.” Positioned behind mangrove forests at the upper limit of the intertidal zone, along estuaries or river tributaries, tannes often have clay-type soils and are very suitable sites for shrimp ponds. This coast also has suitable climate conducive to the production of two crops per year.

## Limited infrastructure

The main constraint to shrimp-farming development on the island is its limited local infrastructure. Most sites are very isolated, and companies need to implement strong logistic infrastructure to support any project, which generally involves significant capital investment. This is the main reason why, until now, only industrial-type shrimp farms have

developed in Madagascar.

## Farm operations

A typical shrimp farm generally includes a camp for several hundred workers; housing for the technicians, supervisors, and managers; a processing plant; a jetty and crane, and often an airfield. Many times, a new village appears in the vicinity for the families of workers and other people attracted by the project.

Madagascar's shrimp farms can be generally classified into two types: semiextensive (following the Latin American model) and intensive (resembling the Asian development model).

### *Semiextensive farms*

The semiextensive farms are typically based on large, 5-10 ha ponds, with 15-20 percent daily water exchange, daily feeding, and no aeration. Stocking density is less than 10 juveniles per m<sup>2</sup>, as a nursery phase in ponds is generally used. The four farms (including those now coming on line) using this technology comprise about 1,200 ha of ponds. Head-on yields range 3.5-5 metric tons (MT) per hectare per year based on two annual crops.

### *Intensive farms*

Madagascar's intensive farms use smaller ponds of 1-3 ha with mechanical aeration that ranges from 4-10 horsepower per hectare. Aeration allows stocking densities up to 20 juveniles per m<sup>2</sup>, but the maximum authorized harvest biomass is 500 grams per m<sup>2</sup>. Daily water exchange is 10-25 percent. Two farms (430 ha total) currently use this technology, with yields of 3.6-7 MT per hectare per year.

## Seedstock

All companies have hatcheries, with typical annual production of 100-300 million postlarvae. One company has successfully developed a broodstock farm and is proceeding with a genetic-selection program.

## Feeds

Currently all shrimp feed is imported, mainly from Taiwan, Mauritius, and the Seychelles. The Aqualma-Unima Group farm intends to set up a shrimp feed plant in 2002 through a joint venture with a well-known company already involved in this sector.

## Processing and marketing

Several packing plants currently operate in Madagascar. All comply with the sanitary norms of the main importing countries in Europe and Japan, and several follow strict specifications imposed by specific clients. The differences between the local product and the Asian black tiger include taste and texture, which are very important for some European consumers. Lower-density rearing and other factors make Madagascar's farmed shrimp a desired product.

## Responsible practices

The government, international financial institutions, and several private companies are trying to steer Madagascar's shrimp-farming development in a sustainable direction. Between 1998 and 2001, a master plan was prepared and a codes of practice largely based on Global Aquaculture Alliance recommendations was produced.

The objectives were to identify the shrimp-farming potential while considering all possible environmental and social issues, and recommend reasonable technical solutions and good management practices for successful project development. All partners involved in local shrimp farming are fully convinced that the only sustainable, long-term approach must be based on the maintenance of environmental integrity and total exclusion of foreign shrimp species and pathogens.

## Conclusion

An important shrimp-farming industry has developed in Madagascar in recent years. Most producers devote significant effort to promote quality over quantity, to preserve the distinct characteristics of the Madagascar black tiger shrimp. Because of its isolated geography, far from other shrimp-farming countries, Madagascar is still disease-free, but producers know that one day they may have to face disease issues.

Based on the country's master aquaculture plan recommendations and application of its codes of practice, the producers association (Groupement des Aquaculteurs et Pêcheurs de Crevettes de Madagascar) plans to preserve the current sanitary status of the country as long as possible. It will also be important to develop a health and sanitary survey of wild and captive shrimp populations through the pathology laboratory jointly supported by the industry. Finally, shrimp domestication is another priority that has already been undertaken by one company.

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