Implementation of the Norm ABNT ISO 14001 in a Shrimp Farming Industry

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ABSTRACT


There is a world consensus that sustainable development should be embraced by all productive sectors. Shrimp farming has grown so much in the last 5 years that it has attracted the attention of both national and international environmental groups. A significant environmental impact in socio-economic terms is being witnessed in surrounding communities. At the moment, Brazil is one of the largest producers of marine shrimp in the world making use of technology developed in various countries which has been adapted to local conditions. In Brazil the industry and the government have attempted to create policies to increase productivity while assuring sustainability. The objective of this paper is evaluate the benefits from the application of the Norm ABNT ISO 14001 on the productive, administrative and processing sectors of Atlantis Aquacultura, a company which produces marine shrimp Litopenaeus vannamei with emphasis on the setting of objectives and environmental management programmes. The results obtained indicate that the process of adapting to the Norm were beneficial in economic, environmental, social, and legal aspects. With the Norm the company had also made a commitment for continuous improvement to their environmental system of management. This commitment contemplates a revision of planning to satisfy their environmental policy as well as monitoring, measuring and evaluating their environmental performance, beyond what had been proposed and implement future measures to optimize production sustainably.

ADDITIONAL INDEX WORDS: Marine shrimp farming industry; Litopenaeus vannamei; ISO 14001.

INTRODUCTION

The rapid growth of the shrimp farming industry, in particular along the tropical coasts of the Americas and Asia, has been due to a series of factors: the increasing demand for the product on the international market; the high profit margins in the industry; its ability to generate jobs and income for local communities; as well as its ability to earn foreign currency to contribute to the technological growth of the producing nations.

The sharp decline, noted by FAO, in shrimp catches in seas and gulfs has helped to increase interest in shrimp farming and the growth of this industry has been a stabilizing factor in the world supply of shrimp given the ever-increasing demand (BRASIL, 2001).

The rapid development of commercial activity in tropical areas of the world has, however, brought with it increasing concern about its environmental sustainability.

As an economic activity which makes use of natural resources to increase the supply of food, shrimp farming could have significant negative impacts effects on its area of influence through poor planning, poor equipment installation and the poor handling of physical-chemical and biological materials on which it depends.

Before the recent expansion of the industry guidelines for its sustainable development were discussed in 1992 in Rio de Janeiro. It was here that the importance of scientific collection of data concerning the environmental risk factors inherent in the production and processing of shrimp was emphasized.

This information is essential for decision making if they are to minimize any adverse effects and take preventive action through the prudent use of the environment in which this activity takes place.

This research attempts to contribute to knowledge on risk factors in shrimp farming and the benefits gained from the implementation of Norm NBR ISO 14001 in increased productivity on sustainable foundations.

METHODS

Environmental sustainability is fundamental to the expansion of the shrimp farming industry.

The main issues concern the environmental impact on mangroves, salinization of fresh water sources, discharge of effluents, water pollution from chemicals and solid and organic waste.

However, all these negative impacts can be prevented and minimized by the correct use of resources and environmental monitoring.

At the moment the Global Alliance for Aquaculture (GAA) is busy promoting sustainable aquaculture and is concentrating its attention on shrimp farming. The GAA recognizes that as well as the Code of Practice in force there is a need for a formal system of verification and certification.

Various alternatives and systems have been developed to help with environmental management and monitoring for small and medium sized companies working in various productive sectors of industry.

Some of these systems include: International Standard For Environment Systems (ISO 14001), Malcolm Baldridge Award Criteria, Eco-Management Audit System (EMAS), and International Chamber of Commerce (ICC), as well as the principles of Hazard Analysis And Critical Control Points (HACCP) Systems.

These 4 systems are mostly applied to businesses which have relatively standardized activities and procedures in each of their productive units.

The development of an efficient system for environmental management for shrimp farming is considered a great challenge due to the local environmental variables and the complexity of each productive system (QUEIROZ, 2001).

The Atlantis Aquaculture Company, located in the State of Pernambuco, Brazil is a shrimp farming business that produces, processes and transports shrimp.
Getting ISO 14001 certification, issued by DQS Gmbh, proved that Atlantis Aquacultura Company implements and maintains an efficient system of environmental management. This took place at a moment in time when the industry had to fulfill certain new legal requirements. These call for preventive action compatible an environmental management system (SGA).

Only the pre-requisites of the norm which are used for the objectives and norms and the proposal for future environmental management programmes will be described in this work as they are technically essential for the implementation and operation of the environmental management system.

The method used for the introduction of an Environmental Management System consisted in application of:

1. General Pre-requisites
2. Environment Policy
3. Planning
4. Environmental Aspects
5. Legal requisites and other requisites
6. Objectives and Goals
7. Environmental Management Programmes
8. Implementation and Operation
9. Structure and responsibilities
10. Training, awareness raising and competence
11. Communication
12. Document control
13. Operational control
14. Preparation and Emergency responses
15. Checking and corrective steps
16. Monitoring and Mediation
17. Non conformity and corrective and preventive work
18. Records
19. Environmental Management System Audit
20. Critical Analysis by Management

RESULTS

A. Environmental Policy in Atlantis Aquacultura Company

- Recognition of the importance of the environment adopting a position of efficacy and constant improvement
- Respecting the relevant legislation on environment
- Environmental Education to instill people with notions of environmental responsibility
- Pollution prevention, identification, removal and controlling sources of waste, effluent and emission generation, which could be harmful to the environment.

B. Planning

Environmental Aspects in Atlantis Aquacultura Company have established and maintained procedures to identify the environmental aspects of their activities, products and services which have a great impact on the environment and which could be controlled by them and over which they have influence.

These aspects were identified using a process approach, embracing the hatching pools, fattening pools and all the activities of the farm.

The identification of the environment aspects was based on the entrance and exit of processes for the flow of materials, supplies, processed product, solid waste, wastewater, atmospheric emissions, and noise.

Normal and unusual environmental aspects were identified such as:
- loss of young shrimp from the pools, consumption of natural resources,
- electricity consumption,
- water rich in young shrimp,
- metabolic production from the decomposition of faces and leftovers of feed, shrimp heads, dangerous waste, sewage,
- use of nutrients in the soil,
- ammonia spills,
- fire, chemical and fuel spills among others

An assessment of the importance of these aspects and their impacts served to define the objectives and goals and programmes of environmental control (PQAs), operational control, monitoring and measuring and the emergency action plan.

C. Legal Requirements and Other Prerequisites

Conformity to all the legal requirements applicable to a shrimp farm was examined. In the case of farms that also process, the quantity of requirements is significantly greater, particularly for those that export the product.

Atlantis Aquacultura Company established a system to access, analyze, understand and update the legal requirements (codes of best practice for production), APPCC and the need of the clients as well as attempt to satisfy the legal requirements and others applicable to the SGA.

D. Objectives and Goals

To establish and revise its goals, the farm took into consideration the legal and other needs, their most important environmental aspects, their technological options, their financial operational and commercial needs as well as a vision of the interested parties.

- To maximize the use of river water and from other sources
- To monitor the soil and plant conditions so as to ensure improved quality of life
- To maximize the use of resources in processes and products, avoid pollution and damage to the environment and man
- To raise awareness, inform and motivate everyone who work in the business

E. Environmental Management Programmes

4 environmental management programmes were adopted according to the company's activities and the main impacts taking into consideration the initial essential measures applied in the farm so as to give continuity to SGA.

The environmental management programme was based on the following questions: What to do? How to do? Why do it? When does it? Where does it? Who should do it?

The following items were taken into account:
- Environmental Policy
- Organizational Objective
- Environmental Management Programme
- Goals
- Indicators
- Improvements and follow-up

Atlantis Aquacultura Company drew up and ran the following environmental management programmes:

PROGRAMME 1: WATER

Tasks:
- Weekly monitoring of the water quality in the pool water
- Plan for environmental monitoring
- Use of trays to minimize the impacts of non-consumed feed in 100% of the pools
- Treatment station for effluents from the process
- Monitoring and treatment of underground waters (wells) to comply with HACCP requirements
- Detailed mapping of the real area of each pool and Bali?? And calculation of the approx. quantity of water so as to optimize the use of fertilizers and other products taking into account the concentration of nutrients according to volume. This is to improve and control
the management of the pools to avoid unnecessary water changes as well as overpopulating the pool.

PROGRAMME 2: SOILS AND VEGETATION
Tasks:
- Maintain and check the legal area of the reserve of 120ha
- Maintenance plan for hillsides and watergates
- Complete replacement of wooden posts for plastic wood to support the feeders
- Physical-chemical analysis of the soils of all the pools on the farm after soil correction

PROGRAMME 3: PRODUCTS AND PROCESSES
Tasks
- Trace and define 100% of the destination of waste on the farm
- Control the organic waste produced on the farm
- Collect, identify and specify the adequate disposal of waste from the laboratories
- Substitute the pumps for new salt water pumps which do not require lubricants and therefore eliminate dangerous wastes (grease, oil and lubricants)
- Rationalize energy consumption (KWh/Kg processed)
- Construction of an oil trap in the workshop

PROGRAMME 4: HUMAN RESOURCES
Tasks
- Environmental Education (Involve employees in environmental issues)
- Stimulate separation of waste
- Emergency procedures programme
- Set up green brigades, first aid brigades and fire brigades
- Organize environmental events (sports days, pamphlets)
- Support the community through the creation of a cooperative for the treatment and disposal of waste in conjunction with the local government.

DISCUSSION OF RESULTS

A. Environmental Policy in Atlantis Aquacultura Company

An environmental policy is essential for the operation and constant improvement of a shrimp farm and its management system. It is of fundamental importance that the upper levels of management are committed to continuing improvement and satisfying legal requirements. This policy, which serves as a basis for the definition of objectives, should be clearly defined and passed to all employees (MAIMON, 1999).

According to the audit certificate report the environmental policy should satisfy the demands of norms, be committed to constant improvement, respect legislation, prevent pollution and contribute to the development of mankind.

This policy is described in the form of principles with the establishment of an environmental management system. And in parallel, the fixing and revision of objectives and goals considered through a reference of objectives and goals defined as a commitment to environmental policy.

One of the difficulties in this is making all the employees feel that they are confident when the audit takes place, due to the fact that most of the employees have poor educational backgrounds.

B. Environmental Aspects in Atlantis Aquacultura Company:

The environmental aspects of the activities or processes that can be controlled by Atlantis or could be influenced by the organization will be dealt with and updated by the technical team and coordinated by a representative from the administrative side. In the analysis of the impacts identified:

- Organizational issues such as the introduction or maintenance of infrastructure and machines, production, processing, transport, cleaning, waste treatment, emissions and treatment of effluent
- Temporary situations such as:
  - Normal - controlled operation
  - Abnormal at the beginning or end of operations
  - Emergency Incident or accident cases
- Relevance of the impacts taking into account:

The risk is calculated by relating

\[ R = A \times O \times S \]

Where,

- \( A \) = Range of related impact
- \( O \) = Frequency, history and chance of these impacts occurring
- \( S \) = Severity of the impacts.

These variables can be assumed as values:
- 1 low
- 2 medium
- 3 high

Impacts which have a calculated risk of 9 and above are considered significant, or an evaluation of more than 3 in any of the items \( R, O \) or \( S \).

Activity \( \Rightarrow \) Aspect \( \Rightarrow \) Impact \( \Rightarrow \) Range/Severity/Frequency

The shrimp farm should introduce and maintain procedures to identify the environmental aspects of those activities, products and services which can be controlled and over which it has influence. The purpose of this is to determine those which have, or could have, significant impacts on the environment.

It is of fundamental importance that the company ensures that the aspects related to these significant impacts are taken into consideration when defining their environmental objectives. The definition of the environmental aspect of ISO 14001 is the element of the activities, products and services of an organization which can interact with the environment (ABNT NBR ISO 14001:1996).

C. Legal Requisites and Other Requisites

Satisfying the legal requirements took longer than expected due to the bureaucracy involved when dealing with certain public authorities to get a document.

Brazil has the most environmental laws in the world and they often do not apply to the reality of the shrimp farming industry as they are not completely directed toward the need for monitoring (GERING, 2001 Personal message).

In the case of Atlantis Aquaculture when the certification took place the CONAMA no 312 Resolution of the 12th October 2002 was still not in force.

D. Objectives and Goals

The objectives and goal established are coherent with the environmental policy of the shrimp farm. Its implementation took into account the initial assessment and the most significant aspects and impacts. (MAIMON, 1990)

In this context, the objectives and goals aimed to:

- Reflect the environmental policy
- Be part of the strategic planning of the company
- Involve all the sectors and people responsible for the implementation
- Undergo periodic revision
- Consider the human and financial resources required
E. Environmental Management Programmes

The implementation of the HACCP led to a need for integration with the environmental management system when certain risks are dealt with by two systems. They should not be dealt with separately, showing coherence of the evaluation of critical points for all the aspects assessed on the farm.

When the goals of an environmental management system are met and its results satisfactory, other programmes should be undertaken so that there is a constant improvement on the farm.

The environmental management programmes described as the goals of the farm can be achieved, as can the timetable and people involved in the implementation of its environmental policy and its accountability directly related to the environmental aspects described.

The objectives, goals and indicators and the communication of the results and need for improvement or correction were discussed in meetings with management and published by the Environmental Committee through the Management of SGA to the Departments of Atlantis as a commitment to constant improvement of the Environmental Management System.

CONCLUSIONS

In spite of all the work and requirements of the norms adopted, the certification does not function as a document proving the absence of environmental impacts. Shrimp farms remain responsible for any possible damages caused by poor implementation and or poor operation.

As a result of the experience of Atlantis Aquaculture, we suggest that independent of the needs for certification to add value to the product produced and allow this to compete on the world market, that other farms that only fatten the shrimp take on these environmental protection measures with a view to improving quality and the sustainability of shrimp farming at a national level.

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