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Managing wastes in the domestication of the BFT: Theoretical and practical considerations

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SUMMARY – The domestication of the BFT, amongst others, has been the target of criticism from environmental and other pressure groups with respect of the perceived impact of the industry on the environment. With its potential scope of growth, problems are likely to increase in the future unless a responsible attitude to its development is adopted. Hence, the way forward in the domestication of the BFT, is to work towards a sustainable production. This would benefit both regulatory bodies and the aquaculture industry, since they all have an interest in the preservation and enhancement of the marine environment. The aim of the present work is to frame some key considerations for the sustainability of the domestication of the BFT, by focusing on the importance of controlling and reducing wastes from marine cage fish farming. The hope is to illustrate that aquaculture, if properly implemented and managed, is the way forward.

Key words: BFT, environment, wastes, sustainability, management.

RESUME – *"Gestion des effluents découlant de la domestication du thon rouge : Considérations théoriques et pratiques". La domestication du thon rouge, entre autres, a fait l'objet de critiques émanant de groupes environnementaux et d'autres groupes de pression dû à l'impact que l'on perçoit sur l'environnement. Etant donné le potentiel de croissance de cette industrie, les problèmes sont susceptibles d'augmenter à l'avenir à moins qu'une attitude responsable ne soit adoptée quant à son développement. Par conséquent pour avancer dans la domestication du thon rouge il faut aller dans le sens d'une production durable. Ceci serait bénéfique aux législateurs ainsi qu'à l'industrie aquacole, car tous ont intérêt à préserver et mettre en valeur l'environnement marin. Le propos du présent travail est de présenter quelques considérations fondamentales pour la durabilité de la domestication du thon rouge, en se focalisant sur l'importance du contrôle et de la réduction des déchets de l'élevage de poissons en cages marines. Notre espoir est de montrer que l'aquaculture, si elle est dûment mise en place et gérée, est une solution d'avenir.*

Mots-clés : *Thon rouge, environnement, effluents, durabilité, gestion.*

Introduction

It is doubtful if any industry has attracted as much attention as aquaculture in the last ten years. At present, aquaculture production constitutes approximately 12% of the world's fishery production, and fish farms are continuing to grow in numbers and in size. Yet despite this, it has been, and still is, the target of criticism from environmental and other pressure groups with respect to the perceived impact of the industry on the environment. As for the case of the domestication of the BFT, the same negative impacts have been put forth, and with its potential scope of growth, problems are likely to increase in the future unless a responsible attitude to its development is adopted. Hence, this new frontier for development should be approached with a degree of caution (Tisdell, 1999).

With these ideas in mind, the way forward in the domestication of the BFT is to work towards a sustainable production. This need is now globally acknowledged (WCED, 1987) and the aquaculture industry has undergone good progress in working towards achieving this fundamental goal, which can be extrapolated to the domestication of the BFT. Such sustainable production would benefit both regulatory bodies and the aquaculture industry, since they all have an interest in the preservation and enhancement of the marine environment.

The aim of the present work is to frame some key considerations for the sustainability of the domestication of the BFT, by focusing on the importance of controlling and reducing wastes from marine cage fish farming. The first part briefly highlights important ecological and economical concerns for the domestication of the BFT and covers the rationale behind achieving a sustainable

development. The second part takes a look at how such theory can be put into practice. The hope is to illustrate that aquaculture, if properly implemented and managed, is the way forward.

Theoretical considerations

Environmental impacts from the domestication of the BFT

Unconsumed feed and fish faeces are the main source of solid and soluble wastes and represent the major sources of pollution. These can lead to enrichment of the benthos and a wide range of other interactions and disturbances can occur in the ecosystem in question.

In some cases production can exceed the assimilative capacity of a given site, so that its long-term viability is not assured.

In the near future, chemicals and antibiotics whilst in use during medication in fish farms, represent another source of pollution as the surrounding environment might be impacted from such practice. For example, there is a risk of toxicity to other more sensitive indigenous species.

The introduction of a pelagic species and a top-predator, as is the BFT, *Thunnus thynnus*, to a coastal environment can have profound disturbances and potentially impact the functioning and structuring of the given ecosystem.

Achieving sustainable development

The concept of sustainable resource usage remains poorly defined for aquaculture. One definition might be that sustainability incorporates social, technical, financial and ecological concerns and that the interactions between aquaculture and its ecological environment are becoming increasingly important if the demand for and supply of environmental goods are to continue indefinitely (Beveridge *et al.,* 1997).

The negative effects of off-farm pollution represent a cost to the coastal environment and other resource users. Waste discharges from aquaculture production suggest that the farmer is using resources inefficiently. Thus, controlling and reducing wastes will be beneficial to both the BFT aquaculture industry and the environment.

Integrating aquaculture, environmental management and product quality is the way forward: such sustainable development conserves the natural environment, reduces the potential conflicts with surrounding land or coastal users, and also enables the marketability of a product that is perceived to be safe, of the highest quality and "environmentally friendly".

Practical considerations

Achieving sustainable development

To date many efforts are being done to attempt to extrapolate considerations and recommendations into practical applications and outcomes to develop and achieve sustainability for the domestication of the BFT.

The major environmental effects of aquaculture generally occur as a result of day-to-day operations and management practices, so many may be reduced or ameliorated by changing these activities. Feed is the primary source of pollution, therefore minimising wastes should receive maximum attention.

At the present day, research and development in the aquaculture industry is at its peak and an integrated and multidisciplinary approach must be taken to work towards sustainability.

New technological developments

Technological advances result in an improvement in environmental performance, enhances resource efficiency and can yield economic benefits to the industry.

At the moment, improvements and developments in fish cage technology are taking place, which allow waste to be readily monitored, collected and removed from cages.

Another alternative is to shift the fish farm into offshore areas. This is being done in many areas of the world, and amongst the multiple advantages which such operations can bring about, is that of waste dilution from offshore currents and deeper water (Emerson, 1999). The necessary technological and engineering aspects that will need to proceed to achieve this offshore farming for the BFT, must be adequately planned, tested and evaluated.

Conclusions

There are many issues confronting developing industries such as the domestication of the BFT, and the sustainable management of environmental resources presents yet another. Throughout the world authorities are demanding stricter environmental control, thus integrating aquaculture and environmental management is the way forward. The challenge for the domestication of the BFT is to maintain profitability and environmental compatibility. Its sustainable development would ensure the conservation of the marine environment, so that the marine life can be maintained and its potential resources be at hand for the future ahead. Furthermore, a sustainable performance would also benefit the industry itself on both short and long-timescales. Ultimately, we all benefit from a fully healthy and functional environment.

As we have seen in the sections above, the domestication of the BFT has undergone good progress in working towards sustainability, but we must acknowledge that this big project is still at its infancy and the industry is hence still at a "learning phase". The future lies into allocating more time, effort, resources, research and development into any area that takes part to achieve the domestication of the BFT in a sustainable manner. This demands a comprehensive, responsible, co-ordinated, multidisciplinary and unified approach to its development.

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