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Strategies for aquaculture development in a small Mediterranean island state: Malta

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SUMMARY - In small island states of subtropical and tropical latitudes, shortage of space, fresh water as well as fierce competition for these precious resources from other economic sectors like tourism usually limits the potential for aquafarming to the marine environment. Moreover, these more lucrative sectors usually force aquaculture away from the prime foreshore sites out into the more exposed waters. Modern technology has come up with very practical and reliable, commercial scale cage structures for offshore sites. Increasingly sophisticated equipment such as for feeding, grading and harvesting have made life easier out at sea and have made possible the strict control over all activities concerned.

Key words: Offshore, aquaculture, cages, feed technology.

RÉSUMÉ - "Stratégies pour le développement de l'aquaculture dans un petit état insulaire Méditerranéen". Dans les petits états insulaires sous des latitudes tropicales et subtropicales, le manque d'espace et d'eau douce, ainsi qu'une concurrence âpre pour ces précieuses ressources à partir d'autres secteurs de l'économie comme le tourisme, font qu'en général les potentialités disponibles pour l'aquaculture soient limitées au milieu marin. De plus, ces activités plus lucratives déplacent habituellement l'aquaculture hors des meilleurs sites littoraux et la repoussent dans des eaux plus exposées. La technologie moderne a mis au point à l'échelle commerciale des structures de cages flottantes très pratiques et fiables, pour des sites en mer ouverte. Des équipements de plus en plus sophistiqués pour l'alimentation, le tri et la récolte facilitent la vie en offshore et ont rendu possible un contrôle strict de toutes les activités concernées.

Mots-clés : Offshore, aquaculture, cages, technologie de l'alimentation.

Aquaculture developments in Malta

Being a small island in the middle of the Mediterranean Sea with considerable territorial waters sitting on the continental shelf linking Italy with North Africa, Malta has considerable potential to develop a sizeable aquaculture industry. More importantly, it is uniquely placed to capitalise on the excellent qualities and favourable temperatures of the surrounding sea water. In fact, all the farms, currently operating on an intensive commercial scale are utilising exclusively offshore technology for fattening marine species mainly sea bass (*Dicentrarchus labrax*) and sea bream (*Sparus aurata*).

In Malta there are currently four companies operating five large commercial scale sites. There are also two small-scale land-based units. Production has soared from 60 metric tonnes in 1991 to 1,500 metric tonnes in 1996 and over 2,000 metric tonnes are expected in 1998 (Table 1). Hatchery production of juveniles is currently restricted to 1 million sea bream per annum but a hatchery with a target of 5 million per annum is under construction.

Approximately 95% of the above production is exported to Italy packed fresh under ice in 7 kg boxes and transported by means of refrigerated lorries.

All farms were established post-1991 and the total licensed potential production of the existing units is approximately 3000 metric tonnes per annum; this is expected to be achieved by the year 2000. The technology employs largely exposed-site cages consisting of rubber (e.g. Dunlop Tempest II) or metal floating framework (Farmocean) which supports the hanging net.

Approximately 70% of the total shareholding is Maltese-owned whereas the rest is owned by investors from European Union countries. Two companies use expatriate technical management whereas the rest use local expertise.

Table 1. Aquaculture annual production in Malta (1991-1998)

| Year | Production in metric tonnes | | | Estimated Value (000's of US\$) |
|-------------|-----------------------------|----------|-------|---------------------------------|
| | Sea bream | Sea bass | Total | |
| 1991 | 40 | 20 | 60 | 520 |
| 1992 | 150 | 150 | 300 | 2,400 |
| 1993 | 350 | 250 | 600 | 4,800 |
| 1994 | 550 | 350 | 900 | 7,200 |
| 1995 | 800 | 500 | 1,300 | 9,700 |
| 1996 | 1,100 | 400 | 1,500 | 10,100 |
| 1997 | 1,600 | 400 | 2,000 | 12,400 |
| 1998 (est.) | 1,800 | 400 | 2,200 | 13,200 |

Following an amendment to the Industrial Development Act in 1991 (the Act that controls investments in industrial projects), aquaculture qualified as manufacturing industry for the incentives accruing under the Aids to Industries Scheme such as: (i) ten-year tax free holiday on profits; (ii) low interest rate loans; (iii) subsidised rents on premises; and (iv) training grants.

There is no restriction whatsoever on foreign investment or on repatriation of profits.

A major disincentive is a 15% tariff on all fish exports from non-member countries like Malta into the European Union.

Development strategies in small islands

Developing aquaculture in an island state is normally considered an important development in view of established fish eating habits and the declining wild fish catches. However like any new development, such a development is likely to suffer from unfavourable economies of scale. It is therefore vital to identify all possible bottlenecks and develop the appropriate strategies accordingly. Indeed it may be easier to develop such an activity in islands rather than island states since the former usually form part of a bigger socio-economic force.

Of the numerous issues that need to be addressed, four key ones emerge:

(i) Identify objectives particularly markets. Small islands inevitably have small local markets and therefore export remains the only viable option. It is imperative therefore that this industrial activity is geared directly for export with priorities set for international quality standards of the product, securing regular product consignments (this may be difficult with small farm units and in the case of exposed site fish farming) and overcoming trade barriers such as the 15% tax on sea bass and sea bream exports to the European Union.

(ii) Identify appropriate technology. In small islands where tourism is likely to be one of the pillars of the economy and with possibly a number of other users such as shipping putting pressure on the coastal zone, the offshore option may be the only one and indeed it may not be advisable to pursue land consuming options such as shrimp pond farming.

(iii) Identify assets. Profitability of the fish farming activities depends on capitalising on natural and other assets. For example with their very favourable temperatures Maltese waters may have a significant edge with winter temperatures ensuring year round growth and therefore lower production costs. The availability of favourable fiscal policies could also play a determining role. For instance in Malta aquaculture is classed under manufacturing industry and therefore benefits from incentives such as a 10 year tax-free holiday on profits, subsidised rents on premises and training grants. The proximity of the Maltese industry to the European Union markets is also an important asset. This is particularly important in the case of perishable goods since the relatively short journey ensures that the product arrives fresh.

(iv) Identify limitations. In a small country there is a higher possibility that specialised human resources such as senior managers, biologists and pathologists, certain services such as heavy marine equipment, as well as some of the materials required such as feeds, chemicals and antibiotics may not be available and will therefore have to be imported at higher than average costs.

Developmental framework

To ensure that the industry is established in an organised and environmentally sustainable way, a set of Policy and Design Guidelines for Aquaculture Development were established within the framework of a National Structure Plan for the Maltese islands. This is a ten-year plan reviewable every two to three years. Its main objective is to achieve at the end of the ten-year period a production of 5,000 to 7,000 metric tonnes per annum.

The approach is to base the industry on a relatively small number of large fattening units. The plan caters for:

(i) A maximum of two hatcheries each producing at least 5 million fingerlings per annum.

(ii) A maximum of twelve offshore cage farms each producing about 400 to 500 metric tonnes per annum. This is planned in two phases (a maximum of six in the first five years) in order to allow for monitoring of possible environmental impact.

(iii) A very limited number of onshore small-scale units with a maximum production of 150 metric tonnes each per annum to produce species other than those that can be grown in cage culture to secure product diversification on the market.

These guidelines urge the developer to:

(i) Ensure that the farm is located in a search area identified in these same guidelines.

(ii) Ensure that the farm:

- is at a depth of between 30 and 45 metres,
- is located in a well-flushed area,
- occupies less than 50,000 m² of surface area,
- is located clear of *Posidonia* beds/meadows,
- has minimal visual impact,
- minimises impact with other users such as tourism, navigation,
- possesses an adequate land base with minimal impact on the foreshore.

(iii) Prepare a full Environmental Impact Assessment (EIA) at his own cost (usual cost is approximately US\$20,000). This should include all relevant aspects notably water quality baseline study, benthic mapping of the seabed and a socio-economic appraisal of the proposed development.

(iv) Submit an annual environmental monitoring report at his own cost (usual cost is approximately US\$20,000).

(v) Keep records of input into the environment, e.g. feed, chemicals.

(vi) Comply with veterinary requirements.

(vii) Guarantee fish health monitoring by an approved laboratory.

(viii) Allow regular inspections by the relevant authorities.

(ix) Deposit a bond to cover restoration costs.

Concluding remarks

Whilst considerable developments in marine aquaculture have been witnessed in a number of islands and island states such as the Greek islands, Croatia, Malta and Cyprus in the past decade

there is still too much emphasis on inshore systems employing mostly rigid steel or wooden cages. In addition many of the more recent cages made of plastic and other semi-rigid material are only really suitable for semi-exposed conditions with maximum recommended wave heights under 4 to 5 metres.

There is also still too much of the "get rich quickly mentality" with too many wanting to invest leading to a proliferation of small units and uncoordinated development. The industry has some way to go in order to mature into one of identical stature as that of salmon with numerous problems still needing resolving. There is a dire need for better planning which will lead to improved organisation and management of the industry. This should then be underpinned by a number of technical considerations such as improved genetic stocks, improved feeds, improved marketing and product presentation as well as a better understanding of fish health practices.

Further reading

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