

## Aquaculture: The blue revolution

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# Aquaculture The Blue Revolution<sup>1</sup>

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**Abstract.** *Aquaculture has been rapidly developing in various parts of the world to help meet an ever increasing demand for fish and fish products within the context of dwindling wild fish stocks. With the setting up of the National Aquaculture Centre in Malta in 1988, Malta has been included in the Mediterranean countries' league of aquaculture development. During 1992, production from this industry is expected to approach 500 metric tons (some 50 % of total fish landings) having an export value of Lm 1.5 million. Future prospects are very bright both with respect to investment and employment opportunities but development should not take place at the cost of environmental degradation. The necessary safeguards have to be introduced to ensure that the ecosystem copes with minimal strain.*

**Titre. L'aquaculture : la révolution bleue.**

**Résumé.** L'aquaculture a connu un développement rapide dans divers pays afin de faire face à la demande croissante en produits de la pêche dans le cadre d'un stock naturel en diminution. Depuis l'établissement du Centre National d'Aquaculture à Malte en 1988, l'archipel fait partie de la ligue des pays méditerranéens pour le développement de l'aquaculture. En 1992, la production aquacole devrait atteindre environ 500 tonnes (50% environ de la quantité de poisson collectée), avec une valeur à l'exportation de 1,5 million de Lm. Les perspectives d'avenir sont brillantes tant pour l'investissement que pour l'emploi mais le développement de l'aquaculture ne doit pas avoir lieu au prix d'une dégradation de l'environnement. On doit s'assurer que l'écosystème ne subisse que des pressions minimales.

**Keywords.** Aquaculture – Mediterranean countries.

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Centuries ago mankind considered the sea as a most alien environment. Man simply feared the sea and some cultures even considered it contagious.

Slowly but surely, man began to flirt with the sea and realized it was a completely new world with considerable riches. As human nature goes, mankind's first instinct was to exploit the natural fisheries. Technological advances after the Second World War were rapid particularly in countries like Japan and exploitation verged on rape with the consequence that by the seventies world fisheries were on the decline and numerous stocks were on the brink of extinction.

## 1. From Fresh to Marine Waters

For centuries the Egyptians, Japanese, Chinese, Indonesians as well as what is now historically Eastern Europe had been experimenting with artificial rearing of common carp. This was the birth of aquaculture which we define as the rearing of aquatic organisms under controlled conditions for purposes of human consumption or other forms of usage. Today aquaculture is practised to some extent in every country of the world with the possible exception of the Antarctic continent. Worldwide, aquaculture is considered as a new growth industry due to increasing human populations, food shortages, declining wild fisheries,

shortfalls between supply and demand of agricultural produce and demand for luxury foods as the standard of living rises. The motivations driving such developments differ completely between the so-called developed societies and the developing nations. Whereas, in the former aquaculture must be a commercially profitable exercise, in the latter situation its primary purpose is to alleviate protein shortages. Because in the past, man considered the sea as an alien environment, developments took place mainly in fresh water species and then only in those countries where this represents an important resource. By the sixties, however, it was becoming clear that fresh water resources on a global basis are limited and man had to cross the last frontier, the seas and the oceans, which cover not less than four fifths of our planet. The potential of a blue revolution contributing significantly to alleviating the world's shortage of protein, particularly in dry climates with access to the sea, appeared limitless.

## 2. The Salmon Boom

This stimulated a hive of activity in research and development in marine farming with Japan, the USA and Europe spearheading this initiative. Today we can indeed say that in thirty years we have witnessed a revolution in marine farming no less spectacular than the green revolution earlier this century. Suffice it to say that the salmon industry boomed in the eighties particularly in Norway, Scotland and Ireland to the extent that it gave the remote parts of these countries a new lease of life. Crofters, who in the sixties had left remote settlements in search of better paid jobs in the industrial and business centres of the big cities, returned in numbers and rural communities were rehabilitated. Norway alone now produces over 150,000 metric tonnes of salmon a year.

## 3. Sea Bass and Sea Bream

All indications are that a similar boom in sea bass and sea bream production is on the cards for the Mediterranean region. After early hiccups in technology the basic problems of hatchery production of juveniles have been overcome and the production of these species on a commercial scale has become financially viable.

In recent years total aquaculture production for the Mediterranean region averaged roughly 500,000 tonnes annually. Shellfish production, particularly oysters and mussels, accounts for 64% of this regional aquaculture production. Aquaculture production of marine fish and shrimps has accounted for less than 5% of total regional production. Nevertheless regional interest particularly in sea bass and sea bream has increased dramatically and these are currently two of the most valuable species in European markets, especially Italy and France. A number of projects is currently underway and there is a growing belief in the industry that the economic success of salmon culture in Northern Europe might be produced in the Mediterranean with these species.

It is estimated that aquaculture may nearly double the current availability of sea bass and sea bream from the region by 1992. These estimates are probably conservative. Spain, Tunisia and Turkey could be the countries with the most significant increase in production for export. This increase in the availability of exportable quantities, which is of the order of 9,000–10,000 tonnes annually, would almost exclusively be aimed at the Italian market.

## 4. Elusive Eels

In spite of significant technical advances however, many fundamental issues remain to be resolved and provide researchers with their bread and butter. We do not know for instance how, where, and when eels breed. When their juveniles are caught from the wild from the estuaries of Western Europe's rivers they are already at least a year old, only a few inches long and would have drifted across the Atlantic Ocean! We are no wiser in so far as the biology of the coryphene (*lampuka*) goes.

## 5. Markets

World demand for fish and fish products is extremely high. This has increased dramatically in recent years as consumers have become more diet conscious and the demand for red meat has fallen sharply. Supply from wild fisheries has levelled off and fisheries scientists have generally agreed that no increase in yield is possible. Indeed, on the contrary, unless scientifically-based stock management programmes are carefully monitored we will witness a dramatic downturn in catches with unavoidable extinction of some of the more fragile species. With the maximal exploitation of wild fisheries and little leeway in improving aquaculture from fresh water, we have to rely on expanding sea farming to make up the shortfall between supply and demand. Failing this, the slowly but surely increasing human population will experience a decrease in the availability of aquatic products.

Many a venture into aquaculture have fallen by the wayside. Hasty and ill-planned investments have led to numerous projects falling short of commercial realization. Panic selling of undersized fish and other similar stop gap measures worsen the situation. In the salmon industry excessive cash liquidity and bad national planning by the Norwegian authorities led to the overproduction of this once luxury food item but now a cheap commodity. The end result: a depressed salmon industry and one or two bankrupt banks!

The fundamental philosophy one must adopt in aquaculture is that at the end of the day it is farming with all the joys and heartbreaks that this age-old practice implies. The big investors' notion of the early days to go into it to become rich quick has backfired as indeed pragmatists had predicted. Whilst it is true that the novel nature of this type of activity will be reflected for a few years yet in a significantly better return on investment compared with any other agro-industrial business, the hard facts remain that you are dealing with growing an animal over at least one year and therefore considerable financial strength (and adequate insurance coverage!) is required to survive this initial period during which of course risks abound, e.g., disease, storm damage, etc. Too many fish farm managers spend their day on computers predicting harvests which at the end fall short of the projections. Whilst computerization does, of course, have its place in this business, the critical players are the farmers, those with 'green fingers' that can understand how the fish behave and react accordingly to best exploit their natural characteristics.

Marine aquaculture is still in its infancy and the present very attractive prices allow for a somewhat jet-set lifestyle. However, once the honeymoon is over, only the fittest will survive and these will simply be the lowest cost producers. Therefore solid planning on a technical, financial and marketing basis is essential and this must be governed by the lowest production cost possible without undue corner cutting that could compromise the reliability and durability of the production system.

## 6. Malta Situation

For a variety of reasons commercial aquaculture took a long time in coming to Malta. However in the short lifetime of the National Aquaculture Centre, set up by the Ministry of Agriculture and Fisheries in 1988, Malta has climbed from a wooden spoonist to mid-table in the Mediterranean countries' league of aquaculture development. The Centre's first ever commercial quantities of farmed fish were produced in 1990. This was rapidly followed by private investment in this sector, such that 1992 production is expected to approach 500 metric tonnes (all for export) with a value of over Lm 1.5 million. Several other farms are being planned by both local and foreign investors; the latter include the Commonwealth Development Corporation, the European Investment Partners as well as private companies. In the coming few years production through aquaculture is expected to exceed catches from wild fisheries. The demand for these products in Europe is insatiable and this produce will therefore be exclusively exported. Significant employment is being created both directly and indirectly together with other numerous beneficial spin-off effects.

What is vitally important is that in this rapidly growing industry one has to get a firm foothold on the European market place in time before this becomes saturated. Furthermore a good if not superior product has to be necessarily presented. In this latter respect, we have every opportunity since by Mediterranean standards the island is surrounded by relatively clean waters.

It is important to shed the outdated mentality that this will threaten the livelihood of the Maltese fisherman. On the contrary, he should educate and transform himself from a gatherer or hunter into a farmer. This is not easy but then this is another reason for calling it a revolution! Decades ago its green predecessor revolutionized land farming beyond recognition. The rest of the world, and more directly relevant to us, all neighbouring Mediterranean countries have realized such needs and we certainly cannot afford to isolate ourselves and refrain from adapting to the evolving world around us. Not only will it have a negative impact on the island's economy, as we will end up importing farmed fish from neighbouring countries in ten years' time or so, but more importantly it will have a catastrophic effect on the fishing communities as the commercial realities of declining fisheries will slowly but surely squeeze the life out of these communities.

The fisherman has to realize that the decline in wild catches is unavoidable and indeed uncontrollable given the complex web of factors affecting it, ranging from biological to political implications. Fishermen from all around the Mediterranean shores are putting their heads (and resources!) together to supplement their income from wild fish catches through aquaculture. We must encourage our fishermen as indeed is the policy of the National Aquaculture Centre, to do the same so as to strengthen the fishing communities.

Professionally planned marine farms not only are environment-friendly but indeed could enhance the environment. Policies being adopted to achieve this aim include the limiting of land-based and inshore installations that could have negative aesthetic influences, limiting the tonnage produced in any given site so as to ensure that the ecosystem can cope with minimal strain and encouraging as much as possible offshore facilities. Increased availability of fresh fish should result in less pressure on wild stocks and indeed aquaculture helps to repopulate overfished waters.

## 7. Conclusion

Properly coordinated planning can lead to the development of a substantial aquaculture industry that may make a considerable contribution to the island's economy. The sea must be the most important natural resource the country possesses and aquaculture provides a mechanism to exploit this resource in harmony with nature and with little impact on competing users. Pioneering of offshore technology currently under intensive study is leading to efficient biological exploitation of waters further afield never before so efficiently tapped by mankind.

### Note

1. A preliminary version of this article appeared in the *Industry Supplement, The Sunday Times*, May 3, 1992.

