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Echinades Fish Farm (Greece)¹

The past decade had seen a dramatic decline in the regional economy along the west coast of the Greece as agriculture faded and few incentives existed for manufacturing companies to locate there given its relatively poor infrastructure. Since the long-established Greek strength of tourism was still focused on the islands and in areas where large natural beaches offered holidaymakers the opportunity to lay out in the glorious Mediterranean sunshine, this region of barren land and traditional lifestyle offered little to entice the modern tourist. Despite this pessimistic background, Nikos Anagnopoulos stood on the deck of the small boat that had pulled alongside his fish farm and talked enthusiastically to his E.U. visitors about the potential for aquaculture in Greece. Nikos highlighted that with a coastline of approximately 4,000 kilometres around the mainland and a further 11,000 kilometres around the islands, Greece offered wonderful opportunities for aquaculture. This comparatively new industry also offered nearby locations on the western coast of Greece the opportunity to turn perceived weaknesses into economic strengths. Indeed, he drew attention to the fact that despite being just two years in operation, his Echinades Fish Farm had already been a positive influence on the local economy. He tenaciously wanted this business to succeed, not just for personal financial reward, but also to demonstrate what can be achieved commercially in regions that he believes have been neglected by the national government.

Greek Aquaculture Industry

Since the beginning of the new millennium, aquaculture has become of increasing importance to many European economies. The reasons for its growth are manifold but two major factors are quickly evident: (1) intense fishing practices have seriously diminished fish resources bringing about shortages in the supply of fish products, and (2) consumers are seeking healthier diet alternatives leading to an increase in the demand for fish products. In Greece, the aquaculture industry has grown in significance to the national economy, whereby it is

¹ This case was prepared by Dr Thomas M. Cooney as the basis for class discussion rather than to illustrate either the effective or ineffective handling of a business situation. The case was first published in the report "The Working Partnership: SMEs and Biodiversity" which was written by B. Dickson, D. Watkins, & J. Foxall (2007) and published by Fauna & Flora International, Cambridge, UK. The case was written as part of the EU funded Probioprise project which was undertaken by Fauna & Flora International, EFMD and the European Bureau for Conservation and Development.

now the second most important export industry and third after shipping and tourism in terms of incoming foreign capital. With an annual growth rate of approximately 10% over the past decade, aquaculture is one of Greece's fastest growing industrial sectors and the change in emphasis from fisheries to aquaculture has been reflected in the allocation of structural funds that the industry now receives. The reasons suggested for the growth in the industry in Greece are partly based upon global trends but also due to the country's natural conditions of a mild climate, relatively clean water, over 3,000 islands, and a large coastline.

The success of Greek aquaculture is based upon the Norwegian Model which focused its attention upon one product – salmon. The Greeks fixed their attention upon just two species – seabass and seabream. Not only are these two varieties extremely popular with customers, but they also are ideal for cultivation as they have a comparatively short production cycle. According to Eurofish (www.eurofish.dk), it is estimated that Greece has become the primary producer in Europe of seabass and seabream, offering more than 51% of the total European production of these species, thereby making it a substantial world player given the minimal production for these species in countries outside of Europe. Approximately 75% of this production is exported to EU Member States with Italy being the principal market, although countries such as Germany, France, Britain, and Spain are increasing their demand for seabass and seabream.

But Eurofish also indicated that while the industry has grown rapidly, there remains plenty of room for development, particularly as the prices for seabass and seabream have dropped in recent years and so new ways have to be found to improve profit margins. Until recently Greece imported much of its juvenile fish, although many fish farms now have their own hatcheries. Additionally, Greek fish farms have to import fish feed which has become a major cost for the expansion ambitions of local fish farmers. A further challenge facing Greek fish farms is their need to broaden the marketing of their produce. Most seabass and seabream are exported as whole, round, or gutted fish. But if Greek fish farmers are to attract a wider range of consumer then they will have to develop new products such as smoked, battered, and fillet fish. Some fish farmers have even started to experiment with different types of higher-value products that are more difficult to cultivate. While substantial progress has been achieved in the industry in recent years, there is still much to do.

While the desire to expand the farming of sea bass and sea bream in Greece may be viewed positively within the industry, others are not so enthusiastic as such a development may have a number of negative effects on biodiversity. Environmentalists believe that the farming operations may have harmful consequences on the marine environment within the immediate vicinity of the farms. The potential sources of pollution include fishmeal that is not consumed and falls to the seabed, waste from the fish, anti-biotics administered with the feed in the case of infections, and the anti-fouling paint used on the cages. While existing research indicates that with the proper siting of fish farms these negative effects may not, in reality, be very large, there is still considerable uncertainty in this area. There is even greater uncertainty about the effect of the escape of farmed fish on wild populations. Farmed fish that are raised in Greece are derived from stock that may have originated in other parts of the Mediterranean, and this stock is itself subject to a degree of further selection in the hatcheries. Little research has been carried out on the genetics of wild populations of seabass and seabream, and even less on the effect of escaped fish breeding with wild fish. The risk is that this interbreeding will lead to an overall reduction in genetic diversity and in a reduction of the biological fitness of local populations of wild fish. But the biggest impact on biodiversity may be that which occurs at the greatest distance from the fish farms. The production of 1 kg of farmed seabass or seabream requires about 2 kg of fishmeal. Much of this fish meal comes from Latin America, with Peru being a major exporter. With the rise of fin fish aquaculture in Europe and elsewhere, the impact on fish stocks elsewhere is considerable. Potentially, the farming of seabass and seabream might reduce the pressure on the wild populations of these species. However, to date the outcome seems to have been increased overall consumption, with little reduction in the consumption of wild fish.

Background to Echinades Fish Farm

Nikos Anagnopoulos's ownership of Echinades Fish Farm was a distant possibility when he graduated with a degree in Biology from the University of Athens. He moved to Italy to study aquaculture and after successfully completing his programme, he returned to Greece to work in the public sector within a government department. However, his entrepreneurial instincts were not appreciated within such an environment and he realised that his most rewarding career path was to be found in the private sector. He initially established a management consultancy business which was focused on the fisheries sector but difficulties with a business partner made the early days a struggle for him and the business. He continued the

business by working alone but in 2002 an opportunity to merge his business with Lamans Management Consultancy offered him a fresh approach to his business that he was happy to take.

Throughout the 1990s, Nikos was a very active member of the National Federation of Aquaculturists, including stints as a Board Member and General Secretary. He additionally represented the Federation in talks with Greek and European agencies, both governmental and industrial. On other occasions he acted as consultant to the Federation when his roles did not cause a potential conflict of interests. During this time he developed an extensive network of contacts in the aquaculture industry throughout Greece, and indeed also built a good base of contacts across Europe. Increasingly he developed a vision of owning his own fish farm and in 2001 took a license to establish such a business. However, despite the spectacular growth of the industry, he felt that the industry remained chaotic and so he decided to wait until the sector had stabilised. It was also a time that he wanted to focus on his management consultancy business but he knew that he was edging closer to realising one of his major ambitions. With the merging of his consultancy business in 2002 and the improvement in the state of the aquaculture industry, Nikos officially started Echinades Fish Farm in 2004.

To establish the business, Nikos required substantial initial capital investment. He estimated that a budget of €540,000 was required and applied for a government grant of 40% to help get him started. However, grants are seen as income under Greek legislation and so are taxed at 35%. Nevertheless, through this support, his own equity investment, and some astute financial management, Nikos was able to finance the business without taking any loans and still leave him with a 99% equity interest in the business. He has since been able to grow the business through retained earnings and he estimates that the business is currently valued in the region of €575,000.

The early days of the business unearthed many difficulties with administrative requirements for government. While much paperwork needed to be completed and a variety of different licenses secured, it was the negative intrusions from the local authorities that Nikos found hardest to accept. In his eyes, here was an entrepreneur attempting to build a business in a region that was suffering economically and all that the local agencies could do was place barriers in his way. At every turn he felt thwarted in his attempts to get the business moving and he wondered what self-interests those involved in working against him might be

protecting. Another group who were unhappy with his business activities was the local fishermen who saw farmed fishing as direct competition to their livelihood. Some of his tanks were interfered with during those difficult early days but Nikos remained fixed upon developing the business despite the many challenges that he faced. He is now the first to acknowledge that his relationship with local fishermen has changed dramatically and through communication and the identification of common goals, they have developed a strong working relationship.

When Nikos was starting the business, he identified a number of goals that he wished to achieve. He wanted to establish a business that would support the local economy and would act as a role model for others. He wanted to build the business, but not too big. Instead his priority was to maximise its efficiency and profitability, rather than constantly increasing turnover. His final goal was to build a business that was conscious of biodiversity and positively strove to make its activities ecologically friendly. In a bid to reduce the prospect of fish escaping, he ensured that the condition of the nets was of top quality, that each tank used two nets, and that a diver examined the nets on a daily basis to ensure that no breaks had occurred in the nets. As part of his ecologically-friendly approach to business, he also had an environmental impact assessment undertaken before building the tanks so as to ensure that he optimised the operation in terms of biodiversity. This was also part of an overall commitment to ensuring that the fish farm complied with national standards at all times.

An area of great difficulty for many fish farms is keeping within the quotas that they are licensed to produce. Echinades Fish Farm has a license for 250 tonnes per year but Nikos estimated that it is not possible to be economically viable with such a small quota. He is therefore left with a dilemma – illegality or insolvency. He perceives that approximately 90% of Greek fish farms are exceeding their quotas since this must occur for the businesses to survive and so he currently produces about 400 tonnes of stock per year. He estimates that 70% of his costs are spent on fish feed since almost all of it is imported from Latin America (predominantly from Peru). He is eager to identify ways in which this cost can be reduced and a more biodiversity-friendly solution can be found. With the collapse of the local tobacco growing industry due to the removal of EU subsidies for tobacco growing, growing oil seed rape as a source for biofuel is one alternative to tobacco. Once the oil has been removed the residue is rich in protein, and Nikos has been experimenting with the use of this to replace some of the fish meal in the feed that he uses. The initial results indicate that it is possible to

replace up to 30 per cent of this fish meal with vegetable derived material without having a negative effect on the rate of fish growth. This additional use of oil seed rape would help local farmers who are producing this product and would also help reduce his cost base as 70% of his costs are spent on fish feed. If widely adopted it might also have an impact on the fish stocks from which the fishmeal is derived, although that would depend also on the overall level of demand.

Nikos is surprised that little research has been undertaken generally on escaped fish from fish farms and the impact that escaped fish might have on other fish farms in the area. For example, despite the fact that more than 25% of Greek Fish farms and 20% of Greek hatcheries of seabass and seabream are now located along the western coastline of Greece, little research has been undertaken about the environmental impact of this growth. Recent studies by researchers such as Dimitrou et al (2007)² have highlighted that the spectacular increase in both the number of farms and their production has resulted in the maintenance in cages of large seabream which are potential spawners. Dimitrou et al identified that reproduction in the cages had occurred in parallel with a remarkable increase in seabream landings from the fish trap fisheries of the Messolonghi-Etolika lagoon. This research points to a possible relationship between the rearing activities in the area, density dependent mechanisms, and the unintentional enhancement of traditional lagoon fisheries, but much more work needs to be undertaken to understand the ecological implications fully.

Current Activities

Echinades Fish Farm is located just a twenty minute boat ride from Askatos on the western coast of Greece. It is nestled amongst a small group of islands in the Ionian Sea and benefits from the warm Mediterranean climate. The farm is situated in a marine Natura 2000 site (Esoteriko Archipelagos Ioniou) between the Greek mainland and the islands of Lefkada, Ithaki, and Kefalonia to the North and West. The site contains an important archipelago of 36 mainly uninhabited islets and small islands. It is a refuge for many top marine predators, including the critically endangered Mediterranean Monk Seal (*Monachus monachus*). Other species include the Bottle-nosed Dolphins (*Tursiops truncatus*), Common Dolphins

² Dimitrou, E.; Katselis, G.; Moutopoulos, D.K.; Akovitiotis, C.; and Koutsikopoulos, C. (2007) – Possible Influence of Reared Gilthead Sea Bream on Wild Stocks in the Area of the Messolonghi Lagoon – Aquaculture Research, Vol. 38, Iss. 4, pp 398-408

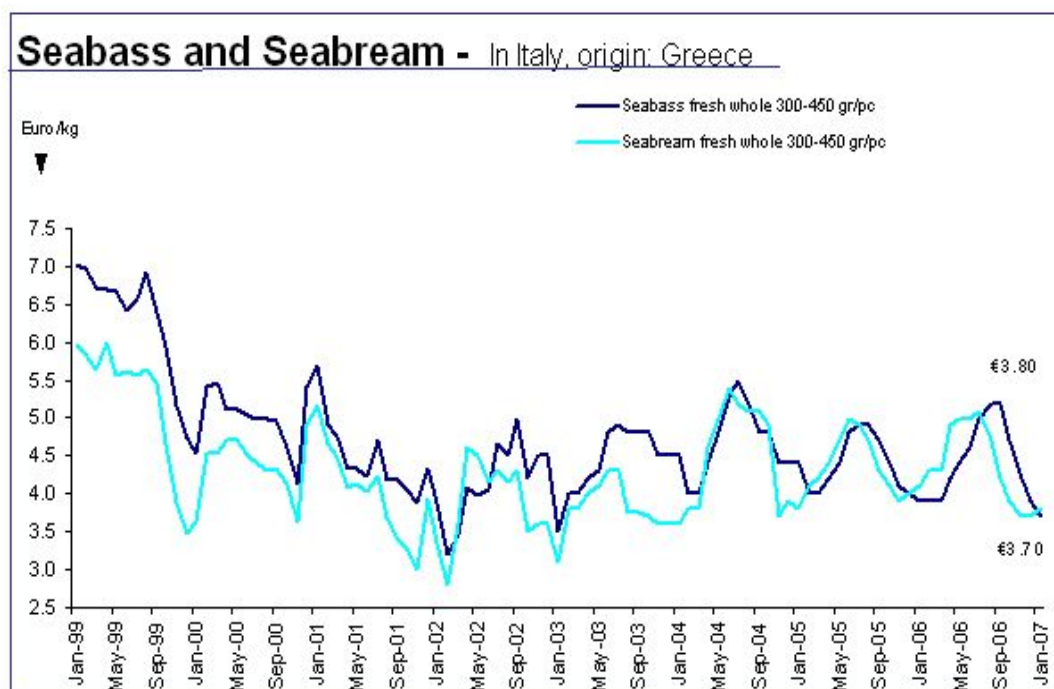
(*Delphinus delphis*), and various shark species. Nikos reported that operating within the Natura 2000 site had not had a significant effect on his operations, apart from adding to some of the paperwork in the set-up stage. He also noted that there are very little resources available for the management of the site, and in the light of that the lack of any regulatory impact on his own farm is understandable.

Since establishing the business in 2004, Nikos Anagnopoulos has quickly put the company on a solid commercial footing. Like most Greek fish farmers, he has focused only on seabass and seabream because there are good markets for these species and because they continue to be very profitable. His fish farm contains 22 cages, 15 of which are 19 metres in diameter and 10 metres in depth, while 7 of them are 12 metres in diameter and 9 metres in depth. Nikos believes that cages any bigger than this are too industrial and will reduce the quality of the fish. Since the cages were built, they have already been moved on two occasions within the local area. He also has a dozen smaller cages which he uses for experimental purposes, such as trying different types of feed (as mentioned earlier). Detailed records are maintained of these experiments so as to properly evaluate the results and so that the more effective methods uncovered can be introduced into the production process. He has a very good relationship with the Hellenic Centre for Marine Research which offers him access to cutting-edge research in this area plus a collaborative arrangement in terms of the experiments on his fish farm. The fry (juvenile fish) used for his business are purchased from different local hatcheries, usually when they are about 120 days old and weighing approximately two grams. The price and quality of the fry vary but because of his background in the industry and strong network of contacts, Nikos believes that he is now getting good quality fry at reasonable rates.

As part of his continued pursuit of improving the profitability of the business, Nikos undertook some research of the prices being achieved for seabass and seabream on the international markets. Good international demand and increasing prices were the main features of the EU seabass and seabream market between January and September 2006. However, from September onwards, with the new generation fish reaching the marketable size of 350-400 grams, the increased supply could not be absorbed by demand anymore, hence the gradual decline of prices. According to Globefish industry correspondents, prices of seabass dropped considerably for all size grades from October 2006 to January 2007. On the other hand, even if the overall trend of seabream prices was a declining one, prices of

small grades were relatively more buoyant than prices of larger grades. As a result, in January 2007, seabass (normally more expensive than seabream) became a cheaper option in several EU markets. None of this was particularly good news for Nikos.

One of the biggest challenges in fish farming is the long production process. Once the fry have been put into the tanks, it is between 15 and 20 months before the seabass will be ready for the marketplace, while for seabream it is between 13 and 17 months. Nikos has established a good distribution system for his fish whereby he uses three different wholesalers to package and distribute his produce. Almost all of his produce is then sent to Italian markets for sale. One of the difficulties about using wholesalers is that the prices change on a weekly basis, although he would not be interested in taking a long-term fixed price contract from them. They also do not pay him until two or three months after delivery, while the Italians pay cash upon delivery. Despite these inconveniences, Nikos believes that this arrangement is most effective for his company as it means that he can focus on the farming of the fish. He wants to be able to provide his customers (i.e. wholesalers) with good quality fish and an efficient service that encourages them to keep coming back to him for more produce. He recognises that he is restricted in the price that he can get for his fish so he is looking to increase the number of orders that he receives and simultaneously reduce the costs of the business. He is also currently exploring the idea of tagging of the fish since branding is not really possible for his produce.



Source: Globefish (2007)

Echinades Fish Farm currently employs eight people. Since Nikos continues to work as a Director of Lamans Management Consultancy, he has employed a local fisherman as his manager who is responsible for overseeing the daily operations of the business. Living locally means that the manager is fully aware of the needs of the area and can engage with local people to support the operations of the business. This was particularly helpful in the early days when many fishermen in the area were distinctly unhappy with their livelihood being threatened by a number of fish farms in the area. The company also employs six full-time people on a shift basis to undertake the daily tasks of fish farming. One of these six employees is required at sea each night keeping nightwatchman on the tanks in case of any intrusion from unwelcome sources. An ecologist is employed on a part-time basis to monitor the results of the experimental tanks and to ensure that the company is fulfilling its environmental obligations. Nikos has contracted Lamans to undertake all of the administrative tasks, including producing monthly financial accounts. Nikos himself is responsible for the buying and selling of the stock, and for determining the strategic direction of the business. The company has already developed a strong team identity which Nikos argues is more likely to occur within a small local community where everyone knows each other, than in a large city such as Athens. Nikos promotes this team spirit by giving the staff responsibility and encouraging them to use their initiative. He has also become well-known in the local area as a businessman who wishes to support local economic development through regional regeneration from such industries as aquaculture.

Role of Government

As with any industry, the role of government can be a critical part of its success or failure. Despite the tremendous growth experienced in the aquaculture sector in Greece over the past decade, Nikos is very critical of Greek fisheries policy. He would suggest that there is no coordinated approach to the needs of the industry and that there is no aquaculture policy in particular. He highlights that while there is legislation for food packaging, freshwater fishing, and environmental protection, there is no specific legislation in Greece relating to fish farming. This lack of control was one of the primary reasons that he was reluctant to enter the market in 2001. He also believes that the lack of government support in terms of legislation has been a primary reason why potential investors are slow to put money into this industry sector, thus depriving companies of the capital required to take the industry to the next level

of growth. There is also little interaction between national, regional, and local government which means that the initiatives of one group are probably being hindered by the other groups. A coherent joined-up approach to policy in the industry would greatly enhance the prospects of the country benefiting further from the wonderful achievements of recent years. As an example, a move up the market value-chain by developing new products such as smoked, battered, and fillet fish would add significant job potential to the processing element of the industry, but he argues that this would be most effectively achieved by increased government regulation and private investment.

There are two major difficulties being experienced by the industry due to the lack of governmental policy. The first is that starting and running a business in the industry is extremely bureaucratic and so discourages people from participation. In starting the business, Nikos Anagnopoulos had to secure seven different licenses. This required going to many different government departments to complete the relevant paperwork. More interestingly was that in addition to the government departments, he also had to go to regional and local authorities to receive appropriate documentation to start his business from these bodies. While acknowledging the role of the Chambers of Commerce in giving information to help point him in the right direction, he considered the idea of a one-stop-shop that would deal with all of these requirements as a sensible solution to the challenges faced by a potential entrepreneur.

The second difficulty faced by businesses in this industry sector is the lack of environmental controls and monitoring. Nikos indicated that the relevant Ministry only allocated a budget of €100,000 in 2006 for the evaluation of the environmental impact of fish farms. Even with just a brief glance at this industry, it is apparent that such a small sum of money is not sufficient to carry out the monitoring required to ensure that environmental standards are being adhered to by those within the industry. Even if government agencies were to monitor the fish farms, what would they be measuring? Criteria such as water temperature, currents, wind, etc are hardly the most important issues when there are far greater matters to be considered. For example, there is no research or monitoring being undertaken to reduce the levels of dioxins that might be present in farmed fish. Equally, there is no monitoring regarding the density of fish in a tank, nor the use of antibiotics to cure them of any potential diseases. Further concerns such as anti-fouling of the nets also go unmonitored and while many manufacturers guarantee environmentally friendly nets, the effect of the red colouring that they discharge

into the sea goes untested. There is therefore no monitoring of the impact of fish farms on the environment, no measures to evaluate, and no incentives for the industry or the small firms within it to police themselves. For companies such as Echinades Fish Farm who wish to behave in an environmentally friendly fashion, these aspects of the industry represent a significant challenge to their way of doing business.

Nikos believes that the growth of the aquaculture sector over the past decade has highlighted the enormous potential that exists for companies within the industry. However, for the Greek government to avail of this opportunity, it needs to act quickly in a number of ways. His recommendations to the government include the need to design and implement a central policy for the aquaculture industry, the allocation of clear responsibility to a centralised department for the monitoring of the adherence to legal and environmental regulations, increased funding to ensure that policy and monitoring measures can be effectively implemented, a significant reduction in the administrative requirements to start and run a business, increased quotas that enable fish farms to be economically viable, a centralised information hub (e.g. website) that caters specifically for the industry, and the reduction of taxation on grant aid. Nikos accepts that it is unlikely that each of these recommendations will be achieved within the near future but it is his wish-list for the industry. He also believes that implementing these measures would have additional benefits for regional regeneration along the western coast of Greece and offer opportunities for peripheral industries.

Future Challenges

Despite the fact that there has been a substantial growth in the number of fish farms along the western coast of Greece, Nikos Anagnopoulos does not see competition from local producers as his biggest threat. Indeed he would argue that there is little competition amongst the fish farmers (beyond the daily management of their fish farmers and the control of diseases) because the market is currently buoyant enough across Europe to support the production of every company. Instead Nikos wishes to focus on stabilising his own operations at approximately 400 tonnes per year, improving the quality of the fish, and reducing the costs of the business. Successfully following this strategy would enable him to improve his profit margins which he would reinvest in the firm so as to undertake research on related activities such as developing ecologically-friendly feed which might be patented and would generate income from royalties. He would also like to explore the concept of tagging the fish in greater

detail so that it might lead to some form of branding for his produce. This is quite a difficult task but could lead to his produce no longer be viewed as a generic commodity item, which in turn could lead to higher profit margins for his produce.

Another idea that Nikos would like to explore is the concept of aquaculture tourism whereby tourists could visit the fish farm with children particularly viewing the trip as an educational experience. The prospect of such an income generating scheme is currently remote as legislation and insurance costs would be enormously prohibitive to the undertaking of such a venture. However, he is aware of its existence in Italy and so believes that it must be possible in Greece also. He believes that having people visit fish farms would also help to break down the perceptual barriers that many consumers still have about farmed fish being inferior in some way to wild fish. This was a critical issue if the European markets for seabass and seabream were to continue to grow. But what Nikos has already decided against doing is starting another fish farm. The whole experience has been quite stressful and while he would be happy to participate as a partner in another venture, he has determined that he will not build a chain of fish farms along the coastline.

The Journey Taken

As Nikos continued to explain to his E.U. visitors the journey that his business had taken, he reflected upon the many ups and downs that he had experienced since the company was established. Some of the challenges that he had endured were due to national, regional, and local authorities being overly bureaucratic but there was nothing that he could do about such situations. He had not anticipated the strength of local opposition to his plans originally but these had now been resolved and he had developed a strong relationship with those who originally were his opponents. One matter that he would do differently if he was starting again would be to head straight for maximum capacity and not begin in a gradual fashion. Nikos feels that he took a gentler approach to production because of the high initial capital costs of production but in reality this was a much less profitable way of doing business. He had lost two years of maximum capacity which would have helped his cash flow enormously now. A more favourable grant-support system would have helped him to make a better financial decision at that time but he feels that the Greek government are not helpful in this regard. Additionally, although a great deal is still unknown about the effect of the farming of sea bass and sea bream on biodiversity, Nikos would like to ensure that his business is

conducted in a biodiversity friendly way. But in the absence of either a national or EU regulatory framework that requires particular biodiversity-relevant standards are met, or the opportunity to increase revenues through biodiversity friendly production, he believes that the incentives to follow this path are not strong. The first years of the business, as he explained to his visitors, have been like the boat journey itself as he initially needed the courage to leave the comfort of the land and since then he has moved through choppy waters. However, it has been a fascinating journey and one that he is glad that he has taken.