



Albania Marine Aquaculture for Gilthead Seabream and European Seabass Production: Sectorial Analyses and Considerations

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Abstract

Aquaculture is representing one of the most attractive sectors in the Blue Economy sectors in Europe, recently. Globally, it is considered as a priority sector and the fastest growing socio-economic development branch of Agriculture. In Albania, the most profitable sub-sector of Aquaculture is represented by growing the European seabass (*Dicentrarchus labrax*) and gilthead seabream (*Sparus aurata*) by using sea-cages in the coastal areas of Albania, though recent initiatives are showing the development of off-shore Aquaculture. Based on the data reported by the Ministry of Agriculture and Rural Development, the market value of this production sector (exclusively localized in the Ionian coast of Albania) is 6.1 million Euro; it results to be a promising sector for providing incomes and employment toward the coastal communities and the Albanian developing economy.

Keywords: European seabass; Gilthead seabream; Blue growth

Abbreviations: EC: European Commission

Introduction

The “Blue Growth” strategy of the European Commission (EC) aims to support the sustainable growth of maritime sectors. It aims to support sustainable growth in all marine and maritime sectors, which are represented by aquaculture, marine and coastal tourism (including cruise and recreational boating), marine biotechnology and marine mineral mining [1]. Furthermore, emerging sectors such as renewable energy, seabed mining and biotechnology are expected to grow even faster, although there is greater uncertainty concerning these developments and their expected impacts on marine

ecosystems [1]. Marine aquaculture is one of the promising sectors for the next 15 years and it seems to grow in developing countries and/or EU candidate countries, like Albania. European seabass (*Dicentrarchus labrax*) is the main species farmed in the Mediterranean and it is commonly found throughout the Mediterranean and Black seas and the Northeastern Atlantic, from Norway to Senegal, and normally along the coast and in brackish waters [2].

In the 1960s, intensive methods for rearing were developed using complex hatchery techniques, though it has been reared using extensive methods, such as closed lagoons, for a long time. Currently, floating sea cages represent the aquaculture production system, where most farmed European seabass are produced, without

excluding the possibilities of land-based farms existence in the Mediterranean basin countries. Normally, the fish is harvested after 18 months and up to two years in size categories of about 0.65 kg [2]. Gilthead seabream (*Sparus aurata*) is a significant species for marine fisheries and it is the main farmed seabream species in all the Mediterranean region. It is commonly found in the entire Mediterranean and Eastern Atlantic, from the UK to the Canary Islands [2]. It lives along the coast and in brackish waters, and similarly to the European seabass, it has traditionally been farmed extensively in lagoons and ponds. Hatchery techniques were developed for gilthead seabream just in the 1980s. Some land-based systems can be found in countries like Spain (for research purposes), though it is normally reared by the farmers in sea cages. Normally, it is harvested after approximately 16 months in the sea, and, as with European seabass, in small size categories below 1 kg [2].

Actually, in the Mediterranean basin, Turkey and Greece, the two largest suppliers to the European bass and bream market, both increased their harvest and export volumes substantially this year. This increase has been relatively more pronounced for bream, pushing prices down on the major Italian market to 4-year lows for the 300-450g size. Bass prices for the equivalent size are at comparable levels to the last few years once seasonal trends are taken into account. However, reports from wholesale markets in Spain suggest that on that market there has been slight decline for farmed bass, again on a seasonally-adjusted basis [3]. Christmas is typically the low point for bass and bream prices, which are more of a summer seafood item, but the usual uptrend in early 2018 will have to contend with further supply increases from Turkey, which stocked

large quantities of juveniles last year [3]. In Greece, meanwhile, the expected consolidation of leading Greek aquaculture companies Selonda and Nireus, following the currently ongoing sales process, is anticipated to be a positive development for the industry as a whole, set to boost investment and innovation in marketing and production and provide renewed strategic direction for the Greek sector [3].

Almost 20 years ago, the marine aquaculture of fish species was less developed in comparison to freshwater species aquaculture in Albania, which was mainly represented by trout and carp species in ponds and raceway systems, respectively. In 2002, based on private investments, it was possible that floating cage farming of marine finfish started to be used by the Albanian farmers, while involving European sea bass (*Dicentrarchus labrax*) and gilthead seabream (*Sparus aurata*) [4].

Anyway from that time, so many changes happened including this important sector, but unfortunately no updates exist about the marine cage farms situation after 16 years. For this reason, based on the data we had from the Ministry of Agriculture and Rural Development, we did some comparative analyses in order to speculate on how promising can be this sector for the future economic and social development of Albania.

Material and Methods

The area of study is represented by the Ionian coastal areas at the south of Albania (Figure 1).



Figure 1: A map showing the areas (fish symbol), where are installed the sea cages for growing gilthead seabream and European seabass in Albania (on the right) and several photos showing the cages from each of the areas (on the left).

The farms are obliged by the law to report annually to the Directorate of Fisheries and Aquaculture Service (DFAS) all the information relative to the production. Previously all the statistics were collected by representatives of the Ministry of Environment, actually named Ministry of Environment and Tourism. Due to these facts, the available data about marine aquaculture production correspond to the period of time from 2014 till 2017. All these data were gently provided to by DFAS for aquaculture farms located in Saranda (including Himara) and Vlora, respectively. These data were analyzed by using Microsoft Office package (Microsoft Excel), based on the criteria of production and market value. It is also important to mention that several surveys were performed in all these farms.

Results and Discussion

Floating cage farming of marine finfish started in 2002 [5] and actually there are present 12 floating cages farms in the territory of Albania, which are specialized on growing gilthead seabream and European seabass. It is important to note that no hatchery exists in the Albanian territory and most of the fingerlings is coming in this on-growing farms from the hatcheries located in Greece, while the fish feed is imported from Italy, France and Germany. Anyway, it is important to note that the FCR is lower than 2.0 and sometimes in some farms (Bakiu, personal observation it is 1.6), which shows that experienced specialist are actually managing these marine farms. Generally, the fish density range is from 10 to 15 kg fish/m³ in the marine cage farms.

Mainly the sea cage farms are located in the Bay of Vlore (close to Karaburun peninsula), Saranda (in Ksamil) and Himara (Porto Palermo), where identical growing technologies used in Greece and Turkey are installed in these areas, represented by pre-on growing cages 3m x

3m, growing circular cages with a diameter of 13 m and 19 m, respectively. The minimum depth, where these cages are located is 20 m depth. Anyway, there is an Italian company which is installing off-shore cages near to Karaburun peninsula. Furthermore, it is important to know that most of the production is exported toward EU countries (Bakiu R., personal observation; company's owner's interview) like Italy, France, Poland and Germany directly by the farming companies or whole-salers. For example, Alb-Adriatico 2013 and ALMARINA-OR have finished the construction of a brand new packing house, following the regulations and demands of hygiene and sanitation of the EU. This refrigerating warehouse for packing and storing the fish products was built under the norms and standards of EU, the materials and machineries installed in the packing house are all of the latest technologies available in the market today, and all were produced in EU countries such as Germany and Italy. These companies represent the EU exporting Albanian companies and the 350-400g fish of gilthead seabream and European seabass.

All the raw data were analyzed on comparative base analyses, where the production results for Saranda and Himara, together with the results of Vlora are reported in Figure 2 and Figure 3, respectively. As it is shown in Figure 2, the production of gilthead seabream increased 14% from 2015 to 2017, while the production of European bass increased 23% from 2014 to 2017. In Vlora Bay (Figure 3) the percentage of increased production resulted to be much higher in comparison to Saranda and Himara, which is represented by an average production increase of 131% for gilthead seabream and 140% for European seabass, respectively. Thus, just in three year a production increase of such levels shows that there is a high interest for the Albanian production of these fish species from the EU markets, where it is manly exported from the farmers and/or wholesalers.

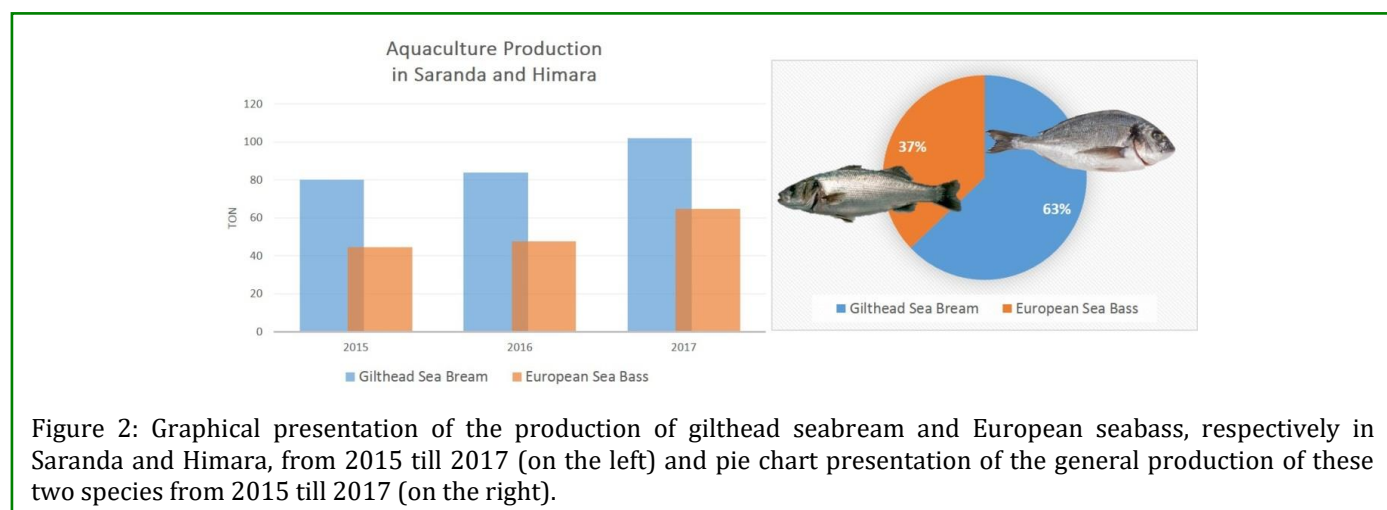


Figure 2: Graphical presentation of the production of gilthead seabream and European seabass, respectively in Saranda and Himara, from 2015 till 2017 (on the left) and pie chart presentation of the general production of these two species from 2015 till 2017 (on the right).

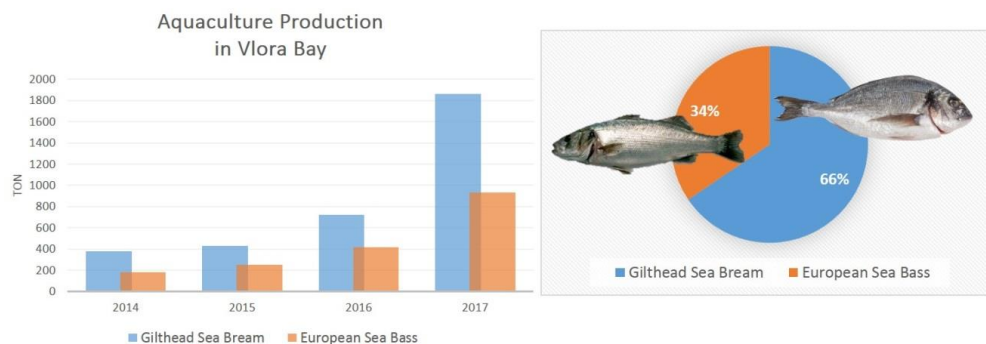


Figure 3: Graphical presentation of the production of gilthead seabream and European seabass, respectively in Vlora Bay, from 2014 till 2017 (on the left) and pie chart presentation of the general production of these two species from 2014 till 2017 (on the right).

Furthermore, it is important to mention that from the pie chart, it emerged out that the preference for growing European seabass in Saranda and Himara are slightly higher in comparison to Vlora Bay farms preferences, while the opposite is happening in the Vlora bay farms, where the farmers prefer to grow more gilthead seabream than European seabass, because in the past they have had problems with the fish diseases affecting mostly European seabass, though the selling price is higher for European seabass in comparison to the other marine aquaculture species.

Anyway, it is important to note that Vlora Bay is the most productive region about gilthead seabream and European seabass, as it is shown in Figure 4, where the Vlora production was registered to be 17 times higher than Saranda and Himara production in 2017.

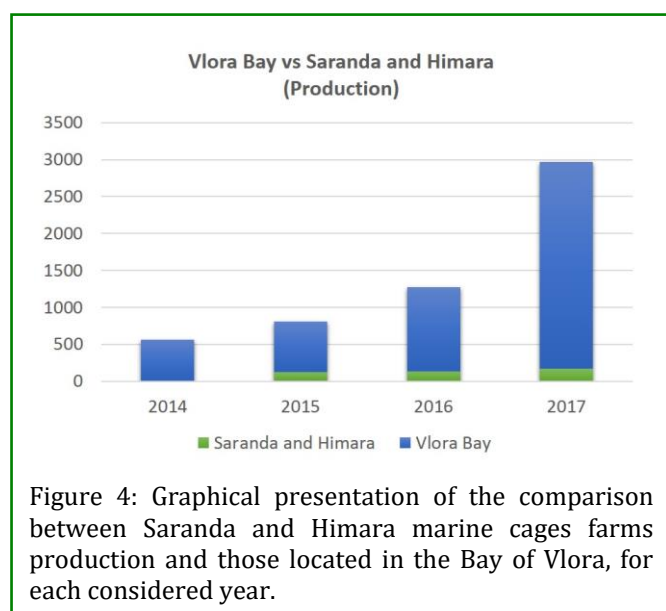


Figure 4: Graphical presentation of the comparison between Saranda and Himara marine cages farms production and those located in the Bay of Vlora, for each considered year.

Furthermore, it is important to note that the total production of gilthead seabream from both regions is comparable to the production volumes in France or Portugal (2000 tonnes), based on Kontali Analyse results [2].

As it is shown in Figure 5, the production trend for both species during the considered period of time was very big, because it was registered a production increase of 417% for gilthead seabream and 455% for European seabass from 2014 to 2017. Anyway, the production of gilthead seabream remained higher than the European seabass, because the mortality rate of European seabass resulted to be higher than the gilthead seabream mortality rate. For example in 2017, the Albanian total production of gilthead seabream was roughly 2 times higher than the production of European seabass. Furthermore, it is also linked to the higher FCR of European seabass in comparison to the gilthead seabream FCR.

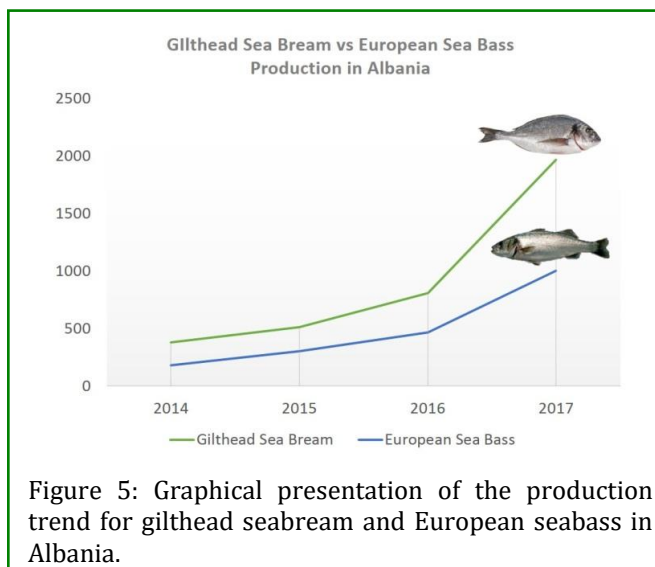


Figure 5: Graphical presentation of the production trend for gilthead seabream and European seabass in Albania.

Based on the average prices of selling European seabass and gilthead seabream in 28 EU countries (EMOFAP, 2017), the production values for each analyzed regions in Albania and the Albanian total production of these species were transformed into their respective market value (Figure 6). Actually, the average price for gilthead seabream is 4.2 Euro, while the average price of European seabass is 4.5 Euro.

As it is shown in Figure 6, the average market value of the sold total production from Vlora is 12 times higher than the average market value of Saranda and Himara production, while the market value of the Albanian total production is 6.1 million Euro.

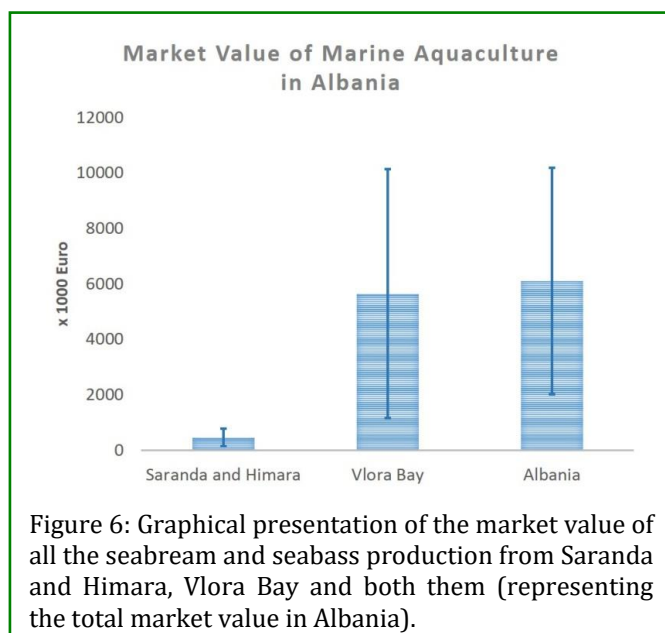


Figure 6: Graphical presentation of the market value of all the seabream and seabass production from Saranda and Himara, Vlora Bay and both them (representing the total market value in Albania).

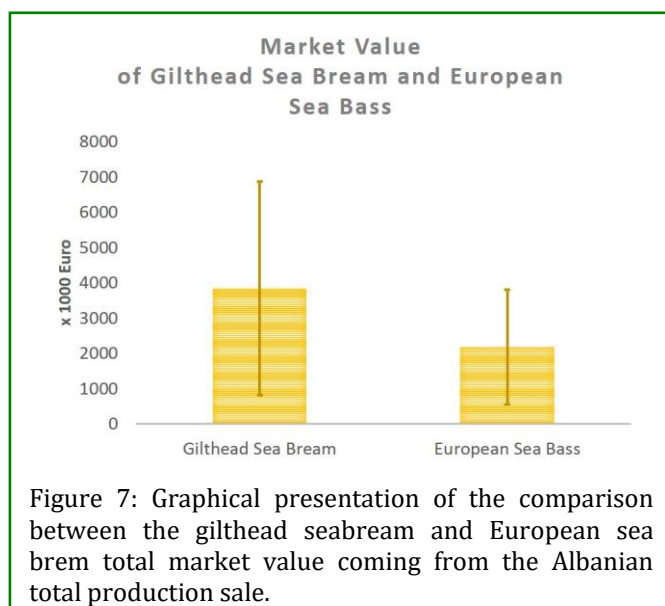


Figure 7: Graphical presentation of the comparison between the gilthead seabream and European sea bream total market value coming from the Albanian total production sale.

Furthermore, the Albanian total production for each of the considered fish species were transformed in market values resulting from their total selling in the EU markets (Figure 7). Though, the price of European seabass is generally higher than the gilthead seabream, the average market value of gilthead seabream resulted to be 1.8 higher than the market value of European seabass.

Albania is an EU candidate from 2004 and it is not an EU member country. The exclusion from the EU membership has influenced a lot on the sustainable development and level of informality characterizing the Albanian marine aquaculture, which is regulated just by the Albanian national laws, Albanian Case Laws, Albanian Ministerial Decisions and Albanian Administrative Documents and Directives, in accordance with a large number of EU Regulations, EU Commission Decisions, EU Council Decisions and EU Council Directives. Recently, (on 20 October 2016) it was approved by the parliament of the Republic of Albania the Law on Aquaculture, based on several EU Regulations and Directives. The Law on Aquaculture emphasizes the establishment Allocated Zones for Aquaculture (AZAs), which are the suitable areas for the development of marine aquaculture [6], where potential adverse environmental impacts and negative interactions with other users are minimized or avoided. Actually the Ministry of Agriculture is performing the preliminary site selection processes, which should define the geographical location and extent of aquaculture in a determined region [7].

As part of this process, physical, ecological and socio-economic criteria should be taken into account. Next, a location that minimizes conflict with the other users of coastal waters, such as shipping, fishing, recreational activities and the energy industry [8], should be identified to site the farm. Ecolabelling and organic certification is also increasingly prevalent and recently there are some related practices performed by some private firms in Albania. Though both species Albanian production (in 2015) (FAO, 2017) constitutes just 0.55% of the both species Greece production (2015), it has been difficult to fully meet the requirements of any regulatory system [9], though Greece had a lot of problems due to bureaucratic complexities and several cases diversity.

Conclusion

In conclusion, this economic sector needs to learn from the errors of the developed neighbor countries and enforce properly the law, based on best management practices in the region in order to have optimal production levels, without deterioration of the ecosystem, where are installed the floating cages.

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