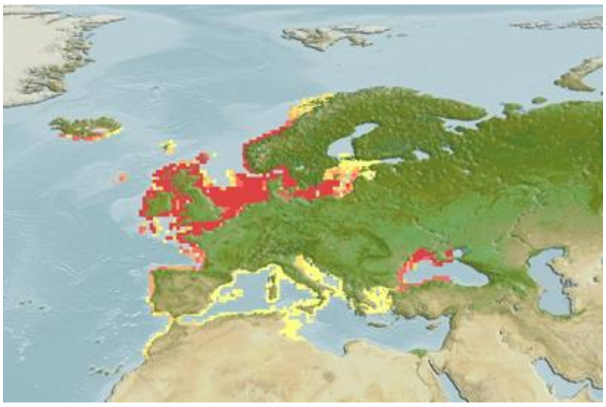
5 Case study – Fisheries and aquaculture of turbot

5.1. Introduction

Turbot (*Psetta maxima*) is a flatfish with an asymmetric and almost round body (eyes on the left side)[20]. With respect to habitat and biology, it is a benthic marine species, living on sandy and muddy bottoms, from shallow waters to 100 m. The turbot's spawning (sequenced, every 2-4 days) usually takes place between February and April in the Mediterranean, and between May and July in the Atlantic.

In the wild it is found in the Northeast Atlantic, throughout the Mediterranean and along the European coasts up to the Arctic Circle, as shown in figure 48[21]. It is also found in most of the Baltic Sea, and a subspecies (*Psetta maxima maeotica)* is found in the Black Sea[22].

Figure 48. **DISTRIBUTION RANGE OF WILD TURBOT (COLOURS FROM RED TO YELLOW INDICATE PROBABILITY OF OCCURRENCE (RED = MORE LIKELY)**



Source: Aquamaps.

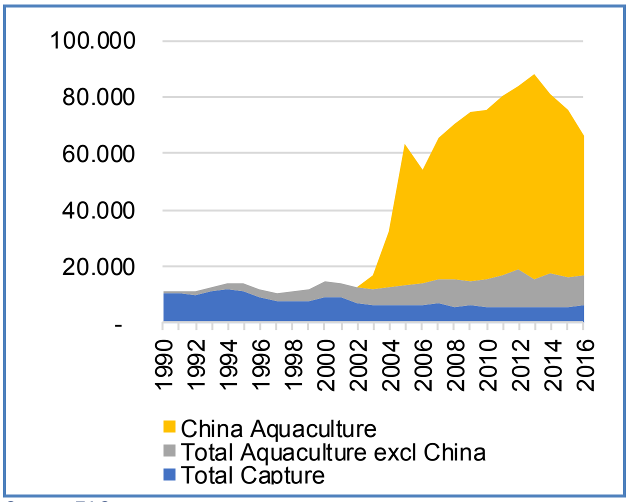
Aquaculture production of turbot started in the 1970s in Scotland (UK). It was subsequently introduced to France and Spain. Due to a scarcity of juveniles, the number of installations in Spain was initially limited. However, with technological development of juvenile production, Spain became the main producing country at the time.

Besides commercial investment in improved facilities and the construction of new farms, other decisive factors have assisted in the consolidation and development of the sector. These have included the production of dry feeds and the development of vaccines for the most important diseases affecting turbot.

[20] http://www.fao.org/fishery/culturedspecies/Psetta_maxima/en
[21] https://www.aquamaps.org/receive.php?type_of_map=regular
[22] https://www.fishbase.se/summary/Scophthalmus-maximus.html

5.2. Global aquaculture production

Figure 49. **GLOBAL CAPTURE AND AQUACULTURE PRODUCTION FROM 1990–2016 (volume in 1000 tonnes)**



Source: FAO.

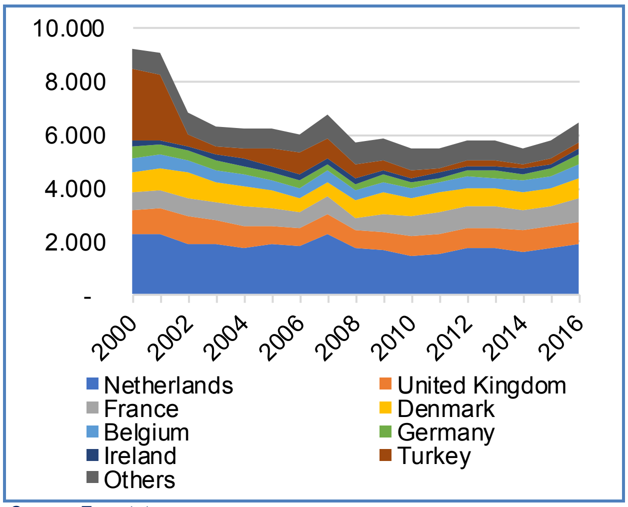
From the early 1990s a reorganization of the sector began, which gave rise to growth both in production and in the number of countries where turbot is farmed. In the EU today turbot is farmed in Spain, Portugal, France, Romania and Croatia. Beyond the EU there is limited production in Norway and Iceland. Since 2000 the growth rate in European production has been on average 6% per year; however, after a peak in 2012 the growth has been flattening out.

Turbot was eventually introduced to other regions such as Chile and China. China started its production in the early 2000s based on European broodstock, and by 2013 production reached 73.000 tonnes. After 2013, production declined to about 50.000 tonnes in 2016. Still, China is by far the world's largest producer of turbot, the products do not compete in the same markets than the European products.

5.3. European catches

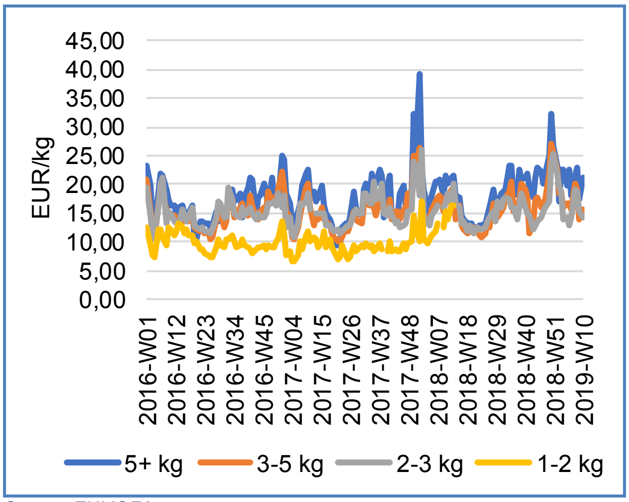
The European turbot captures have since 2000 declined from a total catch of 9.000 tonnes to volumes around 5-6.000 tonnes each year. The share of catch volumes between the countries have remained stable in recent years. The Netherlands has the largest volumes, with a catch of 1880 tonnes in 2016. The United Kingdom and France caught 873 and 846 tonnes of turbot respectively in 2016.

Figure 50. **EUROPEAN CATCHES OF TURBOT BY COUNTRY (volume in tonnes)**



Source: Eurostat.

Figure 51. **WEEKLY FIRST-SALES PRICE OF TURBOT PER SIZE (prices in EUR/kg)**



Source: EUMOFA.

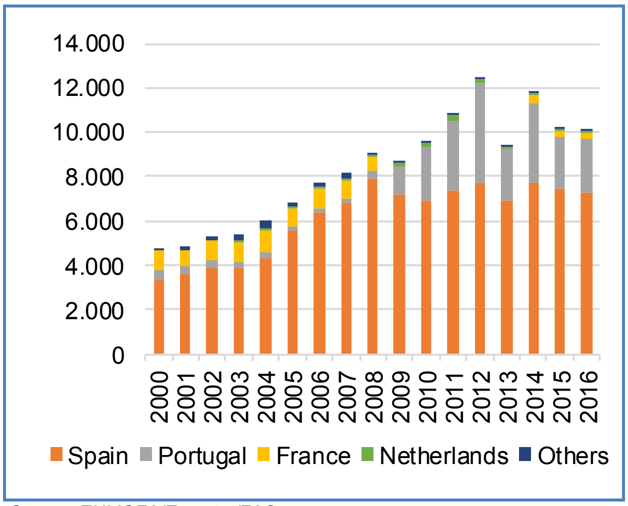
The chart shows the average first sales price of turbot by size for Belgium, Denmark, the Netherlands, Germany, Lithuania and Poland.

There is a slight upward first-sales price trend for turbot sold in the EU from 2016 up to February 2019. The structural price trend through the year shows peaks in prices during the Christmas festive season. The largest sized turbot achieves the highest prices in the market. Over the last two years, the price difference between turbot 5 kg or higher and turbot 3-5 kg has averaged around 2,00 EUR/kg.

5.4. Turbot aquaculture in the EU

The major players in the EU turbot aquaculture sector are Spain, Portugal and France. Spain accounted for 72% of the value of EU production in 2016 and the production share is estimated at 76% in 2017[23]. Production has grown steadily since the beginning of the late 1980s and has recently stabilized at around 10.000 tonnes a year. Portugal has increased its production significantly since 2008 and produced 2.388 tonnes in 2016.

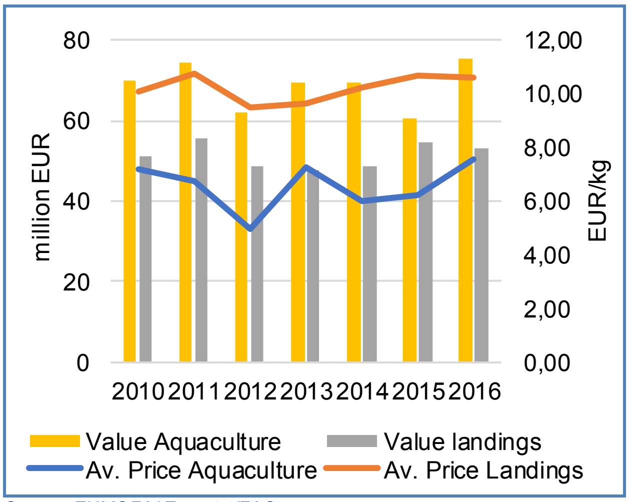
Figure 52. **TURBOT AQUACULTURE PRODUCTION IN THE EU BY MEMBER STATE (volume in tonnes)**



Source: EUMOFA/Eurostat/FAO.

[23] Apromar, La Acuicultura en España 2018.

Figure 53. **PRICE AND TOTAL VALUE OF TURBOT LANDINGS AND AQUACULTURE IN THE EU**



Source: EUMOFA/ Eurostat/FAO.

The turbot from marine fisheries achieves a higher price than farmed turbot. In the figure below, we see that the value from aquaculture is higher due to larger volumes, but that the average price per kg is significantly lower than for turbot landings. In the period 2010-2016, the price for farmed turbot has on average been 6,55 EUR/kg, 56% lower than turbot from marine fisheries (averaging at 10,21 EUR/kg).

It is estimated that production of turbot in Europe rose slightly to 11.000 tonnes in 2017 due to an increase in Spanish production. A slight reduction in production is expected in 2018[24].

5.5. Trade

Extra-EU Imports

Imports of turbot to the EU are small compared with domestic production in the EU. Over the last four years, imports have been stable at around 200 tonnes per year, this represents 1% of total catch and production in the EU.

Almost all turbot imports come from Norway and Morocco. The main source is Norway with 156 tonnes in 2017 and 139 tonnes in 2018; from Morocco 74 tonnes was imported in 2017 and 62 tonnes in 2018[25].

The main importing Member States are Sweden, Spain, Germany and Denmark. While Germany, Denmark and Sweden import turbot from Norway, the main country of origin for Spain is Morocco.

Table 7. **EXTRA-EU IMPORTS OF WHOLE TURBOT BY PRESERVATION STATE (volume in tonnes, price in EUR/kg)**

	2015		2016		2017		2018 (Jan–Nov)	
Product	**Volume**	**Price**	**Volume**	**Price**	**Volume**	**Price**	**Volume**	**Price**
Fresh whole turbot	201	9,13	231	9,69	230	9,89	201	10,70
Frozen whole turbot	n/a	n/a	n/a	n/a	n/a	n/a	5	6,48

Source: EUMOFA/Eurostat.

[24] FEAP, APROMAR.
[25] Data for January–Novevember 2018. Data for December 2018 was not available yet during the preperation of this case study.

Table 8. **EXTRA-EU IMPORTS OF FRESH WHOLE TURBOT BY MAIN IMPORTING MEMBER STATES (SWEDEN, DENMARK, GERMANY, SPAIN), (volume in tonnes, prices in EUR/kg)**

Importing Member State	2015		2016		2017		2018 (Jan–Nov)	
	Volume	Price	Volume	Price	Volume	Price	Volume	Price
Spain	60	11,08	72	12,31	74	12,95	62	14,00
Sweden	76	8,81	53	9,51	63	9,85	75	9,67
Germany	37	7,18	75	8,03	65	7,24	43	8,43
Denmark	26	8,36	31	8,00	29	8,09	21	9,27
Other	3	8,82	0		0,2	14,40	5	6,80
Total	**201**	**9,13**	**231**	**9,69**	**230**	**9,89**	**207**	**10,70**

Source: EUMOFA/Eurostat.

Extra-EU Exports

Of the total catch and production of turbot in the EU of approximately 16.000 tonnes in 2016, only around 400 tonnes were exported to countries outside the EU, of which approximately 75% was fresh product.

The US is the largest export market for fresh whole turbot from the EU. In 2018[26], EU exports of turbot to the US amounted to 119 tonnes.

Table 9. **EXTRA-EU EXPORTS OF WHOLE TURBOT BY PRESERVATION STATE (volume in tonnes, price in EUR/kg)**

Product	2015		2016		2017		2018 (provisional Jan–Nov)	
	Volume	Price	Volume	Price	Volume	Price	Volume	Price
Fresh whole turbot	328	12,25	327	13,85	372	12,77	312	16,73
Frozen whole turbot	106	9,28	69	11,12	68	12,63	83	10,39

Source: EUMOFA/Eurostat.

Table 10. **EXTRA-EU EXPORTS OF FRESH WHOLE TURBOT BY MAIN DESTINATION (volume in tonnes, price in EUR/kg)**

Destination country	2015		2016		2017		2018 (provisional Jan–Nov)	
	Volume	Price	Volume	Price	Volume	Price	Volume	Price
United States	110	9,52	100	10,15	106	10,45	119	10,61
Switzerland	75	17,16	72	16,48	69	15,62	58	15,77
Turkey	56	4,52	66	3,55	84	3,51	24	3,45
Canada	20	25,77	28	25,39	23	25,67	31	25,99
Montenegro	14	8,00	16	11,06	16	9,07	13	11,50
United Arab Emirates	7	14,45	7	12,58	10	16,38	9	15,95
Other	46	15,11	38	29,22	65	21,15	57	32,49
Total	**328**	**12,25**	**327**	**13,85**	**373**	**12,77**	**311**	**16,73**

Source: EUMOFA/Eurostat.

[26] Data for January–November 2018. Data for December 2018 was not available yet during the preperation of this case study.

Table 11. **EXTRA-EU EXPORTS OF FROZEN WHOLE TURBOT BY MAIN DESTINATION (volume in tonnes, prices in EUR/kg)**

Destination country	2015		2016		2017		2018 (provisional Jan–Nov)	
	Volume	Price	Volume	Price	Volume	Price	Volume	Price
United Arab Emirates	40	18,67	35	15,03	28	16,33	22	14,57
Viet Nam	44	2,06	<0,5	n/a	0,4	29,38	0,5	40,76
Dominican Republic	4	6,12	9	5,45	7	7,32	11	7,06
Turkey	0,1	14,40	3	6,92	5	4,70	6	4,00
Canada	0		0,7	5,03	6	6,23	7	5,00
Mexico	3	6,70	3	9,25	6	10,80	3	8,73
Other	15	6,60	18	7,73	15	14,07	33	10,79
Total	**106**	**9,28**	**68**	**11,12**	**68**	**12,63**	**83**	**10,39**

Source: EUMOFA/Eurostat.

Intra-EU Exports

While trade of turbot between EU and third countries is very limited, trade between Member States (especially those of fresh products) is considerably greater. Exports from Spain, Portugal and the Netherlands account for most of the intra-EU trade of turbot. Portuguese production is financed by Spanish investment capital and is almost entirely exported to Spain[27].

Italy and France mainly import turbot from Spain and the Netherlands. The Netherlands imports mainly from Belgium and Germany. Germany imports mainly from Spain, the Netherlands and France.

Table 12. **INTRA-EU EXPORTS OF WHOLE TURBOT BY PRESERVATION STATE (volume in tonnes, price in EUR/kg)**

Product	2015		2016		2017		2018 (provisional Jan–Nov)	
	Volume	Price	Volume	Price	Volume	Price	Volume	Price
Fresh whole turbot	11 850	7.70	10 030	9.60	11 297	9.11	9 641	10.30
Frozen whole turbot	1 206	4.30	637	5.94	542	6.54	613	6.69

Source: EUMOFA/Eurostat.

[27] EUMOFA – “Price structure in the supply chain for turbot“, http://www.eumofa.eu/market-analysis

Table 13. **INTRA-EU EXPORTS OF FRESH WHOLE TURBOT, BY MAIN IMPORTING MEMBER STATES (volume in tonnes, price in EUR/kg)**

Importing Member State	2015		2016		2017		2018 (provisional Jan–Nov)	
	Volume	Price	Volume	Price	Volume	Price	Volume	Price
Spain	3 347	6,91	2.571	9,07	3.322	8,43	3.117	9,65
Italy	3 018	7,41	2.667	8,97	3.053	8,44	2.458	9,62
France	1 951	7,28	1.477	9,63	1.680	8,68	1.071	10,48
Netherlands	923	8,19	923	8,42	773	8,84	805	8,80
Germany	677	11,74	793	12,11	742	11,99	600	12,80
Portugal	213	8,07	206	10,11	460	9,55	534	10,58
Other	1 722	8,35	1.393	11,00	1.266	11,43	1.056	13,22
Total	**11.850**	**7,70**	**10.030**	**9,60**	**11.296**	**9,11**	**9.641**	**10,30**

Source: EUMOFA/Eurostat.

Table 14. **INTRA-EU EXPORTS OF FROZEN WHOLE TURBOT BY MAIN EXPORTING MEMBER STATES (volume in tonnes, prices in EUR/kg)**

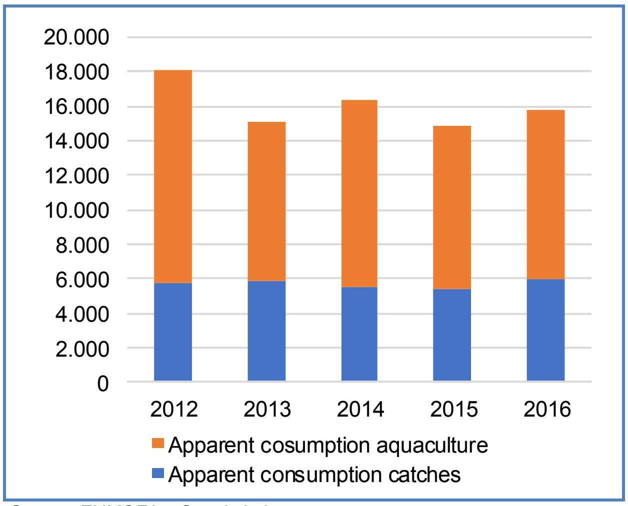
Exporting Member State	2015		2016		2017		2018 (provisional Jan-Nov)	
	Volume	Price	Volume	Price	Volume	Price	Volume	Price
Spain	565	2,73	279	4,24	183	4,21	269	4,85
Italy	239	4,72	125	6,77	109	6,13	108	7,09
Germany	58	6,80	57	4,34	66	7,03	80	7,67
France	132	4,48	69	6,56	49	6,64	36	6,46
UK	0	6,95	0	-	0	11,20	26	5,98
Portugal	55	4,03	4	5,99	10	5,44	21	9,10
Other	51	7,28	35	10,14	57	7,85	40	8,41
Total	1.101	3,82	568	5,31	474	5,67	580	6,10

Source: EUMOFA/Eurostat.

5.6. Consumption

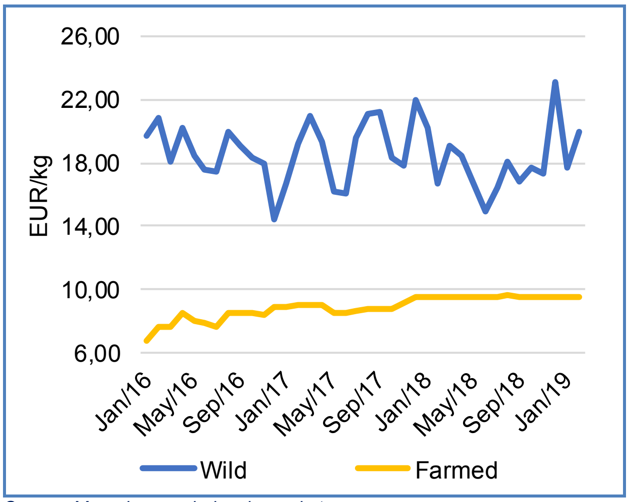
In 2016, 15.750 tonnes of turbot were consumed in the EU, mainly fresh. Consumption is concentrated in Spain, France and Italy, which represent about 75% of the EU market. This makes turbot a niche market compared with other major species[28]. EU apparent consumption of turbot has been relatively stable for both wild and farmed products, although consumption of farmed fish has been slightly more variable than wild fish. However, apparent consumption per capita is estimated to be stable, with approximately 10 grams per capita for captured turbot and double that for farmed turbot (20 grams per capita).

Figure 54. **APPARENT CONSUMPTION OF TURBOT IN THE EU (volume in tonnes)**



Source: EUMOFA – Supply balance.

Figure 55. **WHOLESALE PRICE TREND OF FRESH TURBOT IN SPAIN**



Source: Mercabarna wholesale market.

In Spain, household consumption of turbot rose by 7,7% in terms of volume and by 12% in terms of value from 2016 to 2017. In nominal terms, household consumption is estimated at 4.200 tonnes in 2017, for a value of EUR 44 million[29]. Because Spain is the leading producer of turbot, the country exports a significant share to other Member States, mainly France, Italy and Germany. The market preference is towards fresh product and turbot is sold mainly in whole form, but it can also be sold as fillets to consumers[30].
In France and the Netherlands, turbot is mainly consumed out of home and consumption is supplied to a large extent on fishery-produced fish[31]. In Spain, consumption is mainly based on farmed turbot due to the large national production. A large share of the turbot sales goes to the HoReCa segment and to a lesser extent to fishmongers/small retailers. Like other seafood, an increasing share of turbot is sold by large scale retailers[32].
Over the last 4-year period, annual volumes of turbot sold at the wholesale markets in Spain have been stable at around 2.000 tonnes. The main wholesale markets where turbot is sold are Mercabarna and Mercamadrid, where farmed turbot constitute close to 80% of the sales in volume terms[33].

[28] EUMOFA – "Price structure in the supply chain for turbot", http://www.eumofa.eu/market-analysis
[29] Mapama – panel data.
[30] http://www.fao.org/fishery/culturedspecies/Psetta_maxima/en
[31] EUMOFA – "Price structure in the supply chain for turbot", http://www.eumofa.eu/market-analysis
[32] Mapama – panel data.
[33] Mercabarna and Mercamadrid wholesale markets.

As with prices at the first-sales level, prices at the wholesale level are higher for wild turbot than farmed turbot. The price difference is mainly due to limited availability of wild turbot. While a slight increasing trend is observed for farmed fresh turbot wholesale price in Spain, a clear trend cannot be observed for wild turbot. In 2017 and 2018, wholesale prices peaked during the Christmas festive season.