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Studies for carrying out the Common Fisheries Policy:
Lot 3 Socio-economic dimensions in EU fisheries

Italy: Santa Flavia case study report

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Santa Flavia case study report

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List of abbreviations and acronyms

DCF Data Collection Framework
EU European Union
FLAG Fisheries Local Action Groups (Coastal Action Group)
GSA Geographical sub-Area
GT Gross Tonnes
GVA Gross value Added
ICCAT International Commission for the Conservation of Atlantic Tunas
ICES International Council for the Exploration of the Sea
IGE Instituto Gallego de Estadística (Galician Statistical Institute)
IREPA Institute for Economic Research in Fishery and Aquaculture
INE Instituto Nacional de Estadística (Spanish Statistical Institute)
ITQ Individual transferable quota
ISTAT Italian National Statistics Institute
kW Kilowatt
LAU Local Administrative Unit
MSY Maximum sustainable yield
n Number of questionnaires
NUTS National Unit for Territorial Statistics
SSB Spawning stock biomass
STECF Scientific, Technical & Economic Committee for Fisheries on Assessment of Mediterranean Sea
TAC Total allowable catch
1. Methods

1.1 Secondary data sources
Secondary data used in this report are mainly fisheries data collected by the Institute for Economic Research in Fishery and Aquaculture (IREPA) and elaborated to give a representation of local level fishing activities. The IREPA database consists of landings data by species and fleet stratum per year as well as cost data by fleet stratum per year. The geographical aggregation of this data (fleet stratum) describes the northern coast of Sicily, while the technical aggregation level describes the predominant fishing gear (as for the Data Collection Framework (DCF)) and length class.

Data per unit of landings and revenues and added value or per vessel (number of employees) have been estimated for each fleet stratum. The values for the Porticello (Santa Flavia) fleet segments have been calculated by multiplying the unitary data by the total LOA or number of vessels of that fleet segment. The level of reliability of this data is not available. However, data collected by IREPA has an acceptable level of reliability at GSA level (as this is the geographical level requested by DCF). At the higher level of local community data cannot be considered as reliable and needs confirmation from stakeholders.

Data on the number of vessels, gross tonnage, LOA and engine power per year have been collected through the Italian fishing fleet register and elaborated by IREPA.

Outside the fisheries sector, data on the number of (active) firms have been collected through the Provincia di Palermo, which has produced information based on data from the Chamber of Commerce. This data has been further elaborated to assure homogeneity over the period.

1.2 Interviews with focus groups
Two meetings with local stakeholders and fishermen were held at the Anapi Pesca office in Porticello, Via Pescheria 120. Both meetings were held on 16 April 2013: the first meeting at 10 am and the second at 5 pm.

Those attending the first meeting were selected by aiming to include representatives of all fleet segments (vessels owners), who were also representative of the different fishing cooperatives operating in Porticello, as well as representatives from other institutions such as the labour union, environmental defence association and an association of women in the fishery.

The second group of participants consisted of attendees from the previous meeting and other people representing the local fishermen.

Both groups numbered around ten people. Even though others were invited, some could not participate because they were involved in fishing activities.

The meetings were very difficult to manage as a consequence of the local fishing community experiencing economic difficulties. Local people were more interested in describing their economic problems and concern about regulations imposed at European level rather than focusing on the project.
1.3 Questionnaires
The sample size of questionnaires for stakeholder groups B and C is bigger than the number of people in the focus groups. As reported above, just ten people participated in the focus groups while questionnaires were submitted by a significantly higher number of people (B = 50, C = 102).

A total of 152 questionnaires were submitted to the local fishermen. Fifty questionnaires were compiled for vessels owners (12 for polyvalent lower than 6m, 15 for polyvalent over 6m, 8 for bottom trawlers, 7 for purse seiners and 8 for longliners) and 102 questionnaires were compiled for skippers and crew members (14 for polyvalent below 6m (9 for self-employed and 5 for crew), 34 for polyvalent over 6m (16 for skippers and 18 for crew members), 25 for bottom trawlers (8 for skippers and 17 for crew members)), 14 for purse seiners (5 for skippers and 9 for other crew members)) and 15 for longliners (6 for skippers and 9 for other crew members)). Most of the tables reported below are based on the questionnaires submitted to vessels owners, while the other questionnaires were used to complete the information and the qualitative description of the local social context.

2. Settings
Porticello is the main area in Santa Flavia used by the fishing community, and is only a fraction of the area of Santa Flavia and its port. The entire area of Santa Flavia was chosen for this study for statistical reasons – administrative and demographic data for Porticello are not available – and there are strong connections between Porticello and Santa Flavia (for instance, some of the people working in Porticello live in Santa Flavia).

2.1 Description of the case study site
Santa Flavia is a single local administrative unit level 2 (LAU2) located in the province of Palermo (NUTS3: ITG12) in Sicily (NUTS2: ITG1). Sicily is the biggest island in the Mediterranean Sea. The area of Santa Flavia is 14.46 km², with a latitude of 38° 4′ 57″ N and longitude of 13° 31′ 32″ E. The population is 10,957, with a population density of 757.75 per km². The nearest administrative centre is represented by the Comune di Santa Flavia (Municipality of Santa Flavia). The distance from Santa Flavia to Palermo, the capital city of Sicily, is 17 km.

Santa Flavia is situated on a promontory between the Gulf of Palermo and that of Termini Imerese, a coastal zone that is low and sandy. Santa Flavia has a temperate climate with warm, dry summers and cool, rainy winters (so Mediterranean in climate). Spring and autumn temperatures are mild and pleasant. Sea breezes in the summer, especially in July and August, are frequent and the area is sometimes visited by the sirocco wind.

The average temperature of the coldest month, January, is between 9°C (minimum) and 14°C (maximum), while that of the warmest month, August, is between 22°C and 30°C. Average rainfall is 741 mm per year. The wettest period is from October to February with a monthly average rainfall of around 100 mm, while the driest month is July with only 6 mm of rain. The average length of daylight is 12 hours 14 minutes reaching a maximum in June of 14 hours 48 minutes and a minimum in December of 9 hours 37 minutes.
First settlements in the area date back to the beginning of the 1600s, when the aristocracy of Palermo began to build their villas in the citrus groves of the Conca d'Oro. The Filangeri family bought the principality of Santa Flavia, established the family estate there and developed the area. The villages of Porticello, Sant'Elia and Solanto are all part of the territory of Santa Flavia.

The origins of Porticello, the largest village in Santa Flavia, are linked to the tuna fisheries (dominated by the fixed tunny-fishing net system) of Sant'Elia and Solanto. Initially, during the period of fishing and tuna processing, fishermen from other ports lived in houses dug into the tuff called ‘Pirrieri’ (and their inhabitants were known as ‘Pirriroti’). In the 1500s, with the increased use of fixed tunny-fishing nets, fishermen and their families settled permanently in the area, establishing the settlement of Porticello.

Sant'Elia and Solanto, the other two sectors in Santa Flavia, date back to between 1700 and 1800, and were also based on communities using the fixed tunny-fishing net system. On the Catalfano mountain, about 2 km from the town of Santa Flavia, are the remains of Solunto, a city founded in the fourth century BC by the Phoenicians. The city was abandoned in the second century AD and is now a minor tourist attraction.

Fishing has been practised for hundreds of years in Porticello. In 2012, the local fishing cooperative (‘Marenostrum’) celebrated a centenary. Fishermen highlighted the social and cultural values of fishing and proposed the creation of a museum of the sea in Porticello to share local heritage with younger generations.

2.2 Demographics
As reported in Figure 1, the population of Santa Flavia shows an increasing trend from 9,500 people in 2002 to 11,000 in 2011. Although population has also increased at Sicilian and Italian levels, population growth in Santa Flavia is significantly higher than that of Sicily and Italy: from 2002 to 2011, the population of Santa Flavia increased by almost 15% compared with an increase of 1.7% in Sicily and 6.4% in Italy. This marked difference is probably due to the decline in population of (central) Palermo in the same period as a consequence of the suburbanisation of the Sicilian capital and notably the movement of Palermo residents to neighbouring areas like Santa Flavia and Isola delle Femmine.
The age structure of the Santa Flavia population is typical of developed countries, with an ageing population due to increased life expectancy, a low death rate and a low birth rate. The population age structure in Santa Flavia is very similar to those at Sicilian and Italian levels. The only difference is seen in the first and last age classes, which show Santa Flavia population as slightly younger than the Sicilian, and the oldest group is slightly younger on average that the Italian one.

In the last ten years, as in Sicily and Italy, the population of Santa Flavia has become older (Figure 2). The increase in population reported above is concentrated in the older age classes, 41 to 65 and over 65, which shows an increase of 28% in the period analysed.

More than 99% of the population of Santa Flavia is Italian, while just 0.5% comes from EU countries and 0.4% from non-EU countries. Unfortunately, official statistics on the place of birth of the inhabitants of Santa Flavia are not available as secondary data. However, qualitative information (Figure 3) collected during the focus groups with local stakeholders and fishermen indicate that most of the population is local (this includes people from Palermo, which is 17 km from Santa Flavia).
Figure 3. Origins of the population of Santa Flavia for the year 2011
Source: ISTAT.

Figure 4 shows that immigration has been always higher than emigration, with the exception of figures in 2005 when the balance was close to zero. This phenomenon is the main reason for the increase in population in Santa Flavia. As reported above, migration trends seem to be affected by the proximity of Palermo and the decisions of people working or studying there to move and live in the neighbouring towns.

Figure 4. Trends in migration in and out of Santa Flavia over the period 2002-10
Source: ISTAT.

As data on life expectancy at birth is not available at local level, Figure 5 shows the data for the province of Palermo. This data, which is almost identical to the data registered for Sicily, shows a slightly lower life expectancy than that estimated at Italian level.
2.3 Employment opportunities/sector overview

Fishing is the main economic sector in Santa Flavia and almost the only sector in Porticello. In 2001 almost 35% of all employed people from Santa Flavia worked in fishing and related sectors. Unfortunately, the only information on the relevance of economic sector at municipality level is provided through the census carried out by ISTAT every ten years. The last census was carried out in 2011 but data is still currently unavailable.

In 2001, other relevant sectors of employment included commerce, hotels and restaurants. These sectors are related to tourism, which represented the second most important sector after fisheries. During the last ten years, stakeholders stated that the fishing sector has increased in numbers of employees, estimated at around 600 in 2011 (IREPA) for the catching sector. For the fishing sector as a whole, stakeholders estimated between 700 and 800 employed people. The number of tourists from Palermo increased, although tourism from other European countries decreased probably as a consequence of competition with other better-organised destinations. Indeed, one of the main factors limiting the development of tourism in Santa Flavia is the lack of infrastructure and services.

Data on turnover and value added by economic sectors in Santa Flavia are not available. The minimum geographical level considered by ISTAT is represented by the Local Labour System (LLS), where data on value added are disaggregated by primary, secondary and tertiary sectors. Santa Flavia is included in the LLS of Bagheria, which includes Bagheria, Alavilla Milicia, Casteldaccia and Ficarazzi. As Santa Flavia represents around 14% of total population living in the area of the LLS, and covers almost 13% of the total area of the Bagheria SLL, data at SLL level cannot be considered as representative of the local community.

More recent data provided by the Chambers of Commerce and elaborated by the statistical office of the Province of Palermo on the number of active firms by economic sector are reported in Table 1. Even though the number of firms (Figure 6) cannot be considered a reliable indicator of the relevance of an economic sector, the increasing trends in agriculture, forestry and fisheries and hotel and restaurants seems to confirm the opinions of interviewed stakeholders.
Table 1. Employment by activity in Santa Flavia in 2001

<table>
<thead>
<tr>
<th>Economic sector</th>
<th>Employees 2001</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fisheries (and related)</td>
<td>549</td>
<td>34%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>92</td>
<td>6%</td>
</tr>
<tr>
<td>Production and distribution of energy, gas and water</td>
<td>2</td>
<td>0%</td>
</tr>
<tr>
<td>Building</td>
<td>83</td>
<td>5%</td>
</tr>
<tr>
<td>Commerce</td>
<td>251</td>
<td>16%</td>
</tr>
<tr>
<td>Hotel and restaurants</td>
<td>195</td>
<td>12%</td>
</tr>
<tr>
<td>Transport</td>
<td>61</td>
<td>4%</td>
</tr>
<tr>
<td>Financial services</td>
<td>17</td>
<td>1%</td>
</tr>
<tr>
<td>Other private services</td>
<td>51</td>
<td>3%</td>
</tr>
<tr>
<td>Public administration</td>
<td>58</td>
<td>4%</td>
</tr>
<tr>
<td>Education</td>
<td>146</td>
<td>9%</td>
</tr>
<tr>
<td>Welfare services</td>
<td>72</td>
<td>4%</td>
</tr>
<tr>
<td>Other public services</td>
<td>30</td>
<td>2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1607</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Source: ISTAT.

Figure 6. Number of firms operating in Santa Flavia by economic activity over 2005-11
Source: Chamber of Commerce.
2.4 Fisheries

Fishing in Santa Flavia (Porticello) is predominantly artisanal. This is evidenced by the extreme polyvalence of fishing activities and the multi-species landings composition, which reflects the high biological diversity of fish populations. Indeed, almost all vessels use a variety of fishing systems and gears, and switch from one to another at different times in the year, adapting fishing strategies to the features of target species.

Fishers’ activities are mainly aimed at catching demersal species through static gears (trammel and gill nets) and bottom longliners, but they also use small-scale drift nets (‘ferrettara’) for fishing medium pelagic species (such as albacore, skipjack, peas), longliners for the capture of large pelagic species (such as tuna and swordfish), and seine for small pelagic species. An important bottom trawl fleet also operates in the area of Porticello, and carries out fishing activities by changing strategies and moving to different grounds throughout the year.

Until 2010 the juvenile sardine (‘bianchetto’) fishery was carried out by many vessels from Porticello and represented an important source of income for the local fishing community. This fishery used a special seine called ‘tartarone’. It was annually authorised by a specific decree issued by the Sicily Administrative Region and operated from February to April for 60 days. However, this type of fishery has been prohibited since 2011.

In 2011, 251 vessels were registered in the maritime district office of Santa Flavia. Even though the vast majority of them are polyvalent, they are classified based on the DCF fleet segmentation criteria (LOA and predominant fishing gear), as reported in Table 2.

<table>
<thead>
<tr>
<th>DCF fleet segment</th>
<th>Number</th>
<th>Fleet category</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTS VL1218</td>
<td>33</td>
<td>Bottom trawlers VL1224</td>
</tr>
<tr>
<td>DTS VL1824</td>
<td>21</td>
<td>Bottom trawlers VL1224</td>
</tr>
<tr>
<td>HOK VL1218</td>
<td>16</td>
<td>Vessels using hooks VL1218</td>
</tr>
<tr>
<td>PGP VL0006</td>
<td>68</td>
<td>Polyvalent VL0006</td>
</tr>
<tr>
<td>PGP VL0612</td>
<td>79</td>
<td>Polyvalent VL0618</td>
</tr>
<tr>
<td>PGP VL1218</td>
<td>8</td>
<td>Polyvalent VL0618</td>
</tr>
<tr>
<td>PGP VL0612</td>
<td>4</td>
<td>Polyvalent VL0618</td>
</tr>
<tr>
<td>PMP VL1218</td>
<td>11</td>
<td>Polyvalent VL0618</td>
</tr>
<tr>
<td>PS VL1218</td>
<td>9</td>
<td>Purse seiners VL1224</td>
</tr>
<tr>
<td>PS VL1824</td>
<td>2</td>
<td>Purse seiners VL1224</td>
</tr>
</tbody>
</table>
Table 2 reports the number of vessels, their average overall length and the fleet category selected for reporting in this study. Each fleet segment has been analysed to represent the landings composition. Similarities have been detected between vessels of 12 m to 18 m and those of 18 m to 24 m for both demersal trawlers (DTS) and purse seiners (PS). Consequently, vessels in the different length classes have been combined and two fleet categories have been defined: ‘bottom trawlers VL1224’ and ‘purse seiners VL1224’. Regarding polyvalent vessels, significant differences arose between vessels shorter than 6 m and those above 6 m. As a consequence, two fleet categories have been defined: ‘polyvalent VL0006’ and ‘polyvalent VL0618’. The combination of four DCF fleet segments into the fleet category ‘polyvalent VL0618’ is justified by similarities in fishing gears used and main species landed. No significant differences between vessels classified as vessels using polyvalent passive gears only (PGP) and vessels using active and passive gears (PMP) have been identified in terms of landings composition. Furthermore, even though vessels belong to different length classes, their LOA is not overly dissimilar. The average length of vessels bigger than 12 m is 13.2 m, with just one vessel bigger than 14 m. The final list of fleet segments identified in this report are: ‘polyvalent VL0006’, ‘polyvalent VL0618’, ‘purse seiners VL1224’, ‘bottom trawlers VL1224’ and ‘vessels using hooks VL1218’.

Table 3 shows the number of new constructions in Santa Flavia during the period 2006-2011. Data are based on the construction year of the vessels belonging to the Italian fleet at 31/12/2011 as provided by the Italian managing authorities and included in IREPA database. During that period, ten new vessels entered the local fleet. These comprised four bottom trawlers between 12 and 18 m (DTS VL1218), one purse seiner between 12 and 18 m (PS VL1218), four polyvalent vessels between 6 and 12 m (2 PMP VL0612 and 2 PGP VL0612) and one polyvalent vessel between 12 and 18 m (PMP VL1218). One vessel, a bottom trawler, received public funds for the new construction. Public funds covered 40% of total cost of the vessel, 35% from European funds and 5% from national funds, under the FIFG programme.

Table 3. New vessels entered in the fleet of Santa Flavia

<table>
<thead>
<tr>
<th>Santa Flavia</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>New constructions</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Total fleet</td>
<td>250</td>
<td>252</td>
<td>262</td>
<td>264</td>
<td>262</td>
<td>251</td>
</tr>
<tr>
<td>% of new entrants</td>
<td>0.8%</td>
<td>0.0%</td>
<td>1.5%</td>
<td>0.8%</td>
<td>0.4%</td>
<td>0.4%</td>
</tr>
</tbody>
</table>

Source: IREPA database

Vessels classified as polyvalent represent the majority of the fleet, accounting for 170 units: 102 over 6 m; 68 under 6 m. These vessels use both active and passive gears, but none of these can be identified as predominant. As a consequence, the landings composition is characterised by the presence of both demersal and pelagic species. The bigger vessels in this category also fish for large pelagic species, like swordfish and albacore. Although the other fleet segments also use fishing gears different than the predominant one in some periods over the year, it is possible to identify their specific target species: small pelagic species for purse seiners, demersal species for bottom trawlers and large pelagic species for vessels using hooks.
In 2011, the Porticello fleet landed around 2,300 tonnes, equivalent to more than EUR 13 million in value, registering a reduction of almost 40% in volume and 47% in value when compared with 2006 figures. The strong reduction in landings combined with a decrease in the prices of some important species led to the significant reduction in revenues. Furthermore, the increase in fuel price since 2008 has represented an additional negative factor for the economic performance of the fleets. The negative performance has affected all fleet segments.

Purse seiners VL1224 represents the most important fleet segment in terms of landings, accounting for more than 40% of total production, while another 50% is equally distributed between bottom trawl VL1224 and polyvalent VL1224. In terms of revenues, the greatest contribution to local production is provided by bottom trawl VL1224 (more than 35%) and polyvalent VL1224 (around 30%), while purse seiners VL1224 represents around 15% of total revenues (due to the lower value of small pelagic species). Polyvalent VL0006 represents 5% of total landings in volume and 8% in value. Vessels using hooks VL1218 represents a secondary fleet segment in terms of landings and revenues, accounting for 6% and 8% respectively. However, this fleet segment was of greater relevance in the past, when it represented up to 20% of total landings value.

Most of the vessels of Porticello are active in the Geographical sub-Area (GSA) 10. However, some vessels using hooks and some bottom trawlers also fish in other GSAs during some periods of the year, such as GSA 18 (waters around Sardinia). Given the significant distance from the coast of some fishing zones, trip length for these fleet segments is four days on average. The trip length for other fleet segments is generally one day.

As reported above, the area is characterised by a great variety of stocks. Statistical data on landings and prices are collected for more than 60 species. However, the first five species in terms of landings value are swordfish, giant red shrimp, European anchovy, deep-water rose shrimp and European hake, which account for more than 50% of total revenues. Unfortunately, biological data for these stocks are very limited.

As for the swordfish, recent assessments of Mediterranean stock of this species carried out by the International Convention on the Convention of Atlantic Tuna (ICCAT), mainly on Spanish, Greek and Italian data, indicate that the rate and level of current exploitation are not sustainable in the short and long term. Furthermore, the same assessments show a high presence in the capture of younger units, which have never reproduced (about 50 to 70% of total catch), and a very small number of large individuals.

Regarding European hake (*Merluccius merluccius*), survey indices provided through two programmes carried out by the Italian National Group for Demersal Resource Evaluation (GRUND) and the International Bottom Trawl Survey in the Mediterranean (MEDITS) indicate a variable pattern of abundance and biomass without a clear trend.
### Table 4. Fleet segments in Porticello

<table>
<thead>
<tr>
<th>Segment (length class)</th>
<th>Number of vessels</th>
<th>Main gears used</th>
<th>Number of crew (average)</th>
<th>Main species fished</th>
<th>Main fishing locations (ICES areas)</th>
<th>Trip length (average days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polyvalent VL0006</td>
<td>68</td>
<td>Passive and active gears: trammel net, gill net, hooks, trawl, etc.</td>
<td>1.3</td>
<td>Squids, common octopus, greater amberjack, European hake, common cuttlefish</td>
<td>GSA 10</td>
<td>1</td>
</tr>
<tr>
<td>Polyvalent VL0618</td>
<td>102</td>
<td>Passive and active gears: trammel net, gill net, hooks, trawl, etc.</td>
<td>2.2</td>
<td>Swordfish, common dolphinfish, albacore, European hake, squids</td>
<td>GSA 10</td>
<td>1</td>
</tr>
<tr>
<td>Purse seiners VL1224</td>
<td>11</td>
<td>Purse seine, lampara nets</td>
<td>6.5</td>
<td>European anchovy, greater amberjack, European pilchard (sardine), round sardinella</td>
<td>GSA 10</td>
<td>4</td>
</tr>
<tr>
<td>Bottom trawlers VL1224</td>
<td>54</td>
<td>Bottom otter trawl, drifting longlines, set longlines</td>
<td>3.0</td>
<td>Giant red shrimp, deep-water rose shrimp, common octopus, European hake, common cuttlefish</td>
<td>GSA 10</td>
<td>4</td>
</tr>
<tr>
<td>Vessels using hooks VL1218</td>
<td>16</td>
<td>Drifting longlines, set longlines</td>
<td>3.5</td>
<td>Swordfish, albacore, silver scabbardfish, European hake</td>
<td>GSA 10</td>
<td>4</td>
</tr>
</tbody>
</table>

Source: Elaborations on IREPA data

As reported in STECF-12-03: “EWG 11-20 proposes $F \leq 0.2$ as limit management reference point (basis $F_{0.1}$ as a proxy of FMSY) consistent with high long-term yields. Given the results of the present analysis, the stock appeared to be subject to overfishing in 2006-2010, as the estimates of fishing mortality was 0.63 in 2010. Regardless of the growth pattern a considerable reduction is necessary to approach the FMSY reference point (Factor: ~65-70% of the current F value, depending on the year). However, considering the high productivity in terms of incoming year classes, this stock has the potential to recover fast if F is reduced towards FMSY.”

Regarding deep-water rose shrimp (*Parapenaeus longirostris*), survey indices provided through GRUND and MEDITS indicate a variable pattern of abundance and biomass without a clear trend. As reported in STECF-12-03, “EWG 11-20 proposes $F_{\leq 0.71}$ as limit management reference point of exploitation consistent with high long term yield (basis $F_{0.1}$ as FMSY proxy). Given the results of the present analysis (F current of 2010 about 1.1), the stock is considered subject to overfishing during the period 2006-2010. EWG 11-20 recommends the relevant fleets’ effort to be reduced to reach the
proposed level FMSY, in order to avoid future loss in stock productivity and landings. This should be achieved by means of a multi-annual management plan. However the dynamics of this species seems also influenced by environmental changes."

The reduction in fishing mortality proposed by the EWG 11-20 is related to the entire fleet operating in GSA 10 fishing areas. This means that these reductions are not necessarily expected from the fleet of Porticello or the fleets registered in the province of Palermo, which represent just a part of the total fleet operating in GSA 10. More details on stock assessments for these stocks can be found in the ‘Report of the Scientific, Technical and Economic Committee for Fisheries on Assessment of Mediterranean Sea stocks (STECF-12-03)’.

The port of Porticello consists of a breakwater, a pier and three docks used almost exclusively by fishing boats. The harbour offers good shelter from the waves, has a fuel station on the quay, and numerous sites for the construction and repair of boats. A slipway, for large vessels over 100 tonnes, is also available in the harbour. A fish market in the harbour has only recently become fully operational, providing cold storage and ice machines.

The port is too small for the number of local vessels and is always overcrowded: the constant coming and going of boats creates mooring problems. Many boats are forced to moor in second or third rows often creating structural damage to vessels during strong winds. In addition, both the backdrops and the waters are very polluted and littered with wreckage, which is bad for the environment and public health. The presence of the fuel distributor in a shipyard where blowtorches are used presents a serious safety hazard.

The Porticello fish market only operates during the night until early morning. Fishing activities continue throughout the day due to the versatility of the boats. As a consequence, the catch is mostly sold to informal small traders and wholesalers from other areas, with no guarantees of fair pricing and often without invoicing.

2.4.1 Fleet segment 1: polyvalent VL0006

The fleet segment polyvalent VL0006 consists of vessels with an overall length of less than 6 m, with 1 GT and 4 kW on average. Given the small size of these vessels, crew generally consists of a single fisherman. As he is generally the vessel owner, the skipper and the crew, his employee type is defined here as self-employed. These vessels use both active and passive fishing gears, like trammel nets, gill nets, hooks and trawl. The main target species are squid, common octopus, greater amberjack, European hake and common cuttlefish.

A declining trend in the volume and value of landings has been registered in the last ten years. The number of vessels is also declining. The reduction in revenues and an increase in operating costs (particularly fuel costs) have meant a decline in the profitability of these vessels.
**Fleet segment as a whole**

As reported above, vessels in this fleet segment are generally operated by a single fisherman, who owns a single vessel and brings together the roles of manager, skipper and crew. Of the 12 questionnaires submitted by vessels owners in this fleet segment, the presence of a crew member other than the owner was declared only once where the owner was supported in the fishing activity by his son. Given the constraints associated with the vessel size, the average number of employees has not changed over time, while the total number of employees has declined following the reduction in the number of vessels.

The stakeholder focus group stated that women do not have any direct role in fishing activities. However, in some cases, given the long absence of fishermen from the mainland, wives carry out an administrative role on behalf of husbands. Furthermore, the absence of fishermen from the mainland determines the central role of spouses or partners in making family decisions and providing childcare.

The decision-making process related to fishing activities is managed by the vessel owner, who is generally the only crew member. Other family members, like spouses or partners, are not involved in these decisions, which are guided by the seasonality of fishing activities.

This fleet segment consists of 68 vessels (2011). The average number of employees per vessel is calculated as 1.3 people, accounting for around 85 employees. However, as reported in Table 4, the presence of two employees has been registered on the 13 questionnaires submitted by vessels owners. All employees are male and of local origin. Most of them are in the age class of 40 to 65 (see Table 4 and Figure 7).

**Table 5. Demographics by employee type, polyvalent VL0006 (n=13)**

<table>
<thead>
<tr>
<th>Employee type</th>
<th>Number of employees</th>
<th>Gender</th>
<th>Age</th>
<th>Origin</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Male</td>
<td>Female</td>
<td>0-18</td>
</tr>
<tr>
<td>Managerial</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Administrator</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Self-employed</td>
<td>12</td>
<td>12</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Crew</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: Consultants' calculations based on questionnaires.
Figure 7. Demographics of business within the polyvalent VL0006 (n=13)
Source: Consultants' calculations based on questionnaires.

The questionnaires submitted by fishermen, both self-employed and crew, show that their families consist of three people on average: householder, wife and a son (or daughter). Wives and daughters are not involved in the fisheries sector, while sons are generally fishermen. All questionnaires show that wives are housewives, while sons work as fishermen in the coastal small-scale fishery. This does not mean that all of them work with their fathers as some of them have their own vessel. However, when the vessel-owner is supported by another fisherman, this is usually his son. In these cases, sons are regularly employed as crew with a permanent position and paid through a share-basis contract.

Table 5 shows the number of employees registered through questionnaires, divided into family or non-family members. As employees are generally the householders, all of them are reported as family members. However, as reported above, the only non-householder employees on these vessels are the sons of the householders.

The participation of family members (sons in this case) in the fishing activity of the householder is due to the traditional nature of fishing activities, passed down from father to son, as well as a lack of alternative employment.

Table 6. Level of family involvement in business, polyvalent VL0006 (n=13)

<table>
<thead>
<tr>
<th>Number</th>
<th>Number in management roles</th>
</tr>
</thead>
</table>
Elaborations on data provided by IREPA show a total gross value added (GVA) for the fleet segment equal to EUR 550,000 in 2011. This is equivalent to a GVA per vessel of around EUR 8,000 per year. From 2006 to 2011, GVA per vessel has registered a reduction by almost 50%. This is the result of a reduction in total revenues of around 40% and the increase in fuel price, which began in 2008.

Data shown to stakeholders seems to be realistic as most of them have recognised this information as representative of the local situation.

Table 7. Trend in GVA for polyvalent VL0006

<table>
<thead>
<tr>
<th>Variable (EUR)</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>GVA</td>
<td>1,164,457</td>
<td>989,384</td>
<td>489,429</td>
<td>885,326</td>
<td>319,797</td>
<td>554,854</td>
</tr>
<tr>
<td>GVA/vessel</td>
<td>15,322</td>
<td>1,3018</td>
<td>6,440</td>
<td>1,1964</td>
<td>4,504</td>
<td>8,160</td>
</tr>
</tbody>
</table>

Landings of this fleet segment (Figure 8) are mainly composed of demersal species, which represent almost 85% of the total. Species like squid and common octopus represent more than 30% of total landings. The remaining landings are mainly composed by pelagic species, where greater amberjack represents the most important catch. From 2006 to 2011, total landings volume has been reduced by 44%. Landings of demersal and pelagic species have been reduced by 38% and 62% respectively.

Figure 8. Trends in landings volume for polyvalent VL0006

In terms of landings value, demersal species represent 85% of the total revenues. Squid and common octopus represent more than 35% of total revenues for this fleet segment. The remaining 15% of revenues is mainly due to the pelagic species, where greater amberjack represents the most important
catch (around 10% of total revenues). From 2006 to 2011, the reduction in landings volume has led to a reduction in revenues estimated at almost 40%. This reduction is mainly due to demersal species, which have significantly decreased in price. On the contrary, the reduction in landings for pelagic species has been partially counterbalanced by an increase in market price.

Figure 9. Trends in landings value for polyvalent VL0006
Source: Elaborations on IREPA data.

Figure 9 shows the trends in prices for the main species (or groups of species) landed by vessels classified as polyvalent lower than 6 m. Marine fishes nei (all species not classified elsewhere) and squid represent the main target species in terms of revenues, accounting for more than 45% of the total. Both species have registered a reduction of around 18% in the period under analysis. The price of common octopus, which represents 13% of total landings value, has shown a stable trend. The other two main species, greater amberjack and European hake, have registered an increase in price by 16% and 23% respectively.
The number of vessels shows a stable trend from 2006 to 2008 and a declining trend thereafter. The total number of vessels classified in this fleet segment has reduced from 76 in the first period to 68 in 2011. Gross tonnage and engine power have followed a similar trend.

Figure 10. Trends in landings prices of main species for polyvalent VL0006
Source: Elaborations on IREPA data.

Figure 11. Trends in number of vessels for polyvalent VL0006
Source: Elaborations on IREPA data.
Remuneration type is based on the share-basis contract. The difference between revenues and operating costs is divided into two parts, one remunerating the crew and the other the ship owner. This type of contract is the dominant one in the Mediterranean fisheries sector. Although a minimum wage is set by Italian law, this is only used to calculate and pay social security contributions.

Table 8. Remuneration type by vessel, polyvalent VL0006 (n=13)

<table>
<thead>
<tr>
<th>Remuneration type</th>
<th>No. people</th>
</tr>
</thead>
<tbody>
<tr>
<td>Piece</td>
<td>0</td>
</tr>
<tr>
<td>Share</td>
<td>13</td>
</tr>
<tr>
<td>Wage</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: Consultants’ calculations based on questionnaires.

As reported above, the economic performance of the fleet segment is negative. The reduction in revenues and an increase in fuel costs have meant a significant decline in the GVA. The stakeholders have identified European and international regulations as the main cause of this situation. Regulations have set limits on larger vessels fishing for tuna and swordfish (\textit{Xiphias gladius}) - which in the past represented their most important target species - forcing them to compete with smaller vessels fishing
for the same species. This has increased the fishing effort and therefore pressure on these species and reduced their biomass. Furthermore, limitations on the fishing of large pelagic is also creating problems in the biomass of small pelagic as a consequence of the strong increase in tuna numbers and the associated effects of increased predation.

**Employees within segment**

For all employee types, there is no additional benefit beyond regular salary and pension: pension is the only benefit provided by the business. All fishermen employed in this fleet segment declare a salary below EUR 10,000 per year.

<table>
<thead>
<tr>
<th>Employee type</th>
<th>&lt;10,000</th>
<th>10,000-19,000</th>
<th>20,000-29,000</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managerial</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Administrator</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Self-employed</td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>Crew</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: Consultants' calculations based on questionnaires.

Entering the fleet segment does not require any specific attribute other than to be male, in good health and member of a family involved in the fisheries sector. Generally, the only qualification declared by the fishermen is the seaman’s certificate (‘libretto di navigazione’). There are three different categories outlined in the registration for this certificate and local fishermen are registered as the first (most basic) or third (specific for coastal fishing) categories. However, registration for the first or third categories does not demand any specific attribute or skill; the certificate is merely an administrative document required for employment on a vessel.

Fishermen could obtain other qualifications based on their experience by attending specific training courses. However, given the family-based organisation of the local fishing sector, they do not need additional qualifications to work.

Almost all fishermen in this fleet segment had been educated at primary level (Figure 14). Of the 13 interviewees, only one owner had a more advanced level of education.

All of them had their first job in the sector. However, they are not satisfied with their jobs. Most of them have looked for other employment in recent years and would like to change jobs in the future. They are not able to indicate alternative employment, but they stated that they would choose to work outside the fishing sector.

There is no labour mobility between fleet segments.
The level of transferability of skills in the fishing sector is very high within the family. Questionnaires show almost all the fishermen in this fleet segment had fathers who were fishermen, and the sons of almost all the fishermen interviewed are were also fishermen. The transferability of skills is carried out by the direct involvement of sons in fishing activities from a young age.

The perception of their personal wealth is very low. This perception is not strictly related to the fleet segment, but for the fishing sector as a whole. The fishermen’s level of wealth has reduced in the last ten years and they stated that the economic condition of the local fishing sector changed with the introduction of some EU regulations, which did not take into account local specificities and have negatively affected the sector.

The fishermen do not feel as if they are represented at European, national or local levels; nor do they feel supported by organisations like labour unions. They complain of a complete lack of representation of their interests and economic situation. The only organisation available to represent them is the fishing cooperatives which provides only administrative support.

Regarding the negative economic performance of the fleet segment, the fishermen’s behaviour has been fairly static. Besides attempts to modify the composition of landings by switching among the different target species and fishing gears available according to their fishing licenses, they are not able to carry out any significant initiatives to improve their status. This is due to the lack of institutions and/or

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**Figure 14. Education level of fishermen employed in polyvalent VL0006 (n=13)**

Source: Consultants’ calculations based on questionnaires.
organisations available to defend their interests and negotiate solutions. Furthermore, their low education levels and the lack of alternative employment opportunities represent strong constraints to the possibility of adaptation.

2.4.2 Fleet segment 2: polyvalent VL0618
The fleet segment polyvalent VL0618 consists of vessels with an overall length greater than 6 m, with 4 GT and 45 kW on average. Employees generally consist of two fishermen, the skipper and a crew member. These vessels use both active and passive fishing gears, like trammel nets, gill nets, hooks and trawl. The main target species are swordfish, common dolphinfish, albacore, European hake and squid.

A declining trend in the volume and value of landings has been registered in the last six years. Despite this, the number of vessels classified as polyvalent is slightly increasing. The reduction in revenues and an increase in operating costs (particularly fuel costs) have meant a decline in the profitability of these vessels.

Fleet segment as a whole
As reported above, vessels in this fleet segment are generally operated by two fishermen. The skipper is generally the vessel owner, who usually owns a single vessel. However, four of those fishermen interviewed owned two vessels. Of the 15 vessel owners interviewed in this fleet segment, half declared that the number of employees varies in the year according to the seasonality of the fishing methods adopted. Generally, crew members come from within the family. Just four crew members had no family relationship with the vessel owner, in all other cases crew members were sons or brothers. The average number of employees has slightly decreased over time, while the total number of employees has remained stable as counterbalanced by the increase in the number of vessels classified as polyvalent.

The stakeholder focus group stated that women do not have any direct role in fishing activities. However, in some cases, given the long absence of fishermen from the mainland, wives carry out an administrative role on behalf of husbands. Furthermore, the absence of fishermen from the mainland determines the central role of spouses or partners in making family decisions and providing childcare.

The decision-making processes related to fishing activities is managed by the vessel owner, who is generally the only crew member. Other family members, like spouses or partners, are not involved in these decisions, which are guided by the seasonality of fishing activities.

This fleet segment consists of 102 vessels (2011). The average number of employees per vessel is calculated as 2.2 people, accounting for around 225 employees. All employees are male and of local origin. Employees are equally distributed between the age classes 18 to 40 and 40 to 65 (see Table 9 and Figure 15).
Table 10. Demographics by employee type, polyvalent VL0618 (n=32)

<table>
<thead>
<tr>
<th>Employee type</th>
<th>Number of employees</th>
<th>Male</th>
<th>Female</th>
<th>0-18</th>
<th>18-40</th>
<th>&gt;65</th>
<th>Local</th>
<th>National</th>
<th>EU</th>
<th>Outside</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managerial</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Administrator</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Skipper</td>
<td>16</td>
<td>16</td>
<td>0</td>
<td>7</td>
<td>9</td>
<td>0</td>
<td>16</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td>Crew</td>
<td>16</td>
<td>16</td>
<td>0</td>
<td>8</td>
<td>7</td>
<td>1</td>
<td>16</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>32</td>
<td>32</td>
<td>0</td>
<td>15</td>
<td>16</td>
<td>1</td>
<td>32</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>32</td>
</tr>
</tbody>
</table>

Source: Consultants’ calculations based on questionnaires.

Figure 15. Demographics of business within the polyvalent VL0618 (n=32)

Source: Consultants’ calculations based on questionnaires.

The questionnaires submitted by fishermen show that their families consist of three people on average for crew members and four for skippers. Generally, these are the householder, his wife and one or two sons (or daughters). However, crew members tend to report the father and mother as members the household. The women in the family are not involved in the fisheries sector. They are generally housewives (mothers and wives) or students (daughters). Sons are students or fishermen involved in the coastal small-scale fishery. In these cases, sons are regularly employed as crew with a permanent position and paid through a share-basis contract. Among the daughters, a significant number are unemployed.
Table 10 shows the number of employees registered through questionnaires divided into family or non-family members. As reported above, just a quarter of the crew members (non-skippers) have no family relationship with the vessel owner.

The participation of family members, like sons and brothers, in the fishing activity of the householder is due to the traditional nature of fishing activities, passed down from father to son, as well as a lack of alternative employment.

Table 11. Level of family involvement in business, polyvalent VL0618 (n=32)

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Number in management roles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family employees</td>
<td>28</td>
<td>16</td>
</tr>
<tr>
<td>Non-family employees</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>32</td>
<td>16</td>
</tr>
</tbody>
</table>

Source: Consultants’ calculations based on questionnaires.

Elaborations on data provided by IREPA show a total GVA for the fleet segment equal to EUR 2 million in 2011. This is equivalent to a GVA per vessel of around EUR 20,000 per year. From 2006 to 2011, GVA per vessel has registered a reduction by 60%. This is the result of a reduction in total revenues of almost 40% and the increase in fuel price, which began in 2008.

Data shown to stakeholders seems to be realistic as most of them have recognised this information as representative of the local situation.

Table 12. Trend in GVA for polyvalent VL0618

<table>
<thead>
<tr>
<th>Variable (EUR)</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>GVA</td>
<td>4,744,023</td>
<td>3,381,457</td>
<td>1,478,753</td>
<td>3,327,377</td>
<td>2,491,051</td>
<td>2,056,037</td>
</tr>
<tr>
<td>GVA/vessel</td>
<td>51,011</td>
<td>35,594</td>
<td>14,788</td>
<td>32,944</td>
<td>24,664</td>
<td>20,157</td>
</tr>
</tbody>
</table>

Source: Elaborations on IREPA data.

Landings of this fleet segment are mainly composed of pelagic species, which represent almost 60% of the total. The main stock is swordfish, which represents 30% of total landings. Another 30% is equally distributed between albacore and common dolphinfish. The most important demersal species is European hake, which represents 4% of total landings. From 2006 to 2011, total landings volume has been reduced by 52%. Landings of demersal and pelagic species have been reduced by 31% and 58% respectively. However, the strong reduction in the landings of pelagic species occurred from 2006 to 2007.
In terms of landings value, pelagic species represent 65% of total revenues. The main stock is swordfish, which represents 40% of total revenues. Another 20% is equally distributed between albacore and common dolphinfish. The most important demersal species is European hake, which represents 6% of total revenues. From 2006 to 2011, the reduction in landings volume has led to a reduction in revenues estimated at almost 40%. This reduction is due to both demersal and pelagic species. However, the reduction in landings for pelagic species has been partially counterbalanced by an increase in market price, while prices for demersal species have registered a reduction in the period analysed.

Figure 18 shows the trends in prices for the main species (or groups of species) landed by vessels classified as polyvalent greater than 6 m. The price of swordfish has remained almost stable, while other pelagic species, like albacore and common dolphinfish, have registered significant increases. Despite this, demersal species, like European hake and the group of Marine fishes nei (all fish not classified elsewhere), have registered reductions in prices in the period under analysis.
The number of vessels shows an increasing trend from 2006 to 2011. The total number of vessels classified in this fleet segment has increased by 9 units from 93 in 2006 to 102 in 2011. The engine power has followed a similar trend, while the gross tonnage shows a decline in the last three years.

An increase in the number of vessels even when economic performance is declining is not necessarily surprising as the decline in economic performance of the fisheries is common to the entire area of Northern Sicily as well as other Sicilian coastal areas. Each year a number of vessels move from one port to another (generally along the same coast) changing the maritime district where they are registered. The balance between these administrative variations can result in an increase in the number of vessels even in a situation of economic crisis.

Between 2008 and 2011, 11 vessels entered this fleet segment and 9 vessels left, thereby increasing the fleet segment by 2 units. The Fleet Register shows that 8 of the vessels that have entered the fleet segment were from other ports (Sciacca, Sant’Agata di Militello, Trapani, etc.) while 3 vessels have been newly built. During the same period, 5 vessels moved to other ports (Mondello, Sciacca, etc.) and 4 vessels were decommissioned (3 of them were scrapped with public aid).

As reported above, the fleet segment “Polyvalent VL0618” consists of DCF fleet segments PGP VL0612, PGP VL1218, PMP VL0612 and PMP VL1218. The increasing trend was due to the DCF fleet segment PGP VL0612, which increased from 70 to 79 vessels in the period 2006-2011. PGP 1218 remained almost stable with the entry of just a single vessel in 2009.
Vessels classified as PMP VL1218 show a reduction in 2009. However, this is largely due to a change in vessel classification. Indeed, for statistical reasons three of the vessels classified as PMP VL0612 in 2009, 2010 and 2011 were included in the DCF fleet segment PMP VL1218 in previous years (even though LOA was lower than 12 m)\(^1\).

Table 13. Trend in number for DCF fleet segments included in polyvalent VL0618

<table>
<thead>
<tr>
<th>Fishing technique</th>
<th>LOA</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>PGP</td>
<td>VL0612</td>
<td>70</td>
<td>71</td>
<td>76</td>
<td>76</td>
<td>76</td>
<td>79</td>
</tr>
<tr>
<td>PGP</td>
<td>VL1218</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>PMP</td>
<td>VL0612</td>
<td></td>
<td></td>
<td>5</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>PMP</td>
<td>VL1218</td>
<td>16</td>
<td>17</td>
<td>17</td>
<td>12</td>
<td>13</td>
<td>11</td>
</tr>
<tr>
<td>polyvalent</td>
<td>VL0618</td>
<td>93</td>
<td>95</td>
<td>100</td>
<td>101</td>
<td>101</td>
<td>102</td>
</tr>
</tbody>
</table>

Source: IREPA database

Figure 19. Trends in number of vessels for polyvalent VL0618
Source: Elaborations on IREPA data.

\(^1\) As foreseen by EU Decision 93/2010, when a DCF fleet segment has fewer than 10 vessels (this should be the case of PMP VL0612), clustering may be necessary in order to design the sampling plan.
Remuneration type is based on the share-basis contract. The difference between revenues and operating costs is divided into two parts, one remunerating the crew and the other the ship owner. This type of contract is the dominant one in the Mediterranean fisheries sector. Although a minimum wage is set by Italian law, this is only used to calculate and pay social security contributions.

Table 14. Remuneration type by vessel, polyvalent VL0618 (n=32)

<table>
<thead>
<tr>
<th>Remuneration type</th>
<th>No. people</th>
</tr>
</thead>
<tbody>
<tr>
<td>Piece</td>
<td>0</td>
</tr>
<tr>
<td>Share</td>
<td>32</td>
</tr>
<tr>
<td>Wage</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: Consultants’ calculations based on questionnaires.

As reported above, the economic performance of the fleet segment is negative. The reduction in revenues and an increase in fuel costs have determined a significant decline in the GVA. The stakeholders have identified European and international regulations as the main cause of this situation. Regulations have set limits on vessels classified in this fleet segment fishing for tuna and swordfish.
(which in the past represented their most important target species). Indeed, the strong reduction in landings is mainly related to species like swordfish and albacore.

**Employees within segment**

For all employee types, there is no additional benefit beyond regular salary and pension: pension is the only benefit provided by the business. All fishermen employed in this fleet segment reported a salary of less than EUR 10 000 per year.

<table>
<thead>
<tr>
<th>Employee type</th>
<th>&lt;10 000</th>
<th>10,000-19,000</th>
<th>20,000-29,000</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managerial</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Administrator</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Skipper</td>
<td>16</td>
<td>0</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td>Crew</td>
<td>15</td>
<td>0</td>
<td>0</td>
<td>15</td>
</tr>
</tbody>
</table>

Source: Consultants' calculations based on questionnaires.

Entering the fleet segment does not require any specific attribute other than to be male, in good health and member of a family involved in the fisheries sector. Generally, the only qualification declared by the fishermen is the seaman's certificate (‘libretto di navigazione’). There are three different categories outlined in the registration for this certificate and local fishermen are registered as the first (most basic) or third (specific for coastal fishing) categories. However, registration for the first or third categories does not need any specific attribute or skill; the certificate is merely an administrative document required for employment on a vessel.

Fishermen could obtain other qualifications based on their experience by attending specific training courses. However, given the family-based organisation of the local fishing sector, they do not need additional qualifications to work.

Almost all fishermen in this fleet segment have been educated to primary level (Figure 22). Of the 32 interviewees, only one skipper and a crew member had a more advanced level of education.

All of them had their first job in the sector. However, they are not satisfied with their jobs. Most of them have looked for other employment in recent years and would like to change jobs in the future. They are not able to indicate alternative employment, but they stated that they would choose to work outside the fishing sector.

There is no labour mobility between fleet segments in the sense that there are no fishermen that leave a fleet segment to work in another one. However, some fishermen work for more than one vessel (even in different fleet segments), according to the seasonality of fishing activities and the demand for a different number of employees when a vessel changes fishing gear. Generally, this happens on vessels owned by the same person. The possibility of working on vessels owned by different people is more complicated given the administrative obligations outlined in contracts.
The level of transferability of skills in the fishing sector is very high within the family. Questionnaires show that almost all the fishermen in this fleet segment had fathers who were fishermen and the sons of most of the fishermen interviewed were also fishermen. The transferability of skills is carried out by the direct involvement of sons in fishing activities from a young age.

The perception of their personal wealth is very low. This perception is not strictly related to the fleet segment, but for the fishing sector as a whole. The fishermen’s level of wealth has reduced in the last ten years and they stated that the economic value of the local fishing sector had changed with the introduction of those EU regulations that did not take into account local specificities and have negatively affected the sector.

The fishermen do not feel as if they are represented at European, national or local levels; nor do they feel supported by organisations like labour unions. They complain of a complete lack of representation of their interests and economic situation. The only organisations available to represent them are fishing cooperatives, which provide only administrative support.

Regarding the negative economic performance of the fleet segment, the fishermen’s behaviour has been fairly static. Besides attempts to modify the composition of landings by switching among the different target species and fishing gears available according to their fishing licenses, they are not able to carry out any significant initiatives to improve their status. This is due to the lack of institutions and/or organisations available to defend their interests and negotiate solutions. Furthermore, their low
education levels and the lack of alternative employment opportunities represent strong constraints to the possibility of adaptation.

2.4.3 Fleet segment 3: purse seine VL1224
The fleet segment purse seine VL1224 consists of vessels with an overall length of between 12 m and 24 m, with 24 GT and 128 kW on average. Employees generally consist of six to seven people including the skipper, who is usually the vessel owner. These vessels use purse seine and lampara nets. The main target species are European anchovy, greater amberjack, European pilchard and round sardinella.

The volume and value of landings has shown a stable trend in the last three years, although a strong reduction was registered in the period 2007 to 2008. The number of vessels is quite stable. The vessels in this fleet segment have registered a reduction in profitability from 2006 to 2008 and an increase thereafter.

**Fleet segment as a whole**
As reported above, vessels in this fleet segment employ a significant number of people compared with other fleet segments in the same area. The skipper is usually also the vessel owner, who generally owns a single vessel. Of the seven vessel owners interviewed in this fleet segment, five of them declared that the number of employees varies over the year according to the seasonality of fishing methods adopted. Around 60% of crew members come from within the family. Generally, they are sons or nephews of the vessel owner. The average number of employees has shown a decreasing trend over time with an increase in the last year of data available (2011).

The stakeholder focus group stated that women do not have any direct role in fishing activities. However, in some cases, given the long absence of fishermen from the mainland, wives carry out an administrative role on behalf of husbands. Furthermore, the absence of fishermen from the mainland determines the central role of spouses or partners in making family decisions and providing childcare. The decision-making processes related to fishing activities is managed by the vessel owner, who is generally the only crew member. Other family members, like spouses or partners, are not involved in these decisions, which are guided by the seasonality of fishing activities.

This fleet segment consists of 11 vessels (2011). The average number of employees per vessel is calculated at 6.5 people, accounting for around 70 employees. All employees are of local origin. Two thirds of them are in the age class of 40 to 65, and one third in the class 18 to 40 (see Table 14 and Figure 23).

The questionnaires submitted by fishermen show that their families consist of three people on average for crew members and four for skippers. Generally, these are the householder, his wife and one or two sons (or daughters). However, crew members tend to report the father and mother as members the household.

**Table 16. Demographics by employee type, purse seine VL1224 (n=38)**
<table>
<thead>
<tr>
<th>Employee type</th>
<th>Number of employees</th>
<th>Male 0-18</th>
<th>Female 0-18</th>
<th>18-40</th>
<th>40-65</th>
<th>&gt;65</th>
<th>Local</th>
<th>National</th>
<th>EU</th>
<th>Outside EU</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managerial</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Administrator</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Skipper</td>
<td>7</td>
<td>7</td>
<td>0</td>
<td>2</td>
<td>5</td>
<td>0</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Crew</td>
<td>31</td>
<td>31</td>
<td>0</td>
<td>10</td>
<td>25</td>
<td>1</td>
<td>31</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>31</td>
</tr>
</tbody>
</table>

Source: Consultants’ calculations based on questionnaires.

**Figure 23. Demographics of business within the purse seine VL1224 (n=38)**

Source: Consultants’ calculations based on questionnaires.

The women in the family are not involved in the fisheries sector. They are generally housewives (mothers and wives) or students (daughters). Sons are students or fishermen involved in purse seine and coastal small-scale fisheries. Also the fathers of crew members, if not yet retired, are involved in the same fishing system. In these cases, sons or fathers are regularly employed as crew with a permanent position and paid through a share-basis contract. Among the daughters, a significant number are unemployed.

Table 15 shows the number of employees registered through questionnaires divided into family or non-family members. As reported above, around 40% of crew members have no family relationship with the vessel owner. In a single case, the skipper has no family relationship with the vessel owner.
Table 17. Level of family involvement in business, purse seine VL1224 (n=38)

<table>
<thead>
<tr>
<th></th>
<th>number</th>
<th>number in management roles</th>
</tr>
</thead>
<tbody>
<tr>
<td>family employees</td>
<td>23</td>
<td>6</td>
</tr>
<tr>
<td>non-family employees</td>
<td>15</td>
<td>1</td>
</tr>
<tr>
<td>total</td>
<td>38</td>
<td>7</td>
</tr>
</tbody>
</table>

Source: Consultants’ calculations based on questionnaires.

The participation of family members, such as sons and fathers, in the fishing activity of the householder is due to the traditional nature of fishing activities, passed down from father to son, as well as a lack of alternative employment.

Elaborations on data provided by IREPA show a total GVA for the fleet segment equal to EUR 1.5 million in 2011. This is equivalent to a GVA per vessel of around EUR 135,000 per year. Table 16 shows an exceptional reduction in GVA in 2008. This data has not been confirmed by representatives from the fleet segment, which confirmed a lower profitability in recent years compared with the past.

Table 18. Trend in GVA for purse seine VL1224

<table>
<thead>
<tr>
<th>Variable (EUR)</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>GVA</td>
<td>1,724,276</td>
<td>1,506,449</td>
<td>458,772</td>
<td>1,469,684</td>
<td>1,117,208</td>
<td>1,495,089</td>
</tr>
<tr>
<td>GVA/vessel</td>
<td>172,428</td>
<td>150,645</td>
<td>38,231</td>
<td>122,474</td>
<td>101,564</td>
<td>135,917</td>
</tr>
</tbody>
</table>

Source: Elaborations on IREPA data.

Landings of this fleet segment are composed almost exclusively of pelagic species. This can be considered as a single-species fishery as the main stock, European anchovy represents 80% of total landings. Other species are round sardinella and European pilchard, which represent 10% and 5% of total landings respectively. In the period 2007 to 2008, the landings of European anchovy were reduced by almost 70% compared with 2006 data due to the reduced biomass of this resource. However, specific reasons for the cyclical decline of this stock are not clear.

![Figure 24. Trends in landings volume for purse seine VL1224](image)

Source: Elaborations on IREPA data.
In terms of landings value, European anchovy represents 75% of total revenues. Another relevant species is greater amberjack, which contributes for more than 10% of revenues, while an additional 10% is represented by European pilchard and round sardinella. Figure 25 shows that, after the critical period of 2007 to 2008, revenues have increased, achieving the same levels of 2006.

![Figure 25. Trends in landings value for purse seine VL1224](image)

Source: Elaborations on IREPA data.

Figure 26 shows the trends in prices for the main species landed by purse seiners. With the exception of greater amberjack, which has a price of EUR 11 per kg, the other species have a very low value. European anchovy, the most important species, has registered a price of around EUR 2 per kg. Small pelagic are massive species, which can vary in price significantly, depending on landed amounts.

![Figure 26. Trends in landings prices of main species for purse seine VL1224](image)

Source: Elaborations on IREPA data.
The number of vessels shows a stable trend from 2006 to 2011, with variations of 1 or 2 units. The total number of vessels classified in this fleet segment has changed from 10 in 2006 to 11 in 2011. Gross tonnage and engine power have followed a similar trend.

Figure 27. Trends in number of vessels for purse seine VL1224
Source: Elaborations on IREPA data.

Figure 28. Trends in engine power for purse seine VL1224
Source: Elaborations on IREPA data.
Remuneration type is based on the share-basis contract. The difference between revenues and operating costs is divided into two parts: one remunerating the crew; and the other the ship owner. This type of contract is the dominant one in the Mediterranean fisheries sector. Although a minimum wage is set by Italian law, this is only used to calculate and pay social security contributions.

Table 19. Remuneration type by vessel, purse seine VL1224 (n=38)

<table>
<thead>
<tr>
<th>Remuneration type</th>
<th>No. people</th>
</tr>
</thead>
<tbody>
<tr>
<td>Piece</td>
<td>0</td>
</tr>
<tr>
<td>Share</td>
<td>38</td>
</tr>
<tr>
<td>Wage</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: Consultants’ calculations based on questionnaires.

As reported above, the economic performance of the fleet segment remains positive. Unlike other fleet segments in the area, purse seiners have maintained a good level of profitability. However, this fleet segment is strictly dependent on the cyclical variations in the biomass of European anchovy. The strong reduction in biomass of this stock affected the profitability of these vessels in 2007 and 2008.

**Employees within segment**

For all employee types, there is no additional benefit beyond regular salary and pension: pension is the only benefit provided by the business. All fishermen employed in this fleet segment reported a salary of less than EUR 10,000 per year.

Table 20. Salary band by employee type (EUR). Purse seine VL1224 (n=38)

<table>
<thead>
<tr>
<th>Employee type</th>
<th>&lt;10,000</th>
<th>10,000-19,000</th>
<th>20,000-29,000</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managerial</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Administrator</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Skipper</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Crew</td>
<td>31</td>
<td>0</td>
<td>0</td>
<td>31</td>
</tr>
</tbody>
</table>

Source: Consultants’ calculations based on questionnaires.

Entering the fleet segment does not require any specific attribute other than to be male, in good health and member of a family involved in the fisheries sector. Generally, the only qualification declared by the fishermen is the seaman’s certificate (‘libretto di navigazione’). There are three different categories outlined in the registration for this certificate and local fishermen are registered as the first (most basic) or third (specific for coastal fishing) categories. However, registration for the first or third categories does not demand any specific attribute or skill; the certificate is merely an administrative document required for employment on a vessel.
Fishermen could obtain other qualifications based on their experience by attending specific training courses. However, given the family-based organisation of the local fishing sector, they do not need additional qualifications to work.

Almost all the fishermen in this fleet segment have been educated to primary level (Figure 30). Furthermore, of the 38 interviewees, two crew members were illiterate.

All of them had their first job in the sector. However, they are not satisfied with their jobs. Most of them have looked for other employment in recent years and would like to change jobs in the future. They are not able to indicate alternative employment, but they stated that they would choose to work outside the fishing sector.

There is no labour mobility between fleet segments in the sense that there are no fishermen that leave a fleet segment to work in another one. However, some fishermen work for more than one vessel (even in different fleet segments), according to the seasonality of fishing activities and the demand for a different number of employees when a vessel changes the fishing gear. Generally, this happens on vessels owned by the same person. The possibility of working for vessels owned by different people is more complicated given the administrative obligations outlined in contracts.

![Figure 30. Education level of fishermen employed in purse seine VL1224 (n=38)](source)

Source: Consultants’ calculations based on questionnaires.

The level of transferability of skills in the fishing sector is very high within the family. Questionnaires show that almost all the fishermen in this fleet segment had fathers who were fishermen and the sons
of most of the fishermen interviewed were also fishermen. The transferability of skills is carried out by
the direct involvement of sons in fishing activities from a young age.

The perception of their personal wealth is very low. This perception is not strictly related to the fleet
segment, but for the fishing sector as a whole. Their level of wealth has reduced in recent years.

The fishermen do not feel as if they are represented at European, national or local levels; nor do they
feel supported by organisations like labour unions. They complain of a complete lack of representation
of their interests and economic situation. The only organisations available to represent them are fishing
cooperatives, which provide only administrative support.

The negative economic performance of this segment in 2007 and 2008 was due to the reduction in the
biomass of European anchovy, which represents the main species for these vessels and accounts for
around 75% of total revenues. Fishermen tried to diversify the composition of landings by increasing
catches of sardines and targeting some demersal species, like saddled seabream and bogue. Despite
these attempts, the fishermen have not been able to achieve any significant improvements in their status.
This is due to a lack of institutions and/or organisations able to defend their interests and propose
solutions. Furthermore, the low levels of education of those involved in the business and a lack of
alternative employment opportunities represent strong constraints to the possibility of adaptation.

2.4.4 Fleet segment 4: bottom trawl VL1224

The fleet segment bottom trawl VL1224 consists of vessels with an overall length of between 12 m and
24 m, with 32 GT and 160 kW on average. Employees generally consist of three people including the
skipper, who is usually the vessel owner. These vessels use bottom otter trawl as prevalent fishing
gear, although other fishing gears are also used. The main target species are giant red shrimp, deep-
water rose shrimp, common octopus, European hake and common cuttlefish.

A declining trend in the volume and value of landings has been registered in the last six years. The
number of vessels increased in the period 2007 to 2010, but returned to the 2007 level in 2011. The
reduction in revenues and an increase in operating costs (particularly fuel costs) have determined a
decline in the profitability of these vessels.

Fleet segment as a whole

As reported above, vessels in this fleet segment are generally operated by three fishermen. The
skipper is usually also the vessel owner, who usually owns a single vessel. Of the eight vessel owners
interviewed in this fleet segment, three of them declared that the number of employees varies in the
year as a consequence of the seasonality of the fishing methods adopted. Around three quarters of
crew members come from within the family. Generally, they are brothers or sons of the vessel owner.
The average number of employees has shown an increasing trend over time from 2006 to 2010 and a
strong reduction in the last year of data available (2011) and the same for the total number of
employees.

The stakeholder focus group stated that women do not have any direct role in fishing activities. However, in some cases, given the long absence of fishermen from the mainland, wives carry out an
administrative role on behalf of husbands. Furthermore, the absence of fishermen from the mainland determines the central role of spouses or partners in making family decisions and providing childcare. The decision-making process related to fishing activities is managed by the vessel owner. Other family members, like spouses or partners, are not involved in these decisions, which are guided by the seasonality of fishing activities.

This fleet segment consists of 54 vessels (2011). The average number of employees per vessel is calculated at three people, accounting for around 160 employees. All employees are male and of local origin. They are equally distributed between the age classes 18 to 40 and 40 to 65 (see Table 19 and Figure 31).

Table 21. Demographics by employee type, bottom trawl VL1224 (n=27)

<table>
<thead>
<tr>
<th>employee type</th>
<th>number of employees</th>
<th>18-40</th>
<th>40-65</th>
<th>&gt;65</th>
<th>local</th>
<th>national</th>
<th>EU</th>
<th>Outside</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managerial</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>administrator</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Skipper</td>
<td>8</td>
<td>8</td>
<td>0</td>
<td>3</td>
<td>5</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>crew</td>
<td>19</td>
<td>19</td>
<td>0</td>
<td>10</td>
<td>8</td>
<td>1</td>
<td>19</td>
<td>0</td>
<td>19</td>
</tr>
</tbody>
</table>

Source: Consultants’ calculations based on questionnaires.

Figure 31. Demographics of business within the Bottom trawl VL1224 (n=27)
Source: Consultants’ calculations based on questionnaires.
The questionnaires submitted by fishermen show that their families consist of three people on average for crew members and four for skippers. Generally, these are the householder, his wife and one or two sons (or daughters). However, around 30% of crew members still live with their parents and are not married. The women in the family are not involved in the fisheries sector. They are generally housewives (mothers and wives) or students (daughters). Given the relatively younger age of the employees in this fleet segment, most of their sons and daughters are students. Those working in the fisheries sector are involved in the same fleet segment of their fathers. Also the fathers of crew members, when not retired, are involved in the same fishing system. In these cases, sons or fathers are regularly employed as crew with a permanent position and paid through a share-basis contract. Some the sons and daughters are registered as unemployed.

Table 20 shows the number of employees registered through questionnaires divided into family and non-family members. As reported above, around a quarter of crew members has no family relationship with the vessel owner.

The participation of family members, like sons and fathers, in the fishing activity of the householder is due to the traditional nature of the fishing activities, passed down from father to son, as well as a lack of alternative employment.

Table 22. Level of family involvement in business, bottom trawl VL1224 (n=27)

<table>
<thead>
<tr>
<th></th>
<th>Number of Employees</th>
<th>Number in management roles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family employees</td>
<td>20</td>
<td>8</td>
</tr>
<tr>
<td>Non-family employees</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>27</strong></td>
<td><strong>8</strong></td>
</tr>
</tbody>
</table>

Source: Consultants’ calculations based on questionnaires.

Elaborations on data provided by IREPA show a total GVA for the fleet segment equal to almost EUR 900,000 in 2011. This is equivalent to a GVA per vessel of around EUR 16,500 per year. There is not a clear trend in the data. GVA was declining in the first three years, increased in 2009 and 2010, and shows a strong reduction in 2011. This reduction was due to a decrease in total revenues of around 25% and an increase in operating costs.

The data stakeholders were shown does not appear to be realistic: in particular, they did not recognise the strong difference between the values in 2009 and 2010 and that in 2011. But they did confirm the declining trend in profitability. Unfortunately, alternative data are not available.

An indirect estimation of GVA per vessel can be done by using the declarations of local fishermen on their current wage. Table 25 shows that wages for employees in this fleet segment are distributed in the wage bounds EUR 0-10,000 and 10,000-19,000. Taking into account that 3 people are employed on average on these vessels with a maximum wage of around EUR 16,000 (weighted mean of data) and that wages represent around 50% (as salary is based on the share
contract) of the monte, i.e. the difference between total revenues and variable costs, monte per vessel should be lower than EUR 100,000. GVA per vessel can be calculated by subtracting fixed costs from monte. As fixed costs represent around 18% of GVA (this percentage is derived from AER data on the Italian DTS fleet segments), GVA per vessel is expected to be lower than EUR 80,000 (Table 23).

Table 23. Trend in GVA for bottom trawl VL1224

<table>
<thead>
<tr>
<th>Variable (EUR)</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>GVA</td>
<td>4,711,458</td>
<td>2,304,435</td>
<td>674,583</td>
<td>3,849,317</td>
<td>3,717,971</td>
<td>894,027</td>
</tr>
<tr>
<td>GVA/vessel</td>
<td>88,895</td>
<td>43,480</td>
<td>12,046</td>
<td>65,243</td>
<td>60,950</td>
<td>16,556</td>
</tr>
</tbody>
</table>

Source: Elaborations on IREPA data.

Landings of this fleet segment are mainly composed of demersal species and shellfish, which represent more than 90% of the total. The shellfish species – deep-water rose shrimp and giant red shrimp – are the most important, accounting for 20% and 15% of total landings respectively. The most important demersal species are common octopus and European hake.

From 2006 to 2011, total landings volume has been reduced by 33%. Landings of demersal and shellfish species have been reduced by 28% and 44% respectively.

![Figure 32. Trends in landings volume for bottom trawl VL1224](image)

Source: Elaborations on IREPA data.

In terms of landings value, shellfish species represent more than 60% of total revenues, while demersal species account for 35% of revenues. Giant red shrimp and deep-water rose shrimp represent more than 50% of total revenues, while another half consists of a relevant number of demersal and shellfish species. Small quantities of pelagic stocks, like swordfish and Atlantic horse mackerel, were also landed by these vessels.

From 2006 to 2011, the reduction in landings volume has meant a decrease in revenues estimated at around 50%. This decrease was also due to the significant decrease in price of shellfish and demersal species.
The number of vessels shows an increasing trend until 2010, then a strong reduction in 2011. As a consequence of these contrasting variations, the final number of vessels in 2011 is equivalent to that registered in 2006. Gross tonnage and the engine power have followed a similar trend.
Figure 35. Trends in number of vessels for bottom trawl VL1224
Source: Elaborations on IREPA data.

Figure 36. Trends in engine power for bottom trawl VL1224
Source: Elaborations on IREPA data.

Figure 37. Trends in gross tonnage for bottom trawl VL1224
Source: Elaborations on IREPA data.

Remuneration type is based on the share-basis contract. The difference between revenues and operating costs is divided into two parts, one remunerating the crew and the other the ship owner. This type of contract is the dominant one in the Mediterranean fisheries sector. Although a minimum wage is set by Italian law, this is only used to calculate and pay social security contributions.
Table 24. Remuneration type by vessel, bottom trawl VL1224 (n=27)

<table>
<thead>
<tr>
<th>Remuneration type</th>
<th>No. people</th>
</tr>
</thead>
<tbody>
<tr>
<td>piece</td>
<td>0</td>
</tr>
<tr>
<td>share</td>
<td>27</td>
</tr>
<tr>
<td>wage</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: Consultants’ calculations based on questionnaires.

As reported above, the economic performance of the fleet segment is negative. The reduction in revenues and an increase in fuel costs have meant a significant decline in the GVA. The stakeholders have identified European and international regulations as the main cause of this situation. Regulations have set limits on the use of larger vessels for fishing to catch tuna and swordfish (which in the past represented their most important target species): this segment has been forced to compete for the same demersal and shellfish species as targeted by bottom trawlers. This has increased the fishing effort on these species and reduced their biomass.

**Employees within segment**

For all employee types, there is no additional benefit beyond regular salary and pension: pension is the only benefit provided by the business. Most fishermen employed in this fleet segment reported a salary of between EUR 10,000 and EUR 19,000 per year. However, a significant number reported a salary of below EUR 10,000. There is no real distinction between the salary declared by skippers and that of crew members.

Table 25. Salary band by employee type (EUR), bottom trawl VL1224 (n=27)

<table>
<thead>
<tr>
<th>Employee type</th>
<th>&lt;10,000</th>
<th>10,000-19,000</th>
<th>20,000-29,000</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managerial</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Administrator</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Skipper</td>
<td>3</td>
<td>5</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>Crew</td>
<td>8</td>
<td>11</td>
<td>0</td>
<td>19</td>
</tr>
</tbody>
</table>

Source: Consultants’ calculations based on questionnaires.

Entering the fleet segment does not require any specific attribute other than to be male, in good health and member of a family involved in the fisheries sector. Generally, the only qualification declared by the fishermen is the seaman’s certificate (‘libretto di navigazione’). There are three different categories outlined in the registration for this certificate and local fishermen are registered as the first (most basic) or third (specific for coastal fishing) categories. However, registration for the first or third categories does not need any specific or skill; the certificate is merely an administrative document required for employment on a vessel.
Fishermen could obtain other qualifications based on their experience or by attending specific training courses. However, given the family-based organisation of the local fishing sector, they do not need additional qualifications to work.

Almost all fishermen in this segment have been educated to a primary level (Figure 38). Of 27 interviewees, only one crew member has a more advanced level of education.

All of them had their first job in the sector. However, they are not satisfied with their jobs. Most of them have looked for other employment in recent years and would like to change jobs in the future. They are not able to indicate alternative employment, but they stated that they would choose to work outside the fishing sector.

![Figure 38. Education level of fishermen employed in bottom trawl VL1224 (n=27)](image)

Source: Consultants’ calculations based on questionnaires.

There is no labour mobility between fleet segments in the sense that there are no fishermen that leave a fleet segment to work in another one. However, some fishermen work for more than one vessel (even in different fleet segments), according to the seasonality of fishing activities and the demand for a different number of employees when a vessel changes fishing gear.

The level of transferability of skills in the fishing sector is very high within the family. Questionnaires show that almost all the fishermen in this fleet segment had fathers who were fishermen. The
transferability of skills is carried out by the direct involvement of sons in fishing activities from a young age.

The perception of their personal wealth is very low. This perception is not strictly related to the fleet segment, but for the fishing sector as a whole. The fishermen’s level of wealth has reduced in the last ten years and they stated that the economic value of the local fishing sector had changed with the introduction of those EU regulations that did not take into account local specificities and have negatively affected the sector.

The fishermen do not feel as if they are represented at European, national or local levels; nor do they feel supported by organisations like labour unions. They complain of a complete lack of representation of their interests and economic situation. The only organisations available to represent them are fishing cooperatives, which provide only administrative support.

Regarding the negative economic performance of the fleet segment, the fishermen’s behaviour has been fairly static. Besides attempts to modify the composition of landings by switching among the different target species and fishing gears available according to their fishing licenses, they are not able to carry out any significant initiatives to improve their status. This is due to the lack of institutions and/or organisations available to defend their interests and negotiate solutions. Furthermore, their low education levels and the lack of alternative employment opportunities represent strong constraints to the possibility of adaptation.

### 2.4.5 Fleet segment 5: vessels using hooks VL1218

The fleet segment vessels using hooks VL1218 consists of vessels with an overall length of between 12 m and 18 m, with 20 GT and 150 kW on average. Employees generally consist of three or four fishermen, including the skipper. These vessels use mainly drift and set longlines, although other fishing gears can be used at specific times. The main target species are swordfish, albacore, silver scabbardfish and European hake.

A declining trend in the volume and value of landings has been registered in the last ten years. The number of vessels is stable with a reduction of two units in 2011 (the last year of available data). The reduction in revenues and an increase in operating costs (particularly fuel costs) have meant a decline in the profitability of these vessels.

**Fleet segment as a whole**

As reported above, vessels in this fleet segment are generally operated by three or four fishermen. The skipper is generally also the vessel owner, who usually owns a single vessel. However, in one case reported in the questionnaires, a single owner claimed three vessels. Of the eight vessel owners interviewed for this fleet segment, three of them declared that the number of employees varies in the year according to the seasonality of fishing methods adopted. Generally, crew members come from within the family. Just two crew members have no family relationship with the vessel owner: in the other cases they are brothers or sons. The average number of employees is quite stable and a slight increase was registered in 2011: a decrease in the number of vessels has kept the total number of employees stable over time.
The stakeholder focus group stated that women do not have any direct role in fishing activities. However, in some cases, given the long absence of fishermen from the mainland, wives carry out an administrative role on behalf of husbands. Furthermore, the absence of fishermen from the mainland determines the central role of spouses or partners in making family decisions and providing childcare. The decision-making processes related to fishing activities is managed by the vessel owner, who is generally the only crew member. Other family members, like spouses or partners, are not involved in these decisions, which are guided by the seasonality of fishing activities.

This fleet segment consists of 16 vessels (2011). The average number of employees per vessel is estimated to be 3.5 people, accounting for around 56 employees. All employees are male, of local origin and concentrated in the age class of 40 to 65, although a few crew members are aged 18 to 40 or over 65 (see Table 24 and Figure 39).

<table>
<thead>
<tr>
<th>Employee type</th>
<th>Number of employees</th>
<th>Male</th>
<th>Female</th>
<th>0-18</th>
<th>18-40</th>
<th>40-65</th>
<th>&gt;65</th>
<th>Local</th>
<th>National</th>
<th>EU</th>
<th>Outside EU</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managerial</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Administrator</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Skipper</td>
<td>8</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>Crew</td>
<td>14</td>
<td>14</td>
<td>0</td>
<td>2</td>
<td>11</td>
<td>1</td>
<td>14</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>14</td>
</tr>
</tbody>
</table>

Source: Consultants’ calculations based on questionnaires.
The questionnaires submitted by fishermen show that their families consist of three people on average for crew members and four for skippers. Generally, these are the householder, his wife and one or two sons (or daughters). However, around half the crew members still live with their parents and are not married. The women in the family are not involved in the fisheries sector. They are generally housewives (mothers and wives) or students (daughters). Sons and daughters are students or unemployed, while brothers and fathers are generally fishermen. In these cases, they are regularly employed as crew with a permanent position and paid through a share-basis contract.

Table 25 shows the number of employees registered through questionnaires divided into family or non-family members. As reported, a very small number of crew members have no family relationship with the vessel owner.

The participation of family members, such as fathers and brothers, in the fishing activity of the householder is due to the traditional nature of the fishing activities, passed down from father to son, as well as a lack of alternative employment.

Table 27. Level of family involvement in business, vessels using hooks VL1224 (n=22)

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Number in management roles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family employees</td>
<td>20</td>
<td>8</td>
</tr>
<tr>
<td>Non-family employees</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>22</td>
<td>8</td>
</tr>
</tbody>
</table>

Elaborations on data provided by IREPA show a total GVA for the fleet segment equal to EUR 25,000 in 2011. This is equivalent to a GVA per vessel of around EUR 1,500 per year. However, these data appear to be unreliable, probably due to an overestimation of costs for that year. Unfortunately, alternative data are not available.

Stakeholders confirm that the economic performance of the fleet segment is negative and this trend started in 2000.

An indirect estimation of GVA per vessel can be done by using the declarations of local fishermen on their current wage. Table 30 shows that wages for employees in this fleet segment are distributed in the class EUR 0-10,000 and EUR 10,000-19,000. Taking into account that 3.5 people are employed on average on these vessels with a maximum wage of around EUR 18,000 (weighted mean) and that wages represent around 50% (as salary is based on the share contract) of the monte, i.e. the difference between total revenues and variable costs, monte per vessel should be lower than EUR 128,000. GVA per vessel can be calculated by subtracting fixed costs from monte. As fixed costs represent around
15% of GVA (this percentage is derived from AER data on Italian HOK fleet segments), GVA per vessel is expected to be lower than EUR 110,000 (Table 28).

Table 28. Trend in GVA for vessels using hooks VL1224

<table>
<thead>
<tr>
<th>Variable (EUR)</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>GVA</td>
<td>3,137,378</td>
<td>662,861</td>
<td>879,887</td>
<td>630,051</td>
<td>1,306,431</td>
<td>24,407</td>
</tr>
<tr>
<td>GVA/vessel</td>
<td>174,299</td>
<td>36,826</td>
<td>48,883</td>
<td>35,003</td>
<td>72,580</td>
<td>1,525</td>
</tr>
</tbody>
</table>

Source: Elaborations on IREPA data.

Landings of this fleet segment are mainly composed of pelagic species, which represent more than 70% of the total. The main stocks are swordfish and albacore, which represent 45% and 25% of total landings respectively. Silver scabbardfish represents 15% and European hake 5%, while other species account for less than 2% each. In the period from 2006 to 2011, total landings volume has registered a declining trend, which has been affected by both pelagic and demersal species. Landings of demersal and pelagic species have been reduced by 31% and 58% respectively. However, the strongest reduction in the landings of pelagic species occurred from 2006 to 2007.

![Figure 40. Trends in landings volume for vessels using hooks VL1224](image)

Source: Elaborations on IREPA data.

In terms of landings value, pelagic species represent almost 80% of total revenues. The main stock is swordfish, which represents 60% of total revenues. The landings of albacore account for around 15% of total revenues, while an additional 15% is equally distributed between silver scabbardfish and European hake.

Declining trends have been registered in revenues by group of species for both pelagic and demersal species.
Figure 41. Trends in landings value for vessels using hooks VL1224
Source: Elaborations on IREPA data.

Figure 42 shows the trends in prices for the main species landed by vessels using hooks between 6 m and 18 m. A declining trend in prices is registered for swordfish and European hake, while the other two main species, albacore and silver scabbardfish show a stable trend.

Figure 42. Trends in landings prices of main species for vessels using hooks VL1224
Source: Elaborations on IREPA data.

The number of vessels shows a stable trend from 2006 to 2010 and a reduction of two units in 2011. The total number of vessels classified in this fleet segment has reduced from 18 in 2010 to 16 in 2011. Gross tonnage and engine power have followed a similar trend.
Remuneration type is based on the share-basis contract. The difference between revenues and operating costs is divided into two parts: one remunerating the crew and the other the ship owner. This type of contract is the dominant one in the Mediterranean fisheries sector. Although a minimum wage is set by Italian law, this is only used to calculate and pay social security contributions.
Table 29. Remuneration type by vessel, vessels using hooks VL1224 (n=22)

<table>
<thead>
<tr>
<th>Remuneration type</th>
<th>No. people</th>
</tr>
</thead>
<tbody>
<tr>
<td>Piece</td>
<td>0</td>
</tr>
<tr>
<td>Share</td>
<td>22</td>
</tr>
<tr>
<td>Wage</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: Consultants’ calculations based on questionnaires.

As reported above, the economic performance of the fleet segment is negative. The reduction in revenues and an increase in fuel costs have meant a significant decline in the GVA. The stakeholders have identified in the European and international regulations as the main cause of this situation. Regulations have set limits on larger vessels fishing for tuna and swordfish (which in the past represented their most important target species), forcing them to target other less valued species.

**Employees within segment**

For all employee types, there is no additional benefit beyond regular salary and pension: pension is the only benefit provided by the business. Most fishermen employed in this fleet segment reported a salary of between EUR 10,000 and EUR 19,000 per year. However, a significant number reported a lower salary. There is no real distinction between the salary declared by skippers and that of crew members.

Table 30. Salary band by employee type (EUR) for vessels using hooks VL1224 (n=22)

<table>
<thead>
<tr>
<th>Employee type</th>
<th>&lt;10,000</th>
<th>10,000-19,000</th>
<th>20,000-29,000</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managerial</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Administrator</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Skipper</td>
<td>2</td>
<td>6</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>Crew</td>
<td>2</td>
<td>12</td>
<td>0</td>
<td>14</td>
</tr>
</tbody>
</table>

Source: Consultants’ calculations based on questionnaires.

Entering the fleet segment does not require any specific attribute other than to be male, in good health and member of a family involved in the fisheries sector. Generally, the only qualification declared by the fishermen is the seaman’s certificate (‘libretto di navigazione’). There are three different categories outlined in the registration for this certificate and local fishermen are registered as the first (most basic) or third (specific for coastal fishing) categories. However, registration for the first or third categories does not need any specific attribute or skill; the certificate is merely an administrative document required for employment on a vessel.

Fishermen could obtain other qualifications based on their experience or by attending specific training courses. However, given the family-based organisation of the local fishing sector, they do not need additional qualifications to work.
All fishermen in this fleet segment have been educated to primary level (Figure 46).

All of them had their first job in the sector. However, they are not satisfied with their jobs. Most of them have looked for other employment in recent years and would like to change jobs in the future. They are not able to indicate alternative employment, but they stated that they would choose to work outside the fishing sector.

There is no labour mobility between fleet segments in the sense that there are no fishermen that leave a fleet segment to work in another one. However, some fishermen work for more than one vessel (even in different fleet segments), according to the seasonality of fishing activities and the demand for a different number of employees when a vessel changes fishing gear.

![Figure 46. Education level of fishermen employed in vessels using hooks VL1224 (n=31)](image)

Source: Consultants' calculations based on questionnaires.

Generally, this happens on vessels owned by the same person. The possibility of working on vessels owned by different people is more complicated given the administrative obligations outlined in contracts.

The perception of their personal wealth is very low. This perception is not strictly related to the fleet segment, but for the fishing sector as a whole. The fishermen’s level of wealth has reduced in the last ten years and they stated that the economic value of the local fishing sector had changed with the introduction of those EU regulations that did not take into account local specificities and have negatively affected the sector.
The fishermen do not feel as if they are represented at European, national or local levels; nor do they feel supported by organisations like labour unions. They complain of a complete lack of representation of their interests and economic situation. The only organisations available to represent them are fishing cooperatives, which provide only administrative support.

Regarding the negative economic performance of the fleet segment, the fishermen’s behaviour has been fairly static. Besides attempts to modify the composition of landings by switching among the different target species and fishing gears available according to their fishing licenses, they are not able to carry out any significant initiatives to improve their status. This is due to the lack of institutions and/or organisations available to defend their interests and negotiate solutions. Furthermore, their low level of education and the lack of alternative employment opportunities represent strong constraints to the possibility of adaptation.

2.5 Summary of settings
The economic performance of vessels located in the port of Porticello is negative. With the exception of purse seiners, all fleet segments show negative trends in landings and revenues. Furthermore, operative costs have increased due to increases in fuel price, which began in 2008. This has mainly affected vessels with a significant consumption of fuel, like bottom trawlers.

Data estimated for these fleets using the IREPA database are not always representative of the real local situation. However, the negative trend in landings and revenues (especially of demersal species) is confirmed by local stakeholders: they believe that these trends are the consequence of European regulations, which do not take into account the specificities of local fisheries communities. In particular, these regulations have limited the fishing by larger vessels of tuna and swordfish (which in the past represented their most important target species), forcing them to compete with smaller vessels for the same species, mainly demersal species. This has increased the fishing effort on these species and reduced their biomass. Furthermore, limitations to the fishery of catching large pelagic is also creating problems for the biomass of small pelagic (as a consequence of the strong increase in the number of tunas and the associated effects of their predation of small pelagic).

The failure of EU regulations to reflect the reality of local fisheries is related to a number of technical measures defining the dimensions and positions of equipment fishermen are obliged to take on board. In many cases, given the small dimensions of the vessels, it is very difficult to comply with these regulations. Furthermore, these regulations do not take into account the low level of education of local fishermen.

The negative performance of the fisheries has not affected the fleet dimension. The number of vessels registered in Porticello is mostly stable over time. This is due to a lack of alternative employment opportunities, a consequence of both a stagnant economy with no sign of positive change and the low level of education of people employed in the fishing sector as a constraint to changing jobs.

The business structure is generally family-based. The limited number of people employed on these vessels means that crew are usually related to the vessel owner. The only fleet segment with a relevant
number of employees from outside the family is purse seine VL1224. This is mainly due to the higher average number of employees (around six people) per vessel compared with three or less in other fleet segments. Family members involved in the fishing activities are usually sons, brothers and fathers (when they are not retired).

However, in some cases, given the long absence of fishermen from the mainland, wives carry out an administrative role on behalf of husbands. Furthermore, the absence of fishermen from the mainland determines the central role of spouses or partners in making family decisions and providing childcare.

The level of education of fishermen in these fleet segments is generally very low. Almost all people involved in fishing activities have a primary level (but some of them are illiterate). As reported above, this represents a significant barrier to adaptability.

The average annual income is generally lower than EUR 10,000. Only some employees in the fleet segments bottom trawl VL1224 and vessels using hooks VL1218 show an average annual income of between EUR 10,000 and EUR 19,000. Generally, the household salary is dependent on stakeholders providing a single income (as spouses are usually housewives). The family income is only higher if more than one family member is involved in the fishing sector.

<table>
<thead>
<tr>
<th></th>
<th>Polyvalent VL0006</th>
<th>Polyvalent VL1218</th>
<th>Purse seine VL1224</th>
<th>Bottom trawl VL1224</th>
<th>Vessels using hooks VL1218</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Target species status</strong></td>
<td>Decreasing</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Decreasing</td>
<td>Unknown</td>
</tr>
<tr>
<td><strong>Fleet evolution</strong></td>
<td>Decreasing</td>
<td>Increasing</td>
<td>Stable</td>
<td>Stable</td>
<td>Stable</td>
</tr>
<tr>
<td><strong>Business type</strong></td>
<td>Family</td>
<td>Family</td>
<td>Family</td>
<td>Family</td>
<td>Family</td>
</tr>
<tr>
<td><strong>Demographics</strong></td>
<td>Age classes 40-65 (2/3) and 19-40 (1/3)</td>
<td>Age classes 19-40 and 40-65 equally distributed</td>
<td>Age classes 40-65 (2/3) and 19-40 (1/3)</td>
<td>Age classes 19-40 and 40-65 equally distributed</td>
<td>Age class 40-65</td>
</tr>
<tr>
<td><strong>Average annual income (EUR)</strong></td>
<td>&lt;10,000</td>
<td>&lt;10,000</td>
<td>&lt;10,000</td>
<td>Class 10,000-19,000 (60%) and &lt;10,000 (40%)</td>
<td>Class 10,000-19,000 (80%) and &lt;10,000 (20%)</td>
</tr>
<tr>
<td><strong>Main education level</strong></td>
<td>Primary</td>
<td>Primary</td>
<td>Primary</td>
<td>Primary</td>
<td>Primary</td>
</tr>
</tbody>
</table>
### Highlights

<table>
<thead>
<tr>
<th></th>
<th>Negative economic performance</th>
<th>Stable economic performance</th>
<th>Negative economic performance</th>
<th>Negative economic performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low adaptability</td>
<td>Low adaptability</td>
<td>Low adaptability</td>
<td>Low adaptability</td>
<td>Low adaptability</td>
</tr>
<tr>
<td>Low education level</td>
<td>Low education level</td>
<td>Low education level</td>
<td>Low education level</td>
<td>Low education level</td>
</tr>
</tbody>
</table>

### Key points

<table>
<thead>
<tr>
<th></th>
<th>Negative view of EU regulations</th>
<th>Negative view of EU regulations</th>
<th>Negative view of EU regulations</th>
<th>Negative view of EU regulations</th>
</tr>
</thead>
</table>

### 3. Linkages

#### 3.1 Inter-sectoral linkages

The stakeholders did not highlight any particular competition between fishing activities and other economic sectors. The only problem for fishing vessels (particularly bottom trawlers) is the presence of bulky waste and pollutants on the seabed, which hinders activities and often ruins produce. One of the most serious problems encountered by the vessels of Porticello and other coastal areas in northern Sicily is so-called recreational fishing. This definition includes both amateur anglers and pseudo-sports fishermen, who carry out illegal fishing. Although the global phenomenon is not yet quantified, fishermen have estimated that this involves several hundred pleasure craft of various tonnage and engine types and equipped with specific gear which is sometimes very sophisticated. The amateur anglers are generally seasonal and occasional fishers, whose activity is concentrated mainly during summer holidays and public holidays, but the pseudo-sports fishermen operate throughout the year, intensively and with no regard for regulations. They also sell their catch, creating unfair competition with legal fishermen, who cannot compete with their prices. Illegal activities go almost completely unchecked, leading many professional fishermen to engage in the more profitable abusive activities, using the same tools.

The representatives of vessels using static gears (generally polyvalent vessels lower than 6 m) stated that their activity is limited by the impact that bottom trawlers have on resources as well as competition from a large number of amateurs or pseudo-sports anglers, described above.

Even the fishermen involved in the fleet segment vessels using hook VL1218 complain of the presence of a large number of amateur anglers, who compete with professional fishermen for the same resources.
3.2 Intra-sectoral linkages

3.2.1 Between fleet segments

The increase in the fuel prices, which began in 2008, has determined a significant increase in fuel costs for all vessels operating in Porticello. The fleet segment most affected is bottom trawl VL1224 as around 50% of operating costs represent fuel consumption. This situation has forced bottom trawlers to temporarily halt their activity or operate in areas closer to the coast. In the latter case, trawlers exploit the same fishing grounds of small-scale fisheries (vessels under 6 m) creating a conflict and increasing the fishing effort on the same resources.

Another conflict between fleet segments is represented by the use of ‘cannizzi’ by the purse seiners. This traditional Sicilian fishing method is practised in deep water to catch pelagic species like common dolphinfish, greater amberjack and pilot fish. Cannizzi fishing represents an important economic activity, but creates conflicts with the vessels using hooks and affects navigation of other vessels. Longlines become tangled with nylon cords holding the cannizzi, including any cords left on the sea bed when the cannizzi fishing season ends.

3.2.2 Between subsectors

The fishing subsectors in Porticello are mainly catching and commerce: there is no processing sector. Fishermen highlight a lack of local selling points, self-managed by fishermen’s associations. Landings are mostly sold to informal small traders and wholesalers from areas near Porticello (such as Palermo), with no guarantees of a fair price and very often without invoicing.

The Porticello fish market only operates at night until early morning, whereas fishing continues throughout the day because of the extreme versatility of the fleets. A consortium of cooperatives is needed to organise direct sales of the catches, and with the provision of appropriate self-managed selling points. The fish market should be open for longer hours, with some market space available to the fishing cooperatives.

3.3 Summary of linkages

Linkages with other economic sectors do not exist in Porticello. The only conflict highlighted by stakeholders is related to so-called ‘recreational’ fishing, which is often intentionally illegal and has been highlighted by representatives of different fleet segments as a problem.

Two cases of conflicts among fleet segments were discussed by the stakeholder focus groups: a conflict between bottom trawl VL1224 and polyvalent VL0006 having to exploit the same fishing areas and compete for the same resources; and conflict between vessels using hooks VL1218 and purse seine VL1224 over problems caused by the latter using cannizzi and damaging longlines.

The main problem in the fishery subsectors is fish commerce, which is managed by wholesalers who decide a price and place the risk on fishermen of being left with unsold produce.
4. Role of fishing

4.1 Fisheries as an economic activity

4.1.1 Diversification and adaptation

Santa Flavia is heavily dependent on the fishing sector for employment and income: Porticello is almost exclusively dependent on this sector. Almost all employed people in Porticello are involved in the catching sub-sector. As a consequence, the majority of household incomes are entirely reliant on the positive economic performance of the fishing sector.

The situation in the last ten years has been quite static, even in times of crisis: there is no sign of diversification within in the local economy due mainly to the low level of education and a lack of alternative employment opportunities. Even if most of the fishermen would prefer to leave the fishing sector and find an alternative employment it seems impossible for them to change jobs.

Within the catching sector, diversification can be identified in decisions about changing target species, using different fishing gears and exploiting different fishing grounds. The variety of fishing methods in the area has allowed fishermen to diversify the landings composition in response to the decrease in biomass of demersal species. In some fleet segments (such as bottom trawlers), stakeholders have sought out new fishing grounds to counteract the increase in fuel price.

Younger generations are not interested in the fishing sector, which they describe as less and less attractive, and this has led to an increase in the average age of people working in the catching sector.

The capacity of adaptation to change is very poor. Notwithstanding the economic crisis affecting almost all fleet segments, fishermen remain in the same job. This decision has been constrained by a number of factors. The most important is the lack of alternative employment opportunities that, joined to a very low level of education, does not allow local people to leave the sector and change job.

Furthermore, solidarity is only expressed within the family and sometimes there are conflicts among different families over vessels belonging to different fleet segments. Because of these conflicts, fishermen are not encouraged to empower themselves by forming associations that could defend their interests and propose solutions to the various challenges described above. Local fishermen described a complete lack of support at local, regional and national levels.

Among the list of social indicators proposed to local fishermen for evaluation in terms of their importance in influencing the local community well-being, “level of education” was the most important, scoring 3.96 on average, followed by “unemployment and income support rates” with an average score of 3.77 and “capacity for individual or collective influence”, which scored 3.60. Another important indicator with a score higher than 3 was “health”. The “level of education” is particularly important for purse seiners and vessels using hooks, which employees scored values higher than 4 for this indicator.
It is very important also for bottom trawlers, but less important than the “unemployment and income support rates”. For polyvalent vessels, “level of education”, “unemployment and income support rates” and “capacity for individual or collective influence” are all important at similar level.

4.2 Future development of the community

The future of Porticello (and Santa Flavia) will be determined by developments in the fishing sector. Local fishermen currently believe that the sector is no longer sustainable and will probably decline then actually cease to exist. However, they hope that something might change. They feel that their involvement in this case study represents a new form of communication with the European institution which will highlight their concern regarding EU regulations as the main cause of their critical situation.

Table 31. SWOT analysis

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
<th>Threats</th>
<th>Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>High level of professional experience.</td>
<td>Reduction in landings (especially of demersal species).</td>
<td>Gradual increase of illegal fishing.</td>
<td>Introduction of a self-management system.</td>
</tr>
<tr>
<td>Use of a multitude of fishing gears</td>
<td>Conflicts of bottom trawlers with other fleet segments.</td>
<td>Increase of operating costs.</td>
<td>Introduction of socio-economic measures associated with reductions in the fishing effort.</td>
</tr>
<tr>
<td>High quality of production (high value of species)</td>
<td>Low level of education that does not allow for alternative employment.</td>
<td>Exit of employees from the sector.</td>
<td>Diversification of fishing activity towards fishing tourism.</td>
</tr>
<tr>
<td>A significant number of species landed</td>
<td>Lack of self-managed local fishing market.</td>
<td>Reduction in salaries as a consequence of the increase in operating costs.</td>
<td>Development of Producers’ Organisations.</td>
</tr>
<tr>
<td>Cultural and historic tradition in the fishing sector</td>
<td>Poor capacity of fishermen to develop alternative business activities.</td>
<td>Low participation of younger generations in the fishing sector with the average age of fishermen becoming older.</td>
<td>Development of training courses for fishermen to improve their skills and level of education.</td>
</tr>
</tbody>
</table>

Source: Consultants’ calculations based on interviews.
Local fishermen would like to return to past fishing practices, prior to the implementation of EU regulations, when they had more flexibility in the management of local fishing activities.

Other points they would like to be considered in future are:

- the possibility of working year round by changing seasonal fishing methods;
- the implementation of local or regional self-management;
- the evolution of regulations which take into account the specificities of local fisheries;
- the organisation of a fish market which can appropriately value local produce and directly benefit fishermen.

Table 29 shows the results of a SWOT analysis performed with the local stakeholders.
5. Summary and conclusions

Fishing is the main economic sector in Santa Flavia, employing around 35%. Porticello, the coastal port within Santa Flavia, is almost exclusively dependent on the fishing sector. Most local people are employed in the catching sector, which has a family-based business structure. Other fishery subsectors include fish commerce, mainly carried out by wholesalers from Palermo and other nearby areas, and ship building, which is almost exclusively involved in repairing non-fishery boats. Fish processing is completely absent.

The economic performance of vessels located in the port of Porticello is negative, with the exception of purse seiners: all fleet segments show a negative trend in landings and revenues mainly due to an excessive exploitation of demersal resources. Furthermore, fishing vessels are registering a rise in operating costs due to the increase in fuel price since 2008. This has a particular impact on bottom trawlers as fuel consumption for this fleet segment represents around half of total operating costs.

Notwithstanding the negative performance of the local fleet, the number of vessels operating in the area has been relatively stable over a long period. This is mainly due to local people having a powerful identification with the fishery sector: fishing is considered a traditional activity passed down from father to son. A lack of alternative employment opportunities has also played a role in keeping the sector static. Although fishermen would like to leave the sector and find new work, their low level of education and a stagnant economy presents obstacles to change.

The business structure is usually family-based with the exception of purse seiners, where there is a higher number of employees per vessel requiring the employment of non-family crew. The crew of the other fleet segments is mostly composed of people related to the vessel owner. All crew members are male, predominantly aged between 19 and 45 years old, and women are not involved in the sector although they do carry out an administrative role on behalf of husbands during long absences from the mainland. So to simplify administrative tasks, there are few cases where the wife is named as the vessel owner.

Salaries are very low for both skippers and crew. Most of the fishermen earn less than EUR 10,000 per year. Only bottom trawl VL1224 and vessels using hooks VL1218 show some employees with an average annual income of between EUR 10,000 and EUR 19,000. Generally, the fisheries income represents the entire household salary as wives are usually housewives. The family income is usually only higher if more than one family member is involved in the fishing sector.

The fishing sector in Porticello is also characterised by a number of conflicts among different fleet segments. In particular, the increase in fuel price has forced bottom trawlers to exploit the same fishing grounds as small-scale fisheries, increasing pressure on resources and damaging the productivity of both fleet segments involved. Another case of conflict is caused by the use of *cannizzi* by purse seiners and creating problems for longline fishermen. A major problem also stems from a significant number of illegal fishermen disguising their activities as recreational: they are in competition with legal fishermen for both the exploitation of marine resources and the sales of produce. The value of local produce is
underestimated as a consequence of illegal fishing and creates a situation of inefficiency in the local fish market.

However, local stakeholders identify EU regulations (leading to limitations in the decision-making process for fishing activities) as the main cause of the current economic crisis. The local fleet is characterised by polyvalence in vessels, which have a number of different fishing gears permitted in their fishing licenses. Even though, for statistical reasons, these vessels are classified into specific fleet segments on the basis of their predominant fishing gear, the majority use different fishing gears and methods over the year. This characteristic enables them to adapt their behavior to seasonal fluctuations in stocks. Furthermore, stakeholders were previously used to working with an informal, flexible agreement among skippers that distributed the fishing effort across different stocks and exploited different areas. The obligation to keep on board sophisticated equipment, which is not easy to use, confuses local fishermen. The introduction of EU and international regulations has limited this flexibility and forced local vessels to exploit the same species in the same areas. In particular, this has created reductions in landings of tuna and swordfish, the prohibition of the bianchetto fishery, and limitations on the small-scale driftnets and the species that can be landed using this method.

The increase in regulations and controls aimed at conserving and monitoring stocks, as well as all the administrative and technical requirements that must be met are not understood by local fishermen and are seen as conflicting with the traditional artisanal fishery characteristic of the area. This combined with an absence of control over illegal fishing, has forced professional fishermen out of their jobs and instead they reportedly turned to illegal fishing disguised as a recreational activity.