European Commission, DG MARE

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

France: Paimpol case study report

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Acronyms and abbreviations

**GVA**: Gross value added  
**ICES**: International Council for the Exploration of the Sea  
**IFREMER**: L’Institut Français de Recherche pour l’Exploitation de la Mer (French Research Institute for the Exploration of the Sea)  
**INSEE**: Institut National de la Statistique et des Etudes Economiques (French Statistical Institute)  
**LAU**: Local administrative unit (LAU 1, 2, etc.)  
**MSY**: Maximum sustainable yield  
**n**: Number of questionnaires  
**PO**: Producer organisation  
**SSB**: Spawning stock biomass  
**TAC**: Total allowable catch
1. Methods

1.1 Secondary data sources

Several secondary data sources were used in this report including the French agencies Institut National de la Statistique et des Études Économiques (INSEE), L’Institut Français de Recherche pour l’Exploitation de la Mer (IFREMER) and FranceAgriMer.

INSEE is the French National Statistics agency that collects data on a wide range of subjects, including population, economy and business. It publishes annual data at the national and regional levels – NUTS1 and NUTS2 (nomenclature of territorial units for statistics), respectively. For lower geographical levels (departments – NUTS3), data are estimated either annually (for population, for example) or every five years (for economic data). For towns with fewer than 10,000 inhabitants (local administrative unit 2, or LAU2), statistics are gathered by census every five years. For larger towns, an annual census targets 8% of the population. Most of the data presented at this level were gathered during the 2009 and 1999 censuses.

IFREMER is the French agency responsible for monitoring marine resource trends (through stock evaluation) and fishing fleets behaviour (catch, landings.). Catch data and some economic data related to the fishing fleet are sourced from IFREMER publications.

FranceAgriMer is the French agency responsible for gathering data from the agricultural and fisheries markets, following the supply chain from the first sale to the final consumer. Auction data in this report are sourced from FranceAgriMer datasets.

1.2 Study site

The ‘quartier maritime’ (maritime quarter) is the smallest geographical subdivision of the French maritime administration. In French law a quartier maritime has no formal limit on land as it is defined as a part of the French coastline. Most of the existing statistics concerning fisheries are publicised at the level of the quartier maritime. In order to better represent the economic importance of the quartier maritime, several towns (LAU2) have been aggregated.

1.3 Focus groups and questionnaires

As a result of a recognised risk it was not possible to organise focus groups for this study. Contacts with professional fishermen organisations indicated the principle would not be accepted given the legal form and geographical coverage of the representation of the fishery sector. In addition, there would have been probably little possibility to have any control over who would attend and the representativeness of the attendees. Because of the risks interviews were instead held individually with the same key informants that would have been convened for the focus group using the same semi-structured interview and reporting templates. Interviews were arranged through phone consultation, scheduled at a time that was convenient for the participant. This process allowed the socio-economic data to be collected and discussions developed with fishermen on their vision of the sector and its future. The sampling strategy with the assistance of IFREMER teams who have a wide knowledge of the segments operating in the area. Further discussions were held with informed stakeholders from various groups (local authorities, other sub-sectors of the industry, FLAG) to complement information on the dynamic of the sector in the area.
2. **Settings**

2.1 **Description of case study sites**

This case study focuses on the Paimpol *quartier maritime*. Paimpol (lat 48° 46 N, long 3° 02 W) is on the northern coast of Bretagne (one of the 22 French regions) and borders the English Channel.

In the northern part of the Cotes d’Armor department, the Paimpol area covers almost 760 km² and comprises, for the purposes of this study, 52 towns (LAU2). It has two main fishing ports (Paimpol, Loguivy / Porz Even in the Ploubaznalec municipality) and several secondary small harbours which access depends on the water height in relation with the tide.

The climate is oceanic, with a mild annual average temperature: maximum average temperatures range from 8 °C (January) to 21 °C (July and August); minimum average temperatures range from 3° C (January and February) and 13 °C (July and August). The average annual rainfall is about 800 mm. There are around 130 days of rain and between 1,500 and 1,600 hours of sun every year.

Treguier is one of the oldest settlements in the area and a monastery was built there in the sixth century. The Tro Breizh is a famous Catholic pilgrimage that runs through the town and links to shrines in six other towns in Bretagne.

Paimpol was one of the main fishing ports in Bretagne during the 15th century, with an important fleet that caught cod around Iceland. Several ports developed close to Paimpol due to the natural shelter the area provided. After the closure of the Icelandic fisheries and the development of other fishing grounds, the importance of the port at Paimpol declined and it was overshadowed by other ports, including those on the south coast of Bretagne and the port in Saint Malo.
2.2 Demographics

Paimpol area had just under 110,000 inhabitants in 2009 (last census). The major towns of the area were Lannion (almost 20,000 inhabitants in 2009), Paimpol (7,800 inhabitants) and Perros-Guirec (7,400 inhabitants). The population of the area has been increasing since 1968 (figure 2), with an overall increase of 13 % between 1968 and 2009. The growth has, however, been greater at the regional level, especially from 1975 to 2009.

The population of the area is ageing: between 1999 and 2009, the proportion of inhabitants aged over 45 rose from 48.5 % to almost 54 % (figure 3). This corresponds to the general ageing trend across
Bretagne, although the rate of increase in Paimpol is currently higher than for the rest of the region. This is largely due to the emigration of young people outside the area and pensioners arriving in the area.

Figure 3. Age structure of the population of Paimpol area in 1999 and 2009
Source: INSEE.

Housing statistics show a steady increase in the number of available houses in the area, from over 39,000 in 1968 to 72,500 in 2009, representing an increase of 85% over the period (figure 4). The proportion of vacant houses has remained stable at 6% to 7% of available houses between 1968 and 2009, which is comparable to departmental and regional levels.

In 1968, second homes represented 18% of available houses in Paimpol area, compared to 12% for the Côtes d’Armor department and 9% at regional level. Since then, the proportion of second homes has increased, representing almost a quarter of the available housing in 2009. By comparison second homes represent only 13% of available housing for the whole region.

Figure 4. Trend in property occupation in the Paimpol area 1968–2009
Source: INSEE.

It should be emphasised that French statistics do not record ethnicity, even at national level. Nationalities are not recorded at the LAU2 level. The departmental level is the lowest level for which
data is available on this subject. As in the rest of the Bretagne region, few foreigners live in Cotes d’Armor. Foreign residents are predominantly British (the area attracts British pensioners).

![Pie chart showing origin of population in Cotes d'Armor](image)

**Figure 5. Origin of population in Cotes d’Armor.**
Source: INSEE.

There are no detailed statistics on population movement within France – these are only given at departmental (NUTS 3) and regional (NUTS 2) levels. The Cotes d’Armor department has been attracting immigrants in recent years, with an estimated net migration of about 4,000 annually since 2000.

![Line chart showing annual net migration in Cotes d’Armor department 2000–09](image)

**Figure 6. Annual net migration in Cotes d’Armor department 2000–09**
Source: INSEE.

INSEE does not produce estimates on life expectancy at birth at the LAU2 level. This type of data is only available at departmental level (NUTS3). Life expectancy at birth is increasing slightly in the Cotes d’Armor department, with a gap of more than seven years between women (close to aged 84) and men (aged 76), which is similar to the life expectancy calculated at the regional level. Both male and female life expectancy is rising slightly: male life expectancy increased by 2.9 years between 2000 and 2009; female life expectancy gained 1.8 years in the same period (figure 7).
2.3 Employment opportunities/sector overview

French statistics do not estimate gross value added (GVA) at the communal level, only at the departmental level every five years. The latest available data is from 2005, when services represented almost half of the GVA generated at the departmental level. The public sector was the second largest activity, generating almost a quarter of the departmental GVA. The fishing industry is part of Agriculture, Forestry and Fishing (given as ‘Agriculture’ in figure 8), which overall represents only 7% of the GVA generated in the department.

There were just over 6,000 unemployed inhabitants to almost 56,000 inhabitants in full-time employment in the Paimpol area in 2009. This compares favourably to the situation in 1999, when 6,000 inhabitants were unemployed for 51,000 residents in full-time employment.
The public sector and services are the two key employers in the area. They represented 33 % and 42 % (respectively) of total employment in 2009. These two sectors have been progressing over the last decade gaining overall 4,500 workers, and improving their relative size by 2 % each. The fisheries sector represents less than 1 % of the total employment. Agriculture, Forestry and Fishing and industry are shrinking in the area. Overall this is comparable to the regional trend: services and the public sector are also growing sectors, compensating for the decreases in industry and the primary sector in terms of GVA and employment.

In terms of number of businesses, services is also the leading sector and accounts for more than half the total number of firms in the area. The primary sector represents 16 % of the firms in the area and only 7 % of the employment.
The vitality of the services industry is due to two dynamic sub-sectors: tourism and telecommunications. The west coast of the area is known as the ‘Cote de Granit Rose’ (the Pink Granite Coast); the east part is named ‘Tregor’. Tourists are attracted to both areas for nature and wildlife, the beauty of the landscape and the various outdoor activities on offer (such as hiking, cycling, kayaking and bird watching). Moreover, the number of second homes in the area is high compared to the rest of the region. All these factors contribute to the vitality of the area as a tourist centre.

The largest town of Paimpol area, Lannion, has an important ‘high tech’ sector (both public and private) due to political decisions that were made in the 1960s. The French government favoured the installation of the National Centre for Telecommunication Studies, which attracted some large players from the telecommunications industry. Education and research facilities have been created since then to train and employ the workforce needed to develop the technology sector. Since 2002, the town has been the end point of an important subsea communication cable (the Apollo undersea south cable), linking France to the USA, as well as housing a cable (High-capacity Undersea Guernsey Optical fibre, or HUGO) linking the Channel Islands and the south coast of England. A second cable linking the USA to Europe should also be laid in Lannion in a few years.

2.4 Fisheries

The fishing industry in Paimpol comprises mainly small-scale vessels (under 12 m) targeting large crustaceans and scallops as main species. Over the last decade, the fleet has declined slightly in terms of number of units due to a combination of ageing workforce, ageing fleet and increase in energy prices.

The main species targeted by the inshore vessels are shellfish: great scallops (Pecten maximus), brown crab (Cancer pagurus), European lobster (Homarus gammarus) and spider crab (Maja squinado). There are also some demersal species such as seabass (Dicentrarchus labrax) and pollock (Pollachius pollachius) targeted by hook and line vessels. Netters mainly target demersal species such as anglerfish (Lophius piscatorius and Lophius budegassa), turbot (Scophthalmus maximus), squid (Loligo vulgaris) and John Dory (Zeus faber).

Landings statistics are difficult to obtain as fishery products are mostly sold outside auctions by small-scale vessels not concerned by the EU logbook obligation. The landings of the Paimpol vessels are declared through National logsheets (fiche de pêche) submitted to the authorities. Until 2008, the
French Ministry published an annual estimate of the total local production whether sold under auction or direct to buyers. The latest figure available indicates landings of 2,026 tonnes for a value of EUR 4.1 million including 1,607 tonnes of scallops (EUR 3.1 million), and 248 t of spider crab (value of EUR 0.5 million). No detail was available for other species landed. After 2008, the French administration did not publish official figures on landings in the area.

In 2008, IFREMER estimated the landings in 2007 of the Paimpol fleet under an ad-hoc expertise at the request of the Ministry. The result ended up on an estimation of landings of 4,450 tonnes for a value of EUR 10.9 million, i.e. twice as much as the Ministry published figure. IFREMER figure include landings of the Paimpol fleet in other ports, in particular landings of scallops under the auctions of the Bay of Saint Brieuc (Saint Quay Portrieux, Erquy) where part of the local fleet operate during the winter season.

Table 1 : Estimates of landings by species of the Paimpol fleet in 2007. Source : IFREMER

<table>
<thead>
<tr>
<th>Species</th>
<th>Landing weight (t)</th>
<th>Landing value (EUR ‘000)</th>
<th>% total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scallops</td>
<td>2,520</td>
<td>4,780</td>
<td>44 %</td>
</tr>
<tr>
<td>Spider crab</td>
<td>550</td>
<td>1,148</td>
<td>11 %</td>
</tr>
<tr>
<td>European lobster</td>
<td>44</td>
<td>879</td>
<td>8 %</td>
</tr>
<tr>
<td>Monkfish</td>
<td>123</td>
<td>680</td>
<td>6 %</td>
</tr>
<tr>
<td>Whelk</td>
<td>222</td>
<td>394</td>
<td>4 %</td>
</tr>
<tr>
<td>Seabass</td>
<td>27</td>
<td>364</td>
<td>3 %</td>
</tr>
<tr>
<td>Abalone</td>
<td>13</td>
<td>343</td>
<td>3 %</td>
</tr>
<tr>
<td>Pollack</td>
<td>57</td>
<td>300</td>
<td>3 %</td>
</tr>
<tr>
<td>Edible crab</td>
<td>92</td>
<td>251</td>
<td>2 %</td>
</tr>
<tr>
<td>Sole</td>
<td>18</td>
<td>243</td>
<td>2 %</td>
</tr>
<tr>
<td>Oth. Species</td>
<td>786</td>
<td>1,544</td>
<td>14 %</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>4,451</strong></td>
<td><strong>10,925</strong></td>
<td><strong>100 %</strong></td>
</tr>
</tbody>
</table>

The table confirms that scallops and crustaceans are the two pillars of the local fishing industry.

In the Paimpol area, there is only one auction in Loguivy sur Mer. This auction specialises on scallops with hardly any other product sold. Other fishery products landed in the area are sold direct to fish buyers or consumers or under the auctions of the Bay of Saint Brieuc (in particular Saint Quay Portrieux) which organises pick-up by refrigerated truck in some locations of the area where cold storage rooms are available (Perros Guirec, Locquemeau, Paimpol, Pors-Even, Loguivy). Sales under the auction of Saint Quay concern mostly finfish species.

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1 Since 2008, the French fishery statistics system is encountering several problems stemming from a reorganization of the fishery statistics framework.
The following table shows sales of scallops under the auction of Loguivy s/Mer.

<table>
<thead>
<tr>
<th>Weight (t)</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value (EUR '000)</td>
<td>2,341</td>
<td>2,295</td>
<td>2,694</td>
<td>3,451</td>
<td>2,959</td>
<td>2,663</td>
<td>2,618</td>
</tr>
<tr>
<td>Av. Price (EUR/kg)</td>
<td>1.94</td>
<td>1.90</td>
<td>1.92</td>
<td>1.86</td>
<td>1.89</td>
<td>1.97</td>
<td>2.00</td>
</tr>
</tbody>
</table>

The landing data do not include the high sea trawlers belonging to the fishing company Armement Dahouetin who owned in 2012 15 18-24 m trawlers, including three new trawlers constructed in 2010, 2011 and 2012. The fleet of Armement Dahouetin has been deregistered from Saint Brieuc and registered in Paimpol in 2009 for (unclear) administrative reasons. This fleet has little economic link with the area, exploiting stocks in the Celtic Sea and Channel, unloading its production in Roscoff and selling under the auction of Erquy. Armement Dahouetin employs ≈ 130 staff and lands approximately 9,000 tonnes fishery products per year.

The city of Ploubazlanec harbours the two main fishing ports of the area: Loguivy s/Mer and Pors-Even (≈ 45 fishing vessels). These two ports have basic facilities including an auction for scallops, cold rooms and seawater tanks for storage of live crustaceans. Access is dependent on the tide and only relatively small vessels can use the ports. Other ports in the area include Perros Guirec, Paimpol and Locquémeau, each with less than five vessels permanently based. Basic facilities including cold rooms and seawater tanks are also available in these landing points. The rest of the fleet is disseminated in small mooring points of the coast with no particular facilities, or use permanently port facilities in other locations (Roscoff for the high-sea fleet registered in Paimpol, Saint Quay Portrieux)

Status of stocks

Scallops are mostly caught in the nearby Bay of Saint Brieuc, only a small part of which is in the Paimpol area; the remainder in the nearby waters of Saint Brieuc, the neighbouring quartier. This fishery is managed through a complex licence system. Around 230 vessels are authorised to fish two days a week from October to April in different parts of the bay. One day of fishing corresponds to 45 minutes of active fishing. The scallop population is assessed annually by IFREMER: The stock has experienced high recruitment levels in 2006-2008. However, since 2008 recruitment is poor and the exploitable biomass is declining.

Results are communicated at the beginning of the season to the departmental Fisheries Committee; the Committee decides a quota for the fishery as a whole. The number of days the scallop fishery is open is then calculated according to the quota. Scallops can only be landed and weighed in designated ports, one of which is Loguivy sur Mer in the Paimpol area. There are heavy fines, including administrative suspension of licences for fishermen who do not comply with the system.
There is a smaller scallop fishery near Perros-Guirec which is also managed through a licence system, but for which no stock-assessment is performed. Stock enhancement has taken place in this fishery for more than ten years using juvenile scallops hatched in the Brest-Tinduff Nursery.

Anglerfish stocks are evaluated by the International Council for the Exploration of the Sea (ICES). Due to lack of data, notably discard data, ICES does not currently provide reference points. However, ICES working groups reported good recruitment for both species up to 2008. Nonetheless, the latest advice indicates that the total allowable catch (TAC) should be reduced to reflect the recent downward trend in biomass.
The stock of haddock has been increasing slowly over the last decade. Good recruitment was observed in 2009, which was mainly translated in increasing discards. ICES has advised this fishery to maintain landing levels while finding technical solutions to avoid discards, which had a higher biomass than the landings in 2009 and 2010, thus lowering the positive impact of the 2009 recruitment on the stock biomass.

The various shellfish stocks (brown crab, lobster, spider crab) targeted by vessels from the area are not thoroughly assessed on a regular basis. Recent trends for these species are believed to be stable by IFREMER specialists.
Seabass is also an important species that is not currently fully evaluated, although IFREMER specialists believe that the biomass is decreasing due to an increase in targeted effort. ICES has not evaluated rays as these are generally considered to be bycatch, rather than a targeted fishery.

<table>
<thead>
<tr>
<th>Species</th>
<th>ICES Area</th>
<th>Management responsibility</th>
<th>Stock status relative to MSY</th>
<th>Main management regulations affecting the stock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scallops</td>
<td>VIIe</td>
<td>Fishermen organisation (comité régional des pêches)</td>
<td>above MSY</td>
<td>licence, effort regime, TAC</td>
</tr>
<tr>
<td>Spider crab</td>
<td>VIIe</td>
<td>No specific management - Fishermen organisations regulate access to coastal fisheries</td>
<td>Unknown - Stable</td>
<td>licence, area closures</td>
</tr>
<tr>
<td>Brown crab</td>
<td>VIIe</td>
<td>No specific management - Fishermen organisations regulate access to coastal fisheries</td>
<td>Unknown – Stable</td>
<td>licence, area closures</td>
</tr>
<tr>
<td>European lobster</td>
<td>VIIe</td>
<td>No specific management - Fishermen organisations regulate access to coastal fisheries</td>
<td>Unknown - Stable</td>
<td>licence, area closures</td>
</tr>
<tr>
<td>Seabass</td>
<td>VIIe</td>
<td>No specific management - Fishermen organisations regulate access to coastal fisheries</td>
<td>Unknown - Decreasing</td>
<td>licence, area closures</td>
</tr>
<tr>
<td>Anglerfish</td>
<td>VII-VIII</td>
<td>EU</td>
<td>Unknown</td>
<td>TAC and Quotas</td>
</tr>
<tr>
<td>Haddock</td>
<td>VII b-k</td>
<td>EU</td>
<td>above MSY but fishing mortality is too high</td>
<td>TAC and Quotas</td>
</tr>
</tbody>
</table>

Source: ICES and IFREMER.

The local stakeholders have developed several initiatives in relation with resource management:

- Monitoring interactions with cetaceans: the Local fisheries committee of Paimpol has implemented in cooperation with IFREMER an own observer programme onboard local netters to monitor interactions with cetaceans. This programme, co-funded by EU structural funds, was a contribution to the observer scheme promoted under Reg (EC) 812/2004. According to fishermen representative, this programme has been developed to support the locally perceived finding that accidental catches of cetaceans by the local net fishery are very low, and that pingers were not necessary.

- Study of the local stocks of lobsters: there is little knowledge on the dynamics of lobster stocks in the area. In 2009, the local fishermen association developed in cooperation with IFREMER a tagging programme under an objective to identify migration of mature lobsters in and out the area. Co-funded by the EU through EFF, this ongoing operation involves tagging and releasing lobsters (three annual campaigns so far between 2009 and 2012), communication with other fishermen, including recreational fishermen, for better knowledge of the programme and to secure return of tagged lobsters, hiring of a dedicated agent and purchase of an inflatable boat to release some lobsters in an area closed to fishing (cantonnement de La Horaine).

- Management of the scallop fisheries. As detailed in other sections, the local stocks of scallops are managed by local representation of fishermen. This operation involves access regulations (licensing scheme), control (the Saint Brieuc committee hires a plane, but only for the stocks in the Bay) and stock enhancement through dissemination of young recruits purchased from the Brest-Tinduff hatchery.
Stock enhancement started in the early 2000 for Paimpol stocks. It is now implemented on a pilot scale basis in the Bay of Saint Brieuc to compensate for the declining stock.

- Development of a fishery observatory: called SIPECHE, the objectives of this observatory is to obtain on a fine geographical scale (3 miles x 3 miles) details of the activity of the various fishing fleet of the whole Departement of Côtes d’Armor. The project started in 2012 and will concern the fishing communities of Paimpol and Saint Brieuc areas.

Figure 15. Fishing area of the Paimpol quartier maritime waters
Source: Prepared by consultant.
There is just one seasonal auction in the area, situated in Loguivy-de-la-Mer which operates during the scallop season as a designated landing point for the scallops. Local vessels sell their catches either in Roscoff (west of the *quartier maritime*), in Saint-Quay-Portrieux or in Erquy (both are east of the *quartier*). A large part of the catch is also sold to first buyers (fish traders, restaurants) without any bidding process.

The fishing industry in Paimpol area comprises four groups of vessels:

- small-scale vessels of less than 12 m using mainly passive gears such as pots, nets or hooks but also sometime active gears such as scallop dredges. They represented 57 % of the active fleet in 2010, with 70 units out of a total of 123 vessels in all four groups in the area.
- dredgers of less than 18 m, which are also using active gears (trawl). In 2010, this group accounted for 25 % of the active fleet of the area (31 ships).
- a small group of vessels over 12 m using a variety of passive and active gears (four vessels).
- trawlers operating offshore (eight vessels between 18 m and 24 m, and 10 vessels over 24 m). The majority of these vessels registered very recently in the area in 2009 and 2010, but are operating mainly from other nearby *quartiers*. As outlined above, their link with the area seems weak as they land in nearby auctions: Saint-Quay-Portrieux and Erquy (Saint Brieuc *quartier maritime*) and Roscoff (Mortlaix *quartier maritime*).
### Table 4. Fleet segments registered in Paimpol (2010)

<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>0-12m</td>
<td>70</td>
<td>Passive gears (pots, line) and active gears (dredge)</td>
<td>2</td>
<td>Spider crab, brown crab, European lobster, seashell, scallops</td>
<td>VIIe</td>
<td>1</td>
</tr>
<tr>
<td>0-18m</td>
<td>31</td>
<td>Dredge, trawl</td>
<td>3</td>
<td>Scallops, anglerfish, turbot, squid</td>
<td>VIIe</td>
<td>1</td>
</tr>
<tr>
<td>12-18m</td>
<td>4</td>
<td>Passive gears (pot, net) Trawl</td>
<td>4</td>
<td>Spider crab, brown crab, European lobster anglerfish, haddock, John Dory</td>
<td>VIIe</td>
<td>5</td>
</tr>
<tr>
<td>18-40m</td>
<td>18</td>
<td></td>
<td>4-6</td>
<td></td>
<td>VIllef</td>
<td>10</td>
</tr>
</tbody>
</table>

Source: IFREMER.

Between 2000 and 2010, the 0 m to 10 m segment has reduced from 100 vessels in 2000 to 70 vessels in 2010, while the 10 m to 12 m has received new units. Overall the power and the tonnage of the 0 m to 12 m segment have increased in the area. According to fishermen representatives, the small-scale fleet remains attractive to newcomers as fishing vessels are simple to operate and do not require large amounts of capital. In general, fishing vessels leaving the area are replaced by vessels from other areas purchased on the second-hand market. In 2011 for example, 13 small scale vessels registered in Paimpol, largely offsetting the departure of four small-scale vessels during the same year. Very few vessels from the Paimpol area (estimated ≈ three) have been decommissioned with public aid under EFF or FIFG since 2004.

One explanation given for the stability of the small-scale fleet is that the professional fishing business in the area remains attractive to young fishermen. The Paimpol area benefits from the presence in Paimpol city of a dedicated maritime school (Lycée Pierre Loti) which provides initial and vocational training for maritime professional activities. According to the school management, an average of 60 students out of the total number of 160 per year (37 %) would select a carrier in the fishing industry.

Another major development was the arrival of several offshore trawlers (18-24 m and 24-20 m vessels) that moved from other French ports to register in the quarter maritime in 2009 and 2010. These vessels operate mainly from fishing ports outside the area (Roscoff, Erquy) and have little direct interactions with the Paimpol economy.

![Figure 17. Trends in number of vessels by fleet segment 2000–10](source: IFREMER)
2.4.1 Fleet segment 1: passive gears 00-12 m

This fleet segment comprises ≈ 70 small-scale vessels (0 m to 12 m) using a wide variety of passive gears: nets, pots and hooks, but also sometimes dredge for scallops. This type of vessel catches brown crab, spider crab and lobster all year, targeting each species depending on seasonality (Table 5). During the opening of the scallop season (October to April), these vessels may participate in the heavily regulated scallop fishery if they are granted a licence.

Table 5. Seasonality of fishing by species: passive gears 0-12 m

<table>
<thead>
<tr>
<th></th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spider crab</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>xx</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Brown crab</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>European</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lobster</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seabass</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scallops</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Consultants’ calculations, based on FranceAgriMer and IFREMER data.

These vessels operate on a family-based business model, with limited crew (two to three men). Skippers are usually the boat owners. Decisions on fishing zones and techniques are based on seasonality, weather and the opening periods of particular fisheries. These decisions are usually taken by skippers, sometimes after discussion with the crew. For those who have a scallop licence, the
calendar of authorised periods of the scallop fisheries dictates the location and gear used from October to April. The vessels always operate close to the coast as the fishing zones are in the coastal area, or in the nearby Bay of Saint Brieuc.

A significant number of skippers come from outside the area and are relatively old; two-thirds of the skippers are aged over 40.

**Table 6 Demographics by employee type: passive gears 00-12 m (n=13)**

<table>
<thead>
<tr>
<th>Employee type</th>
<th>Number of employees</th>
<th>Male</th>
<th>Female</th>
<th>0-18</th>
<th>19-40</th>
<th>41-65</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>Skipper</td>
<td>13</td>
<td>13</td>
<td>4</td>
<td>9</td>
<td>6</td>
<td>7</td>
<td>13</td>
<td>1</td>
<td>1</td>
<td></td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td>Crew</td>
<td>15</td>
<td>15</td>
<td></td>
<td>4</td>
<td>9</td>
<td>0</td>
<td>21</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>21</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>28</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>9</td>
<td>21</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>28</td>
</tr>
</tbody>
</table>

n: Number of questionnaires.
Source: Consultants’ calculations, based on questionnaires.

A third of the 15 crew members that responded are relatives (sons or fathers) of the skippers. One skipper was hopeful that his son would take over the business. Another skipper reported that his son had already taken over the business, but that he (the father) stays on board to improve his level of pension on retirement.

Spouses and partners are sometimes also involved in the business, although their legal status may not be well defined. The status ‘collaborating partner’ (‘conjoint collaborateur’) was recently introduced into French law. This gives a spouse or partner legal recognition as a worker in the family business even if he or she is not remunerated and it also permits them to claim for a pension and other social benefits.
Spouses and partners mainly participate in administrative and accounting tasks and in selling the catch in local markets.

**Table 7. Level of family involvement in business: passive gears 00-12 m (n=13)**

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Number in management roles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family employees</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Non-family employees</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>0</td>
</tr>
</tbody>
</table>

n: Number of questionnaires.  
Source: Consultants' calculations, based on the questionnaires.

In recent years the increase in fuel prices has been one of the main factors affecting the profit level for these vessels. However, their fuel dependency remained relatively low due to the use of passive gears. Market gutting for brown crab at the European level affected income in recent years by lowering the price. The high prices obtained from the species of fish targeted by these vessels did not fully compensate for this.

**Table 8. Economic structure of the business: passive gears 00-12 m**

<table>
<thead>
<tr>
<th></th>
<th>Passive gears 00-12 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income</td>
<td>100.00</td>
</tr>
<tr>
<td>Operating costs</td>
<td>25.41</td>
</tr>
<tr>
<td>Wages</td>
<td>43.86</td>
</tr>
<tr>
<td>Depreciations</td>
<td>7.36</td>
</tr>
<tr>
<td>Interests</td>
<td>1.39</td>
</tr>
<tr>
<td>Net profit (Cash flow-depr-int)</td>
<td>7.73</td>
</tr>
</tbody>
</table>

Source: Consultants' calculations, based on DFC data.

The prices that are set by the fishermen are sometimes derived from prices in the nearby auctions. The price of scallops has been stable for several years (close to EUR 2 per kg). Spider crab and edible crab are bought under auction, also at EUR 2 per kg – this price has barely fluctuated over the last eight years. On the other end of the spectrum, seabass and lobster show higher prices with more variability.

![Figure 21. Trends in landed price for main species 2003–10](image)

Source: FranceAgriMer.
As for most small-scale vessels in France, crew remuneration is based on a share system, which spreads the burden of fuel costs and other fishing costs between the boat owner and the crew. In the case of this segment, all respondents distribute remuneration according to the share system.

When a spouse or partner is declared as a ‘collaborating partner’ it does not affect the share system as he or she does not receive any remuneration from the family business.

**Table 9. Remuneration type by vessel: passive gears 00-12 m (n=13)**

<table>
<thead>
<tr>
<th>Remuneration type</th>
<th>Number of vessels</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>
<tr>
<td>Operating surplus/mixed income</td>
<td>0</td>
</tr>
</tbody>
</table>

n: Number of questionnaires.

Source: Consultants calculations based on the questionnaires.

Most skippers had completed secondary education. Some of them had achieved the Baccalaureat (the highest level of secondary education) and a few had entered higher education system. All of them had passed various maritime diplomas that are specific to the French system and do not fall into the traditional categories of primary/secondary/higher education. The diplomas cover topics such as ‘fishing skippers’, ‘fishing captains’ and ‘fishing mechanics’. French law requires new crew members to complete either vocational training or a specific secondary-school programme before joining the fisheries sector.

**Figure 22. Education level of actors within the artisanal fleet in Paimpol (n=13)**

n: Number of questionnaires.

Source: Consultants’ calculations, based on questionnaires.

**2.4.2 Fleet segment 2: dredge and trawl 0-18 m**

This fleet segment comprises in 2010 a total of 31 small-scale vessels, mostly under 13 m, which is the upper limit for the granting of a licence to target scallops in the Bay of Saint Brieuc. Although these vessels are in the dredge/trawl segment, they may also diversify their activities by sometimes deploying passive gears. This type of vessel targets a wide range of species (but mainly scallops, brown crab, spider crab and lobster) throughout the year. Each species is targeted according to seasonality (Table 10). During the opening of the scallop season (October to April), these vessels may participate in the heavily regulated scallop fishery if they are granted a licence.
Table 10. Seasonality of fishing by species: dredge and trawl 0-18 m

<table>
<thead>
<tr>
<th></th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scallops</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anglerfish</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rays</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Spider crab</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brown crab</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>European lobster</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Source: Consultants' calculations, based on FranceAgriMer and IFREMER data.

The fuel-price increase has been one of the major drivers for business cost-structure over the last five years. Overall, operating costs represent just over a third of their income (34 %), while crew remuneration is estimated around 38 %.

Table 11. Economic structure of the business: passive gears 00-12 m

<table>
<thead>
<tr>
<th></th>
<th>Passive gears 00-12 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income</td>
<td>100.00</td>
</tr>
<tr>
<td>Operating costs</td>
<td>34.48</td>
</tr>
<tr>
<td>Wages</td>
<td>38.28</td>
</tr>
<tr>
<td>Depreciations</td>
<td>8.90</td>
</tr>
<tr>
<td>Interests</td>
<td>2.08</td>
</tr>
<tr>
<td>Net profit (Cash flow-depr-int)</td>
<td>4.40</td>
</tr>
</tbody>
</table>

Source: Consultants' calculations, based on DFC database.

First-sale data for the area is quite poor, except for scallops. Fishermen have to land their scallops in designated ports to fulfil their licence requirements. Loguivy is the only designated port for the Paimpol area. As already noted, the auction is only open during the scallop season. The other designated landing points are the auctions of Saint Quay Portrieux and Erquy.

Other species caught by these vessels are either sold without auctioning to mareyeurs (fish traders/first buyers) and end consumers or landed in ports from nearby areas (auctions in Saint Quay Portrieux, Erquy or Roscoff), where they enter the bidding process.

![Figure 23 Trends in landings volume under the Loguivy auction](image)

Source: FranceAgriMer.
2.4.3 Fleet segment 3: passive gear 12-18 m

This fleet segment comprises a few (four in 2010) vessels targeting large shellfish (brown crab, spider crab and lobster). These vessels deploy pots and nets to target these species, depending on seasonality (Table 12).

<table>
<thead>
<tr>
<th></th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spider crab</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Brown crab</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>European lobster</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
</tbody>
</table>

Source: Consultants’ calculations, based on FranceAgriMer and IFREMER data.

The ≈ four vessels of this segment stay about 10 days at sea and keep crabs alive onboard in seawater tanks. The vessels land mostly in Roscoff harbour where the main crab buying entity has its facility (Viviers Beganton).
Table 13. Economic structure of the business: FPO 12-18 m

<table>
<thead>
<tr>
<th></th>
<th>Passive gears (FPO) 12-18 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income</td>
<td>100.00</td>
</tr>
<tr>
<td>Operating costs</td>
<td>29.92</td>
</tr>
<tr>
<td>Wages</td>
<td>45.36</td>
</tr>
<tr>
<td>Depreciations</td>
<td>10.33</td>
</tr>
<tr>
<td>Interests</td>
<td>1.78</td>
</tr>
<tr>
<td>Net profit (Cash flow-depr-int)</td>
<td>3.20</td>
</tr>
</tbody>
</table>

Source: Consultants' calculations, based on DFC database.

2.4.4 Fleet segment 4: 18-24 demersal trawl

This fleet segment is composed of 18 offshore trawlers that have registered fairly recently in the Paimpol quartier maritime (2009–10) for unknown administrative reasons. This fleet was registered in Saint Brieuc before. However, the links between the area and these vessels are weak as they are exploiting fishing grounds located in the Celtic Sea and in the English Channel and operating from various ports that have permanents auctions where they can sell their fish (Roscoff, Erquy, Saint-Quay-Portrieux).

There are no data available on the economics of this fleet. However, the construction of three brand new trawlers recently (2010, 2011 and 2012), an exception in France, indicate that the company owning these vessels has investment capacity in relation with profitability of fishing operations.

2.4.5 Socio-economic settings by port

Since some secondary ports of the area harbours only often less than a handful of vessels, two coherent territorial aggregations of ports have been created:

- Paimpol area grouping the two main ports (Loguivy and Porz Even) and small secondary ports (Pleubian, Paimpol). These groupings correspond to the eastern part of the area with a direct access to the Bay of Saint Brieuc fishing grounds. The ports include ≈ 60 fishing vessels, including 47 in Ploubazlanec (Porz Even and Loguivy).
- Perros area grouping mostly secondary ports in the Western part of the area (Perros Guirrec, Trebeureden, Locquémeau, Port Blanc). This group includes ports opening on the Baie of Lannion (Tregor area) fishing grounds. The fleet operating from these ports is approximately of 40 small scale fishing vessels.

The following sections present the main settings by port aggregate.
Demographics by employee type

Figure 26: Demographics by employee type. Paimpol (n=18); Perros (n=10)
Source: Consultants’ calculations, based on questionnaires.

In both areas, skippers are in majority in the 41-65 years old age class. No female crew has been reported by interviewees. Most skippers are originating from the area.

Level of family involvement

Formal employment in the fishing enterprises is shown below. For half of the fishermen interviewed, crew is formally recruited from the family circle. About 80% of respondents in both areas reported informal implication of spouses and other relatives in the business mostly for accounting or commercialisation of catches.

Table 14: Formal family involvement in fishing enterprises

<table>
<thead>
<tr>
<th></th>
<th>Paimpol</th>
<th>Perros Guirec</th>
</tr>
</thead>
<tbody>
<tr>
<td>family employees</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>non-family employees</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
<td>6</td>
</tr>
</tbody>
</table>

Source: Consultants’ calculations, based on questionnaires.
**Education level**

Figure 27: Education level of skippers Paimpol (n=9); Perros Guirec (n=4). Source: Consultants' calculations, based on questionnaires.

In both areas, most fishermen have a basic secondary education level. The few skippers that have a higher education level in Paimpol have started a second carrier after initial carrier in other maritime sectors (Navy).

**Length of time (years) spent in organisation by fleet segment and employee-type**

The following graphs show the distribution of time spent in the enterprise by skippers and crew.

Figure 28: Length of time (years) spent in organisation by fleet segment and employee-type. Paimpol (n=18); Perros Guirec (n=10). Source: Consultants' calculations, based on questionnaires.

Figures indicate that skippers from the Paimpol area have a relatively short history with their vessels (77% less than four years). This is explained by recent changes of vessels with skippers buying new units on the second-hand market. Most crew have a similar short experience with the same enterprise, with however some crew members declaring longer experience. In Perros Guirec, experience is balanced between skippers and crew having short and long experience.
Length of time (years) spent in sector by skippers

![Graph showing the distribution of time spent in the sector by skippers for Paimpol and Perros Guirec.]

Figure 29: Length of time (years) spent in the sector by the skippers. Paimpol (n=9); Perros Guirec (n=4).
Source: Consultants' calculations, based on questionnaires.

Most skippers from the Paimpol area have 10 years and more of experience in the sector. For Perros Guirec area, the majority of skippers interviewed have between 10 and 20 year experience in the sector.

2.5 Summary of settings

The following table summarises the settings by port aggregate. Most of the local fleets in the different ports have common features with an exploitation based on scallops and crustaceans with small-scale vessels of less than 12 m.

Table 15. Summary of settings by port

<table>
<thead>
<tr>
<th></th>
<th>Paimpol</th>
<th>Perros Guirec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of vessels</td>
<td>60</td>
<td>40</td>
</tr>
<tr>
<td>Target species status</td>
<td>Stable</td>
<td>Stable</td>
</tr>
<tr>
<td>Fleet evolution</td>
<td>Stable</td>
<td>Stable</td>
</tr>
<tr>
<td>Business type</td>
<td>Family</td>
<td>Family</td>
</tr>
<tr>
<td>Demographics</td>
<td>Aged 40-65</td>
<td>Aged 40-65</td>
</tr>
<tr>
<td>Average annual income (euros)</td>
<td>&lt;20,000</td>
<td>&lt;20,000</td>
</tr>
<tr>
<td>Main education level</td>
<td>Secondary</td>
<td>Secondary</td>
</tr>
<tr>
<td>Highlights</td>
<td>Fleet based on scallops and crustaceans exploitation</td>
<td>Fleet based on scallops and crustaceans exploitation</td>
</tr>
<tr>
<td></td>
<td>Strong connections with Bay of Saint Brieuc fisheries</td>
<td>Use mostly short commercialisation networks</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Connection with Bay of Saint Brieuc scallop fishery</td>
</tr>
</tbody>
</table>

Source: Prepared by consultants.
3. Linkages

3.1 Inter-sectoral linkages

3.1.1 Geographical

The fishing fleet based in Paimpol faces spatial competition from aggregate dredging, undersea cables, recreational fishing and offshore renewables.

**Aggregate dredging**

The Paimpol area hosts one of the largest companies exploiting marine aggregates in France. This company is exploiting several maerl (or marl) beds in the area and in nearby waters. Following the introduction of the EC Habitats Directive (1992), maerl beds are now protected, which means that the various administrative authorisations granted for exploiting these beds will not be renewed. Several hydraulic dunes (undersea sand dunes resulting from the combination of tide and streams) are now targeted by this company in the area waters and in nearby quartiers maritimes. Some fishermen are opposed to the development of this activity as it may impact some sandeel populations (*Ammodytidae*) that are targeted as bait for handlining seabass and Pollack and thought to be a major component of the trophic food web supporting the abundance of target species.

**Undersea cables**

Several telecom cables have been laid on the seabed in the area and nearby waters. On the west side of the area, Lannion is the end point of two major cables. Situated just after the east border of the quartier maritime, Plérin is the French end point for the FLAG Atlantic 1 cable (Fiber-Optic Link Around the Globe).

Fishing zones may be closed during the immersion of these cables, but only for a short period as the cables are heavily protected. The cables are usually buried in the seabed to avoid snagging with fishing gear. Depending on local arrangements, their installation may also provide temporary contractual work for fishing vessels as guard ships.

**Recreational fishing**

Almost half the skippers mentioned existing conflicts with recreational fishermen who shoot pots on the same fishing grounds as commercial fishermen, producing technical interactions and congestion. The recreational fishermen are retired commercial fishermen, local residents and tourists. It is often claimed that they do not comply with rules limiting the number of pots they can shoot.

**Offshore renewables**

The offshore renewable sector is interested in the north coast of Bretagne for its steady wind conditions and for locations in which tidal streams generate enough energy to be harnessed profitably.

One of the first experimental undersea tidal generators has been installed in the in an area that has been closed for fishing since 1966 (except for handlining), avoiding conflicts with fishermen regarding the boundaries of the tidal farm zone. The zone (*Bréhat*) concerned is a small area where fishing
possibilities are limited due to tidal currents strength (≈ 6 knots). The project is now developing with the development of tidal energy on a commercial basis foreseen to start in 2013. The deployment of these tidal turbines will generate some economic effects for the municipality of Ploubaznalec with construction of connecting facilities between the tidal turbines and the National electricity network and rental of land. The National French electricity company (EDF) owner of this tidal turbine also committed to support financially the local fishermen association. EDF already agreed to support the construction of refrigerated seatanks in Paimpol habour, and also supports the study of the dynamics of the local lobster stocks though funding of tagging operations.

In the nearby waters of the Bay of Saint Brieuc, one of the first French offshore windfarms is planned for construction between 2017 and 2018, with potential impact on fleets targeting scallop and demersal species. Although most of the vessels from the Paimpol zone do not fish permanently in the development area, displacement of vessels might have a knock-on effect, creating congestion in other parts of the Bay. The development of the fishery observatory by the Côtes d’Armor fishing committee (SIPECHE project) will be used to monitor fleet displacements and assess the possible effects on resources.

3.1.2 Labour

There are currently no competing activities in the marine environment that could attract the workforce away from the fishing industry. However, the development of an important offshore wind farm in the Bay of Saint Brieuc has led to fears that it could attract some of the best crew members – notably, those who are trained in marine mechanics. Some fishermen see this new marine development as an opportunity for diversifying their activities and some envisage the creation of servicing businesses that would bid for contracts with the wind-farm operator.

3.1.3 Institutions

Until recently, all fishermen from a quartier maritime were represented in a local committee (Comite Local des Pêches Maritimes et des Elevages Marins or CLPMEM). Local committees were associated via a regional committee (Comite Régional des Pêches Maritimes et des Elevages Marins or CRPMEM), with a national committee, based in Paris, at the head (Comite National des Pêches Maritimes et des Elevages Marins or CNPMEM). Recent changes in French regulations have led to a regrouping of the local committees into departmental committees (Comite National des Pêches Maritimes et des Elevages Marins or CDPMEM2), in order to rationalise teams and daily operations. The departmental committee is the first representative organisation of fishermen with the French administration and other economic activities. The departmental committee that represents fishermen from Paimpol quartier maritime is based in Saint-Quay-Portrieux (about 30 km from Paimpol); the regional committee is based in Rennes (about 140 km from Paimpol). The new departmental committee retained the offices of the former local committee to maintain a close link with fishermen that are not based in Saint-Quay-Portrieux.

The departmental committee is currently involved in key discussions with other marine-users to highlight the importance of the fisheries sector, especially with the development of new areas opened for aggregate dredging and offshore renewables.

2 In some regions, no departmental committees were created. Local committees were absorbed by regional committees.
The fish auction in Loguivy is managed by the departmental Chamber of Commerce (CCI), as are all the auctions in the department. The fishing ports and harbours are mostly managed by the CCI. Producer Organisations (POs) are also important for the local fishing community as they help to organise the scallop market. There are two main POs with members in the area: Cobernord, based in the nearby port of Saint-Quay-Portrieux and Pêcheurs d’Atlantique, based in Quimper.

There is no FLAG in the area. Various reasons have been given, not always convincing. The most frequent comment is that the creation of a FLAG would have incurred lots of discussions with stakeholders not used to cooperate, for little perceived benefits. The reportedly high financial support offered by receipts from the energy companies was also a reason cited for not engaging into the creation of a FLAG.

3.1.4 Economic

Although the fishery sector is a small economic player compared to other sectors (such as tourism and telecommunications), it nevertheless plays an important role in local tourism in the municipalities of Paimpol, Ploubazlanec and Locquémeau. The fishing industry adds to the attractiveness of the area (things to see, things to eat). So far, no professional fishing vessels of the area engaged in some form of Pesca tourism.

Vessels from the passive gear segment generate around a third of their turnover through short-supply chains, either by selling their catch directly to end consumers, mainly in local markets (around 23 % of the turnover on average), to local restaurants (5 % of the turnover on average) and local fishmongers (5 % of the turnover on average).

The development of the offshore wind farm in the Bay of Saint Brieuc will give an economic boost to the local fishing industries of Paimpol and Saint Brieuc. A memorandum of understanding has been signed between the Departmental Fisheries committee and the developer company, whereby the developer will contribute to the funding of several projects supported by the fishing industry. In Paimpol, the developer supports onshore facilities (known as ‘viviers’) to improve the marketing of shellfish (especially lobsters). When the windfarms are in operation, regular funding will be obtained from a tax paid by windfarms operators on each megawatt produced. According to a Decree adopted in early 2012, the tax will benefit:

- 50 % for coastal municipalities from which the wind farms can be seen
- 35 % for development of fisheries development projects in accordance with rules of eligibility set out by EFF regulation (art. 37, 38, 40 and 41)
- 15 % for funding of project supporting sustainable development of other maritime activities.

The total receipts from this tax should be in the region of EUR 7 million / year over the life span of the wind farm (= 20 years). The Departemental fishery committee, which include both Paimpol and Saint Brieuc, areas has a right of initiative to propose fisheries development projects to be supported by the tax receipts.

3 Décret n° 2012-103 du 27 janvier 2012 relatif à l'utilisation des ressources issues de la taxe instituée par l'article 1519 B du code général des impôts NOR: AGRM1125430D
3.2 Intra-sectoral linkages

3.2.1 Between fleet segments

Geographical

The fleet based in Paimpol area is a small-scale fleet that work primarily in the area. However, some vessels seasonally migrate to ports of in the Bay of Saint Brieuc to exploit the local scallop stocks. The economy of Paimpol fishing fleet is also integrated with the economy of Saint Brieuc fleet as the auctions are operated by a same entity (Chamber of Commerce). For fishery products that are not scallops, the main auction for local products is the auction of Saint Quay Portrieux (West of the Bay of Saint Brieuc).

Local regulations lower the risk of interactions for small-scale vessels as all passive gears are regulated through a local system of licences defined by the Regional Committee for Fisheries and Aquaculture (RCFA). These licences specify the zone in which a fishing vessel can operate – usually the waters of the vessel’s quartier maritime and the adjacent quartier, if the fishermen specifically request it. In the quartier maritime waters, a limited number of vessels from other quartiers maritimes can be granted a licence for almost every type of gear (pots, nets, hook or dredge). There are also rules to limit the access of trawlers targeting non-quota species.

None of the skippers mentioned competition with other fishermen for fishing grounds as an issue in the sector.

Labour

Very little labour mobility between segments has been observed.

Institutions

As already noted, all fishermen are members of the CDPMEM. One of the objectives of this organisation is to prevent tensions between fleet segments by providing a forum for fishermen to prevent potential conflicts on fishing grounds. This committee, in conjunction with the regional committee, has the authority to suggest management measures that are then validated and enforced by the maritime administration. In Bretagne there is a comprehensive system of licences regulating the access to non-quota species fisheries in the 12 nm zone.

In Paimpol, most of the species targeted by local vessels are non-species quota that are covered by licences, technical measures and closed areas defined by these committees. There are limits on the seasonal opening of fisheries, maximum size and/or number of gears and other types of measures. Scallop fisheries are also heavily regulated, as already mentioned.

Some vessel owners are member of POs, even if they target non-quota species. With the recent fusion of several large POs in Bretagne, there are only two POs that have members in the quartier maritime: Cobrenord, based in Saint-Quay-Portrieux and Pêcheur d’Atlantique, based in Quimper but with a seasonal office in Saint-Quay-Portrieux. French POs are implementing withdrawal prices even for species that are not covered by the EC regulation\(^4\). The withdrawal price system implemented in the

scallop fishery and the recurrent market gutting make it almost mandatory for fishermen to join POs if they apply for a scallop licence.

Several support mechanisms have been created to maintain cohesion in the fishing community. As in the rest of the French fishing fleet, fishermen are registered with the social security for seafarers (ENIM), which provides a full range of services such as social security, pensions and dependency allowances.

There are also specific insurance funds that have been implemented by fishermen. The insurance fund for bad weather and damages (‘caisse de garantie contre les intempéries et avaries de la pêche maritime’) covers wages for a certain number of lost days every year, depending on the level of premium paid by each individual fisherman. Fishermen from the area may be covered by the insurance fund from the Côtes d’Armor department.

Economic

The vessels from Paimpol area target mainly non-quota species. They are managed through a licensing system that does not allow a licence market to emerge. Once a skipper retires, the licence(s) he was holding is (are) allocated by the regional committee to a new vessel, based on a waiting list. If a skipper modifies his business structure radically by changing the gear type of his vessel (from trawl to pot, net to line), he needs to apply for a new licence as if he was a new entrant in the fishery and his former licences will be reallocated to a vessel on the waiting list.

There are market issues for specific species, such as seabass that can be caught by a nomadic fleet of pair pelagic trawlers during the first semester of the year. These trawlers, originating from the Atlantic coast (mainly from La Turballe), regularly land several tonnes at once in nearby auctions (Roscoff), depressing the price for all seabass by flooding the market. The small vessels based in Paimpol target seabass with hook-like gears. Although this metier provides what is regarded as the highest quality of seabass, massive landings of trawl-caught seabass in nearby markets affect the price they receive.

3.2.2 Between subsectors

Geographical

There are no spatial interactions between various subsectors in the area. The other usages of marine environment cover shellfish aquaculture (oyster) and algae extraction which take place mainly in the intertidal area, which is not used by fishermen. Few native oyster concessions have been granted, representing only 38 hectares.

Labour

Very little mobility between subsectors has been observed.

Institutions

Mareyeurs (first buyers/fish traders) have reserved seats on the boards of the departmental and regional committees, however, they are not well organised.

As already noted, the largest (and almost only) scallop processor is part of a joint venture with fishermen organisations, which creates a scallop market driven by demand, in which fishermen are price-takers.
The marine cooperative is a large organisation that is present in most French ports. It offers several services to the fishing sector (catching and aquaculture), such as bulk purchase, specific insurance and accounting services. Fishermen do not have to be members of this organisation to benefit from its services. Marine cooperative shops are open to all customers (local residents and tourists, for example) as a means of diversifying and increasing their market.

Economic

Local catches are mainly destined to the fresh market, with almost no processing involved. Crab and lobster are kept alive throughout the supply chain until the end consumer. There is one large buying company (Viviers Béganton) based in Roscoff and other smaller specialised companies based in Paimpol that buy crustaceans from the ports of all the regions. Regarding market competition, local fishermen are affected by overproduction of brown crab at the European level, which lowers the price they can obtain from first buyers. This triggered the innovative approach of building in Paimpol a refrigerated seatank to sell crustaceans according to market situation. Most crustaceans, including European lobsters are caught between May and September by the local fleet. Placing the crustaceans on the market when supply is lower will help to obtain better prices. The seawater tank is currently under construction. Previously in the 90’s, the operators from Paimpol created the association “Les Homardiers des Côtes de France” to promote local lobsters compared to lobsters imported from Canada or other countries. Lobsters labelled under this scheme must comply with some criteria (live animal, not injured). However, this labelling scheme has been progressively being abandoned as it does not generate interest beyond the Paimpol area for reasons that may be in relation with the membership fee and the fee per lobster labelled.

There is high competition for market access in the various scallop fisheries. With the implementation of local rules restricting access to the fishery to a few hours every week, the fresh market can easily saturate, especially at the beginning of the season (October) and after the Christmas season. This season coincides with the fishing season on other major French scallop stock in the Baie de Seine (Normandy). The various POs from Bretagne have created a joint venture with an important processing group, called Fipêche. This group controls a processing factory in Saint-Quay-Portrieux (about 30 km from Paimpol, 50 employees) and is able to absorb the production when the fresh market is saturated. Scallops are extracted from the shell and frozen. The price paid by this processor is decided at the beginning of the campaign in October and remains stable throughout the fishing season. This is the major driver explaining the limited price evolution for scallops. To enter this supply chain, fishermen have to join one of the PO partners of the joint venture. The absence of other businesses able to absorb this scallop production is also leading the departmental committee to establish daily quotas preventing production levels that could not be absorbed by the processing plant.

Shellfish aquaculture mainly produces Japanese oysters, but also native oysters and mussels. None of these species can be landed by fishing vessels, thus potential competition for market access is avoided. Oysters and mussels are grown in the intertidal area. As shown in the following map, there are two main production centres, one on the North Coast (Treguier) mainly in estuaries, and a second one on the East Coast on mud and sand banks. In total, the bivalve aquaculture sector supports ≈ 440 jobs in total (ETP not available) in the area.
There is one finfish aquaculture company that produces an estimated 200 tonnes of turbot every year, which are sold on the French market (targeting supermarkets and restaurants) and exported (Europe, USA and Asia). Aquaculture turbot and fresh-caught turbot are the two ends of the turbot market.

### Table 16. Value from aquaculture

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finfish value</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Shellfish value</td>
<td>11</td>
<td>4,5</td>
</tr>
<tr>
<td>Total value (m EUR)</td>
<td>13</td>
<td>6,5</td>
</tr>
</tbody>
</table>

Source: Estimate from consultants.

As elsewhere in France, the bivalve aquaculture sector is hit by abnormal mortalities with a 30 % decrease of production over the last couple of years. The main orientation in response to the crisis is a restructuration of the sector with merging or associations between small companies to generate economies of scale.

### 3.3 Summary of linkages

Several linkages can be observed in the area:

- between various sectors over the use of the marine space. The Paimpol area is currently one of the few locations in France where some maritime space has been allocated to renewable energy production (tidal turbines). The history of this development shows that it can benefit to the fishermen community through substantial additional funding. The current development of wind farms in the Bay of Saint Brieuc is conducted on the same model, and should benefit also to the fishermen community of Paimpol now merged - institutionally speaking - with the community of the neighbouring area of Saint Brieuc.
- between fleet segments from the area and from nearby quartiers, as they share some fishing grounds (especially the scallop fishery in the Bay of Saint Brieuc) but also some market facilities (no permanent auctions in Paimpol area) and some representative organisations (departmental committees);
between the fishing fleet and some scallop processors that hold significant market power as they are able to drive prices and even production levels.

In addition, the fishery sector contributes to the touristic attractiveness of cities like Paimpol or small villages nearby (Locquémeau, Ploubaznalec). As an example, the decision has been recently taken to invest in the refurbishing of the Loguivy auction to keep a concentration of fishing vessels in the area. The other option was to close it and sell the products through the auction of Saint Quay Portrieux but this would have possibly triggered a change of port by the local fishing fleet, detrimental for the touristic attractiveness of the area.
4. Role of fishing

4.1 Fisheries as an economic activity

4.1.1 Diversification

The fishing industry in Paimpol represents less than 2% of the total employment of the area. Overall, the relative size of the sector has been stable over the last decade. It consists of extractive fishing, accounting for 0.8% of the employment in 2009, and of aquaculture.

Most spouses and partners are associated with the fishing business, although they are not paid. Two thirds of respondents indicated that their spouse or partner was registered as ‘collaborating partner’, a status that recognises their involvement as a worker for the family business even if they do not receive any remuneration. In this area, spouses that participate in the business usually sell the fish in the local market in order to maximise the value of the catch.

In terms of diversification, some families rely on external income to complement household income. Some vessel-owners already generate alternative income, either by using their vessels in non-fishing activities (servicing, transport, guard duty) or by having another activity onshore. What emerge from the discussions is that fishermen in the area do not envisage parallel carriers in other sectors. One of the main local ambition is to have better knowledge of the resource and improved capacities to interact with the markets in order to get the most out of the limited resources accessible (quantities, prices). The fishermen professional organisation is currently conducting several projects in this respect.

Most of the skippers have been working in the fishing industry for more than 20 years and usually started as a crew member. Half the skippers had other jobs before joining the industry, some in the naval sector (merchant navy), others in the military sector (navy or army), but some in completely different sectors (such as teaching). The main reason is the development of the local scallop fishery which needed deckhands in the 90’s. The deckhands progressively became skippers. Since scallop dredging is a rather simple technique that does not require specific talents, the newcomers could rapidly make a living out of this activity. On average, crew members had joined the business in the last five years, which can be explained either by some fluidity in crew composition or by the fact that some crew members tend to become skippers of their own fishing vessel.
More than half the skippers indicated that they had relatives in the fishing sector prior to joining the industry. All of them indicated that their reason for joining the industry was due to their affinity with the fishing sector and/or the marine environment. Very few respondents indicated that they had entered the industry for the remuneration.

Overall, the local economy does not rely on the fishery sector to provide important economic benefits. As already noted, services and public sectors are dominant in the area, and provide the most employment for local residents.

For the passive gear segment, joining the fishing industry is a livelihood choice rather than a default choice as several opportunities can be found on shore. However, the development of marine activities, notably in offshore renewables, in the nearby sector may attract some fishermen who would either move to the sector or diversify their activity by becoming part-time fishermen.

4.2 Future development of the community

The fishing fleet operating from the ports of Paimpol area (mostly Porz Even / Loguivy, Paimpol port, Perros Guirec or Locquémeau) have succeeded to remain fairly constant over the past few years. According to stakeholders, this is the result of successful management of stable inshore resources (scallops, crustaceans) from both the area and the adjacent area of Bay of Saint Brieuc where Paimpol vessels have fishing possibilities on scallops.
The main orientations for the future are to further support research on the main stocks exploited by the local fleet for better understanding and management of the resource, and to improve fishermen capacities to influence the market.

The development of offshore renewable energy in the area is expected to support the development of the local fishing industry through availability of funding. Taking advantage of their position of main user of the areas, the local representation of fishermen negotiated memoranda of understanding with the developing companies (EDF for the tidal turbine near Paimpol, Ailes Marines consortium for the wind farm in Bay of Saint Brieuc). Under these memoranda, additional funding (in the region of EUR 2.5 million / year according to the tax repartition scheme) will be available to support fishermen initiative. Some projects have already started (sea tank in Paimpol, lobster tagging, fishery observatory, scallop stock enhancement) and other will develop.

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
</table>
| - Variety of species targeted (passive gears)  
- Major stocks are sustainably targeted  
- Trained crews  
- Positive image of the heritage and the culture  
- Short supply chains  
- Resilience | - High reliance on a few stocks (dredgers)  
- Ageing vessels  
- Ageing crew  
- Fuel dependency  
- Market bottleneck (scallops) | - Newcomers are well trained  
- Presence of a maritime school in Paimpol  
- Profitable sector that could attract investment  
- Improvement of fish traceability  
- Development of offshore industries with availability of funding | - Increase in energy prices  
- Access to finance  
- Market competition from aquaculture and from other fleet segments (seabass)  
- Market competition from other European countries (brown crab, scallops)  
- New marine users interested by the location (wind, tide...) |

Source: Consultants' calculations, based on questionnaires.

Regarding analysis of strengths, weaknesses, opportunities, threats (SWOT), the Paimpol fishing sector shows a high level of resilience. Although the economic downturn has hit major markets, driving the price for species landed in Paimpol, vessels continue to be profitable. The range of species caught by the fleet is mainly for the high-end market of fresh crustaceans, line-caught fish (seabass) and fresh scallops. Average prices for these species remained fairly stable over the last few years and have helped to maintain turnover levels. Overall, the crew working in the area are well trained.
Fishing is a small economic sub-sector of Paimpol area as a whole, but an important one for the identity of area. The sub-sector has slightly declined over the last decade in its more historical segments (passive gears, small dredgers) and has recently attracted some offshore trawlers (although their link to the area seems weak). Its image has been associated with the shellfish industry for several years, either for the large crustaceans or the scallops it produces.

The adaptability and resilience of the fishing industry is reflected in the scallop fishery in the Bay of Saint Brieuc, which is considered a success story. Its complex and strict management system has enabled more than 230 vessels to benefit from one of the richest scallop grounds in France, without forcing too many fishermen out of the fishery. Although this fishery may seem overcapitalised, it is regarded as a key factor for the stability of the fishing communities in the area, providing income to a wide range of small-scale vessels that would struggle to find alternative employment. However, the market gutting situation does not allow fishermen to benefit fully from this resource, which is not caught for the market.

The second pillar of the local industry (crustaceans) is also the focus of actions promoted by fishermen representation. Initiatives are being developed to obtain better knowledge of the local resource, and to develop an innovating marketing strategy with objective to smooth out production peaks through live storage in dedicated refrigerated seawater tanks.

The development of local offshore renewable energy in the area is a threat in terms of potential deprivation of fishing grounds. This has led to fierce negotiations on the final location of the wind farm, partly at the advantage of fishermen as the wind farm will be built further offshore than initially envisaged, on less productive fishing grounds. However, the growth of the renewable energy sector in the area is also seen as an opportunity as reportedly fairly large amounts of funding are available to the local fishermen representation to develop collective projects seeking to have better knowledge of the resource dynamics and improve marketing conditions of local fishery products.

The main points are as follows:

- The business is family-based. Spouses and partners sometimes participate in onshore tasks such as accounting and direct sales of the catch in local markets.

- Most skippers have achieved secondary education and all of them have passed the marine training certificates that are required by French law to command fishing vessels.

- The local fleet could remain stable over the past few years in relation with a relatively positive image of the activity in the area and availability of a maritime school in Paimpol.

- There are few spatial interactions with other marine users, although this is changing quite rapidly with new sectors, such as energy renewables, entering the zone.

- Overall, the fishermen are price-takers. There are, however, some attempts to improve price influence by better controlling supply of the market for crustaceans that may prove successful.

- The scallop supply chain is characterised by a bottleneck resulting in a quasi-monopsony, with a large processor driving the whole market. Efforts to diversify the market for local scallops
have not proved successful so far. Scallop prices paid to producers is an issue for all the fleets of Côtes d’Armor with Paimpol producers having little influence.

- Fuel-price increases and fish-price stagnation are major drivers for the declining profitability of the sector.

- The local fishing community should benefit from large amounts of private funding to develop collective actions in a near future. Funding is available from the energy companies implementing the offshore renewable projects (tidal turbine in Paimpol, wind farms in Bay of Saint Brieuc). This has already permitted to support local initiatives in the field of resource management and commercialisation.
### 6. Annex: retail and first-sale prices

**Table 18. Mean retail prices in France of the main species caught by the Paimpol fishing fleet 2005–10**

<table>
<thead>
<tr>
<th>Retail prices</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spider crab</td>
<td>5.60</td>
<td>5.50</td>
<td>5.30</td>
<td>5.60</td>
<td>5.70</td>
<td>5.90</td>
</tr>
<tr>
<td>Brown crab</td>
<td>7.30</td>
<td>8.30</td>
<td>7.90</td>
<td>8.10</td>
<td>7.60</td>
<td>8.10</td>
</tr>
<tr>
<td>European lobster</td>
<td>23.50</td>
<td>26.00</td>
<td>23.80</td>
<td>25.20</td>
<td>23.30</td>
<td>21.90</td>
</tr>
<tr>
<td>Seabass</td>
<td>13.30</td>
<td>13.40</td>
<td>13.60</td>
<td>13.70</td>
<td>12.60</td>
<td>13.30</td>
</tr>
<tr>
<td>Scallops</td>
<td>5.10</td>
<td>5.40</td>
<td>5.70</td>
<td>5.70</td>
<td>5.60</td>
<td>6.30</td>
</tr>
</tbody>
</table>

Source: FranceAgriMer.

**Table 19. First-sale prices of the main species caught by the Paimpol fishing fleet 2005–10**

<table>
<thead>
<tr>
<th>Retail prices</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spider crab</td>
<td>1.64</td>
<td>2.06</td>
<td>1.82</td>
<td>1.80</td>
<td>1.91</td>
<td>1.88</td>
</tr>
<tr>
<td>Brown crab</td>
<td>2.24</td>
<td>2.36</td>
<td>2.30</td>
<td>2.15</td>
<td>2.00</td>
<td>2.02</td>
</tr>
<tr>
<td>European lobster</td>
<td>17.11</td>
<td>17.42</td>
<td>18.96</td>
<td>16.97</td>
<td>14.73</td>
<td>16.49</td>
</tr>
<tr>
<td>Seabass</td>
<td>10.68</td>
<td>9.97</td>
<td>12.67</td>
<td>11.84</td>
<td>12.53</td>
<td>11.04</td>
</tr>
<tr>
<td>Scallops</td>
<td>1.90</td>
<td>1.92</td>
<td>1.86</td>
<td>1.89</td>
<td>1.97</td>
<td>2.00</td>
</tr>
</tbody>
</table>

Source: FranceAgriMer.

**Table 20. Retail prices: first-sale prices ratio**

<table>
<thead>
<tr>
<th>Retail prices</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spider crab</td>
<td>3.41</td>
<td>2.67</td>
<td>2.91</td>
<td>3.11</td>
<td>2.98</td>
<td>3.14</td>
</tr>
<tr>
<td>Brown crab</td>
<td>3.26</td>
<td>3.52</td>
<td>3.43</td>
<td>3.77</td>
<td>3.80</td>
<td>4.01</td>
</tr>
<tr>
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<td>1.37</td>
<td>1.49</td>
<td>1.26</td>
<td>1.48</td>
<td>1.58</td>
<td>1.33</td>
</tr>
<tr>
<td>Seabass</td>
<td>1.25</td>
<td>1.34</td>
<td>1.07</td>
<td>1.16</td>
<td>1.01</td>
<td>1.20</td>
</tr>
<tr>
<td>Scallops</td>
<td>2.69</td>
<td>2.81</td>
<td>3.06</td>
<td>3.02</td>
<td>2.85</td>
<td>3.15</td>
</tr>
</tbody>
</table>

Source: Consultants’ calculations, based on Table 18 and Table 19.