

# Annual Aquaculture Report

Findings of the National Seafood Survey 2023



Rialtas na hÉireann  
Government of Ireland



Có-mhainithe ag an  
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# 1. Executive Summary

The Irish aquaculture sector exhibited encouraging results in 2022, marked by notable gains in sales volume, generated value, and sustained employment opportunities. Nevertheless, these achievements were not uniform across all segments. The shellfish sector demonstrated robust output volume and maintained a healthy average unit sales value. In contrast, the finfish sector encountered challenges, witnessing a decline in output volume, despite an upswing in average unit sales values.

Employment increased in both the finfish and shellfish sectors despite a reduced number of Production Units (PUs) due to consolidation within the shellfish segments. In 2022, the sector contributed €208 million to the economy, supporting 2,008 jobs, with a full-time equivalent (FTE) of 1,177 across the 292 PUs. The average individual salary for the year was €34,372 per worker.

A total of 44,623 tonnes of products were sold directly at the farmgate, generating sales of €186 million. This represents a 4% increase in both volume and value compared to the previous year when 42,822 tonnes were produced, resulting in sales valued at €179 million. This production involved 554,000 culture structures such as suspended head ropes, trestles, pens, tanks, and ponds, covering over 12,250 hectares of licensed ground throughout the country.

The culture of Atlantic salmon continued to be the largest contributor to national sales value, amounting to €104 million in 2022. This diverse segment has significant economic impacts locally and nationally, with multiplier effects evident in turnover, employment, and gross value added. Along the west coast regions, five businesses operated 16 PUs.

The mussel and oyster producing segments led the sector in terms of employment, with 1,693 people working across 260 PUs. These segments generated €76 million in 2022, with shellfish operations dispersed across all maritime regions of the country.

The remaining PUs are land-based operations involved in the production of rainbow trout, salmon smolt, perch, and lumpfish, collectively generating €8.9 million in 2022.

## Industry challenges

A survey conducted on the sector's technical challenges highlighted the struggle of shellfish segments in sourcing or retaining suitably trained staff. Consequently, these businesses are exploring technologies that have the potential to reduce or eliminate labour-intensive tasks in production.

Water quality is a growing concern for all aquaculture businesses, and infrastructure upgrades to enhance product access and movement are pressing issues for many PUs. Additionally, businesses requiring the importation of non-native juvenile stock are increasingly concerned about seed survival.





# National Aquaculture: Scale of operation in 2022

## INCOME

TOTAL €208.3 MILLION



Turnover

**€186  
million**

Subsidies

**€3.7  
million**

Other income

**€22.3  
million**

## EXPENDITURE

TOTAL €195.4 MILLION



Wages and salaries  
**€39.7 million**

Imputed value of  
unpaid labour  
**€2.5 million**

Energy Costs  
**€8.8 million**

Raw  
Material  
Costs



Livestock costs  
**€32.5 million**



Feed costs  
**€35.8 million**

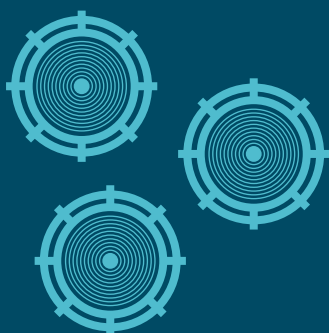
Repair & maintenance  
**€13.4 million**

Other operational costs  
**€46.1 million**

Depreciation of capital  
**€12.3 million**

Financial costs, net  
**€4.3 million**

## ASSETS



Total value  
of assets

**€254  
million**

Net  
Investments

**€5  
million**

Debt

**€87.3  
million**



## INPUT AND OUTPUT

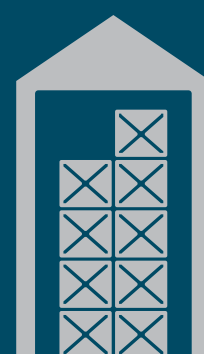


## ENTERPRISES SUMMARY

Number of enterprises  
**292** Production Units

Licenced hectares  
**12,250** hectares

Number of structures used  
**554,000**



## EMPLOYMENT

**1,769**  
Male employees

**239**  
Female employees

**1,155**  
FTE employees



**2,008**  
People employed



## ECONOMIC INDICATORS

 Gross Value Added (GVA)  
**€68**  
million

Net Profit  
**€8.3**  
million

EBIT  
**€32.4**  
million

# 1.1 National Aquaculture Output in 2022

In 2022, the national aquaculture sector demonstrated continued growth in overall output volume and sales value.

A total of 44,723 tonnes of aquaculture products were produced, amounting to a sales value of €186 million. This represents a 4% increase in both volume and value compared to the previous year, where 42,822 tonnes were produced with a sales value of €179 million (Table 1).

The notable positive trend observed at the national level was primarily driven by the shellfish segments. These segments experienced a significant increase of 10% in output volume and a noteworthy 13% increase in sales value. The farmed oyster and rope mussel segments played a pivotal role in driving this trend, with the unit sales value per tonne of fresh product continuing to rise.

Conversely, the finfish segments faced a decline of 7% in output volume and a 1% decrease in generated sales value. However, the decrease in output volume was partially offset by increases in unit sales value across the finfish segments, providing some mitigation.

The emerging seaweed segment, on the other hand, contributed a total of 493 tonnes of various species, collectively valued at just under €400,000 in 2022.

Regarding exports, the sector shipped a total of 30,122 tonnes of products in 2022 reflecting a 3.5% decrease in volume compared to 2021. Notably, the export volume of finfish experienced a significant decline of 32% compared to the previous year.

Table 1 Aquaculture output trend by category, 2021 to 2022

Aquaculture Category	2021	2022	% change 2021 to 2022
Finfish			
Sales volume (tonnes)	13,904	12,925	-7%
Sales value (millions €)	€111.30	€110	-1%
Shellfish/Other			
Sales volume (tonnes)	28,909	31,796	10%
Sales value (millions €)	€67.57	€76.10	13%
National output (tonnes)	42,822	44,723	4%
National sales value (millions €)	€178.88	€186	4%

## 1.2 Employment and Production Units

### Employment

In 2022, employment in the national aquaculture sector experienced a 3% increase, reaching a total of 2,008 individuals (including those employed in State-run farms), compared to 1,950 in 2021 (Table 2). The growth in FTE employment increased by 4%, totalling 1,177 (including those employed in State-run farms) compared to 1,127 in the previous year. This indicates a slight shift towards a higher proportion of full-time employment.

Both the finfish and shellfish segments experienced employment growth, with increases of 7% and 2% respectively. However, the increase in finfish employment was primarily in part-time positions as the FTE employment declined by 3%.

The rise in employment, coupled with an increase in output from salmon hatcheries, provides a promising indication of potential output growth in 2023 for the dominant salmon sea-pen farming segment. Employment in the shellfish segments increased by 2%, with a more pronounced increase in FTE positions representing a 7% increase.

**Table 2** Aquaculture employment and production unit trends by segment, 2021 to 2022

Aquaculture Category	2021	2022	% change 2021 to 2022
<b>Finfish</b>			
Number employed	292	313	7%
Number of FTE	268	261	-3%
Number of Production Units	36	34	-6%
<b>Shellfish/Other</b>			
Number employed	1,658	1,695	2%
Number of FTE	859	916	7%
Number of Production Units	279	258	-8%
<b>National Totals</b>			
Number employed	1,950	2,008	3%
Number of FTE	1,127	1,177	4%
Number of Production Units	315	292	-7%

**Table 3** Aquaculture employment demographics, 2021 and 2022

	% of Workforce 2021	% of Workforce 2022	% Trend
<b>Nationality</b>			
Irish	88.9%	88.5%	-0.5%
EU	9.2%	9.0%	-2.4%
EEA	0.0%	0.0%	0.0%
Other	1.9%	2.6%	34.7%
<b>Age Profile</b>			
16-24	27.5%	28.3%	2.9%
25-34	20.3%	16.2%	-20.3%
35-44	20.0%	21.8%	9.0%
45-54	14.9%	16.8%	13.0%
55-64	11.4%	11.5%	1.1%
65 or over	5.9%	5.4%	-9.2%
<b>Education</b>			
Primary education	14.5%	13.4%	-7.4%
Secondary education	58.8%	62.4%	6.1%
Third-level education	23.9%	20.7%	-13.4%
Other education	2.9%	3.5%	20.3%

As shown in Table 3, there was a slight decrease in the proportion of Irish national and other EU citizens employed in the sector, with drops of 0.5% and 2.4% respectively. However, there was a significant increase of 34.7% in the employment of individuals from outside the EU/EEA area. The 25–34 year age cohort experienced a significant decline of over 20%, while the 35–54 year cohort increased by 19%.

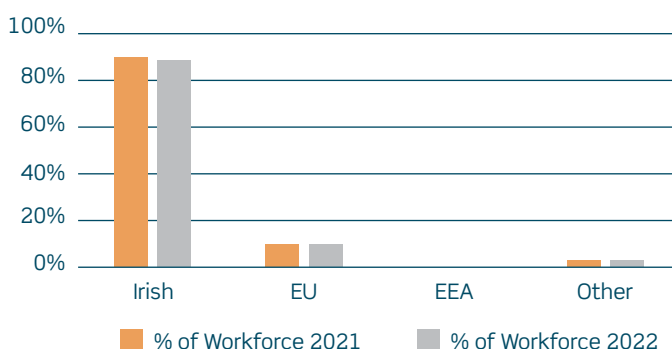
The youngest cohort of 16–24 years saw a modest increase of 3%, while employment among individuals aged over 65 years declined by 9%. Most of the employed population (83%) in 2022 were aged 55 years or younger. The gender ratio of paid employment in 2022 was 88% males and 12% females. While the overall gender ratio is higher for males, female employment increased by 1% compared to 2021 (Figure 1).

The majority of those employed in the sector attained a secondary level education (62%) and this proportion saw an increase of 6% in 2022. However, there was a noticeable decrease of 13.4% in the level of employees attaining a third-level education (Figure 1). The physical labour-intensive nature of the sector, coupled with increasing opportunities in other sectors for graduates, may be a factor influencing the retention of third-level graduates in aquaculture employment.

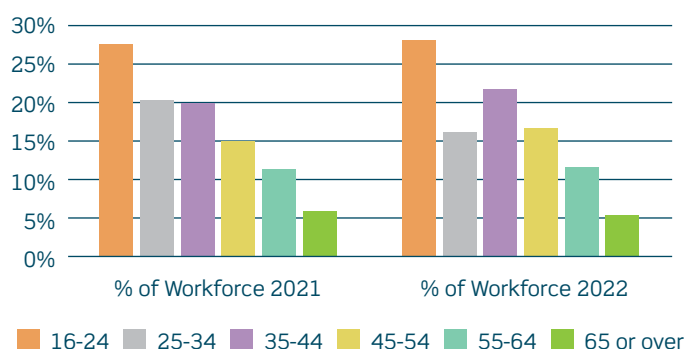
### Production Units

The number of production units nationally decreased by 7% from 315 in 2021 to 292 in 2022. Within the finfish segments, the 6% decline was attributed to production cycles rather than an amalgamation or consolidation of production units. In contrast, the 8% decline within the shellfish segments resulted from decreasing number of businesses in the sector and the ongoing amalgamation of production units in the oyster and mussel segments. The sector utilised approximately 12,250 hectares of licensed area for production in 2022.

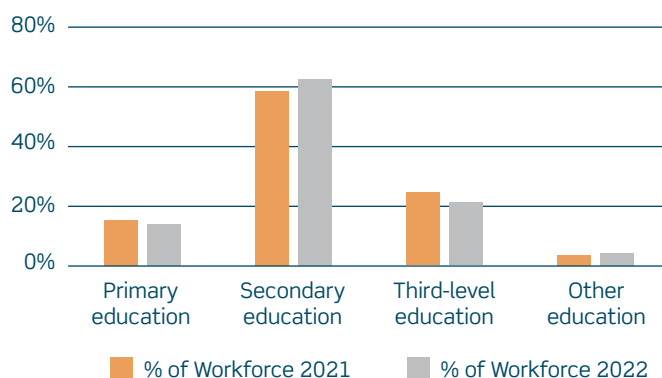
**Workforce nationality profile, 2021 and 2022**



**Workforce age profile, 2021 and 2022**



**Workforce education level, 2021 and 2022**



**Figure 1** Workforce age profile, nationality, and education level, 2021 and 2022

# 1.3 Markets

In 2022, a total of 30,122 tonnes of aquaculture products, primarily fresh and consumer-ready, were exported, with a sales value of approximately €117 million.

Along with the export market, there is a growing domestic demand developing for farmed oysters and rope-grown mussels, particularly for half-grown and consumer-ready products. The home market for these two segments alone was valued at €20.4 million in 2022, reflecting the emergence of a thriving home market.

The export-oriented aquaculture sector continues to send its produce primarily to the European Union (91%), with the United Kingdom accounting for 5% of exports. Southeast Asia and other destinations make up the remaining 4% each (Table 4).

Among the EU Member States, France stands as the most important trading partner, accounting for 59% of the total export volume in 2022 where oysters and salmon are the dominant export. The Netherlands follows with a share of 22%. Salmon, oysters, and mussels are the dominant exports to France and the Netherlands. Spain, Italy, Germany, and Poland also play significant roles as trading partners (Figure 2).

Table 4 Aquaculture market destinations, 2022

Destination	Tonnes exported	%
France	17,749	59%
The Netherlands	6,629	22%
UK	1,506	5%
Other EU	3,027	10%
Southeast Asia	564	2%
Other	647	2%
Total export volume	30,122	100%

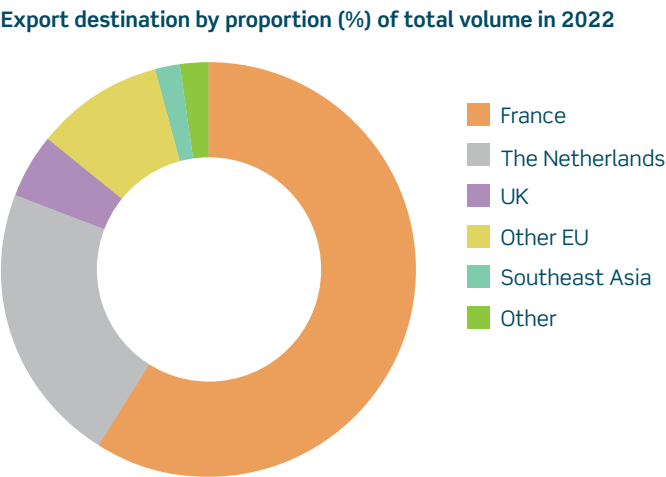


Figure 2 Aquaculture market destinations 2022

## 1.4 Inputs and Costs

The total estimated costs for the aquaculture sector in 2022 amounted to €191 million (excluding financial costs), representing 92% of the total estimated income. This reflects a proportional decrease of 2.3% compared to 2021.

Input costs, such as those related to juvenile stock and feed, play a significant role in the sector. The combined cost for these inputs in 2022 was €68.3 million, showing a decrease of €1.7 million (2.43%) from the €70 million in 2021.

The various operational costs (overheads, professional fees, licences, dues, rents, and miscellaneous expenses) accounted for another large proportion of total costs totalling €46.1 million. However, this cost category experienced a significant decrease of 29% from the previous year.

Wages and salaries were the next significant cost, amounting to €39.7 million in 2022. This cost saw a substantial increase of 17.8% compared to 2021 driven by an increase in employment coupled with rising wages and salaries linked to inflation. The average annual wage per FTE in 2022 was €34,372, an increase from the 2021 figure of €26,705.

Other cost components experienced increases in 2022. Depreciation costs amounted to €12.3 million, representing a 33.7% increase. Repair and maintenance costs totalled €13.4 million, reflecting a 41% increase.

Energy consumption costs reached €8.8 million, showing the most substantial proportional increase of all costs at 57%. This increase in energy consumption costs significantly impacted land-based and intensive production units.

The extent to which these individual cost increases affected the aquaculture segments varied depending on factors such as the level of culture intensity, technology utilization, market access, production environment, and required infrastructure.





**Table 5** Aquaculture production costs, 2021 to 2022

National-level Costs (millions €)	2021	2022	% Trend, 2021 to 2022	% of Total 2022 cost
<b>Total income</b>	<b>€193.0</b>	<b>€208.0</b>	<b>7.8%</b>	
Wages and salaries	€33.7	€39.7	17.8%	20.8%
Imputed value of unpaid labour	€2.2	€2.5	13.6%	1.3%
Energy costs	€5.6	€8.8	57.1%	4.6%
Total input cost	€32.0	€32.5	1.5%	17.0%
Feed cost	€38.0	€35.8	-5.8%	18.7%
Repair and maintenance	€9.5	€13.4	41.1%	7.0%
Other operational costs	€64.9	€46.1	-29.0%	24.1%
Depreciation	€9.2	€12.3	33.7%	6.4%
<b>Total costs*</b>	<b>€195.1</b>	<b>€191.1</b>	<b>-2.1%</b>	
<b>Cost % of Income</b>	<b>101.1%</b>	<b>91.9%</b>		

\* Minus financial costs

**National aquaculture costs, 2021**

**National costs breakdown, 2022**



**Figure 3** Aquaculture Costs, 2021 to 2022

## 1.5 Economic Performance

The aquaculture sector demonstrated positive economic indicators in 2022, showcasing improvements in total income, turnover, and profitability compared to 2021.

Total income and turnover increased to €208 million and €186 million, respectively, marking growths of 7.8% and 4% from the previous year's figures of €192.9 million and €178.9 million. The Gross Value Added (GVA) for 2022 reached €68 million, more than doubling the value from 2021 (Figure 4).

Furthermore, the sector experienced a positive operating capital flow of €24.9 million. Both Earnings Before Interest and Taxes (EBIT) and net profit exhibited

positive values in 2022, amounting to €32.4 million and €8.3 million respectively.

These economic indicators represent a significant improvement compared to the negative values recorded in 2021. The overall positive trend in total income, turnover, gross value added, and profitability demonstrates the sector's ability to enhance its economic performance and achieve financial growth in 2022.

Aquaculture 10-year economic performance, 2013-2022

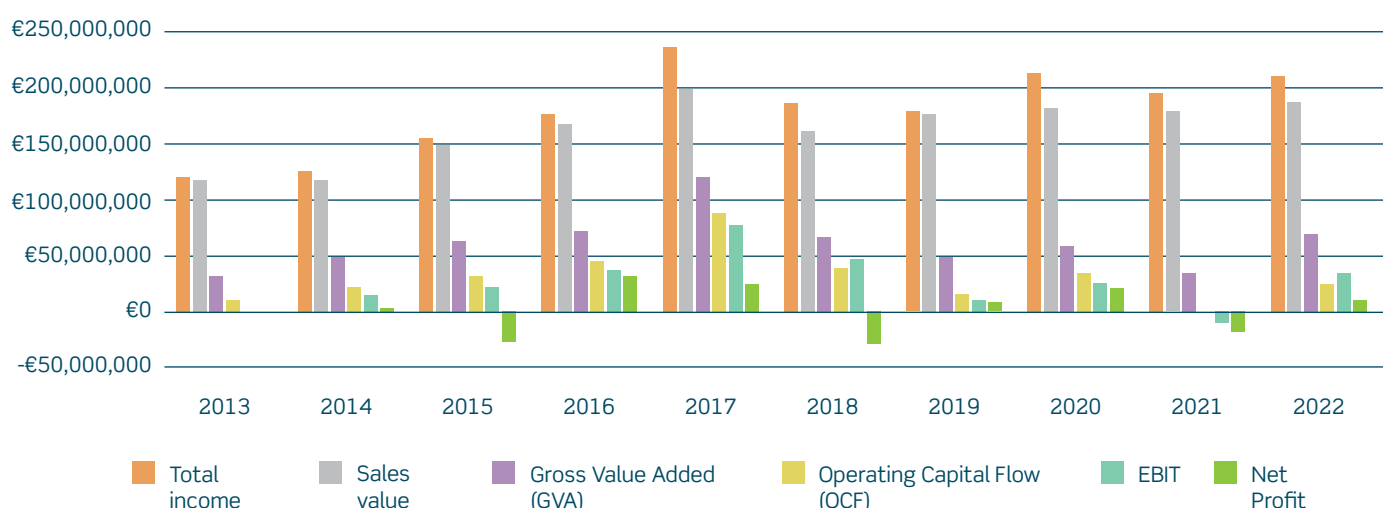


Figure 4 Aquaculture 10-year economic performance, 2013-2022

## 1.6 Aquaculture Regional Output

The production sites of the aquaculture sector are strategically distributed along the coastal regions of Ireland, taking advantage of varying environmental conditions and resource availability.

The salmon pen production operates in dynamic and exposed sites spanning the west coast, from Donegal to Cork. Rope mussel production is concentrated in the deep sheltered bays of the South and Southwest, as well as suitable bays in the West, Northwest, and North.

Seabed cultured mussel units operate in shallow estuarine bays and loughs of the Northeast, Southeast, and Southwest. Farmed and native oyster culture also take place in shallow bays and estuaries with moderate flow and suitable substratum (underlying layer), with farmed oysters found in all coastal regions.

Salmon hatcheries and trout land-based units are situated in various inland locations of counties Donegal, Galway, Cork, Carlow, Tipperary, Roscommon, Kilkenny, and Wicklow.

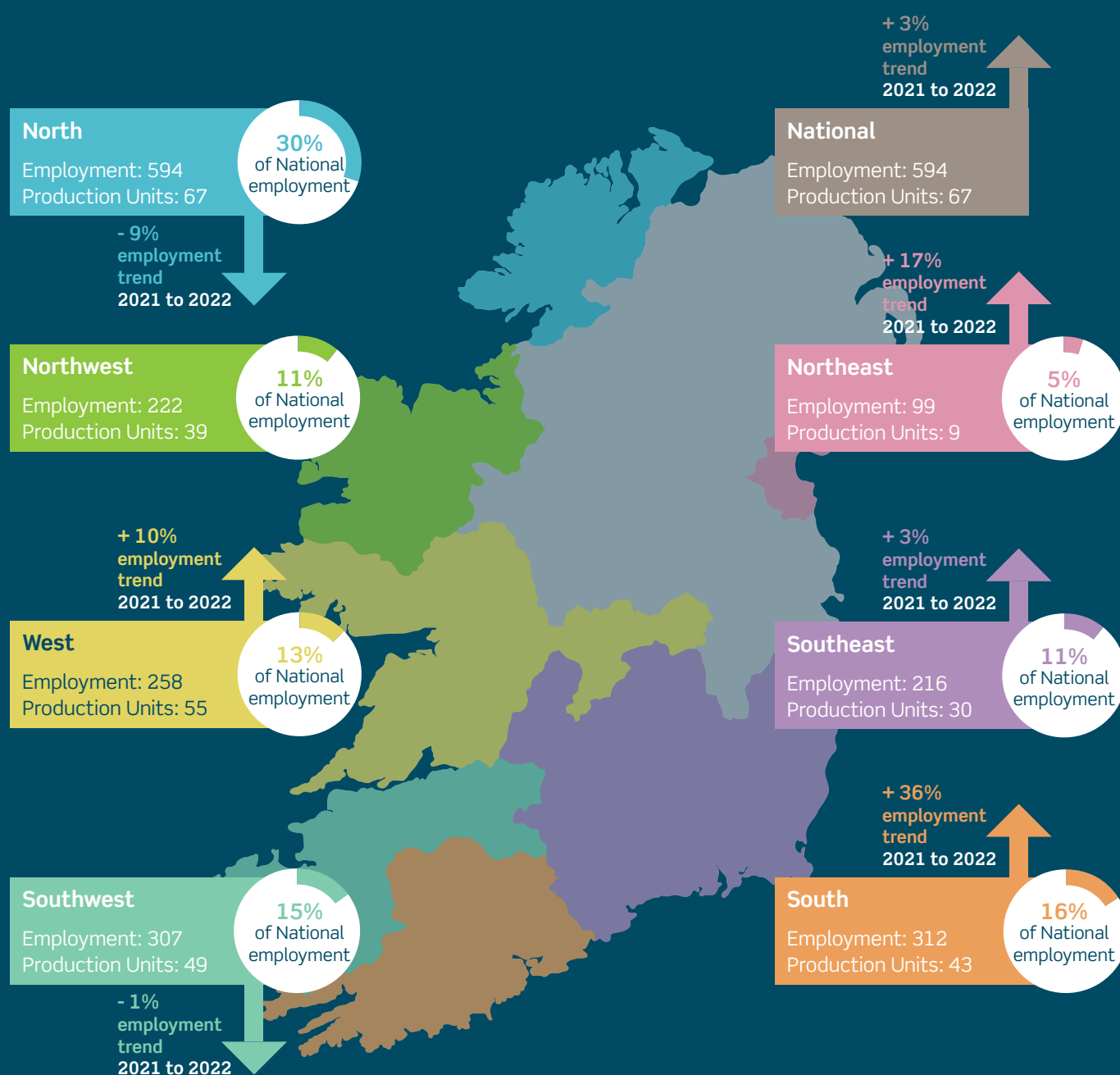
The Northern region, specifically Donegal, stands out as a significant contributor to the aquaculture sector. It generated the highest sales value of €57 million and maintained the largest number of production units (67) and employment (594 people) in 2022. The region accounted for 31% of the national turnover and employed 30% of the workforce. It hosts sites for farmed oysters, salmon pens, salmon hatcheries, seabed cultured and rope mussel units.

The West region, with a turnover of €38.4 million (18% of the national total), is home to 55 businesses, predominantly smaller in scale compared to other regions. It employs a total of 258 people working in the salmon pen, salmon hatchery, farmed oyster, rope mussel, and native oyster segments.

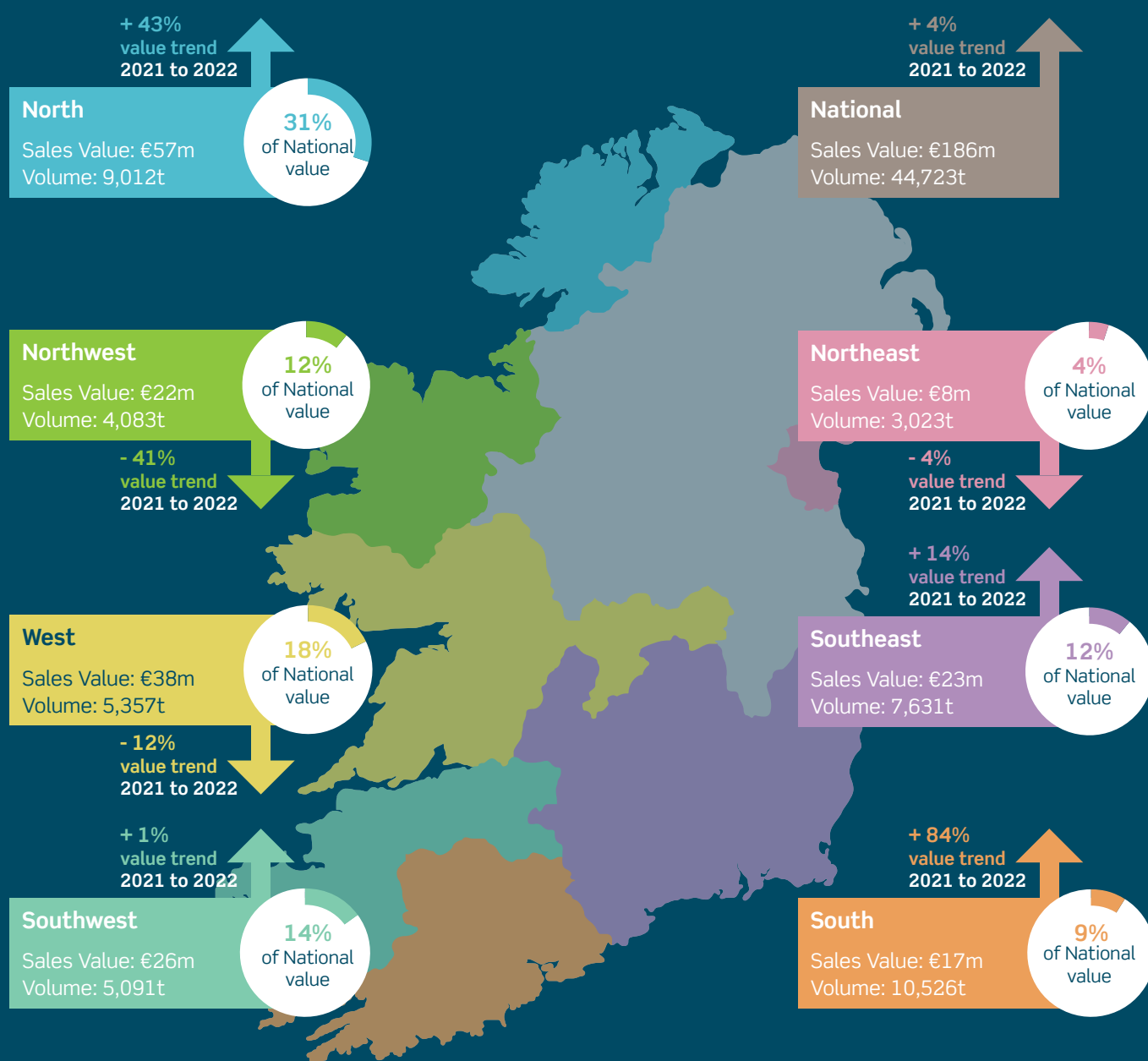
The deep sheltered bays of the South are the primary location for rope mussel production. The region also includes pen and hatchery salmon, farmed oysters, trout, and seaweed units. In 2022, the region contributed 10,526 tonnes of combined produce, valued at €17 million (9% of national turnover). It employed 312 people across 43 production units, representing the second-largest workforce by region.

The Southwest region is characterised by pen salmon, rope mussel, farmed oyster, and native oyster production. With a sales value of €25.6 million (14% of the national total), the region supported 307 people employed in 49 production units.

The Northeast and Southeast Bays specialise in farmed oyster and seabed cultured mussel production. Combined, these regions generated a sales value of €30.6 million (16% of the national total) in 2022. They employed 315 individuals across 39 PUs.



**Figure 5** Map of regional employment and production unit distribution by NUTs III regions, 2022



**Figure 6** Map of output volume (tonnes) and sales value (€) by NUTs III region, 2022

## 2. The Segments

### 2.1 Farmed Salmon

#### 2.1.1 Output and production

The output volume of sea pen Atlantic salmon (*Salmo salar*) production experienced a 7% decline between 2021 and 2022, dropping from 12,844 to 11,916 tonnes (whole round). Consequently, the sales value also decreased by 2% from €106 to €104 million. However, there was a 2.7% increase in the average unit sales value, which partially mitigated the impact of the output decline (Table 6).

It is worth noting that hatchery output showed promising growth in 2022, increasing by 17% to 611 tonnes compared to 522 tonnes in 2021. This positive trend in hatchery output provides hope for increased production and sales value in 2023. Additionally, the combined sales value of stand-alone and auxiliary hatchery units reached €6.7 million.

Salmon sea-pen and land-based hatchery production units are strategically located along the western seaboard regions. The production output follows a cyclical pattern, influenced by factors such as organic certification fallowing, low stocking density requirements, and limited licensed capacity for smolt and on-growing standing stock.

Environmental events, including red tide or jellyfish infestations, can periodically impact production, and their severity and duration are increasing due to climate change.

In 2022, the majority of production output, accounting for 66% of the national total, was concentrated in the North and West NUTs III regions. The West and South regions maintained the highest employment levels, with a total of 149 people employed.

However, the Northwest experienced a significant drop in output by 55% compared to 2021. The difference in output for the Northwest region between 2021 and 2022 is due to the cyclical nature of organic salmon production, necessitated by the need to fallow production sites (leave empty for a year), coupled with a lack of available on growing and smolt growing licenced capacity. The production fluctuations in the South and Southwest regions are closely interconnected due to their shared production strategy.

**Table 6** Penned salmon output trend, 2021 to 2022

	2021	2022	% Trend
Output volume (tonnes)	12,844	11,916	-7%
Sales value ('000s €)	€106,108	€104,259	-2%

### 2.1.2 Employment and production units

Overall, employment in the sector experienced a 7% increase reaching a total of 238. However, this growth primarily occurred in part-time positions as the FTE figure decreased by 4%. Specifically, the full-time employment component saw a significant decline of 16%, dropping from 197 in 2021 to 165 in 2022. Male employment was most impacted by losses (17 employees), while female employment increased by a multiple of four, increasing by 32 employees. The gender ratio in 2022 was 14:3 males to females (Table 7).

The sea-pen production segment is composed of five businesses, operating 13 PUs. These units utilised a licensed capacity of just over 4,000,000m<sup>3</sup> and covered approximately 850 hectares, utilizing 280 cages. In terms of hatchery units, there were 10 in operation, employing 43 persons. Notably, the full-time component of employment increased in 2022, with the FTE rising from 20 to 36 persons.

**Table 7** Penned salmon employment and production units 2021 to 2022

	2021	2022	% Trend
<b>Employment Category</b>			
Full Time	197	165	-16%
Part Time	24	70	193%
Casual	2	3	28%
Males	213	196	-8%
Females	10	42	319%
<b>Total Employed</b>	<b>223</b>	<b>238</b>	<b>7%</b>
<b>Total FTE</b>	<b>209</b>	<b>200</b>	<b>-4%</b>
<b>Production Unit Category</b>			
5 or less employed	4	5	0%
6-10 employed	5	4	-20%
10 or more employed	7	4	-43%
<b>Production Units</b>	<b>16</b>	<b>13</b>	<b>-19%</b>



### 2.1.3 Markets

In 2022, Ireland exported a total of 6,556 tonnes of salmon, with France as the largest recipient, accounting for 4,272 tonnes or 64% of the total export volume. Other significant EU importers included Poland, Germany, and the Netherlands, collectively receiving 1,909 tonnes or 29% of the exported volume.

Switzerland, North America, and the UK imported 494 tonnes or 7% of the total volume. The exported products included whole round, head-on-gutted, fillets, steaks, and frozen products. Additionally, 44% of the salmon output volume, equivalent to 5,241 tonnes, was retained in Ireland for the fresh domestic market or further processing, which could be sold in the home market or exported later.

Destination of export volumes in 2022

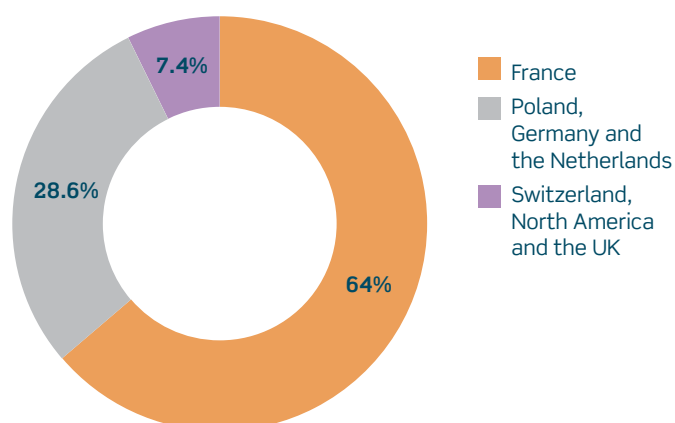


Figure 7 Destination of export volumes in 2022

### 2.1.4 Inputs and Costs

The sea-pen salmon segment experienced an increase in total income to €108 million, but this was outweighed by rising costs (Table 8). Most cost categories saw an increase, except for 'other operational costs' and 'feed cost'. The decrease in the total amount of purchased feed kept cost down, although the unit cost per tonne of feed increased by 11.5% from €1,556 to €1,735.

Combined, feed and juvenile stock accounted for 49% of total costs amounting to €55 million in 2022. Feed costs alone were the largest portion at 29.7%, followed by 'other operational costs' at 23.6%.

The costs of repairs and maintenance and energy costs doubled by 2022, while depreciation also saw a significant increase of 18.4%. Wages and salaries increased sharply by 43.4%, making up 13% of total costs, equivalent to €14.7 million in 2022. The average wage/salary per person in 2022 reached €73,355 per FTE.



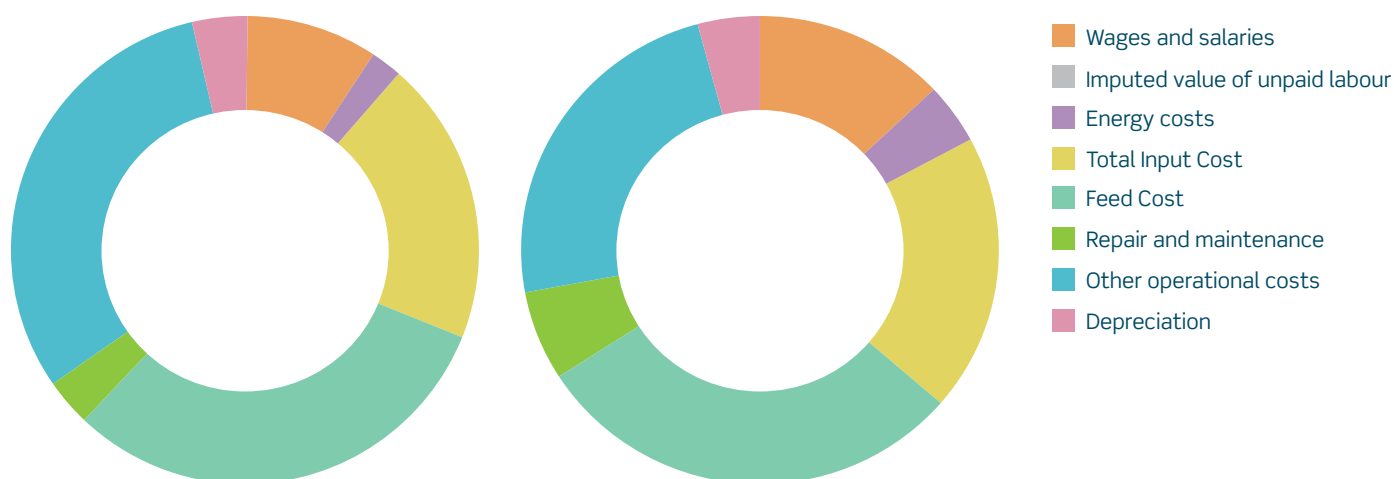
**Table 8** Panned salmon: production costs (‘000s €) 2021 to 2022

Panned salmon culture costs	2021	2022	% Trend, 2021 to 2022	% of Total 2022 cost
<b>Total income</b>	<b>€106,153</b>	<b>€107,749</b>	<b>1.5%</b>	
Wages and salaries	€10,229	€14,671	43.4%	13.0%
Imputed value of unpaid labour	€0	€0	0.0%	0.0%
Energy costs	€2,276	€4,474	96.6%	4.0%
Total input cost	€21,334	€21,643	1.4%	19.2%
Feed cost	€34,092	€33,363	-2.1%	29.7%
Repair and maintenance	€3,565	€7,191	101.7%	6.4%
Other operational costs	€34,051	€26,562	-22.0%	23.6%
Depreciation	€3,871	€4,583	18.4%	4.1%
<b>Total costs*</b>	<b>€109,418</b>	<b>€112,487</b>	<b>2.8%</b>	<b>100%</b>
<b>Cost % of Income</b>	<b>103%</b>	<b>104%</b>		

\* Minus financial costs

**Panned salmon production costs breakdown in 2021**

**Panned salmon production costs breakdown in 2022**

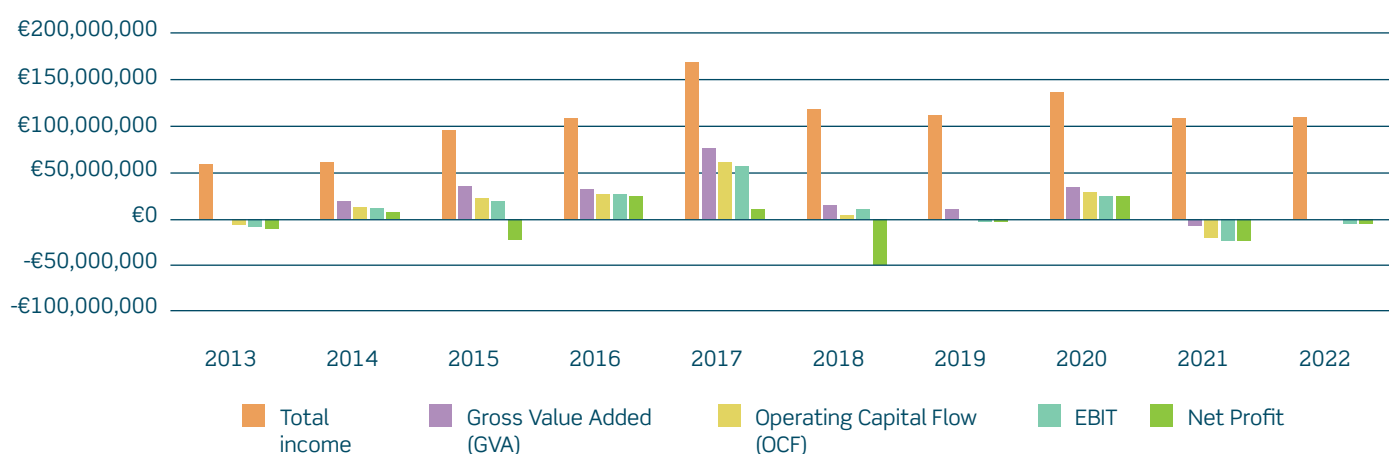


**Figure 8** Panned salmon production costs, 2021 to 2022

### 2.1.5 Economic performance

In 2022, the sea-pen segment experienced rising costs that outpaced income, leading to negative values for key economic indicators such as GVA, EBIT, and net profit (Figure 10). The substantial cost increases, including sharp rises in energy and repairs and maintenance, had a

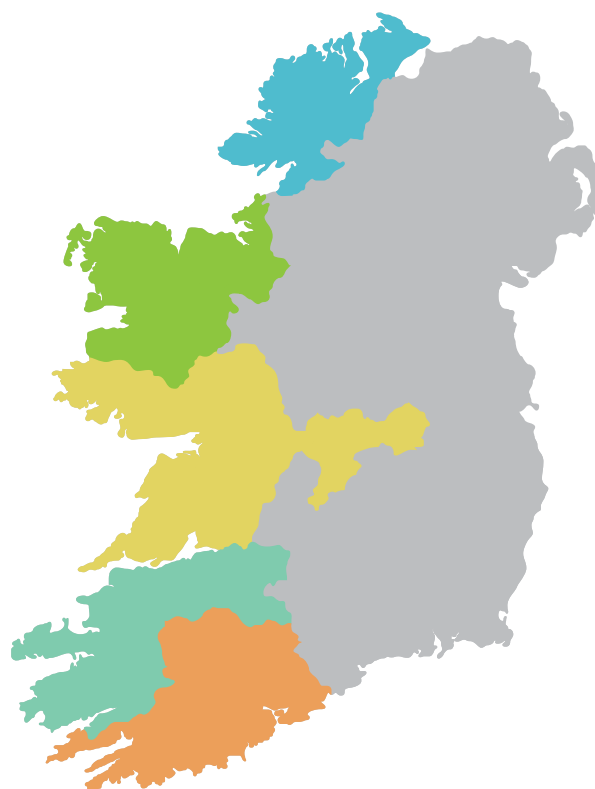
significant impact. While feed costs typically play a role in determining profitability, the overall cost escalation across multiple categories, coupled with a decline in output volume and sales value, has contributed to the negative trends observed in economic indicators.



**Figure 9** Pinned salmon 10-year economic performance, 2013 to 2022

<b>National 2022</b>			
Tonnes Sold:	11,916	Total Employed:	38
Sales Value ('000s€):	€104,259	Production Units:	13
<b>North</b>		<b>Southwest</b>	
Tonnes Sold:	4,509	Tonnes Sold:	1,615
Total Employed:	51	Total Employed:	16
Production Units:	5	Production Units:	1
<b>Northwest</b>		<b>South</b>	
Tonnes Sold:	1,681	Tonnes Sold:	739
Total Employed:	22	Total Employed:	71
Production Units:	2	Production Units:	2
<b>West</b>			
Tonnes Sold:	3,372		
Total Employed:	78		
Production Units:	3		

**Figure 10** Map of combined salmon output volume (tonnes) and employment by NUTs III Region in 2022



## 2.2 Farmed oyster

### 2.2.1 Output and production

Farmed oyster (*Crassostrea gigas*) production has demonstrated steady growth since 2007, except for the disruption caused by Covid. Oysters are cultured in all coastal regions with suitable bays with most production and larger production units are found in the Southeast and North regions. These regions accounted for 5,628 tonnes of output worth €28.7 million, representing 52.6% of the national turnover in 2022.

Specific bays such as Carlingford Lough, Bannow, Dungarvan, Castlemaine Harbour, Poulfnasherry, Clew, Sligo Donegal, and Traigheanna Bays are increasingly producing specialised oysters, some meeting the “Speciale” standard, which is a recognised French standard.

In 2022, the combined production units in the West and Northwest regions generated a sales value of €9.6 million. Overall, 11,121 tonnes of oyster products were harvested in 2022, a 2.8% increase from 2021, with a sales value of €54.7 million, indicating strong growth in unit sales values across various grades (Table 9). The unit sales value varied among different types of oysters, with diploid products experiencing a slight decline to €3.09 per kg, while consumer-ready triploid products sold for an average of €5.28 per kg.

The top-grade “Speciales,” comprising 49.8% of the total sold volume, had an average unit sales value of €6.17 per kg, up from €5.54 per kg in 2021. Half-grown oysters destined for further growth also saw an increase in average unit value from €3.27 to €3.54 per kg (Table 10).

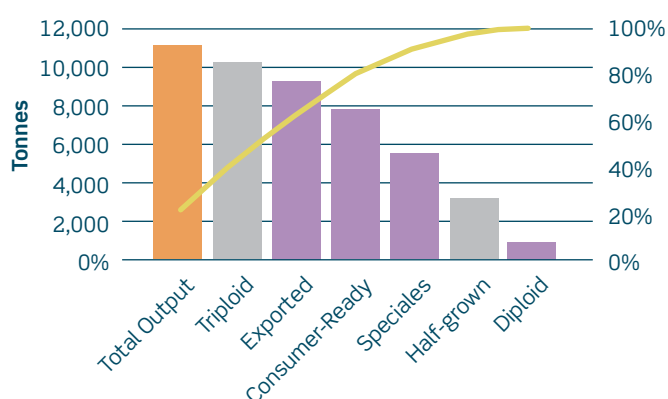
Total exports in 2022, including consumer-ready and half-grown oysters, increased slightly to 9,288 tonnes. Additionally, there is evidence of a growing domestic consumer market. Ireland retained 1,833 tonnes of farm-gate output in 2022 representing an increase of 412 tonnes compared to the previous year.

**Table 9** Farmed oyster output trend, 2021 to 2022

Farmed oyster	2021	2022	Output Trend (%)
Sales volume (tonnes)	10,823	11,121	2.8%
Sales value ('000s)	€47,551	€54,686	15%

**Table 10** Farmed oyster unit value by product category, 2022

Output category	Tonnes	Sales value per tonne 2022
Total output	11,121	€4,917
Consumer-Ready	7,852	€5,277
Speciales	5,541	€6,171
Half-grown	3,269	€3,535
Exported	9,288	
Triploid	10,206	€4,925
Diploid	915	€3,090



**Figure 11** Farmed oyster tonnage output profile in 2022

### 2.2.2 Employment, production units, and capacity

Total employment within the segment has shown a marginal increase reaching a total of 1,037 in 2022 (Table 11). This modest growth can be attributed to a slight rise of 24 FTEs, a stronger increase of 60 part-time employees, and a corresponding decline of 80 casual workers.

The overall increase of 7% in FTE compared to 2021 reflects a shift away from casual employment practices. Furthermore, the proportion of female employees rose by 11 individuals, accounting for a total of 122 or 11.8% of the segment's workforce.

No significant new entries were observed within the segment, resulting in a decline of one production unit. However, there was an increase in the number of units employing 6 to 10 people and more than 10, indicating some consolidation of enterprises within the industry.

The production output amounted to 11,121 tonnes cultivated across a licensed area of 1,983 hectares. This was facilitated by a total of 548,038 structures, comprising both traditional trestles, and an increasing number of modified structures designed for enhanced efficiency and labour-saving measures.

**Table 11** Employment and Production units, 2021 to 2022

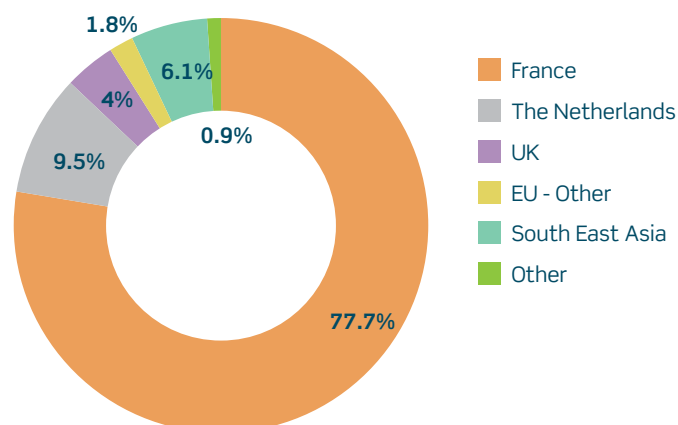
Category	2021	2022	% Trend
<b>Employment Category</b>			
Full Time	406	430	6%
Part Time	265	325	23%
Casual	362	282	-22%
Males	922	915	-1%
Females	111	122	10%
<b>Total Employed</b>	<b>1,033</b>	<b>1,037</b>	<b>0</b>
<b>Total FTE</b>	<b>599</b>	<b>640</b>	<b>+7</b>
<b>Production Unit Category</b>			
5 or less employed	114	103	-10
6-10 employed	29	32	+10
10 or more employed	23	27	+17
<b>Total PUs</b>	<b>166</b>	<b>162</b>	<b>-2</b>

### 2.2.3 Markets

France maintained its position as the primary destination for Irish exported oyster products, accounting for 7,219 tonnes or 77.7% of the total volume exported in 2022. The Netherlands has also emerged as a significant market, receiving 879 tonnes or 9.5% of the export volume. Other EU Member States, including Germany and Italy, collectively accounted for 2% of the exports (Figure 12).

Outside of the EU, the United Kingdom imported 4% of Irish oyster products. In Southeast Asia which represents a substantial set of markets, the collective share of exports declined from 8.9% in 2021 to 6% in 2022. Additionally, 1% of exports were distributed across various destinations, ranging from the Gulf States to North America (Figure 12).

Oyster production destinations in 2022 by % of total exports



**Figure 12** Farmed oyster market destinations by % of total exports, 2022



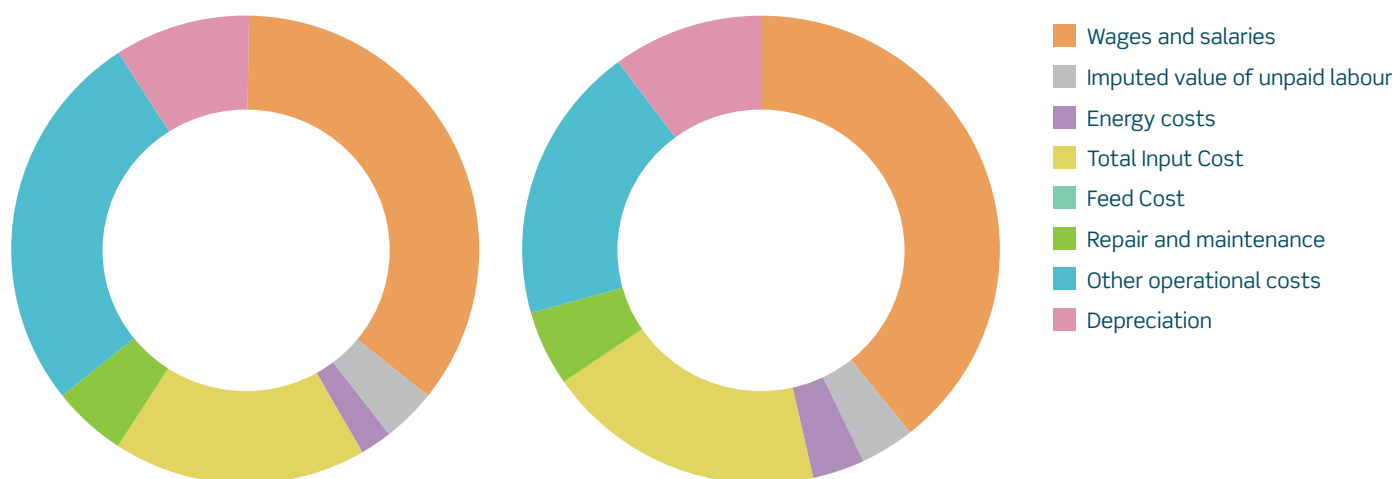
### 2.2.4 Inputs and Costs

Most cost categories in farmed oyster production experienced significant increases, but these were collectively offset by a decrease in the major cost of “other operational costs,” resulting in an overall 4% increase (Table 12). The segment heavily relies on hatchery supply for its juvenile stock input and remains a labour-intensive industry. Therefore, wages and salary and input costs play a crucial role in determining profitability. Together, they accounted for 58% of total costs in 2022, experiencing increases of 13.5% and 16.3% respectively.

Fortunately, energy costs, although significant, represent a proportionally minor component of expenses, even though they increased by 53% in 2022. There is also an element of unpaid labour provided by business owners or their family members. This is estimated to have an imputed value of €1.56 million, reflecting a 12% increase from 2021. Costs relative to income have decreased to 65% from 73% leading to improved profitability in the segment (Figure 13).

**Table 12** Farmed oyster production ('000s €), 2021 and 2022

Farmed oyster culture costs	2021	2022	% Trend, 2021 to 2022	% of Total 2022 cost
<b>Total income</b>	<b>€54,112</b>	<b>€64,454</b>	<b>19.1%</b>	
Wages and salaries	€14,196	€16,116	13.5%	39.1%
Imputed value of unpaid labour	€1,393	€1,563	12.2%	3.8%
Energy costs	€927	€1,419	53.2%	3.4%
Total input cost	€6,834	€7,945	16.3%	19.3%
Feed cost	€15	€13	-13.3%	0%
Repair and maintenance	€2,064	€2,102	1.9%	5.1%
Other operational costs	€10,444	€7,847	-24.9%	19.1%
Depreciation	€3,642	€4,181	14.8%	10.2%
<b>Total costs</b>	<b>€39,514</b>	<b>€41,187</b>	<b>4.2%</b>	<b>100%</b>
<b>Cost % of Income</b>	<b>73.0%</b>	<b>63.9%</b>		

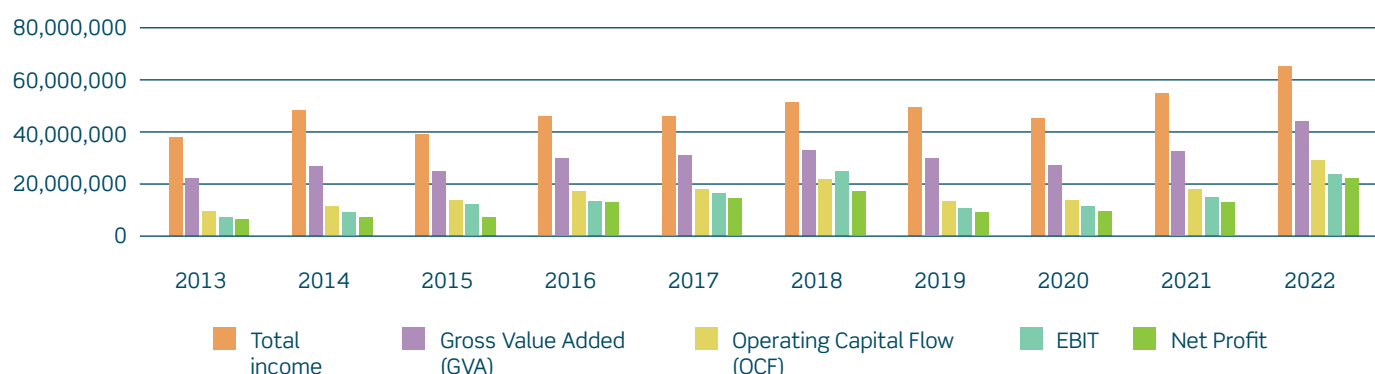
**Farmed oyster production costs breakdown in 2021****Farmed oyster production costs breakdown in 2022****Figure 13** Farmed oyster production costs, 2021 and 2022



### 2.2.5 Economic performance

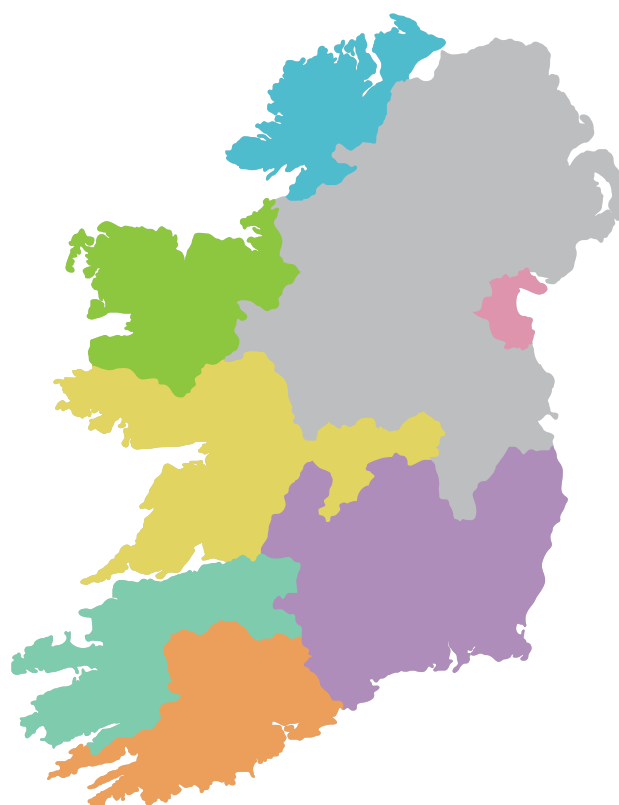
In 2022, the segment recorded a notable increase in income to €63.7 million, coupled with a successful control of costs, resulting in improved profitability. GVA amounted to €43.6 million, and EBIT reached €21.8 million. The segment experienced a significant rise in net profit from €12.5 million to €20.6 million, driven by strong sales performance (Figure 14).

However, it should be noted that the segment faces environmental threats such as deteriorating water quality leading to increased costs for depuration processes before sale, and the potential introduction of invasive species and pathogenic organisms, which could impact future sales.



**Figure 14** Farmed oyster 10-year economic performance, 2013-2022

<b>National 2022</b>			
Output (tonnes):	11,031	Total Employed:	1,037
Sales Value ('000s €):	€54,609	Production Units:	164
<b>North</b>		<b>Northeast</b>	
Output (tonnes):	2,524	Output (tonnes):	763
Sales Value ('000s €):	€13,530	Sales Value ('000s €):	€4,592
Total Employed:	364	Total Employed:	57
Production Units:	47	Production Units:	4
<b>Northwest</b>		<b>Southeast</b>	
Output (tonnes):	1,752	Output (tonnes):	3,104
Sales Value ('000s €):	€7,466	Sales Value ('000s €):	€15,174
Total Employed:	137	Total Employed:	168
Production Units:	28	Production Units:	19
<b>West</b>		<b>South</b>	
Output (tonnes):	475	Output (tonnes):	723.7
Sales Value ('000s €):	€2,132	Sales Value ('000s €):	€2,691
Total Employed:	78	Total Employed:	54
Production Units:	28	Production Units:	8
<b>Southwest</b>			
Output (tonnes):	1,690		
Sales Value ('000s €):	€9,025		
Total Employed:	179		
Production Units:	30		



**Figure 15** Map of farmed oyster production and employment by NUTS III Regions, 2022.

**Table 13** Farmed oyster average unit sales value from selected bays in 2021

Region	Bay	Average unit sales (€)/kg 2021	Average unit sales (€)/kg 2022
North	Donegal Bay	€5.17	€5.81
North	Lough Foyle	€5.45	€6.14
North	Trabreaga Bay	€3.12	€3.58
Northeast	Carlingford Lough	€4.88	€6.02
Northwest	Achill Island	€3.85	€4.96
Northwest	Clew Bay	€3.65	€3.64
South	South Bays Average	€3.72	€3.72
Southeast	Bannow Bay	€5.34	€5.98
Southeast	Dungarvan Bay	€4.88	€5.54
Southwest	Dingle Bay	€4.97	€5.37
West	Shannon Estuary	€3.06	€4.11
West	Galway Bay	€4.49	€4.53

## 2.3 Suspended Mussel Culture

### 2.3.1 Output and production

The suspended or rope-grown mussel (*Mytilus edulis*) segment demonstrated continuous growth in production output with a 12% increase to 12,921 tonnes. The total sales value also saw a substantial rise of 22% to €9.7 million across all grades (Table 14). The strong unit sales value per tonne contributed to this growth, with fresh product achieving an average of €895 per tonne and processed product increasing to an average of €553 per tonne. Although exports of mainly fresh product slightly declined to 6,607 tonnes, valued at approximately €5 million, there are indications of a growing domestic market, not fully captured in this survey (Table 15).

Production occurs along the entire western seaboard but is concentrated particularly in the sheltered bays of the South and also in the Southwest and West. The South and West regions saw the biggest output volume increases, collectively producing 10,334 tonnes, up by 1,349 tonnes on that of 2021. Employment in these two regions increased by 18 and 7 people respectively.

**Table 14** Suspended mussel national output, 2021 and 2022 (National sales values ('000s €))

Farmed oyster	2021	2022	Output Trend (%)
Sales volume (tonnes)	11,575	12,921	12%
Sales value (€)	€7,952	€9,671	22%

**Table 15** Suspended mussel, output product profile, 2021 and 2022

Output category	Tonnes	Sales value (€) per tonne 2022
Total output	12,921	€748
Fresh market	7,402	€895
For process	5,518	€553
Exported	6,607	



However, most regions had a decrease in the number of PUs operating compared to 2021. Despite this decline, the overall production and employment growth in the South, Southwest, and West regions indicate positive developments in the segment.

### 2.3.2 Employment, production units and capacity

In 2022, employment in the suspended or rope-grown mussel segment experienced a slight increase to a total of 232, representing a rise of six individuals. Full-time and casual employment saw gains of six and seven people respectively, while part-time employment workforce decreased by seven. The proportion of female employees decreased by three, accounting for 11% of the segment's workforce. Notably, there was a positive shift in the trend of FTE, which increased by 3% after years of steady decline (Table 16).

The number of production units employing five or fewer individuals continued to decrease, with a decline of seven units in 2022. Conversely, the other two categories of production units saw an increase of one unit each,

reflecting a consolidation trend in the industry. Overall, there was a reduction of five production units in the segment. The production of rope-grown mussels in 2022 utilised 1,786 long lines spanning over 940 hectares of cultivation area.

### 2.3.3 Markets

Exports of rope-grown mussels are primarily directed to EU Member States and the UK. In 2022, France retained its place as the largest market, accounting for 4,008 tonnes or 61% of the total exported volume. The Netherlands followed with 1,955 tonnes or 30% of the export volume. Other EU states collectively accounted for 359 tonnes or 5%, while the UK received 285 tonnes or 4% of the total exported volume (Table 17).

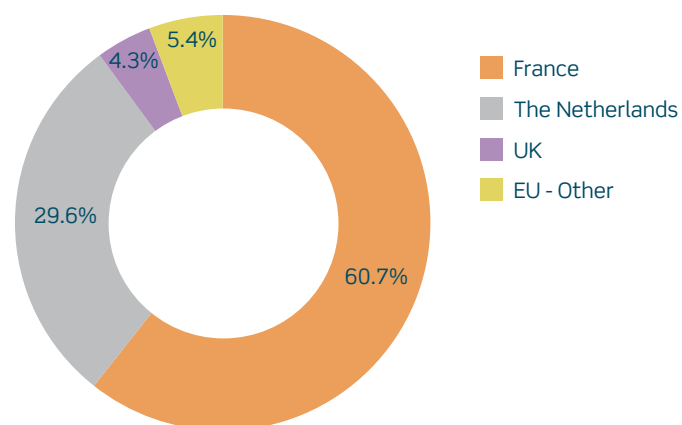
Within Ireland, 6,314 tonnes of rope-grown mussels were sold in 2022. Most of this quantity underwent further processing, and it is likely that a portion of the resulting product was exported, while the remaining balance entered the domestic market for processed products.

**Table 16** Suspended mussel, employment, and production units, 2021 and 2022

Rope Mussel	2021	2022	% Trend
<b>Employment Category</b>			
Full Time	86	92	7%
Part Time	82	75	-9%
Casual	58	65	12%
Male	198	207	5%
Female	28	25	-11%
<b>Total employed</b>	<b>226</b>	<b>232</b>	<b>+3</b>
<b>Total FTE</b>	<b>137</b>	<b>140</b>	<b>3%</b>
<b>Production Unit Category</b>			
5 or less employed	46	39	-15%
6-10 employed	10	11	10%
10 or more employed	3	4	33%
<b>Total PUs</b>	<b>59</b>	<b>54</b>	<b>-8%</b>

**Table 17** Suspended mussel market destinations by % of export in 2022

Destination	Tonnes	% Proportion
France	4,008	60.7%
The Netherlands	1,955	29.6%
UK	285	4.3%
EU- Other	359	5.4%
<b>Total exports</b>	<b>6,607</b>	<b>100%</b>

**Market destination by % proportion of suspended mussel products in 2022****Figure 16** Suspended mussel market destinations by % in 2022

### 2.3.4 Inputs and Costs

In 2022, the main cost categories for the suspended or rope-grown mussel segment were wages and salaries (38.7% of total costs) and 'other operational costs,' (17.4% of total costs). It is worth noting that the latter category experienced a significant decrease of 56%. However, all other costs increased, in particular, 'input costs' and also 'the imputed value of unpaid labour' and 'energy costs'.

This suggests a potential increase in the amount of unpaid time contributed by owners and family members to their businesses. The specific reasons for the substantial 226%

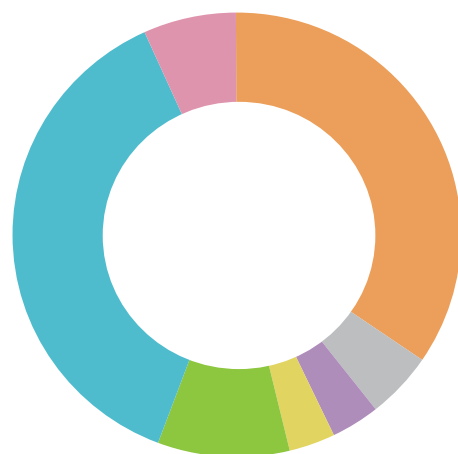
increase in input costs remain unclear. However, factors such as rising costs of seed collection raw materials, labour hiring, and equipment deployment for seed transfer are likely contributors.

Despite these variations in cost categories, total costs decreased from €8 million in 2021 to €7.6 million in 2022. As a result, costs accounted for a reduced proportion of 64.8% of total income compared to 74.3% in 2021, ultimately improving the profitability of the segment (Figure 17).

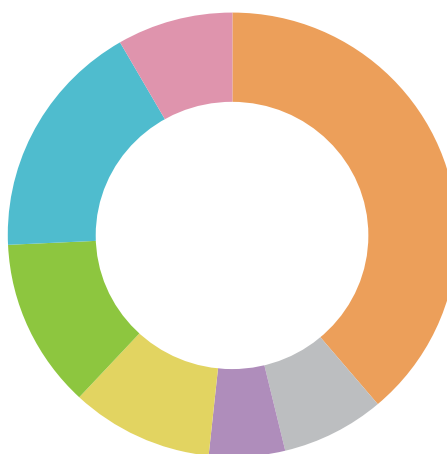
**Table 18** Suspended mussel production income and costs ('000s €), 2021 and 2022

National Totals ('000s €)	2021	2022	% Trend, 2021 to 2022	% of Total 2022 cost
<b>Total income</b>	<b>€10,789</b>	<b>€12,664</b>	<b>17%</b>	
Wages and salaries	€2,756	€2,949	7%	38.7%
Imputed value of unpaid labour	€404	€568	41%	7.5%
Energy costs	€293	€408	39%	5.3%
Total input cost	€245	€798	226%	10.5%
Feed cost	€0	€0	0%	0%
Repair and maintenance	€768	€946	23%	12.4%
Other operational costs	€3,026	€1,327	-56%	17.4%
Depreciation	€529	€628	19%	8.2%
<b>Total costs</b>	<b>€8,021</b>	<b>€7,624</b>	<b>-5%</b>	<b>100%</b>
<b>Cost % of Income</b>	<b>74.3%</b>	<b>60.2%</b>		

**Suspended mussel: production costs breakdown in 2021**



**Suspended mussel: production costs breakdown in 2022**



- Wages and salaries
- Imputed value of unpaid labour
- Energy costs
- Total Input Cost
- Feed Cost
- Repair and maintenance
- Other operational costs
- Depreciation

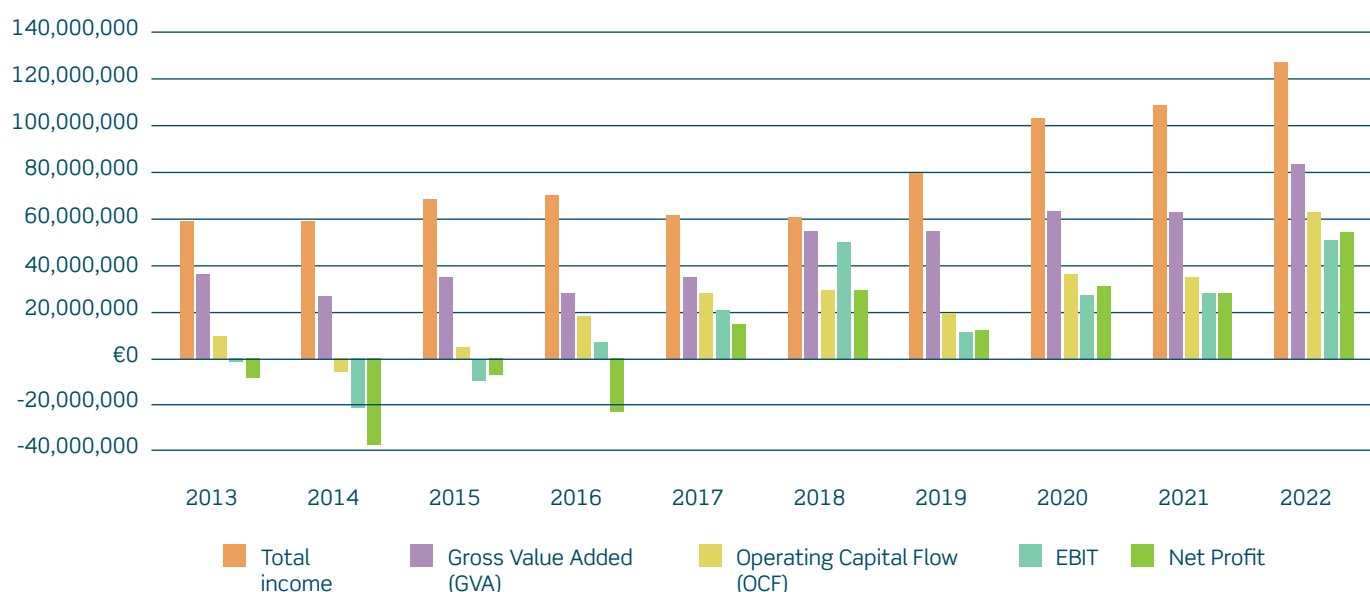
**Figure 17** Suspended mussel production costs, 2021 and 2022



### 2.3.5 Economic performance

In 2022, the segment experienced positive growth in key economic indicators. Total income increased from €10.8 million in 2021 to €11.8 million in 2022. Conversely, costs decreased from €8 million to €7.6 million.

These changes resulted in favourable outcomes for economic indicators: GVA increased from €6.2 million to €8.2 million, and net profit rose from €2.8 million to €4.4 million. These upward trends in economic indicators reflect the segment's overall positive performance in 2022 (Figure 18).



**Figure 18** Suspended mussel 10-year economic performance trend, 2013-2022

<b>National 2022</b>			
Sales Volume (tonnes):	12,921	Total Employed:	232
Sales Value ('000s€):	9,748	Production Units:	54
<b>North</b>		<b>Southwest</b>	
Sales volume (tonnes):	960	Sales volume (tonnes):	1,021
Total Employed:	11	Total Employed:	14
Production Units:	2	Production Units:	9
<b>Northwest</b>		<b>South</b>	
Sales volume (tonnes):	606	Sales volume (tonnes):	9,013
Total Employed:	7	Total Employed:	157
Production Units:	1	Production Units:	28
<b>West</b>			
Sales volume (tonnes):	1,321		
Total Employed:	43		
Production Units:	14		

**Figure 19** Map of suspended mussel output and employment by NUTs III region, 2022



## 2.4 Seabed Cultured Mussels

### 2.4.1 Output and production

The output volume of seabed cultured mussels showed a notable increase of 17% in 2022, reaching 6,864 tonnes. However, there was a decrease in the unit sales value declining from €1,559 per tonne in the previous year to €1,306 per tonne in 2022. As a result, the overall sales value generated by the segment decreased by 2% to €8.97 million (Table 19). Despite the decrease in sales value, the significant growth in output volume suggests a positive trend for seabed cultured mussel production.

Output was concentrated in the Southeast (Wexford Harbour) and northeast (Carlingford Lough), making up almost 97 % of the total. A small resurgence of seed availability in the Southwest (Castlemaine Harbour) allowed for seasonal employment in its collection and sale to nearby finishing units. Castlemaine Harbour, once a major seabed mussel producing area, has switched to farming oysters. However there remains the capacity, equipment, and expertise to resume seabed culture when the opportunity presents itself, as happened to a limited extent in 2022. Dredger owning companies of the Southwest also work for east coast companies, transferring seed, and several have business stakes in east coast PUs.

### 2.4.2 Employment, production units, and capacity

In 2022, overall employment in the segment experienced a marginal increase of 1%, reaching a total of 103, equivalent to 64 FTEs (Table 20). However, it is worth noting that the proportion of full-time workers decreased by 11, indicating a shift towards part-time and seasonal employment. Part-time workers now constitute the majority of the segment's workforce, while female employment accounts for 8% of the total workforce.

Consolidation within the Irish industry remains ongoing, with a decrease in the number of PUs across all categories except for the largest PUs employing more than 10 persons. As a result, the total number of PUs in the segment decreased to 19. This consolidation trend is also observed in Europe, as larger businesses acquire full control over the production-to-distribution supply chain of mussels.

Most businesses in the segment operate their own dredgers, although some in the Southwest region still rely on smaller, traditional vessels, due to the availability of local seed supply at intervals. The production of 6,864 tonnes of mussels in 2022 utilised a combined area of 1,695 hectares, consisting of both licensed and order area grounds.

**Table 19** Seabed cultured mussel output, 2021 and 2022 (National Output values)

Seabed cultured mussel	2021	2022	Output Trend (%)
Tonnes produced	5,865	6,864	+17
Sales value ('000s €)	€9,142	€8,966	-2



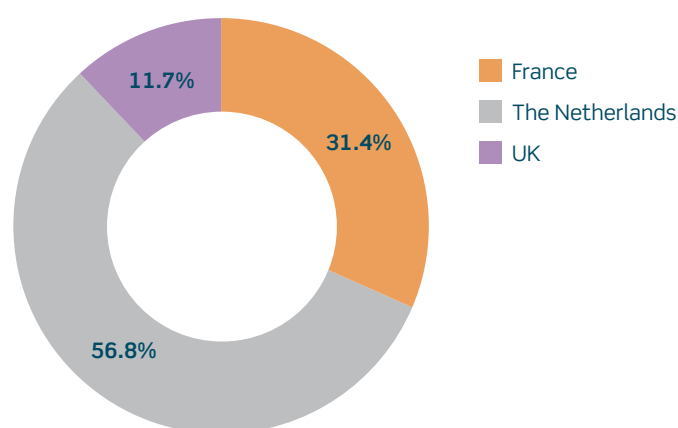
**Table 20** Seabed cultured mussel employment and production units, 2021 and 2022

Bottom Mussel	2021	2022	% Trend
<b>Employment Category</b>			
Full Time employed	50	39	-22%
Part Time employed	20	44	120%
Casual employed	14	20	43%
Sum of Males	80	95	19%
Sum of Females	4	8	100%
<b>Total Employed</b>	<b>84</b>	<b>103</b>	<b>23%</b>
<b>Total FTE</b>	<b>62</b>	<b>64</b>	<b>3%</b>
<b>Production Unit Category</b>			
5 or less employed	18	16	-11
6-10 employed	5	3	50
10 or more employed	2	3	0
<b>All PUs</b>	<b>25</b>	<b>22</b>	<b>-12</b>

### 2.4.3 Markets

The Netherlands continues to be the primary destination for consumer-ready products from this export-oriented segment. In 2022 a total of 3,772 tonnes (56.8%) were sold in the Netherlands. France accounted for 2,085 tonnes (31.4%) of the sales, while the United Kingdom emerged as a significant destination for the first time, receiving 779 tonnes (11.7%) (Figure 20).

In addition, a small portion of farm-gate product (3.3%) was sold locally to finishing production units in a half-grown state.

**Figure 20** Seabed cultured mussel market destinations by % of total export volume, 2022.

#### 2.4.4 Inputs and Costs

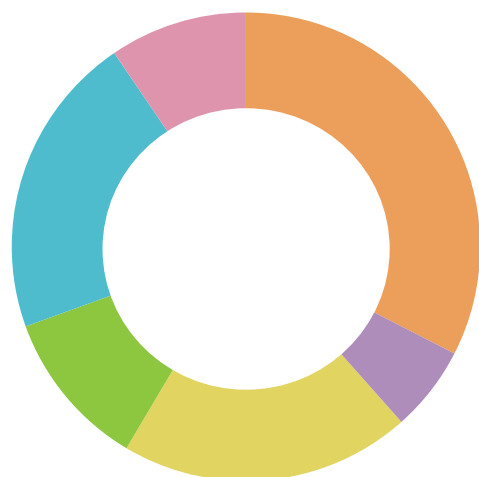
The proportion of costs relative to income has slightly increased from 91% to 92%. The largest cost increases were observed for energy costs and wages and salaries. The latter has risen across all segments and now accounts for 38% of total costs in this segment (Table 21).

Input costs encompasses the expenses associated with finding, gathering, transporting, and relaying seed on licensed ground, typically using a dredger. As shown in Figure 21, the significant drop of 42% in this category from 2021 suggests that seed availability was relatively better in 2022 than in some recent years. Another notable category is 'other operational costs', which represents 23% of the total costs.

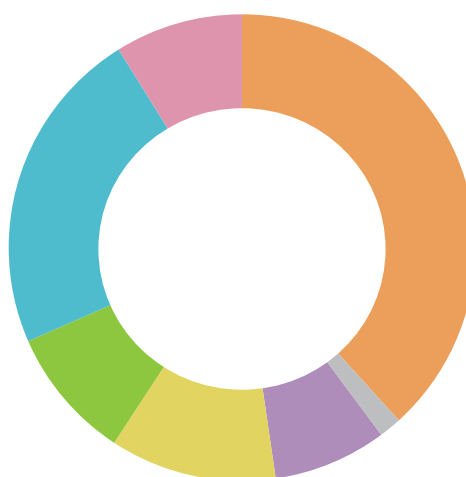
**Table 21** Seabed cultured mussel production costs ('000s €) trend 2021 to 2022

Bottom mussel culture costs	2021	2022	% Trend, 2021 to 2022	% of Total 2022 cost
<b>Total income</b>	<b>€9,480</b>	<b>€9,524</b>	<b>0.5%</b>	
Wages and salaries	€2,815	€3,362	19.4%	38%
Value of unpaid labour	€0	€132	0%	2%
Energy costs	€489	€689	41%	8%
Total input cost	€1,727	€1,010	-41.5%	12%
Feed cost	€0	€0	0%	0%
Repair and maintenance	€919	€810	-11.9%	9%
Other operational costs	€1,819	€1,969	8.2%	23%
Depreciation	€827	€780	-5.6%	9%
<b>Total costs</b>	<b>€8,595</b>	<b>€8,751</b>	<b>1.8%</b>	<b>100%</b>
<b>Cost % of Income</b>	<b>91%</b>	<b>92%</b>		

**Seabed cultured mussel: production costs in 2021**



**Seabed cultured mussel: production costs in 2022**

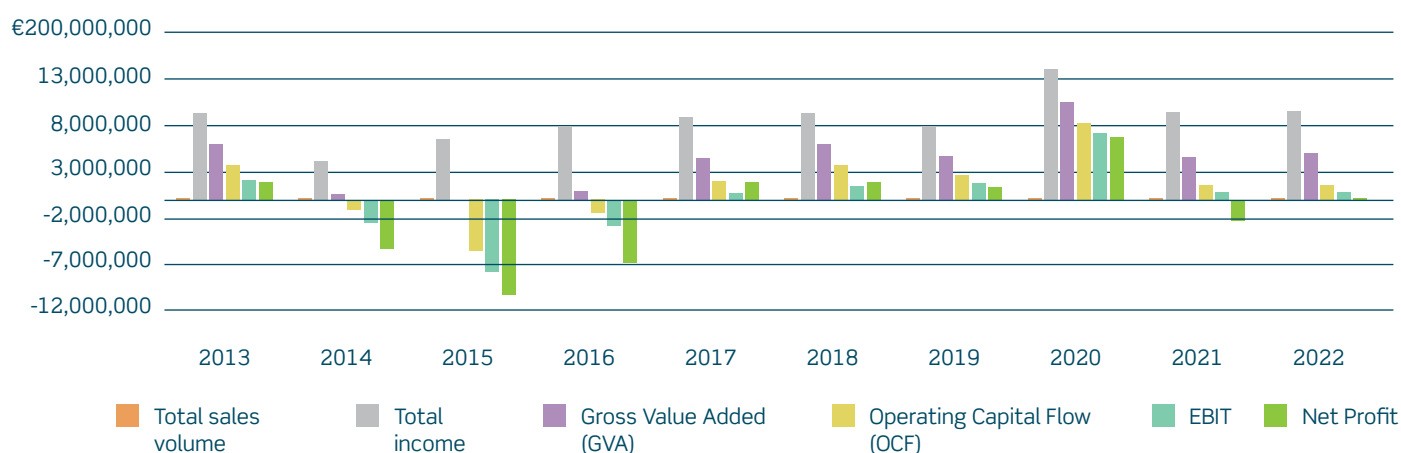


- Wages and salaries
- Imputed value of unpaid labour
- Energy costs
- Total Input Cost
- Feed Cost
- Repair and maintenance
- Other operational costs
- Depreciation

**Figure 21** Seabed cultured mussel production costs, 2021 and 2022

### 2.4.5 Economic performance

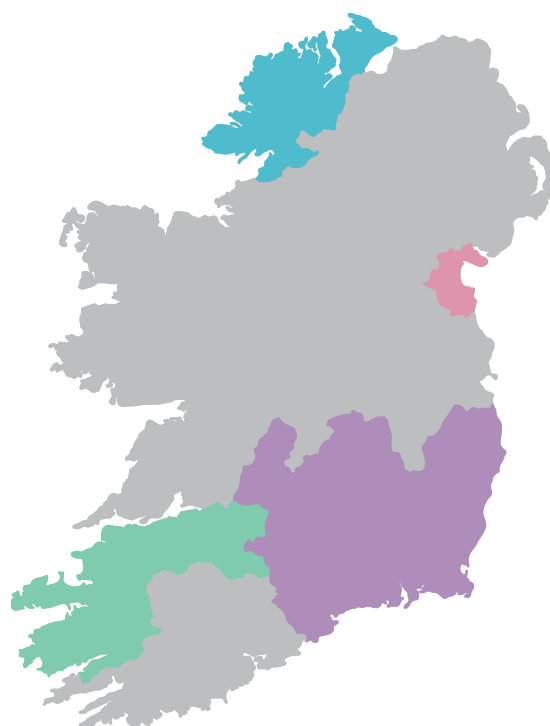
The segment achieved a total income of €9.5 million, slightly higher than the previous year. This positive performance contributed to positive economic indicators, although the net profit remained at a break-even level. Gross Value Added (GVA) to the economy increased by over €500,000, reaching €5 million (Figure 22).



**Figure 22** Seabed cultured mussel 10-year economic performance, 2013-2022

<b>National 2022</b>			
Output (tonnes):	6,864	Total Employed:	103
Sales Value ('000s€):	€8,966	Production Units:	19
<b>North</b>		<b>Northeast</b>	
Output (tonnes):	8	Output (tonnes):	2,260
Total Employed:	5	Total Employed:	42
Production Units:	2	Production Units:	5
<b>Southwest</b>		<b>Southeast</b>	
Output (tonnes):	495	Output (tonnes):	4,101
Total Employed:	23	Total Employed:	33
Production Units:	6	Production Units:	6

**Figure 23** Map of seabed cultured mussel output and employment by NUTs III regions, 2022



## 2.5 Other Segments

In addition to the four main aquaculture segments, there are other ongoing productions in the industry.

The seabed culture of native oysters (*Ostrea edulis*) and King Scallops (*Pecten maximus*) continue to be cultivated. Clam cultivation (*Ruditapes philippinarum*) has resumed on a smaller scale in specific sites along the west coast. The land-based finfish sector consists of freshwater Atlantic salmon hatcheries and Rainbow trout (*Oncorhynchus mykiss*) on-growing PUs.

A nascent saltwater cultivation of lumpfish is also emerging, primarily used for controlling ectoparasites in salmon stocks within on-growing units. This cultivation is carried out in through-flow tanks, ponds, or cages located in lakes.

Additionally, there are several land-based shellfish units that rear shellfish in tanks, as well as a rapidly developing suspended culture seaweed segment. The distribution of these units by county can be found in Table 22.

**Table 22** Distribution of other aquaculture units, 2022

	Other extensive shellfish	Land based shellfish	Seaweed	Salmon Hatcheries	Freshwater trout	Perch/Charr/Other
Clare						
Cork						
Donegal						
Galway						
Kerry						
Kilkenny						
Mayo						
Offaly						
Roscommon						
Sligo						
Tipperary						
Wexford						
Wicklow						

## 2.5.1 Native oysters

### 2.5.1.1 Output and production

In 2022, the volume output of native oysters decreased by 9% compared to 2021, amounting to 399 tonnes. However, there was a significant increase in the average unit sales price, reaching €5.91 per kilogram. As a result, the overall value generated from native oyster sales rose by 16% to €2.36 million, surpassing the value generated in 2021 (Table 23).

The majority of exports - accounting for 62% of the total - were sent to Spain, followed by France (23%) and the Netherlands (15%).

Lough Foyle and Tralee Bay are the most significant production areas for native oysters, producing 97% of output equivalent to 389 tonnes in 2022. The other producing bays are Galway Bay, Kilkieran Bay, Clew Bay, Blacksod Bay and Lough Swilly.

### 2.5.1.2 Employment, Business structure, capacity

In the seabed culture of native oysters' segment, employment primarily consists of casual workers who are members of co-operatives. These workers have a short season of operation and use small vessels and light dredges to harvest the seabed cultured stock.

In 2022, employment in the segment increased by 18 people (three FTE) to reach a total of 290. The workforce in this segment is predominantly male, making up 96% of the employed individuals (Table 24). The culture practices are extensive, and production is maintained at a low density per hectare. The segment operates with 12 PUs, primarily organised as cooperatives, located in seven bays stretching from Kerry to Donegal (Figure 24).

**Table 23** Other bottom bivalve culture output, 2021 and 2022

	2021	2022	% trend
Volume (tonnes)	440	399	-9%
Value ('000s €)	€2,037	€2,358	16%

**Table 24** Other bottom bivalve employment and production units, 2021 and 2022

Employment categories	2021	2022	% Trend
Male employed	255	273	7%
Female employed	18	18	0%
Total Employed	273	290	6%
Total FTE	50	53	5%
5 or less employed	5	4	-20%
6-10 employed	1	2	100%
10 or more employed	6	6	0%
Production Units	12	12	0%



**Figure 24** Production bay locations of other bivalve shellfish aquaculture by output volume (tonnes) in Ireland, 2022

## 2.5.2 Land-based finfish production

### 2.5.2.1 Output, employment, production units and capacity

This sector encompasses various species including salmon, Rainbow trout, European perch, Arctic charr, and lumpfish. In 2022, there were a total of 21 PUs within this category, employing 75 persons. The PUs utilised a combination of ponds, tanks, and pens, with a combined capacity of 111,779 m<sup>3</sup> to produce 1,009 tonnes in 2022. The licensed area used for production covered 75 hectares (Table 25).

The total production volume from the land-based units in 2022 was 1,009 tonnes, with a total sales value of €8.9 million. The production systems used in the Irish PUs are primarily of the through-flow type, which differs from the Recirculation Aquaculture Systems (RAS) used in other jurisdictions.

### 2.5.2.2 Costs and economic performance

The land-based units generated a total income of €8.9 million with total costs amounting to €6.46 million accounting for 72.7% of the income in 2022 (Table 26). Although the trout sector experienced a decrease in output, there was a slight increase in unit sales value. The production of lumpfish for salmon cages shows promising signs of continuing success.

As shown in Table 26, this category witnessed a 22% increase in costs. Energy, wages and salaries, and depreciation expenses recorded significant increases of 57%, 44%, and 144% respectively. Wages and salaries, feed, and other operational costs constituted 64% of the total costs in 2022. These cost components experienced increases ranging from 10% to 44% during that period.

**Table 25** Land-based fin-fish aquaculture output, employment, and capacity, 2022

Variables	Values
Tonnage output	1,009
Sales value ('000s)	€8,883
Total Employed	75
Total FTE	60
Sum of Production Units	21
Licensed Capacity (m <sup>3</sup> )	111,779
Number of Structures Used	526

**Table 26** Land-based fin-fish aquaculture production costs ('000s €), 2021 and 2022

Freshwater Finfish	2021	2022	% Trend, 2021 to 2022	% of Total 2022 cost
<b>Total income</b>	<b>€5,805</b>	<b>€8,883</b>	<b>53%</b>	
Wages and salaries	€1,197	€1,729	44%	26.8%
Imputed value of unpaid labour	€2.5	€0	0%	0%
Energy costs	€405	€634	57%	9.8%
Total input cost	€776	€674	-13%	10.4%
Feed cost	€1,163	€1,291	11%	20%
Repair and maintenance	€478	€359	-25%	5.6%
Other operational costs	€988	€1,092	10%	16.9%
Depreciation	€277	€676	144%	10.5%
<b>Total costs</b>	<b>€5,287</b>	<b>€6,456</b>	<b>22%</b>	
<b>Cost % of Income</b>	<b>91.1%</b>	<b>72.7%</b>		



### 2.5.3 Seaweed

The relatively new segment of seaweed production experienced a growth in output volume, reaching 493 tonnes, with a sales value of €400,000. The segment employs 33 individuals across 10 PUs (Table 27).

Production is carried out using 343 longlines, covering 165 hectares of licensed sub-tidal inshore area. The primary cultured species in this segment is *Alaria esculenta* (commonly known as winter weed), a red macro-alga that can be cultivated to harvest specification within a span of six months. The seed for cultivation is sourced from a hatchery in Cork and is placed in on-growing suspended culture sites in December, ready for harvest from May onwards. The unit value per kilogram ranges from €1 to €3 based on wet weight.

Additionally, a variety of other seaweed groups, including *Laminaria* and *Saccarina* species, are also cultivated within this segment. The segment is undergoing a phase of investment to bring it to an economically sustainable scale. The segment had not yet reached a point of net profitability in 2022.

**Table 27** Seaweed culture output and employment, 2022

Year	2022
Tonnage output	493
Sales value ('000s €)	€396
Total employed	33
Total FTE	19
Production Units	10
Licensed capacity (Hectares)	165
Number of structures used	343





# 3. Appendix

## Appendix 1 Concepts, terms, and definitions

**Financial Position:** The financial position of a business or grouping of them is an EU Data Collection Framework economic indicator measuring liquidity. The formula is:

$$(Assets-debt/debt)*100$$

**Future Expectations of the industry (FEI):** A measure of its trend towards growing, surviving or leaving the sector, depending on its value being positive, zero or negative, in that order. The formula is:

$$(Net\ investment-Depreciation/assets)$$

**Turnover:** Comprises the totals invoiced during the reference period and corresponds to market sales of goods or services supplied to third parties. Turnover includes all duties and taxes on the goods or services invoiced by the unit with the exception of the VAT invoiced by the unit vis-à-vis its customer and other similar deductible taxes linked to turnover. It also includes all other charges (e.g., transport, packaging) passed on to the customer, even if these charges are listed separately in the invoice. Reduction in prices, rebates, and discounts as well as the value of returned packing must be deducted. Income classified as other operating income, financial income and extraordinary income in company accounts is excluded from turnover.

**Subsidies:** The financial assistance received from public authorities or the institutions of the European Union which are excluded from turnover. It includes direct payments, e.g., compensation for stopping trading, refunds of fuel duties or similar lump sum compensation payments; excludes social benefit payments and indirect subsidies (e.g., reduced duty on inputs such as fuel or investment subsidies).

**Other income:** Refers to other operating income included in company accounts which are excluded from turnover; income coming from other activities than aquaculture (e.g., the licensing of ponds for recreational fishery purposes).

**Wages and salaries:** Defined as “the total remuneration, in cash or in kind, payable to all persons counted on the payroll (including homeworkers), in return for work done during the accounting period.” regardless of whether it is paid on the basis of working time, output or piecework and whether it is paid regularly or not. Wages and salaries include the values of any social contributions, income taxes etc. payable by the employee even if they are actually withheld by the employer and paid directly to social insurance schemes, tax authorities, etc. on behalf of the employee. Wages and salaries do not include social contributions payable by the employer.

**Social security costs:** Employers’ social security costs correspond to an amount equal to the value of the social contributions incurred by employers in order to secure for their employees the entitlement to social benefits. Imputed value of unpaid labour: Unpaid workers normally refer to persons who live with the proprietor of the unit and work regularly for the unit, but do not have a contract of service and do not receive a fixed sum for the work they perform. This is limited to persons who are not included on the payroll of another unit as their principal occupation. Thus, imputed value of unpaid labour estimates the value of the salaries that these unpaid workers would have received if their work was remunerated.

**Energy costs:** Corresponds to the purchase of energy products (in value) during the reference period.

**Livestock costs:** Correspond to the variable livestock volume. Feed costs: Include the purchasing costs of the feed during the reference period. The feed costs should correspond to feed volume.

**Repair and maintenance:** Under repair and maintenance there should be included the costs incurred to bring an asset back to its earlier condition or to keep the asset operating at its present condition (as opposed to improving the asset).

**Other operational costs:** Comprise outsourcing costs, property or equipment rental charges, the cost of raw materials and supplies that cannot be held in the inventory and have not been already specified (i.e. water, small items of equipment, administrative supplies, etc.), insurance premiums, studies and research costs, external personnel charges, fees payable to intermediaries and professional expenses, advertising costs, transportation charges, travel expenses, the costs of meetings and receptions, postal charges, bank charges (but not interest on bank loans) and other items of expenditure.

**Depreciation of capital:** Refers to the decline in value of the assets. In accounting, it is used as the allocation of the cost of tangible assets to periods in which the assets are used, in order to reflect this decline in their value.

**Livestock (volume):** Volume of livestock purchased during the reference period. The livestock volume should correspond to the livestock cost.

**Fish feed (volume):** Volume of feed purchased during the reference period. The feed volume should correspond to feed cost.

**Volume of sales:** The volume of sales should correspond to the variable on turnover value.

**Number of persons employed (Total employment):**

This indicator refers to the number of people employed (including full-time and part-time employees inclusive of working proprietors, partners working regularly in the unit and unpaid family workers), as well as persons who work outside the unit who belong to it and are paid by it (e.g., sales representatives, delivery personnel, repair, and maintenance teams). The number of employees should be reported by gender.

**FTE National:** The number of employees converted into full time equivalents (calculation methodologies vary between countries).

**Number of enterprises:** This parameter corresponds to a count of the number of enterprises active during at least a part of the reference period.

**Average wage:** The average salary or mean wage estimates the salary an employee working full time is receiving in this sector. It includes the salaries, the social security costs, and imputed value of unpaid labour.

*Mean wage = (Wages and salaries + Imputed value of unpaid labour) / FTE*

**Gross Value Added (GVA):** Measures the contribution of the sector to the economy and is defined as the gross income from operating activities after adjusting for operating subsidies and indirect taxes. It can be calculated from turnover, plus capitalised production, plus other operating income, plus or minus the changes in stocks, minus the purchases of goods and services, minus other taxes on products which are linked to turnover but not deductible, minus the duties and taxes linked to production.

Gross Value Added is calculated on this report as:

*GVA = Turnover + Other Income – Energy costs – Livestock costs – Feed costs – Repair and maintenance – Other Operational costs.*

**GVA to Revenue:** Indicates the share of revenue that contributes to the economy through factors of production (returns to labour and returns to capital). Indicator is calculated as the ratio between gross value added and revenue (the sum of Turnover and Other Income). Expressed as a percentage.

*GVA to Revenue = GVA / Turnover + Other Income 100%*

**Earnings Before Interest and Tax (EBIT):** Or “Operating profit” is a measure of a firm's profitability that excludes interest and income tax expenses.

*EBIT = Turnover + Other Income + Subsidies – Energy costs – Wages and salaries – Imputed value of unpaid labour – Livestock costs – Feed costs – Repair and maintenance – Other*

**Net profit:** Measure of a firm's profitability that includes the results of financial activity of the enterprise.

**Net profit margin:** Measure of the economic performance of a sector or enterprise expressed in relative terms. It is a difference between total income and all incurred costs (operating, capital and financial). Expressed as a percentage.

## Appendix 2

### Aquaculture output tonnage by culture Groups, 2013 to 2022

Culture Groups	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Bottom Mussel	5,527	3,206	5,697	6,475	7,491	4,697	4,894	4,354	5,865	6,864
Penned Salmon*	9,125	9,368	13,116	16,300	18,342	11,984	11,333	12,870	12,844	11,916
Minor Finfish	988	886	848	720	647	557	608	604	537	398
Other Bottom Bivalves	500	581	521	413	241	250	256	233	443	399
Seaweed/Other	43	72	72	52	96	97	73	75	215	493
Rope Mussel	9,834	8,169	10,318	9,770	8,582	9,541	10,460	10,375	11,762	12,921
Salmon Hatchery	473	488	527	610	545	256	400	462	522	611
Farmed oyster	8,146	8,939	8,953	9,459	9,990	10,196	9,899	8,763	10,624	11,121
<b>National value</b>	<b>34,635</b>	<b>31,708</b>	<b>40,052</b>	<b>43,798</b>	<b>45,934</b>	<b>37,577</b>	<b>37,922</b>	<b>37,735</b>	<b>42,812</b>	<b>44,723</b>

\*Sea units only

## Appendix 3

### Aquaculture Sales value by culture groups

Culture Groups	2013	2014	2015	2016
Bottom Mussel	€9,173,400	€4,181,450	€6,015,030	€5,858,497
Penned Salmon	€55,679,943	€57,725,266	€89,835,735	€104,478,116
Minor Finfish	€3,301,950	€3,132,950	€2,727,910	€2,038,910
Other Bottom Bivalves	€2,665,300	€2,995,525	€2,816,550	€2,417,250
Seaweed/Other	€281,000	€280,500	€377,500	€347,500
Rope Mussel	€5,736,008	€5,394,809	€6,672,827	€6,479,047
Salmon Hatchery	€3,261,000	€3,202,500	€4,845,079	€4,166,600
Farmed oyster	€37,108,687	€39,297,661	€34,961,262	€41,175,352
<b>National value</b>	<b>€117,207,288</b>	<b>€116,210,661</b>	<b>€148,251,893</b>	<b>€166,961,272</b>

## Appendix 4

### Aquaculture employment number by culture groups

Culture Groups	2013	2014	2015	2016
Bottom Mussel	130	120	107	114
Penned Salmon	129	131	141	160
Minor Finfish	32	29	26	23
Other Bottom Bivalves	487	502	462	507
Seaweed/Other	25	20	21	26
Rope Mussel	273	260	256	262
Salmon Hatchery	54	53	50	51
Farmed oyster	675	725	772	811
<b>National value</b>	<b>1,805</b>	<b>1,840</b>	<b>1,835</b>	<b>1,954</b>

2017	2018	2019	2020	2021	2022
€8,829,931	€6,074,218	€7,885,878	€7,067,211	€9,141,696	€8,966,418
€133,519,265	€95,742,392	€108,721,367	€118,942,346	€106,108,320	€101,112,470
€1,970,910	€1,635,000	€1,674,425	€1,882,885	€1,762,045	€2,224,091
€1,387,150	€1,375,000	€1,238,650	€853,850	€2,047,000	€2,357,599
€342,400	€346,600	€260,200	€271,265	€753,115	€396,239
€5,774,665	€6,069,065	€6,906,938	€6,200,213	€8,078,215	€9,671,218
€5,345,605	€5,118,322	€3,393,079	€7,831,331	€3,437,000	€6,658,420
€43,727,845	€44,609,884	€44,057,456	€36,735,163	€47,551,477	€54,685,948
<b>€200,897,771</b>	<b>€160,970,480</b>	<b>€174,137,992</b>	<b>€179,784,263</b>	<b>€178,878,868</b>	<b>€186,072,403</b>

2017	2018	2019	2020	2021	2022
124	112	102	110	98	103
149	179	194	170	223	238
19	20	22	22	21	26
491	505	524	376	273	290
31	29	32	29	35	33
240	228	226	249	228	232
63	51	49	47	48	49
823	847	837	850	1,024	1,037
<b>1,940</b>	<b>1,971</b>	<b>1,986</b>	<b>1,853</b>	<b>1,950</b>	<b>2,008</b>

## Appendix 5

### Aquaculture Economic performance 2013 to 2022

Variable	2013	2014	2015	2016
Turnover	€117,724,288	€116,298,661	€148,594,293	€167,724,372
Subsidies	€782,533	€1,719,820	€1,816,919	€4,316,202
Financial income	-	-	-	-
Other income	-	-	-	-
Other income Total	€782,533	€1,719,820	€1,816,919	€4,316,202
Total income	€118,741,434	€126,521,383	€154,505,319	€176,106,777
Wages and salaries	€23,556,423	€28,256,803	€30,872,908	€27,854,618
Imputed value of unpaid labour	€1,347,506	€1,789,891	€1,517,451	€1,416,301
Energy costs	€11,053,024	€3,782,682	€4,160,373	€4,988,212
Raw material costs: Livestock costs	€14,632,886	€14,678,690	€28,504,784	€16,886,284
Raw material costs: Feed costs	€23,465,062	€24,903,003	€20,100,628	€36,196,864
Repair and maintenance	€11,409,961	€7,034,956	€9,412,331	€9,851,804
Other operational costs	€26,211,630	€25,238,866	€29,141,074	€33,084,156
Depreciation of capital	€6,926,407	€5,028,579	€9,132,866	€5,745,397
Financial costs, net	€3,025,541	€6,367,228	€8,979,875	€4,877,908
Extraordinary costs, net	€365,602	€6,997,236	€40,242,642	€4,914,061
Sum of costs	€120,280,934	€115,290,807	€140,304,839	€139,485,242
Total value of assets	€165,109,019	€199,768,441	€175,865,728	€190,942,888
Net Investments	€3,893,007	€20,441,417	€3,833,551	€7,208,575
Debt	€85,266,379	€85,968,019	€76,138,898	€84,362,877
Raw material volume: Livestock	€15,598	€15,866	€17,592	€15,612
Raw material volume: Feed	€11,049	€17,030	€13,333	€23,883
Total sales volume	€34,667	€31,659	€40,128	€44,018
Male employees	1,716	1,692	1,713	1,798
Female employees	124	129	118	150
Total employees	1,840	1,821	1,830	1,948
Male FTE	891	871	917	950
Female FTE	66	70	67	78
FTE	956	941	983	1,027
Number of enterprises: 5 or less employed	198	197	200	194
Number of enterprises: 6-10 employed	58	49	48	61
Number of enterprises: 10 or more employed	27	31	31	34

All information in red is provisional

2017	2018	2019	2020	2021	2022
€200,017,543	€179,455,531	€175,288,680	€179,962,851	€178,878,868	€186,071,314
€1,724,345	€2,769,867	€1,720,133	€9,538,153	€2,224,592	€2,224,592
€32,269,404	€776,749	€989,726	€5,971,344	€373,574	€3,367,581
€979,456	€1,688,522	€3,387,468	€16,700,557	€11,398,805	€15,227,930
€34,973,205	€5,235,137	€6,097,327	€32,210,055	€13,996,971	€20,820,103
€234,990,748	€184,690,669	€178,143,158	€212,172,906	€192,875,840	€206,891,417
€26,830,773	€29,820,207	€31,027,724	€34,331,124	€33,697,747	€39,700,353
€852,315	€1,966,961	€309,763	€3,480,619	€2,203,905	€2,500,113
€2,693,931	€9,564,373	€2,736,982	€3,689,535	€5,573,681	€8,828,723
€14,280,006	€12,317,040	€18,623,317	€14,679,024	€32,024,488	€32,470,093
€31,099,907	€23,658,466	€21,733,606	€30,536,557	€37,995,860	€35,833,445
€9,721,112	€9,397,921	€5,949,501	€7,777,028	€9,548,801	€13,412,074
€18,099,786	€65,402,360	€64,917,632	€60,710,589	€64,934,180	€46,131,864
€9,057,950	€9,346,213	€12,488,705	€10,030,618	€9,193,925	€12,290,823
€3,084,344	€1,355,238	€1,301,243	€18,300,472	€8,786,587	€4,314,143
€47,924,575	€5,308,483	€2,110,405	-	-	-
€114,867,810	€160,861,817	€158,778,709	€180,054,946	€191,122,449	€192,981,518
€194,431,686	€240,470,462	€315,087,657	€315,087,657	€252,253,199	€253,995,700
€7,639,443	€10,548,856	€11,130,926	€11,130,926	€6,728,866	€5,063,710
€66,635,403	€79,492,327	€70,675,213	€70,675,213	€79,528,553	€87,287,286
€14,083	€860,790	€3,361,766	€12,138,047	€5,050,377	€14,220,469
€22,576	€16,347	€20,113	€20,388	€24,328	€20,653
€45,726	€37,201	€38,289	€37,822	€42,970	€44,723
1,773	1,709	1,824	1,665	1,768	1,764
150	149	162	188	189	239
1,923	1,858	1,986	1,853	1,957	2,002
950	1,006	999	926	1,038	1,032
78	77	81	90	106	138
1,026	1,083	1,080	1,016	1,128	1,170
185	181	200	208	220	187
67	68	48	61	57	60
30	32	40	41	41	45

## Appendix 6

### Aquaculture Economic Indicators 2013 to 2022

Culture Groups	2013	2014	2015	2016
Total sales volume	€34,667	€31,659	€40,128	€44,018
Total income	€118,741,434	€126,521,383	€154,505,319	€176,106,777
Gross Value Added (GVA)	€45,799,427	€46,397,303	€66,772,520	€86,114,597
Operating Capital Flow (OCF)	€8,177,835	€14,123,481	€28,219,114	€43,178,637
EBIT	€1,251,428	€9,094,902	€19,086,248	€37,433,241
Net Profit	-€2,139,715	-€4,269,563	-€30,136,269	€27,641,271
Return on Investment (ROI)	0.0	0.0	0.1	0.2
Financial Position	0.9	1.3	1.3	1.3
FTE	956	941	983	1,027
Subsidies	€782,533	€1,719,820	€1,816,919	€4,316,202
Labour productivity	€47,883	€49,285	€67,903	€83,887
Capital productivity	0.3	0.2	0.4	0.5
Running cost to turnover ratio	94	89	82	77
EBIT to turnover ratio	1	7	12	21
GVA per FTE	€47,883	€49,285	€67,903	€83,887
Future Expectations of the Industry (FEI)	0	0	0	0

All information in red is provisional



2017	2018	2019	2020	2021	2022
€45,726	€37,201	€38,289	€37,822	€42,970	€44,723
€234,990,748	€184,690,669	€178,143,158	€212,172,906	€192,875,840	€206,891,417
€160,086,131	€109,330,583	€107,264,378	€128,936,666	€83,584,064	€90,058,803
€132,265,233	€34,530,302	€36,397,245	€60,449,050	€9,101,083	€30,514,865
€123,207,282	€25,184,089	€23,908,540	€50,418,432	-€92,842	€18,224,042
€72,198,363	€18,520,369	€20,496,893	€32,117,960	-€8,879,429	€13,909,899
0.6	0.1	0.1	0.2	0.0	0.1
1.9	2.0	3.5	3.5	2.2	1.9
1,026	1,083	1,080	1,016	1,128	1,170
€1,724,345	€2,769,867	€1,720,133	€9,538,153	€2,224,592	€2,224,592
€156,027	€100,952	€99,293	€126,906	€74,087	€76,973
0.8	0.5	0.3	0.4	0.3	0.4
51	84	83	84	103	95
52	14	13	24	0	9
€156,027	€100,952	€99,293	€126,906	€74,087	€76,973
0	0	0	0	0	0

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