BIM
Ireland's Seafood Development Agency

Annual Aquaculture Report

A Snapshot of Ireland's Aquaculture Sector

2022

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An Roinn Talmhaíochta, Bia agus Mara
Department of Agriculture, Food and the Marine

Có-mhaoinithe ag an Aontas Eorpach
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1. Overview

The production year of 2020 was, as for most Member States, an unprecedented period due to the onset of the Covid-19 pandemic. The 2021 annual report and the economic study of select production bays carried out by BIM in 2021 both illustrate the pressures the industry faced. This report focuses on the performance of the sector in 2021 and compares with that of 2019, rather than 2020, given the disruption to the industry during 2020. Pre and post pandemic lockdown production periods are therefore compared in order to make a fair performance comparison within normal trading conditions.

By late 2021, the Irish aquaculture sector had largely recovered from the disruptions to production caused by the Covid-19 pandemic and new trading conditions created by Brexit in 2020. Output volume in 2021 was 42,812 tonnes, up 11.8 % on the 2019 pre-lockdown output of 37,922 tonnes. The national output growth trend was largely driven by the shellfish segments. Output value in 2021 was €178.9 million, up 2% on the 2019 output value of €175.3 million.

The number of businesses in the sector has remained stable at 266, operating 313 production units, due in part to the steady growth of start-up units in the farmed oyster segment and the rapid development of units of the new seaweed (i.e., macroalgae) segment. Employment in 2021 had almost fully recovered with 1,950 persons employed compared to the 2019 figure of 1,980 persons (and a 2020 lockdown low of 1,853). Meanwhile, Full Time Equivalent (FTE) employment reached a 13-year high of 1,127 persons.

Profitability was significantly impacted by increasing costs, in particular for stock input and feed costs. Gross Value Added (GVA) to the economy was down -33% to €87 million (provisional) in 2021 compared to €128.9 in 2019. In 2021, net profitability for the sector was estimated to be a marginal €800,000 compared to a value of €32.1 million in 2019. The effects of the Covid-19 lockdown periods and of changes arising from Brexit collectively increased costs and negatively impacted product placement and unit sales value of some products of both the shellfish and finfish segments. Economics of scale challenges became more pronounced for parts of the finfish sector and the entry of competitors into the organic salmon market is a particular challenge for Irish producers.

In summary, 2021 was a year of strong output recovery and business expansion for the aquaculture sector and particularly for the shellfish sector. Employment was successfully safeguarded by both shellfish and finfish sectors through the assistance of state-funded pandemic schemes (e.g., Pandemic Unemployment Payment (PUP) Scheme). Looking ahead, employment is expected to increase in addition to a recovery in unit sales values.

NATIONAL AQUACULTURE: SCALE OF OPERATION IN 2021

€179M
Turnover

€13M
Other Income

€192M
TOTAL INCOME

€30M
Wages and Salaries

€9M
Repair and Maintenance

€5M
Energy Costs

€59.7M
Other Operational Costs

Raw Material **LIVESTOCK** 17,004 TONNES

Raw Material **LIVESTOCK** €31M

Raw Material **FEED** 24,157 TONNES

Raw Material **FEED** €38M

MALE EMPLOYEES 1,760

FEMALE EMPLOYEES 190

TOTAL EMPLOYEES 1,950

FTE 1,127

Number of enterprises

315

production units

Total sales volume

42,812

Number of structures used

498,000

EARNINGS BEFORE INTEREST AND TAXES (EBIT) €10M

Depreciation of capital

€9M

Licenced Hectares

12,000

€191M

Total costs

€87M

Gross Value Added (GVA)

NET PROFIT

€0.8M

2. National level report

In 2021, the Irish aquaculture sector saw a general recovery and increase in sectoral output volume and sales value returning to pre-lockdown 2019 figures. Production grew from 37,922 tonnes, to 42,812 tonnes, with the value increasing from €174 million to €178.9 million, an increase of 13% in volume terms, and 3% in value. The overall trend was driven by the shellfish segments where output volume and sales value increased by 13% and 12%. This was due to the strong unit sales value of fresh oyster and mussel products. Sales in the latter half of the year were particularly strong after a slow start to the year.

2.1 National aquaculture output in 2021

The finfish segment maintained output volume however, it showed a marginal decrease in overall sales value. The trend is principally affected by that of the dominant penned salmon segment, where whole and 'head on gutted' unit prices held and finished strongly in the Q3 and Q4. While frozen products dropped in value with over-supply for the same period. A harmful algal bloom in the southwest also impacted output. The total sector export volume of 31,261 tonnes in 2021 was close to the 2019 volume of 31,401 tonnes.

Table 1: Aquaculture output trend by category, 2019 to 2021

Aquaculture Category	2019	2021	% Change
Finfish			
Sales volume (tonnes)	12,341	13,904	13
Sales value (millions €)	114	111	-2
Shellfish/Other			
Sales volume (tonnes)	25,581	28,909	13
Sales value (millions €)	60	68	12
National			
National output (tonnes)	37,922	42,812	13
National Sales value (millions €)	174.1	178.9	3

2.2 Socio-employment, production units and capacity

Overall employment numbers recovered to 1,950 persons in 2021 compared to the pre-lockdown 2019 level of 1,986. This was from a 2020 low of 1,853. The intensity of employment or Full Time Equivalent (FTE) increased by 3% to 1,127 persons in 2021 from 1,089 persons in 2019.

During the lockdown period, the female proportion of the workforce increased from 8% in 2019 to 10% in 2021. The sector's workforce in 2021 comprised predominantly of Irish citizens (89%). Other EU (European Union) nationalities made up 9% and the balance was non-EEA (European Economic Area) workers.

The period saw an increase in the proportion of the workforce reaching retirement age from 4% to 6%. The proportion of 16 to 34-year-old age groups also increased, while that of the 35-64 age groups declined. Most of the workforce had left education by the end of second level. In 2021, this group made up 59% of the workforce while the proportion attaining a third level education made up 24%, a 4% increase on 2019.

The number of aquaculture businesses has increased significantly since 2019 as new entrants to the farmed oyster and seaweed culture have entered commercial output phase. In total there are 267 businesses in the sector, operating 315 Production Units (PUs) in 2021. Approximately 12,000 hectares were used by the sector in production in 2021.

Table 2: Aquaculture employment and production unit trends by segment, 2019 to 2021

Aquaculture Category	2019	2021	% Change
Finfish			
Number employed	265	292	10
Number of FTE	234	268	14
Number of Production units	33	36	9
Shellfish/Other			
Number employed	1,721	1,658	-4
Number of FTE	855	859	0
Number of Production units	261	279	7
National			
Number employed	1,986	1,950	-2
Number of FTE	1,089	1,127	3
Number of Production units	294	315	7

Table 3: Aquaculture employment demographics, 2020 to 2021

Category	% Of Workforce 2020	% Of Workforce 2021	% Trend
Nationality			
Ireland	90	89	-1
EU	9	9	0
EEA	0	0	0
Other	1	2	1
Age Categories			
16-24	27	28	1
25-34	18	20	11
35-44	21	20	-4
45-54	17	15	-11
55-64	13	11	-13
65 or over	4	6	60
Education Level			
Primary education	14	15	8
Secondary education	63	59	-7
Third-level education	20	24	22
Other education	4	3	-28

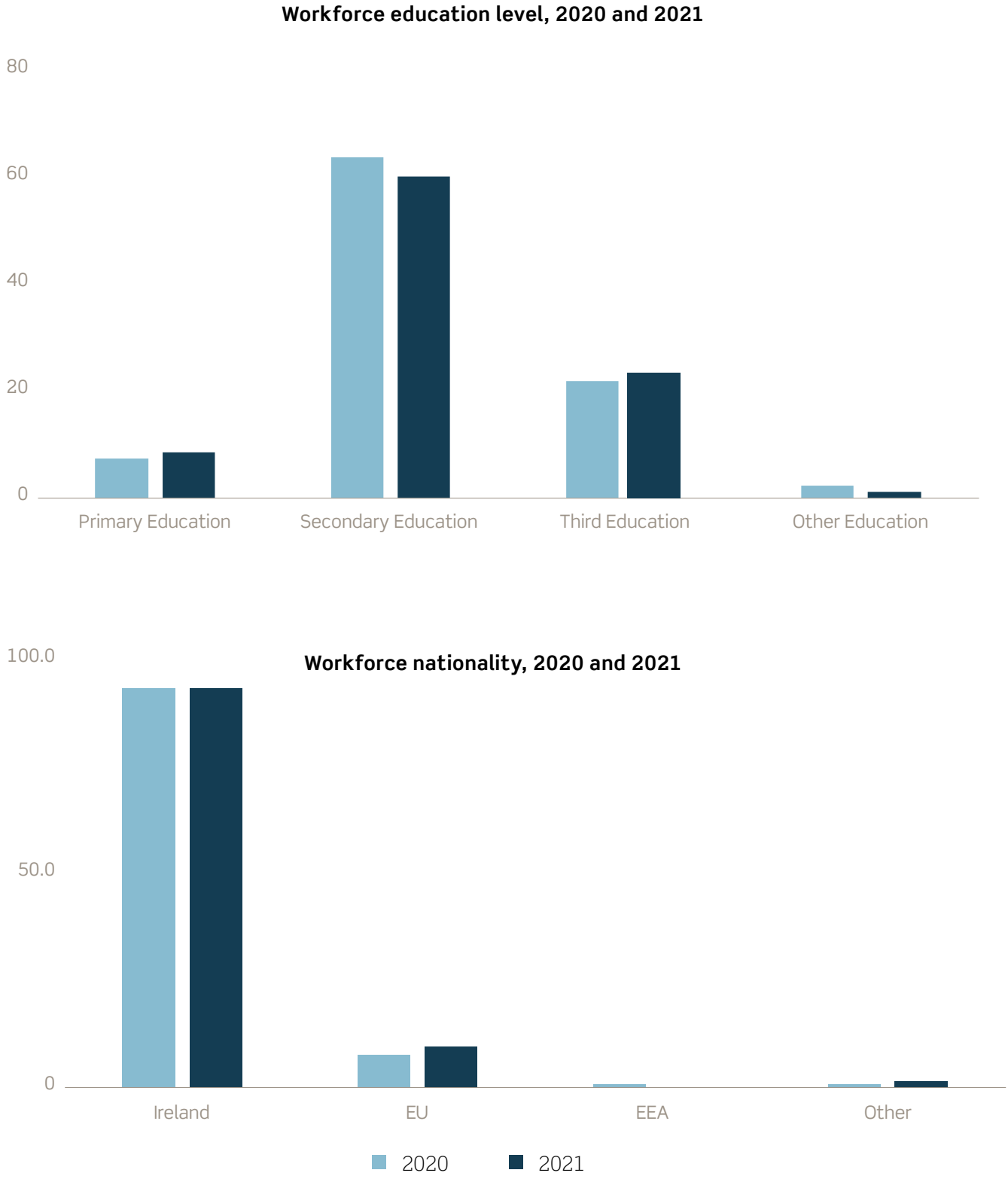


Figure 1: Workforce profile, nationality, and education level, 2020 to 2021

2.3 Markets

The sector is export oriented with the majority of aquaculture produce going to other EU Member States. France and The Netherlands account for 73% by total volume of exports in 2021. Poland, Germany, and Belgium collectively make up 15% and the UK, Switzerland, East Asia, and the Middle East are the most important other non-EU destinations. A total of 31,261 tonnes of produce, consumer-ready and half-grown combined, was exported in 2021 with a value of €130.6 million.

Table 4: Known aquaculture market destinations, 2021

Destination	Tonnes exported	%
France	15,093	54.6
The Netherlands	5,027	18.2
Poland	1,752	6.3
Germany	1,255	4.5
Belgium	1,049	3.8
Southeast Asia	769	2.8
UK	769	2.8
EU Other	867	3.1
Switzerland	386	1.4
North America	148	0.5
Other	550	2.0
Total volume	**27,665**	

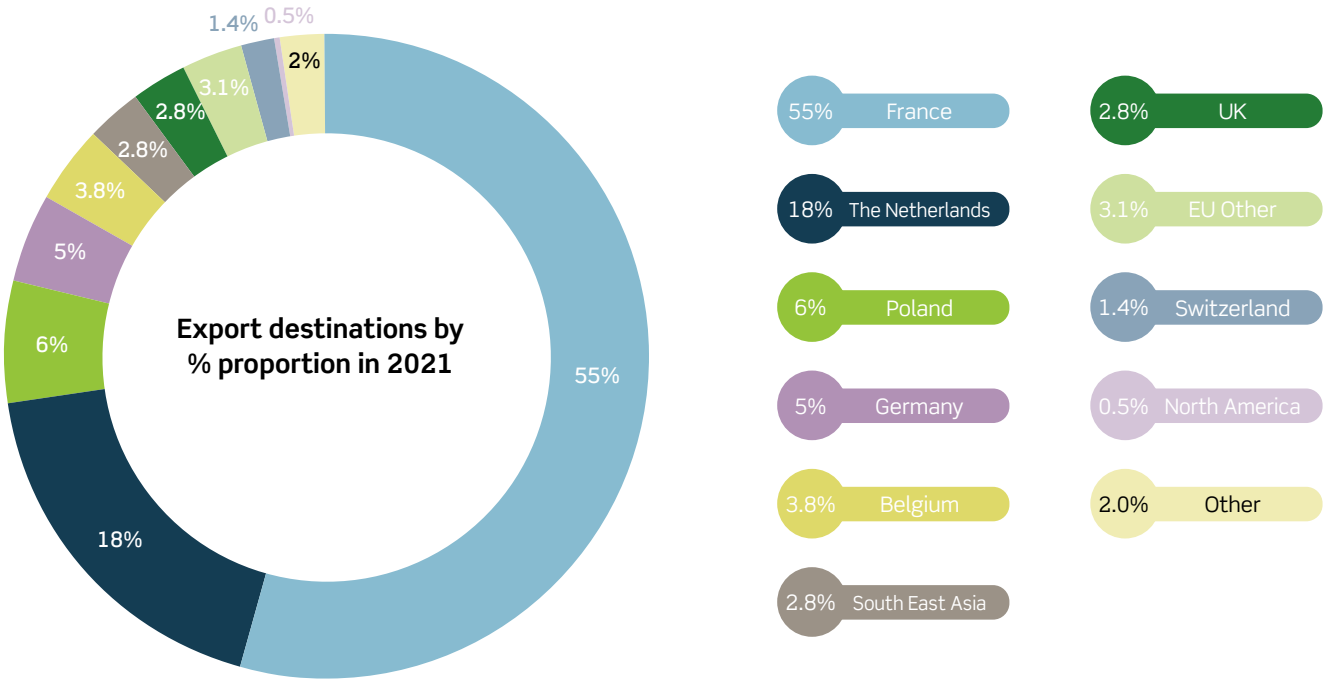


Figure 2: Aquaculture market destinations by %, 2021

2.4 Input and Costs

The costs of raw material over the 2019 to 2021 period increased significantly. Stock input costs increased from €18.4 million to €32.9 million, while feed costs increased from €20.7 million to €37.6 million, from 2019 to 2021. These represent cost increases of 74% and 82% respectively. Wages and salaries during the lockdown were maintained in many cases, with the assistance of the State, via pandemic assistance schemes (e.g. Pandemic Unemployment Payment (PUP) Scheme). Throughout 2021, labour costs were still proportionally lower than for 2019. The average unit personnel cost in 2021 was €26,705. Repairs and maintenance and other operational costs remained proportionately lower than 2019 costs, while energy costs remained unchanged. The overall increase in costs from 2019 to 2021 was 9%.

Table 5: Aquaculture production costs, 2019 to 2021

National-level Costs (millions €)	2019	2021	% Trend
Stock input cost	18.4	32.9	73.9
Feed cost	20.7	37.6	81.6
Wages and salaries	31.5	29.8	-5.4
Imputed value of unpaid labour	2.4	2.3	-4.2
Energy costs	4.9	5.1	3.7
Repair and maintenance costs	10.7	8.8	-17.9
Other operational costs	71.5	59.2	-17.2
Depreciation	9.0	8.5	-6.3
Total Costs	**169.1**	**184.2**	

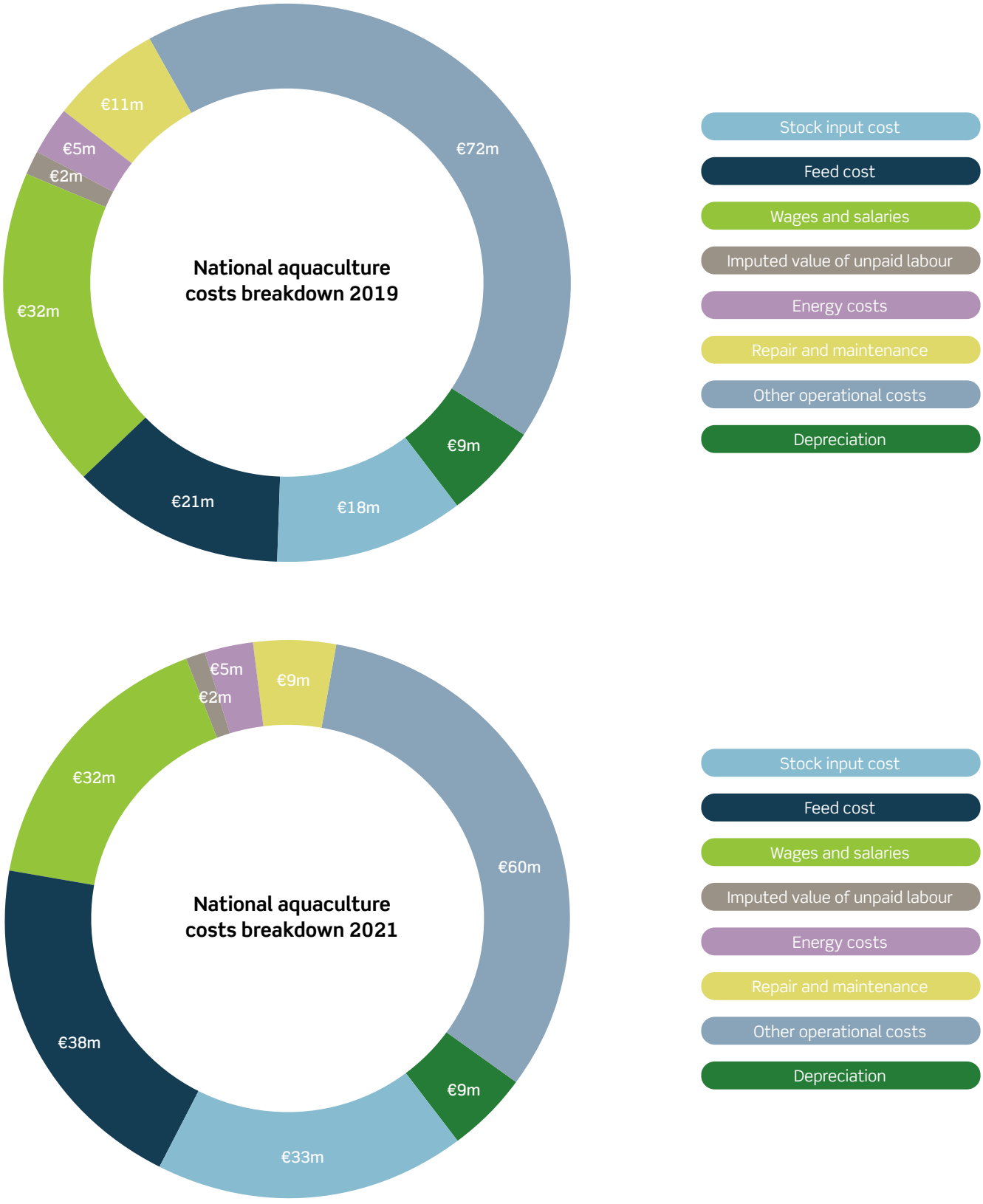


Figure 3: Aquaculture Costs, 2019 to 2021

2.5 Economic Performance

Turnover (€178.9 million), total income (€191.9 million) and output volume (42,812 tonnes) values for 2021 indicate strong economic performance within a 10-year time series but in an environment of increasing costs. This resulted in a mixed set of economic indicator values for 2021.

In 2021, GVA decreased by 24% to €82.6 million compared to €109.3 million in 2019. Operating capital flow and earnings before interest were up on the previous two years, however, net profit for the sector in 2021 dropped below €0.8 million due to increases in certain costs.

Unit sales values per segment show mixed trends for the 2019 to 2021 period. Decreases of -14% were estimated for combined salmon products, -5% for other bottom bivalves and –3% for seabed cultured mussels.

Unit sales values increased by 4% overall for Rope mussels, driven by the fresh market. A strong increase of 19% was observed for the value of Trout product but with decreased output volume. A unit sales value increase of 1% was observed for farmed oysters overall, driven by a recovery for the unit value of Irish 'Speciales'. National output volume and value increased by 3% and 12% respectively in 2019. The decreases in unit sales value however and the increase in costs, in particular input costs for key culture segments such as penned salmon, over the same period heavily impacted sectoral profitability in 2021.

There has been continuing investment by the sector and the State. The latter, together with the EU, invested almost €3 million in 2021 in combined capital and operational development.

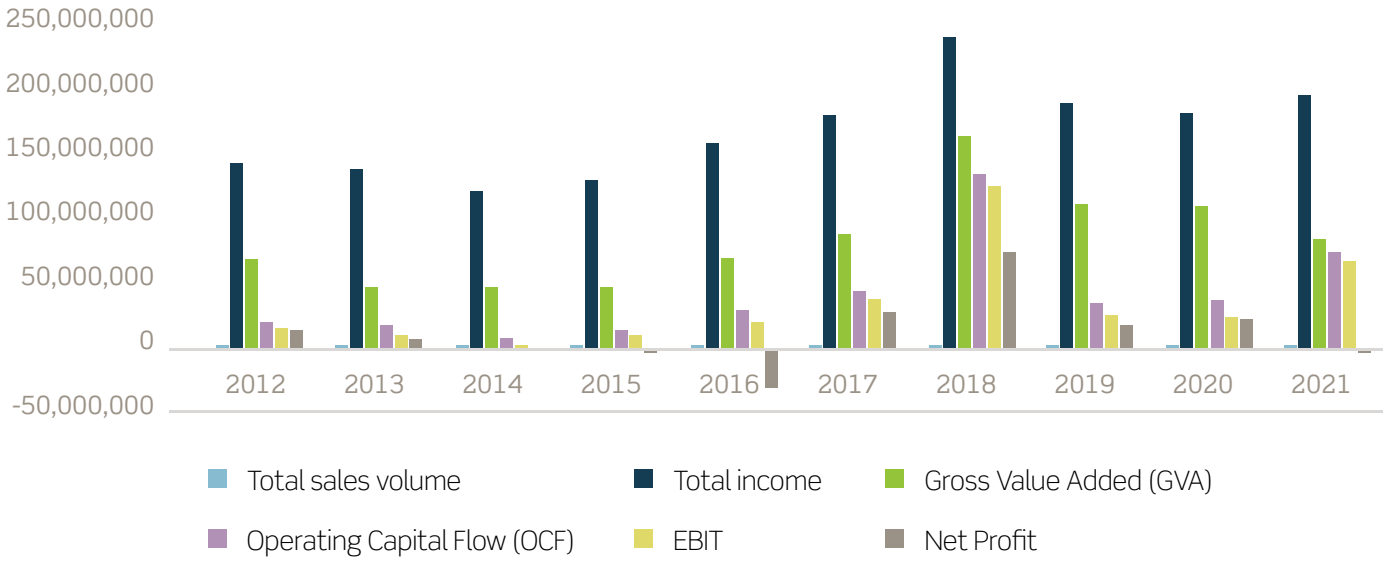


Figure 4: Aquaculture 10-year economic performance to 2021

2.6 Aquaculture: Regional output

The North, Northwest and West regions generated the largest sales value in 2021 accounting for 22%, 21% and 21% respectively, corresponding to the regions where most salmon and oysters are harvested. Employment in the North region has increased to make this the largest regional employer in the aquaculture sector in 2021.

Despite the increases in sales value employment in the Northwest and Southwest have declined. The number of production units has increased throughout the western NUTs III regions, corresponding to the start-up of oyster and seaweed units over the two-year period.

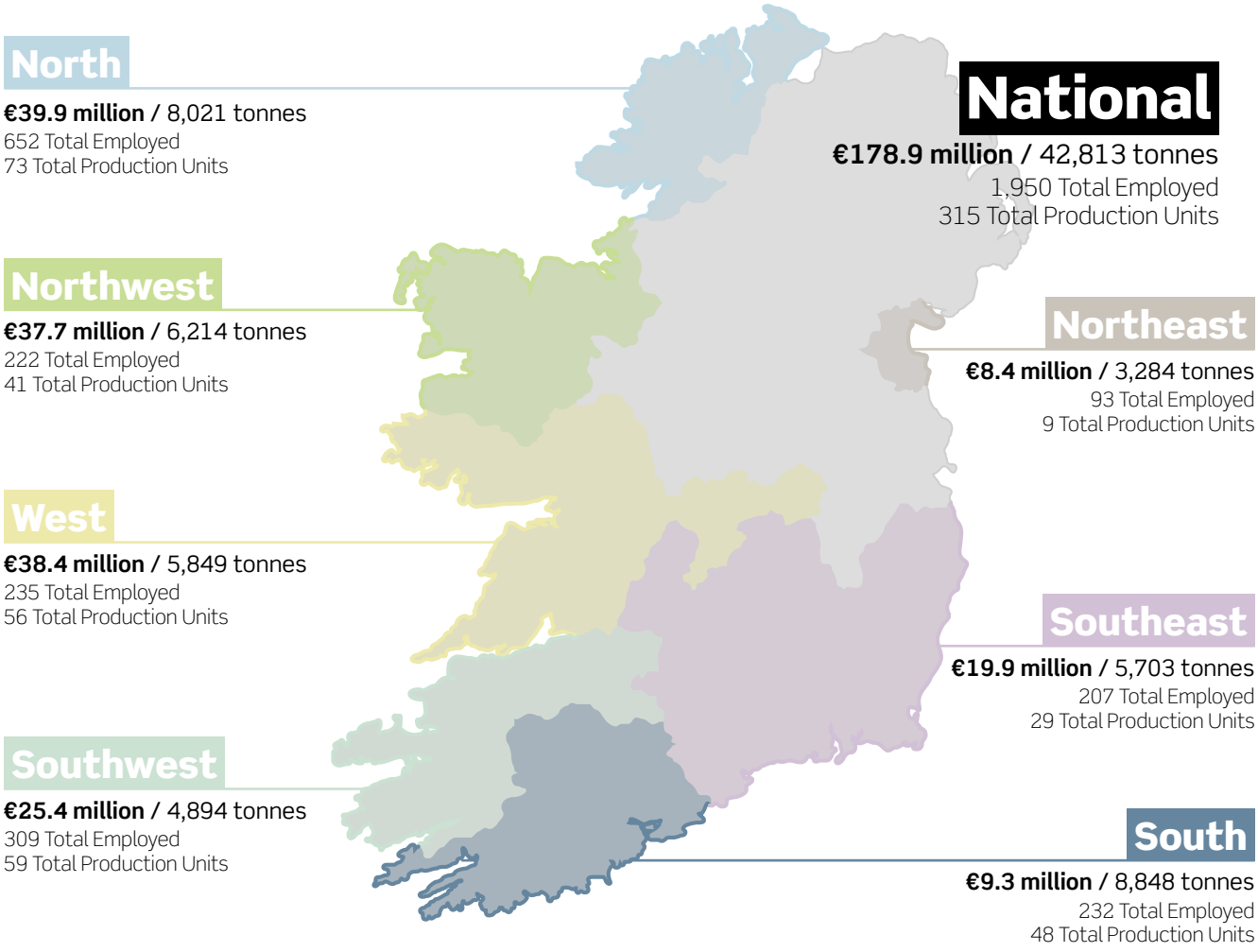


Figure 5: Map of regional outputs in 2021

1. The NUTS classification (Nomenclature of territorial units for statistics) is a hierarchical system for dividing up the economic territory of the EU for the purpose of the collection, development and harmonisation of European regional statistics. NUTS iii: is the small regions level category for specific diagnoses.

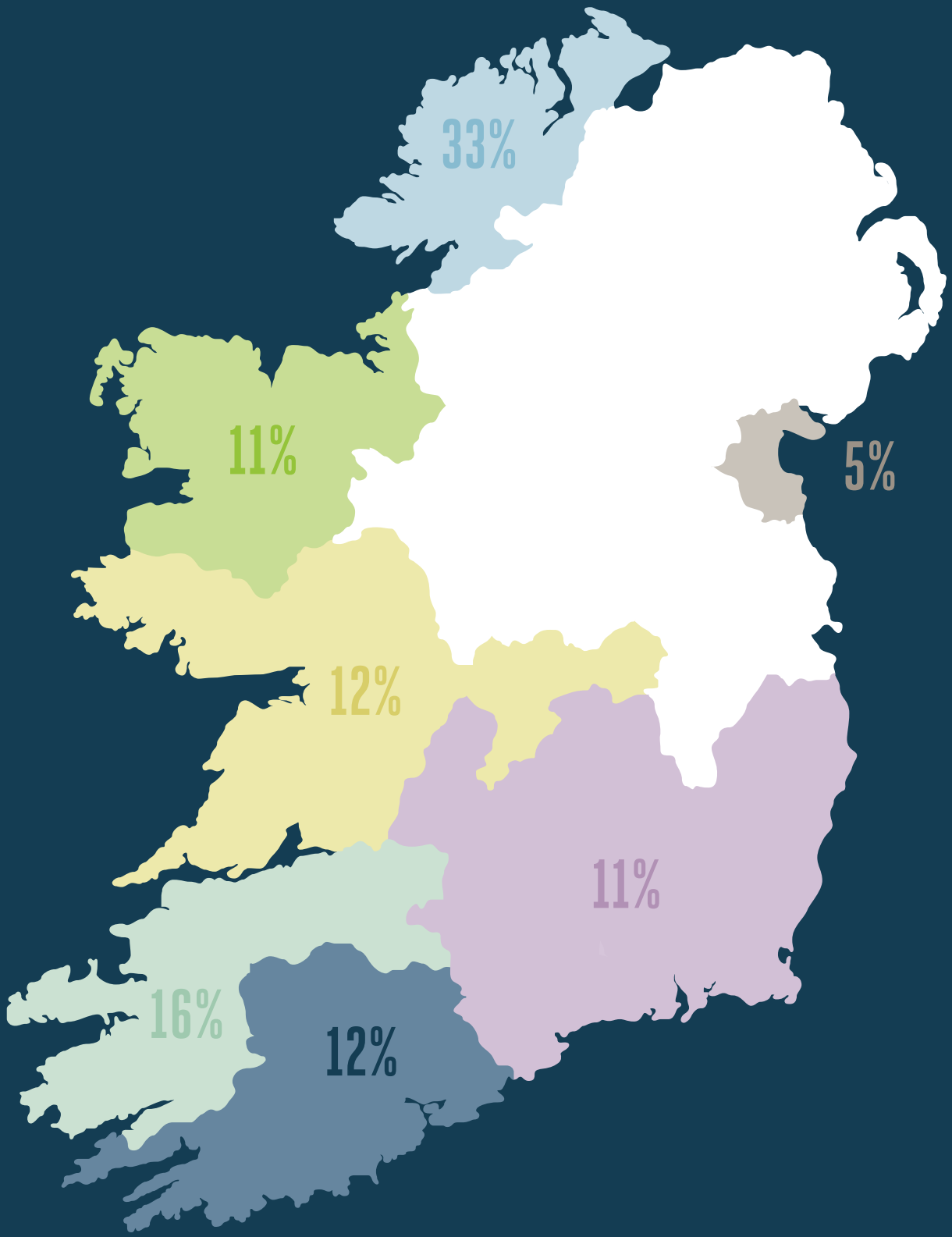


Figure 6: Map of aquaculture output by employment NUTs III region 2019 to 2021

3. The Segments

3.1 Farmed Salmon

3.1.1 Output

Output volume of Atlantic salmon (*Salmo salar*) increased from pre-lockdown volumes in 2019 of 11,333 tonnes to 12,844 tonnes in 2021. Overall sales value decreased from €108.7 million to €106.1 million. Sales were slow in the first half of the year and a disruptive red tide event in one region hampered supply. Sales recovered in the final two quarters of the year. Whole-round and head-on-gutted salmon maintained their 2019-unit sales value. However, there was an over-supply of frozen product, which depressed the national average price. Up to 6,970 tonnes of farm-gate product was estimated as processed from whole-round to a value-added product. A total of 522.4 tonnes of smolts were produced in 2021 (compared to 400 tonnes in 2019), with the stand-alone units generating over €3.4 million in sales to on-grown units.

Table 6: Penned salmon output trend, 2019 to 2021

	2019	2021	% Trend
Output volume (Tonnes)	11,333	12,844	16.6
Sales value ('000s €)	108,721	106,108	-2.4

3.1.2. Socio-employment, production units, capacity

In 2021, five businesses operated 16 sea-site production units and five businesses operated 12 hatchery units. Approximately 4,300,000 cubic meters of licenced capacity occupied by 290 cages over 1027 hectares are in use for sea-production.

A total of 223 (or 209 FTEs) persons worked on sea-sites in 2021. 157 persons (143 FTEs) worked on site, with a further 66 FTEs providing specialist services to the sites. A total of 48 persons (20 FTEs) worked in hatchery units.

Table 7: Penned salmon employment and production units 2019 to 2021

Category	2019	2021	% Trend
Employment			
Full Time	162	197	22
Part Time	31	24	-23
Casual	1	2	100
Males	186	213	15
Females	8	10	25
Total Employed	194	223	15
Total FTE	178	209	18
Production Units			
<=5 employed	5	4	-20
6-10 employed	4	5	25
>10 employed	5	7	40
Total PUs	14	16	14

3.1.3. Markets

In 2021, a total of 9,741 tonnes (or processed equivalents) of Irish salmon were directly exported. EU Member States were the main destinations for organic salmon, France 40.6%, Poland 20.3%, Germany 14%, and Belgium, 10%. Poland is a major processor of farmed salmon and hence the significant level of exports. Smaller quantities of Irish product were exported to the UK, North America, and Asia. Head-on-gutted, whole-round, fillets, steaks and frozen remain the main product formats. The remaining production (24%) was retained for the home market or for further processing within Ireland before exporting.

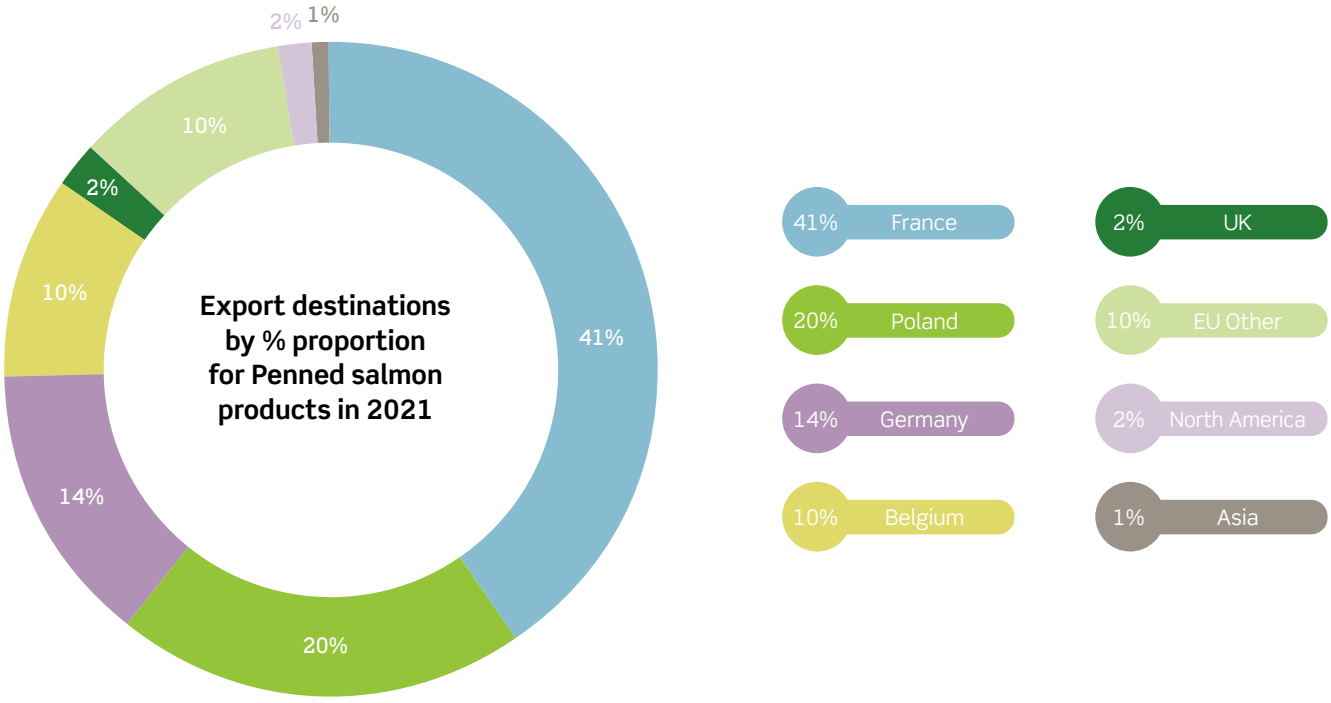


Figure 7: Penned salmon market destinations by % in 2021

3.1.4 Inputs and Costs

Over the period 2019 to 2021, the cost of feed and stock input doubled in proportion to other costs and also in proportion to 2019 costs. Stock inputs were up 111% to €21.9 million from €10.4 million. Feed costs rose 86.3% to €36.4 million from €19.6 million. Energy costs rose significantly; up 35.3% to €2.86 million from €2.12 million. With total income down to €108.7 million from €110.1 million, the period has been challenging in terms of net profit generation for the segment. Other costs such as personnel, depreciation and repairs and maintenance showed more moderate cost trends, €8.7 million (+2.7%), €3.7 million (-0.1%) and €4.48 million (-7.2%) respectively. Other operational costs (e.g., insurance premiums, professional fees, equipment rental charges etc.) fell significantly by 31.3% to €43.4 million.

Table 8: Penned salmon: production costs 2019 to 2021

Penned salmon culture costs	2019	2021	% Trend
Total income	110,139	108,699	-1.3
Stock input cost	10,355	21,851	111.0
Feed cost (€)	19,573	36,455	86.3
Wages and salaries	8,454	8,684	2.7
Imputed value of unpaid labour	0	0	0.0
Energy costs	2,116	2,863	35.3
Repair and maintenance	4,831	4,485	-7.2
Other operational costs	63,205	43,406	-31.3
Depreciation	3,748	3,745	-0.1
Total costs	112,282	121,489	8.2

Figure 8: Penned salmon production costs 2019 to 2021

3.1.5 Economic performance

According to the 2019 to 2021 BIM economic surveys, economic performance improved in 2021. The economic indicator results for 2021 are at least partially explained by disruptions to output as a result of red tides, large rises in stock and feed inputs, energy costs and changeable consumer demand during the lockdown periods and immediately afterwards.

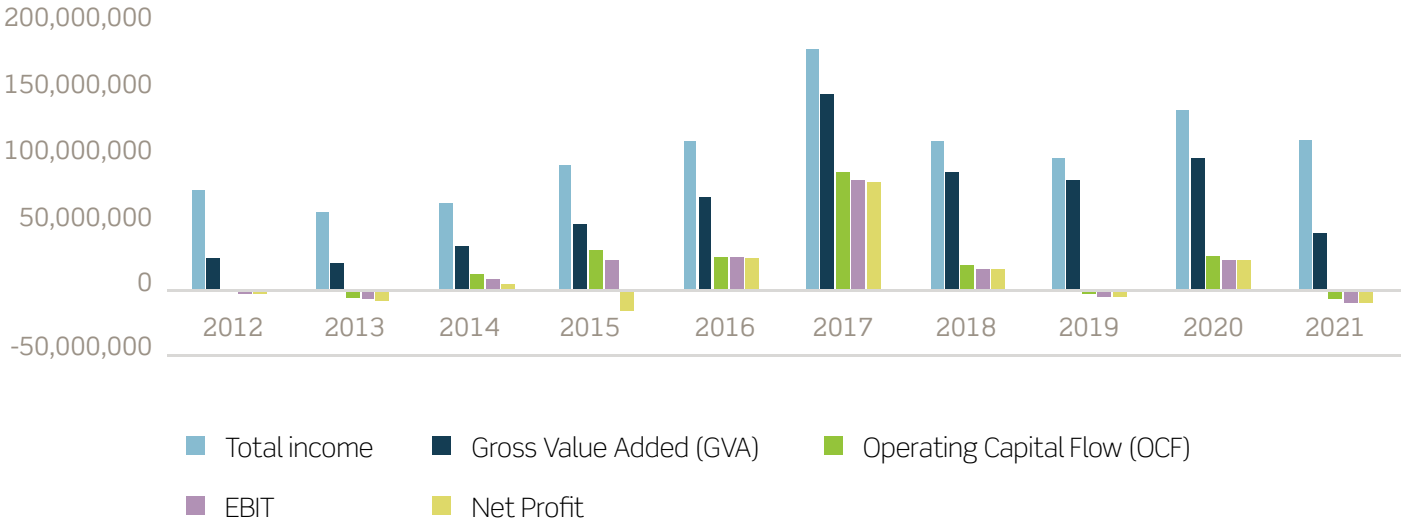


Figure 9: Penned salmon: 10-year economic performance trend to 2021

3.2.6 Regional production

Salmon hatchery and on-grown (penned) production occurs predominantly along the western seaboard regions. Variations in penned output are caused by the practice of site fallowing and alternating harvesting sites in accordance with organic certification practice.

In 2021, production finishing occurred principally in the West, Northwest, and North regions. The North provided the most employment of all regions in 2021 from 10 production hatchery and penned units.

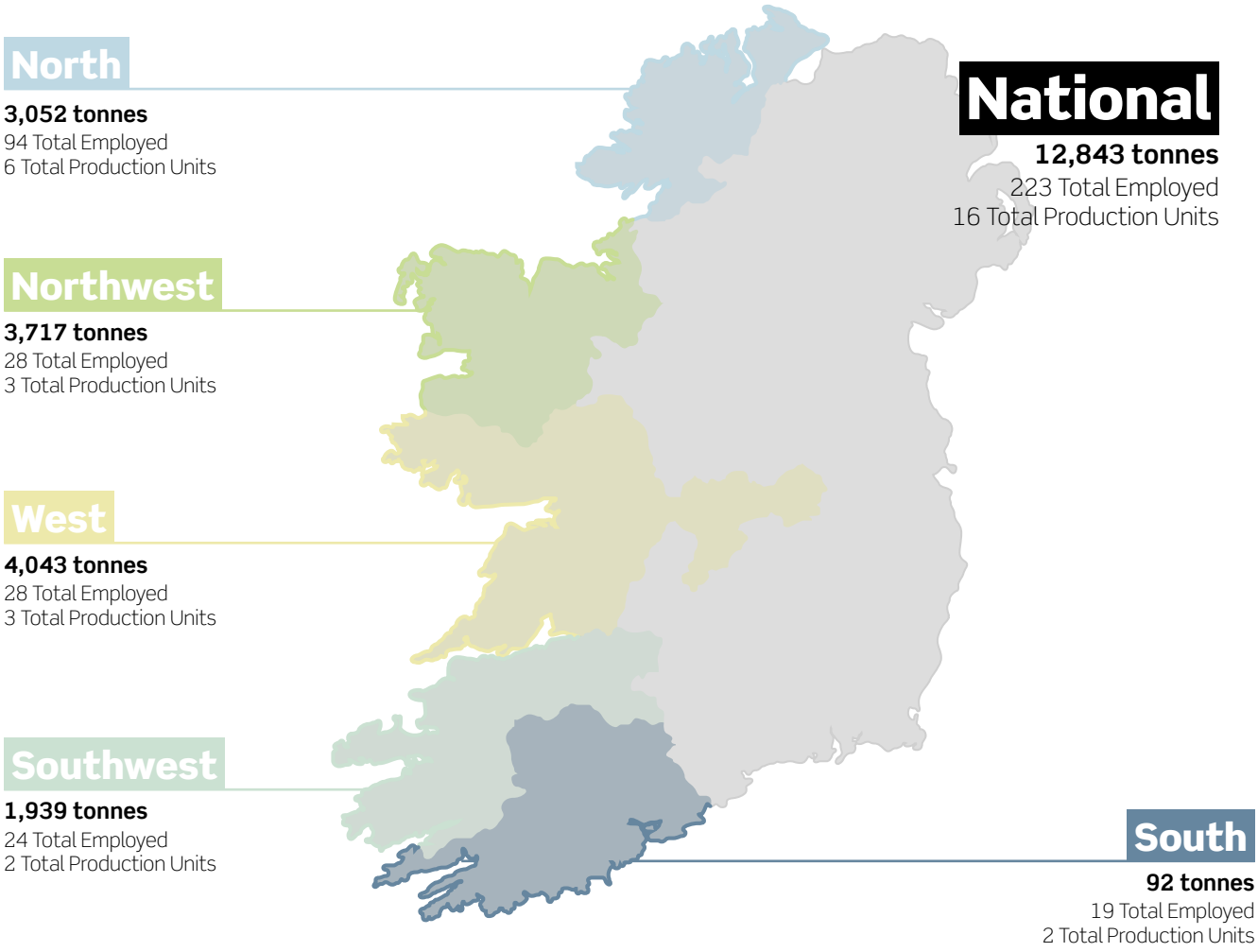


Figure 10: Map of combined salmon output volume (tonnes) and employment by NUTs III Region in 2021

3.2 Farmed oyster

3.2.1 Output

Output volume and sales value overall for the farmed oyster (*Crassostrea gigas*) segment have recovered from the market difficulties of early 2020 and production increased by 7% and 8% respectively from 2019 output. In 2021, output volume and sales value of 10,624 tonnes valued at €47.55 million (all grades) was achieved and unit sales value improved marginally compared to 2019 by 0.6% to €4.48 per kg.

Sales began slowly in 2021 with below average unit values in the first two quarters. It increased strongly in both volume and unit value for the final two quarters. Grades "0's" and "1's" sold steadily, over the latter quarters, with "Speciales" making between €5 per kg to €6 per kg, while Grade "2's" selling for €3.50 per kg.

A total of 9,941 tonnes of triploid Gigas oysters were sold at an average price of €4.88 per kg with a further 683 tonnes of diploid Gigas oyster sold at an average price of €3.28 per kg. Production of the more lucrative triploid oysters has extended into bays of the mid-west and west bays, previously licenced for diploid production only.

A total of 3,044 tonnes of Half-Growns (<65g animals) were sold in total in 2021, up from 2,906 tonnes in 2019. Unit prices ranged from €2.06 to €5.71 per kg., averaging at €3.55 per kg. Some 2,700 tonnes were exported, mostly to France and Asia (Singapore) as size '4s' consumables (45-64g.)

Table 9: Farmed oyster output trend, 2019 to 2021

Farmed oyster	2019	2021	% Output Trend
Sales volume (tonnes)	9,899	10,624	4.2
Sales value ('000s €)	44,057	47,553	6.1

Table 10: Farmed oyster unit value by product category 2021. (Please note, the example categories below are from different sets of categories and are for illustrative purposes only. They do not reflect the total output sum).

Output category	Tonnes	Sales value (€) per tonne 2021
Total output	10,624	4,476
Speciales	5,371	5,477
Half-grown	3,044	3,550
Exported	9,203	
Triploid	9,941	4,881
Diploid	683	3,282

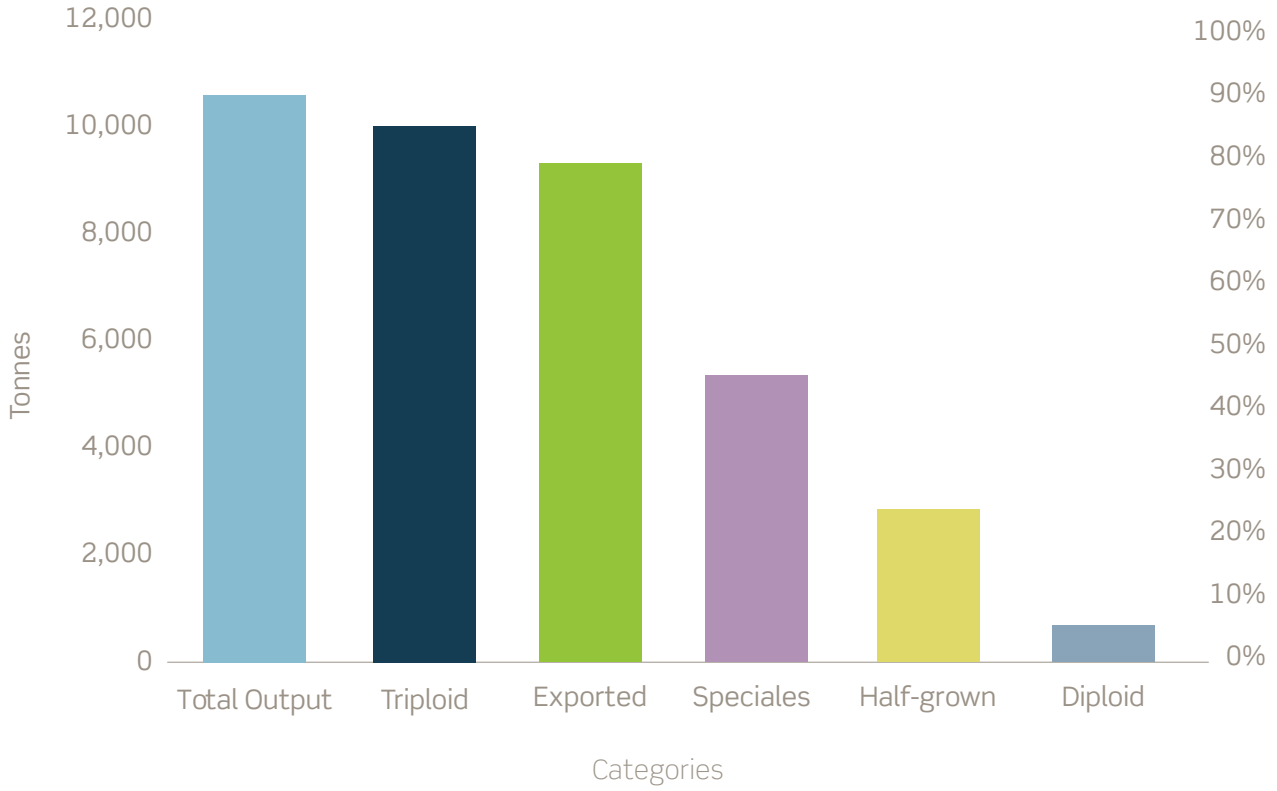


Figure 11: Farmed oyster tonnage output profile in 2021

3.2.2 Employment, production units, Capacity

Despite the challenges of Brexit and Covid-19 which impacted on sales in early 2020, the farmed oyster sector has seen growth in terms of employment and number of production units. In addition, several new units have entered full production.

Employment numbers increased in this sector. The casual workforce increased by 71%, while FTE employment rose by 10%. These trends result from the expansion of existing units and introduction of new ones as new licenced sites continue to be awarded or renewed. Over 493,000 trestles or equivalents comprising 1,911 hectares of licenced area was used for production in 2021, up from 1,804 hectares in 2019.

Table 11: Employment and production units, 2019 to 2021

Category	2019	2021	% Trend
Employment			
Full-Time	391	403	3
Part-Time	229	259	13
Casual	212	362	71
Total employed	832	1,024	23
FTE	541	593	10
Production Units			
Less <=5 employed	106	115	8
6 - 10 employed	22	28	27
More than 10 employed	23	23	0
Total PUs	151	166	10

3.2.3 Markets

A total of 9,223 tonnes of farmed oysters, valued at €45.9 million of all grades and ploidies, were exported in 2021. This was marginally more than the export volume of 2019, indicating a full recovery in the export market. France remains the dominant destination, making up 78.4% of the export market. At 9% share of exports, Southeast Asia is now the second most significant export country having grown steadily despite Covid-19. Additionally, The Netherlands has grown into a significant buyer of Irish oysters gaining a 5.7% share. The UK and other EU Member States made up the balance of exports in 2021.

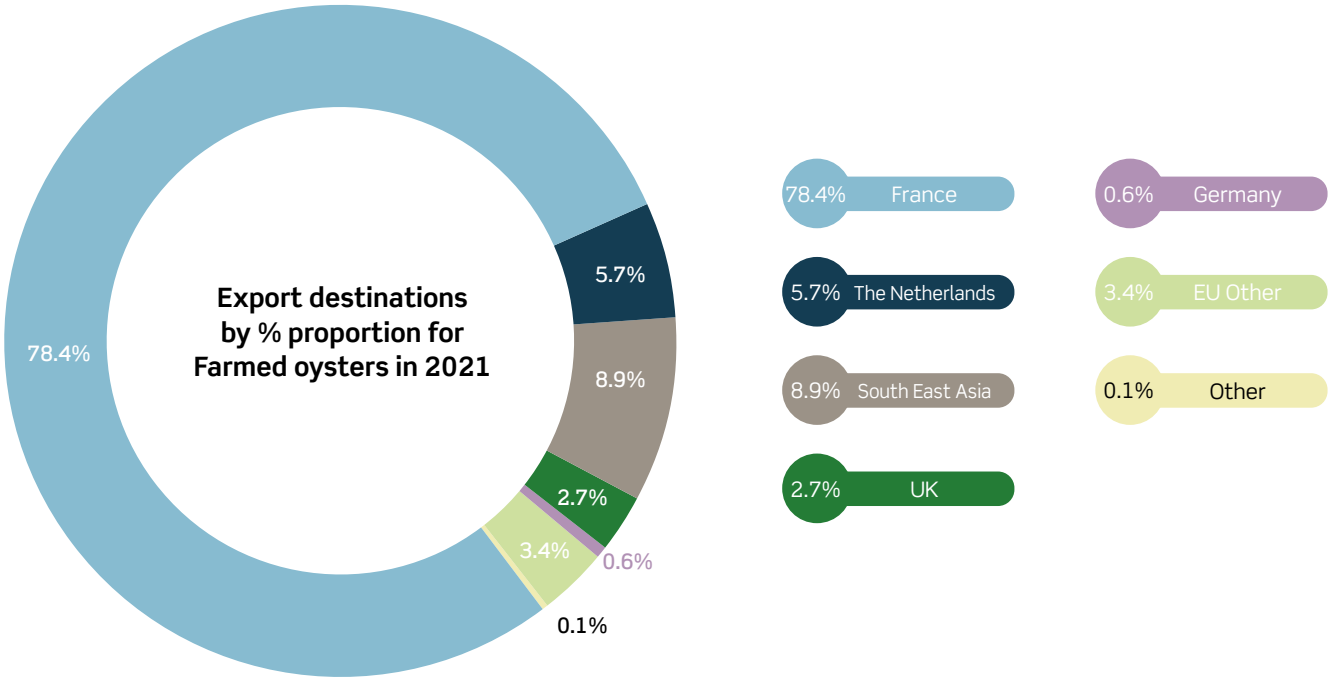


Figure 12: Farmed oyster export destination by % in 2021

3.2.4 Costs

Personnel costs remain down on 2019 (-11%), while unpaid labour has increased. For most of 2020 wages were supported by Covid-19 Pandemic Unemployment Payment (PUP) assistant schemes.

Other operational costs and seed input costs were up from 2019, by 57% and 42% to €10.4 and €8.4 million, respectively. The increase associated with 'other operational costs' reflects the increased costs of selling produce, post-Brexit and in the face of market adjustment during and post Covid-19 lockdowns. The cost of seed oysters which is mostly imported increased, due to Brexit and Covid.

Table 12: Farmed oyster production costs, 2019 to 2021

Farmed oyster culture costs (000s €)	2019	2021	% Trend
Stock input cost	5,913	8,367	41.5
Feed cost	0	15	
Wages and salaries	15,904	14,196	-10.7
Imputed value of unpaid labour	307	1,393	353.8
Energy costs	1,799	927	-48.5
Repair and maintenance	4,204	2,064	-50.9
Other operational costs	6,642	10,444	57.2
Depreciation	3,417	3,391	-0.8
Total costs	38,186	40,797	6.8

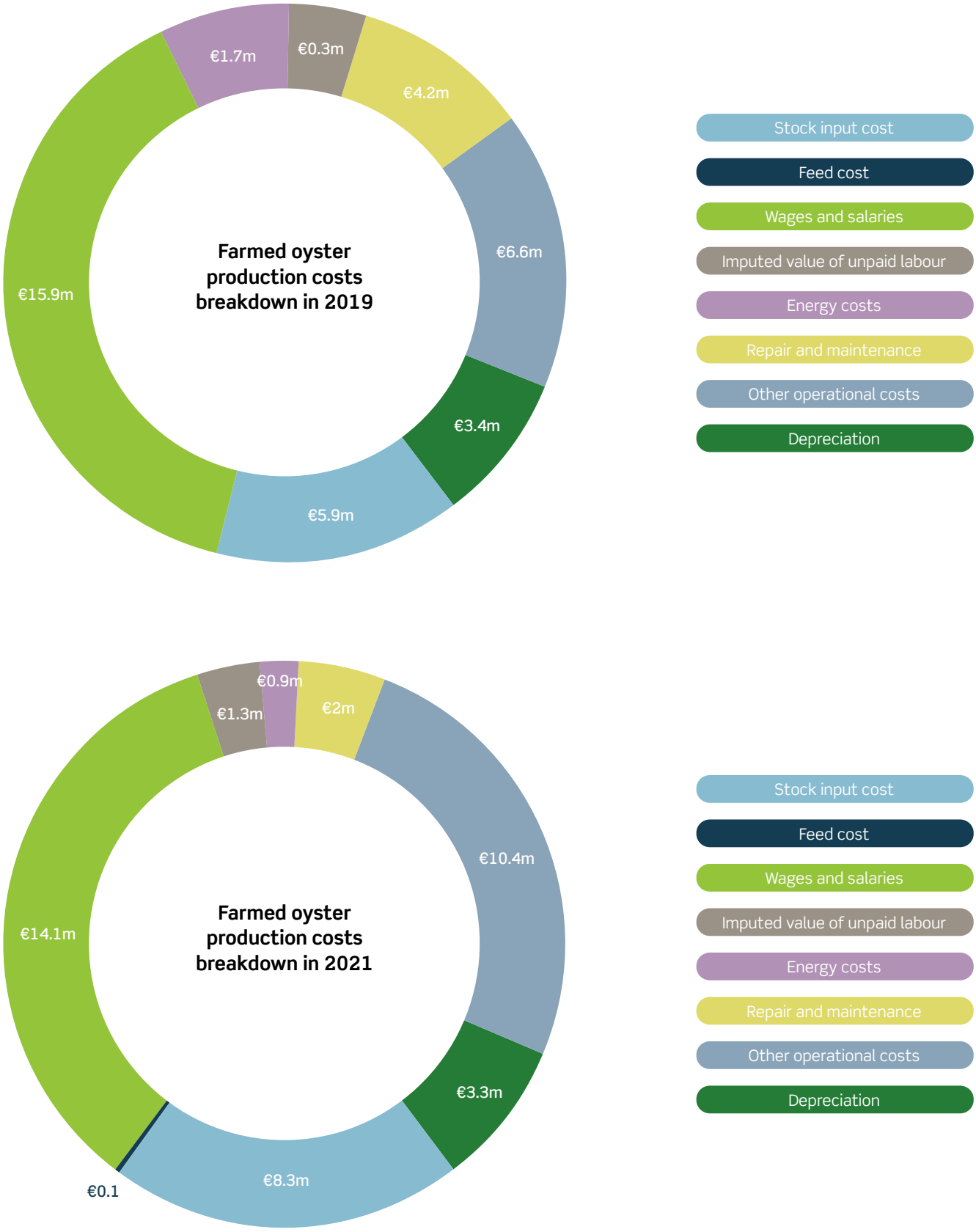


Figure 13: Farmed oyster production costs 2019 and 2021

3.2.5 Economic performance

Covid-19 and Brexit related challenges have impacted profitability in both 2020 and 2021. Recovery to the profitability of 2019 has some way to go and was hampered by increasing costs associated with rises in input and selling costs. Turnover and total income have slowly increased again in 2021. GVA and other economic indicators show a strengthening economic contribution in 2021 but also show weakening net profits in the face of rising costs.

3.2.6 Regional Production

Farmed oyster culture is widespread across the coastal regions and most concentrated in the North and Southeast, where €12.7 million and €13 million in sales value was generated in 2021. Smaller production units tend to be more common in the North, employing a total of 381 persons.

The unit sales values achieved for oyster products in different bays is dependent on the product class sold and the market targeted. A select number are compared in Table 13.

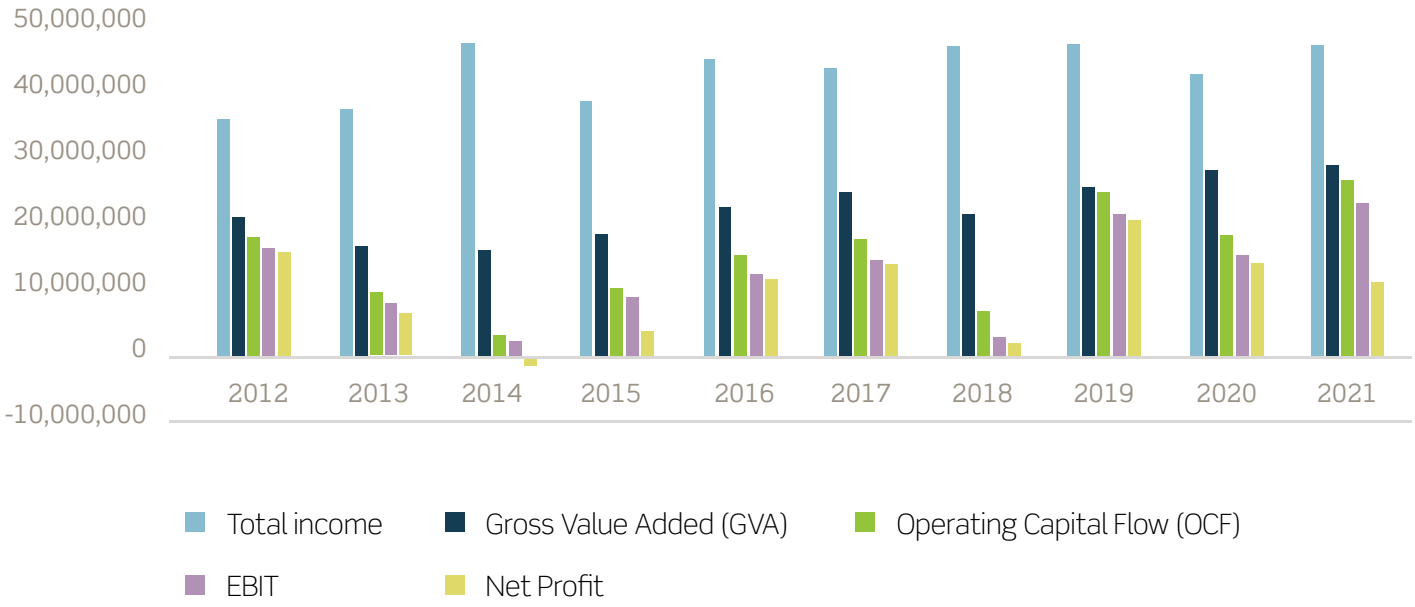


Figure 14: Farmed oyster 10-year economic performance trend to 2021

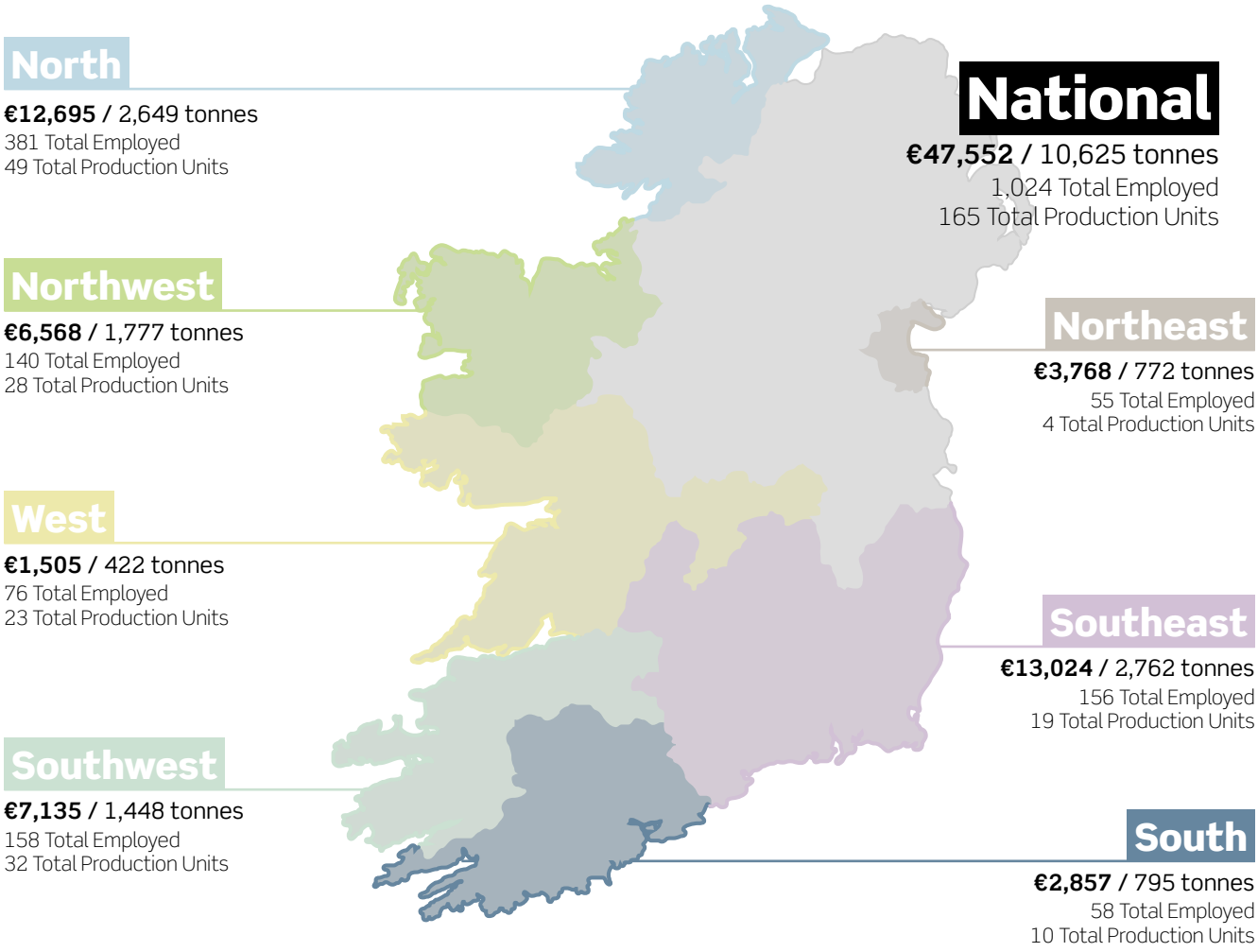


Figure 15: Farmed oyster production and employment by NUTs III region in 2021

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

Region	Bay	Average unit sales (€)/kg
North	Donegal Bay	5.17
North	Lough Foyle	5.45
North	Trabreaga Bay	3.12
Northeast	Carlingford Lough	4.88
Northwest	Achill Island	3.85
Northwest	Clew Bay	3.65
South	South Bays Average	3.6
Southeast	Dungarvan Bay	4.88
Southwest	Dingle Bay	4.97
West	Shannon Estuary	3.06
West	Galway Bay	4.49

3.3 Suspended Mussel Culture

3.3.1 Output

In 2021, the Suspended mussel *(Mytilus edulis)* segment fully recovered from the economic impacts of Covid-19 and Brexit. The segment performed strongly in 2021 in terms of overall volume and sales value generated. Production was 11,762 tonnes, worth over €8 million, up 12.4% and 17% respectively compared to 2019. The increase in value was driven by a combination of increasing output volume and an increase in the Unit Sales Value (USV) of the fresh live product. The average unit price of fresh product increased by 22% over the two-year period. However, the volume of exports has fallen significantly by 9.6% since 2019 amounting to 6,640 tonnes in 2021.

3.3.2 Employment, production units, Capacity

Employment overall remained steady with a slight increase. There has been an increase of 6% in full-time employment and a concurrent decrease in part-time employment (5%). Female employment has increased by 5 persons (22%).

In 2021, 1,780 suspended structures supported the production of over 943 hectares of licenced area. This is a slight increase on previous years.

Table 14: Suspended mussel national output, 2019 to 2021

Rope Mussel	National Sales values ('000s €)			National average unit sales values (€/tonne)		
	2019	2021	Output Trend (%)	2019	2021	Trend (%)
Sales volume (tonnes)	10,460	11,762	12.4			
Sales value (€)	6,907	8,078	17	646	687	6.3

Table 15: Suspended mussel, output product profile, 2019 to 2021

Year	National output tonnage	For Process market	For Fresh market	For Export market	Fresh market USV (€)	Process market USV (€)
2019	10,460	2,620	7,840	7,343	663	664
2021	11,762	4,256	7,506	6,640	809	514

Table 16: Suspended mussel, employment, and production

Rope Mussel	2019	2021	% Trend
Employment			
Full Time	81	86	6.2
Part Time	86	82	-4.7
Casual	59	60	1.7
Male	203	200	-1.5
Female	23	28	21.7
Total employed	226	228	0.9
Total FTE	134	137	2.4
Production Units			
<=5 employed	45	48	6.7
6 - 10 employed	8	10	25.0
More than 10 employed	3	3	0.0
Total Production Units	56	61	8.9

3.3.3 Market Destination

A total of 6,240 tonnes valued at approximately €5.4 million was exported in 2021. France and The Netherlands were the chief export destinations of the fresh product, accounting for 81.5% of exported tonnage in 2021. The UK accounted for 6% and other EU Member States, 4.5%. Other destinations accounted for 8% of exports. The growing home market accounted for 5,122 tonnes, although some of this volume may have been subsequently exported after processing.

Table 17: Suspended mussel market destinations in 2021

Destination	Tonnes	% Proportion
France	4,211	67
The Netherlands	904	14.5
EU Other	279	4.5
UK	356	6
Other	490	7
Ireland	**6,240**	

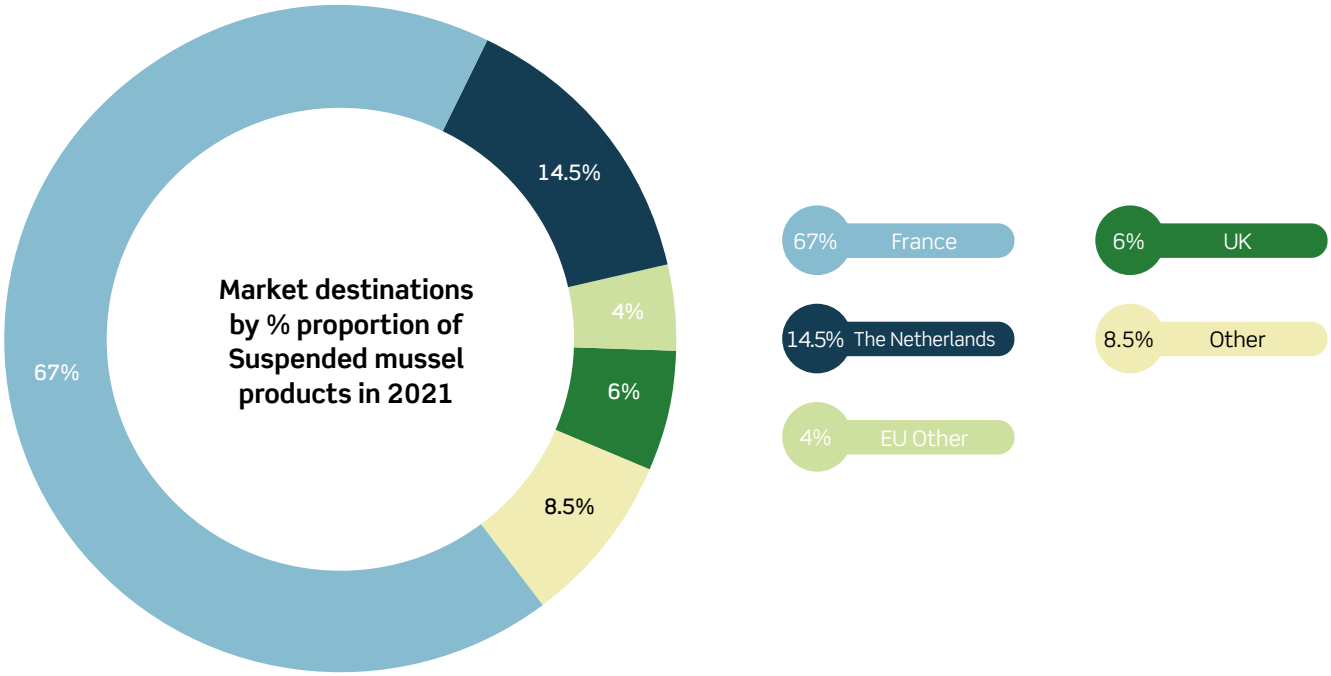


Figure 16: Suspended mussel market destinations by % in 2021

3.3.4 Costs

Operational costs and to a lesser extent, input costs have risen significantly between 2019 and 2021. Transport costs experienced the steepest increase over the two-year period which has negated the benefits of cost reductions elsewhere. These cost rises were offset by strong sales performance of both fresh and processed product. Overall costs increased from €5.7 million to €7.8 million over the two years.

Table 18: Suspended mussel production income and costs

National Totals (000s €)	2019	2021	Trend (%)
Total income	7,957	10,541	32.5
Total input cost	176	246	39.9
Wages and salaries	3,476	2,756	-20.7
Imputed value of unpaid labour	261	404	55
Energy costs	446	293	-34.4
Repair and maintenance	985	768	-22
Other operational costs	762	3026	296.8
Depreciation	774	529	-31.7

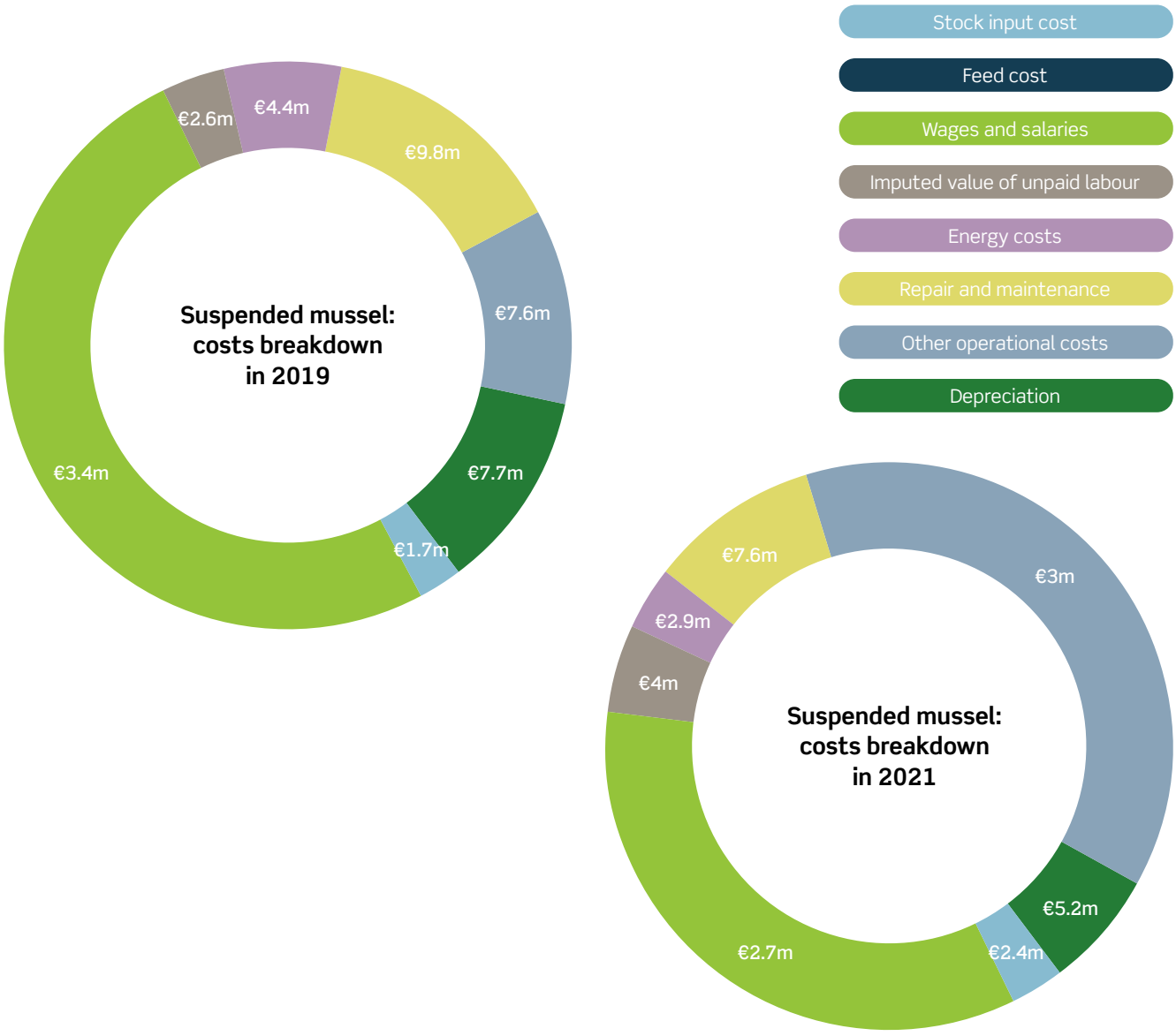


Figure 17: Suspended mussel production costs 2019 to 2021

3.3.5 Economic performance

The segment recovered well after the initial shock of curtailment of sales in the first half of 2020. This continued in 2021 despite a steep rise in production costs. GVA to the economy rose from €3.7 million in 2019 to €7.2 million in 2021. Net profit for the segment rose from €2 million to €2.8 million over two years.

3.3.6 Regional production

While the segment is concentrated in the Southern region, some production units are found throughout the western seaboard regions. They generated approximately €0.5 million to €0.7 million in turnover in each region. Figure 19 outlines regional output level in tonnes for 2019 and 2021.

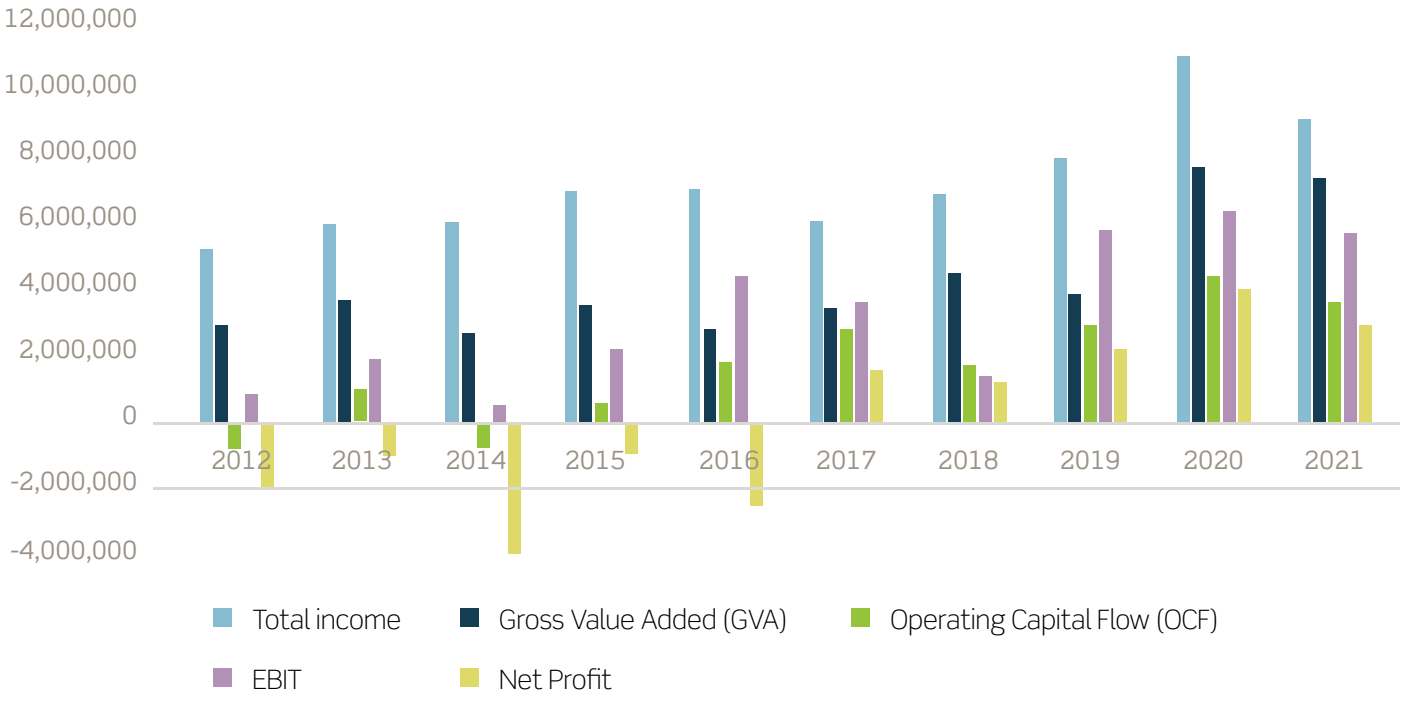


Figure 18: Suspended mussel 10-year economic performance trend to 2021

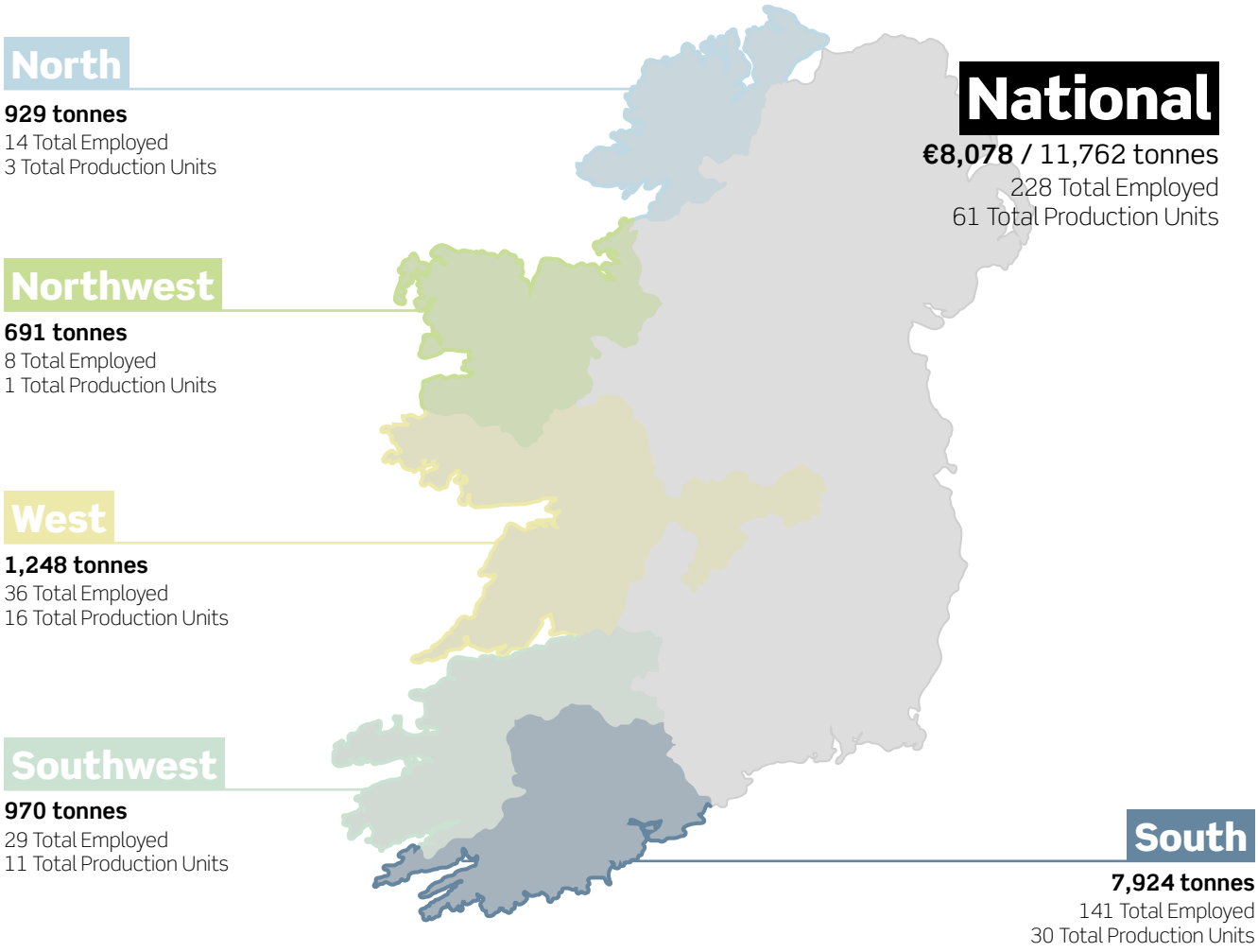


Figure 19: Suspended mussel output and employment by NUTs region in 2021

3.4 Seabed Cultured Mussels

3.4.1 Output

The seabed cultured mussels *(Mytilus edulis)* segment experienced modest recovery in terms of output volume with 5,835 tonnes (+20%) and sales value of €9.14 million (+16%). Output has remained well below previous national output levels of 16,000 tonnes prior to 2010 and below 10,000 tonnes since 2012. The product is sold fresh, live, and exported. Average unit sales value per tonne decreased by 3% from €1,611 per tonne in 2019 to €1,559 in 2021.

Table 19: Seabed cultured mussel output 2019 to 2021

Seabed cultured mussel	National Output values			National average unit sales values (€/tonne)		
	2019	2021	Output Trend (%)	2021	2019	Output Trend (%)
Tonnes produced	4,894	5,865	20			
Sales value ('000s €)	7,886	9,142	16	1611	1559	-3

3.4.2 Employment, production units, capacity

The segment is experiencing further consolidation across Europe as Dutch processors move to control the production phase of the wider mussel seafood sector within Ireland. The number of active production units decreased from 32 to 25, half operate their own dredgers and the remainder use open boats or half-deckers. Employment also contracted to 98 persons, representing 62 FTEs.

Table 20: Seabed cultured mussel employment and production units

Bottom Mussel	2019	2021
Employment		
Full Time employed	59	41
Part Time employed	20	33
Casual employed	23	24
Sum of Males	97	93
Sum of Females	5	5
Total Employed	102	98
Total FTE	73	62
Production Units		
<=5 employed	26	18
6 - 10 employed	5	3
More than 10 employed	1	4
Total PUs	32	25

3.4.3 Markets

The Netherlands was the main destination for Irish seabed cultured mussels with 4,538 tonnes valued at €7.3 million exported. The balance of 1,327 tonnes valued at €2.1 million was exported to France.

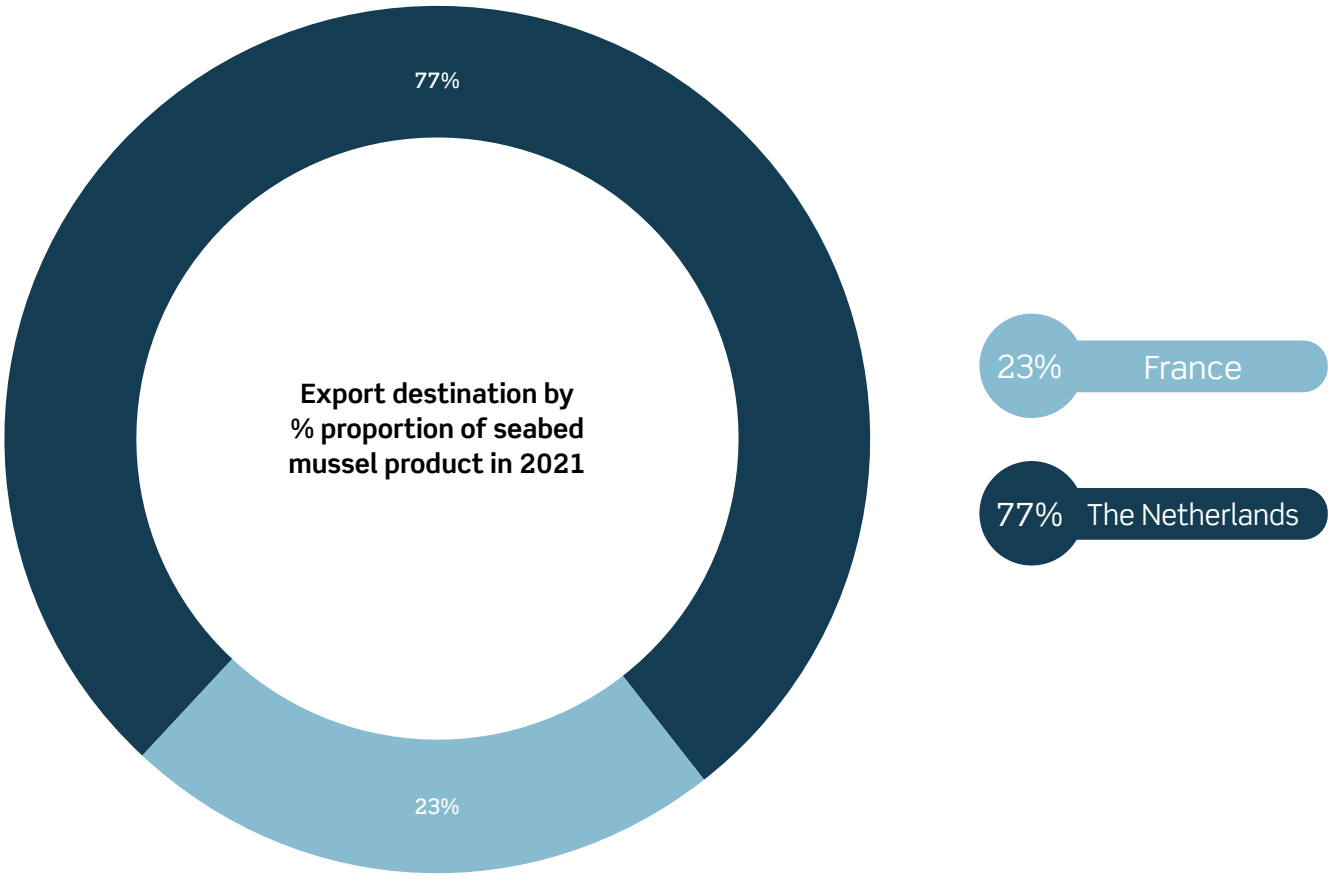


Figure 20: Seabed cultured mussel market destinations by % in 2021

3.4.4 Inputs and Costs

As with other segments, costs have risen significantly since 2019. The new trading arrangements with the UK post-Brexit were the many causes of these increases.

Turnover increased to €9.1 million in 2021 from €7.9 million in 2019. The increase in total income for 2021 offset the effects of the rise in costs in the same year. The effects of higher costs generally incurred since 2019 resulted in a decrease in profit margin of 26%.

Table 21: Seabed cultured mussel production costs ('000s €) trend 2019 to 2021

Bottom mussel culture costs €	2019	2021	% Trend
Total income	7,976	9,778	23
Stock input cost	1,595	1727	8
Feed cost	0	0	0
Wages and salaries	2,099	2,920	39
Imputed value of unpaid labour	121	108	-11
Energy costs	389	482	24
Repair and maintenance	626	869	39
Other operational costs	531	1,723	224
Depreciation	878	546	-38
Total costs	**6,239**	**8,375**	**34**

Figure 21: Seabed cultured mussel production costs in 2019 and 2021

3.4.5 Economic performance

Total income in 2020 was sufficient to offset the steep rise in costs that year. Turnover in 2020 decreased from €7.9 million to €7.2 million. In 2021, GVA increased by 15% to €4.6 million from €3.9 million in 2019.

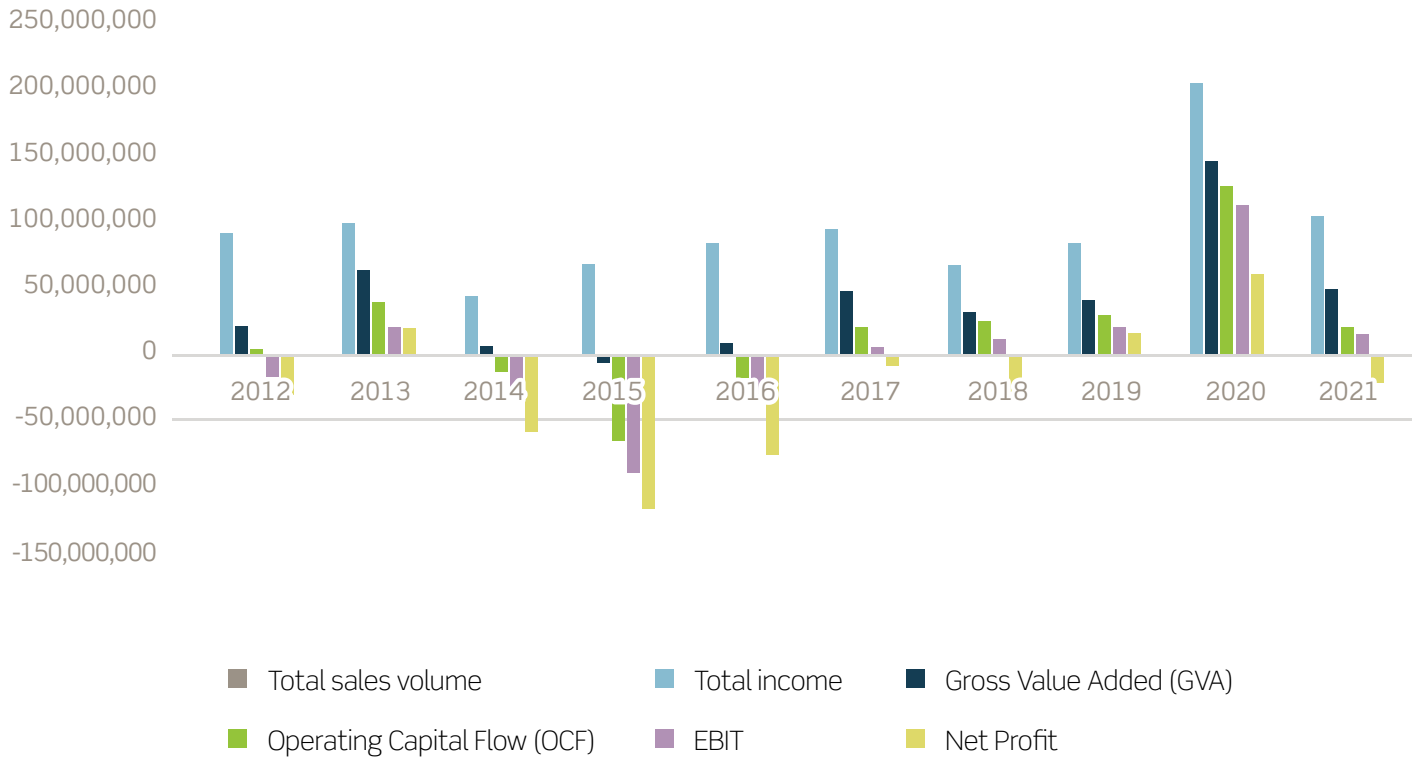


Figure 22: Seabed cultured mussel 10-year economic performance trend

3.4.6 Regional Output

Increases in output were observed in the northern and eastern production bays, while there was a continuing decline in the southwest bay of Castlemaine. In recent years, the focus in the bay of Castlemaine has switched from mussels to farmed oyster production. Local mussel seed settlement has not occurred there in any significant quantity for some years. Several dredger companies in the area have relayed seed for others elsewhere and have likely taken a stake in production in those other bays. Wild seed beds used for supplying stock inputs for the last two years were from the south Irish sea areas from Cahore Point to Rosslare.

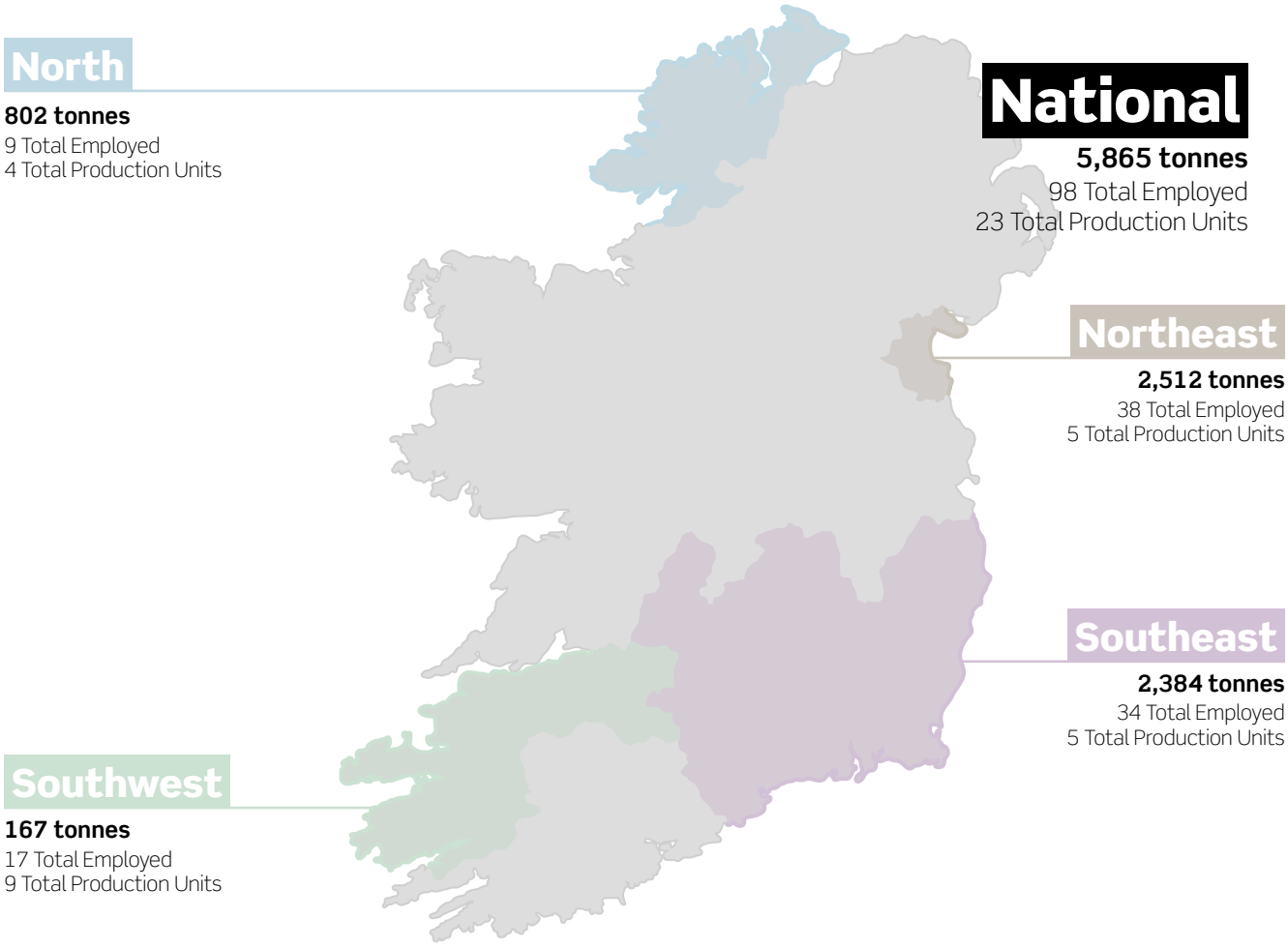


Figure 23: Seabed cultured mussel output and employment by NUTs iii region in 2021

3.5 Other Segments

In addition to the four largest aquaculture segments, production continued in the seabed culture of native oysters *(Ostrea edulis)* and King Scallops *(Pecten maximus)*, as well as the inland freshwater finfish sector where principally Atlantic salmon smolts and Rainbow trout *(Onychorhyncus mykiss)* are reared in tanks ponds or cages. There are also several land-based tank-reared shellfish units and a new rapidly developing, seaweed segment. These units are located by county in Table 22 below.

Table 22: Distribution of other aquaculture units in 2021

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

3.5.1 Other bottom bivalves

3.5.1.1 Output

From 2019 to 2021, seabed cultured Native oyster *(Ostrea edulis)* production increased in national volume output by 74% to 443 tonnes and in sales value by 65% to over €2 million. Average unit sales value in 2021 amounted to €4.62 per kg with 59% of output exported to France, The Netherlands (19%) and Southeast Asia (7%).

Table 23: Other bottom bivalve culture output

	2019	2021	% Trend
Volume Tonnes	255.5	443.3	74
Value € ('000)	1,239	2,047	65

3.5.1.2 Employment, Business structure, capacity

Employment is primarily casual, seasonal work available to co-operative members typically involving inshore fishermen operating two-man vessels equipped with light dredges. A total of 316 people, operating within 14 Co-op production units were involved in management and harvesting in 2021.

Table 24: Other bottom bivalve employment and production units

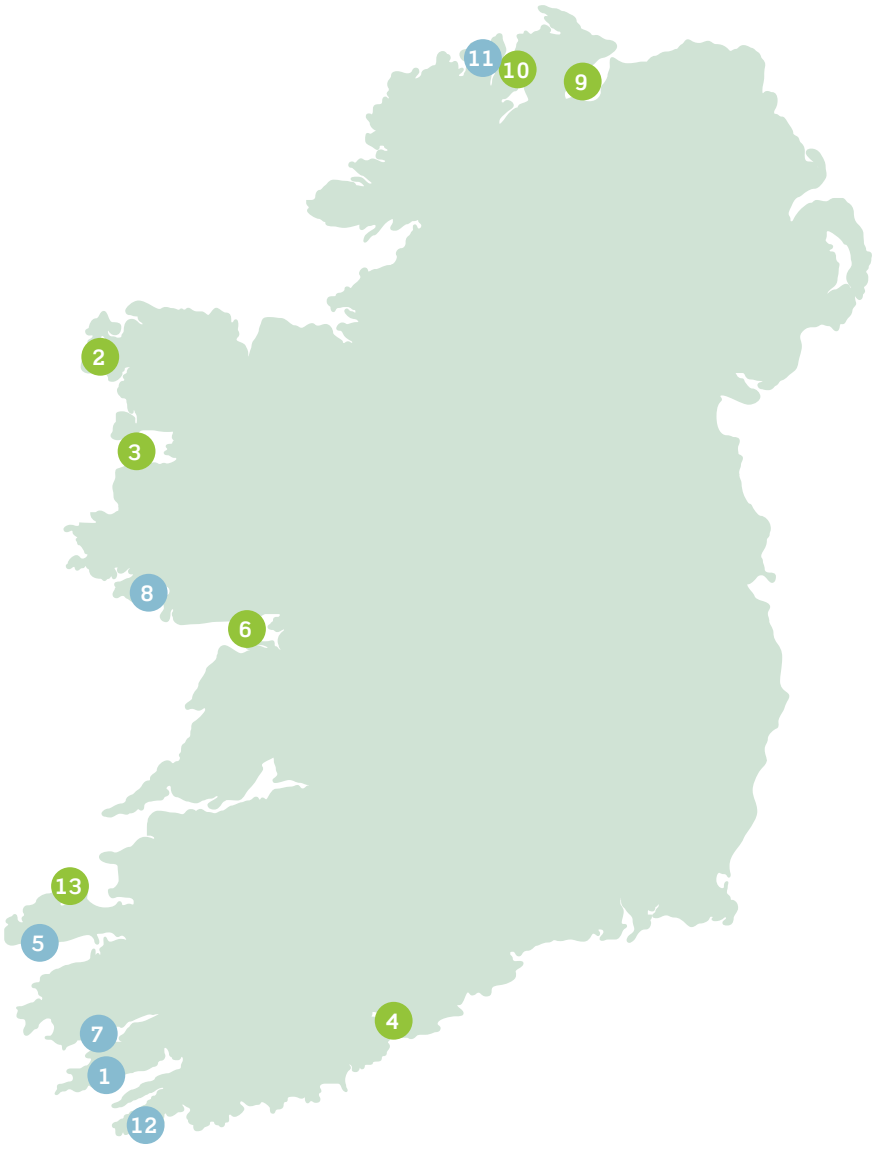
Employment categories	2019	2021	% Trend
Male employed	503	255	-49
Female employed	21	18	-14
Total Employed	524	273	-48
Total FTE	92	50	-46
Employed<=5	4	5	25
Employed 6-10	1	1	0
Employed >10	8	6	-25
Sum of PUs	13	12	-8

3.5.1.3 Regional production

The Tralee and Lough Foyle fisheries are the main producers of Native oyster. Collectively they produced an estimated 320 tonnes and 69 tonnes respectively in 2021. Smaller quantities of oysters are harvested in bays off the west coast (Figure 24).

Increasingly, drainage schemes are adversely impacting the continued commercial viability of stocks in some of these bays.

Scallop *(Pecten maximus)* production, once widespread across western regions, is now confined to a re-launch level in Mulroy Bay where seed continues to be collected most years. Similarly, clams *(Ruditapes philipinarum)*, once widely cultivated before Brown-Ring disease stock destruction, are being re-introduced at certain locations.



1. Bantry Bay
   King Scallop: **<10**
2. Blacksod Bay
   Native Oyster: **< 10**
3. Clew Bay
   Native Oyster: **10 - 50**
4. Cork Harbour
   Native Oyster: **<10**
5. Dingle Bay
   King Scallop: **<10**
6. Galway Bay
   Native Oyster: **10 - 50**
7. Kenmare Bay
   King Scallop: **<10**
8. Kilkieran Bay
   Native Oyster: **10 - 50**
   King Scallop: **10 - 50**
9. Lough Foyle
   Native Oyster: **51 - 200**
10. Lough Swilly
    Native Oyster: **10 - 50**
11. Mulroy Bay
    King Scallop: **10 - 50**
12. Toormore Bay
    King Scallop: **<10**
13. Tralee Bay
    Native Oyster: **51 - 200**

Figure 24: Map showing the production bay location of other bivalve shellfish aquaculture by output volume (tonnes) category

3.5.2 Freshwater finfish

3.5.2.1 Output, employment, production units and capacity in 2021

In 2021, this sector consisted of 12 Atlantic salmon hatcheries and eight other units producing mostly consumer-ready rainbow trout and European perch *(Perca fluviatilis)*. Collectively over 1,000 tonnes of product with a sales value of €5.2 million was produced in 2021. There were 69 FTEs with 284 tanks, ponds and enclosed cages totalling an estimated production capacity of close to 100,000 cubic metres.

There were six salmon smolt hatcheries operating as stand-alone businesses. A further two were state-owned fishery support units with four auxiliary feeder units incorporated into the production cycles of on-growing businesses. The smolts produced supply the national sea-sites, subject to production levels and market conditions. The other freshwater fish and processed products produced are sold into home niche markets in the retail and hospitality sectors.

3.5.2.2 Freshwater finfish costs and economic performance

As with other segments, the freshwater finfish sector saw steep increases in the costs of feed and stock inputs by 60% and 85% respectively between 2019 and 2021. This was partly driven by an increase in smolt production over the same period.

The output volume of trout contracted from the 2019 level of 608 tonnes to 537 tonnes in 2021. In contrast, trout unit sales value increased from an average €2.75 to €3.28 per kg. The trout sector lost some markets during the height of Covid-19 and was forced to abandon all but the most important product lines, focusing on operational activity to the essential markets. This may account for some of the steep reductions in repairs and maintenance costs and other operational costs estimated for the period.

Wages and salaries for the freshwater sector dropped by 42% to €1.16 million. Repairs and maintenance, energy costs and other operational costs demonstrate steep reduction trends. However, it should be noted that the data for this segment is sparse and the trends should be treated with caution.

Table 25: Freshwater finfish output, employment, and capacity in 2021

Variables	Values
Tonnage output	1059
Sales value ('000s €)	5,199
Total employed	69
Total FTE	59
Number of production units	20
Total capacity (m^3)	95,666
Number of structures used	284

Table 26: Freshwater finfish production costs, 2019 to 2021

Cost ('000s €)	2019	2021	% Trend
Total income	5,137	5,683	11
Wages and salaries	1,992	1,157	42
Imputed value of unpaid labour	0	0	0
Energy costs	217	130	-40
Stock Input Cost	609	1,127	85
Feed Cost	2,213	3,539	60
Repair and maintenance	632	134	-79
Other operational costs	8,085	473	-94
Depreciation	727	146	-80

3.5.3 Seaweed culture

3.5.3.1 Output, employment, production units and capacity

By 2021, 11 new seaweed aquaculture production units had reached a phase of commercial production. Collectively they produced a total of 173 tonnes of total seaweed valued at €467,000 and provided employment for 23 FTEs. The most popular seaweed cultivated was *Alaria esculentia*, colloquially known as "winter weed" as it is stocked into on-growing units in December of each year. Other species grown include *Laminaria* and *Saccarina* species. Unit sales value in wet weight varied from €1 to €3.50 per kg depending on species and product format. Seaweed is mostly exported in the form of a variety of end-products for the animal feed, pharmaceutical or cosmetics fields, among others.

In addition to the seaweed production units, a County Cork-based hatchery uses rope cultivation to supply seaweed seed stock. This material is supplied to suspended-culture on-growing units located throughout the west coast regions. A total of 181 suspension lines were estimated to be in use in 2021.

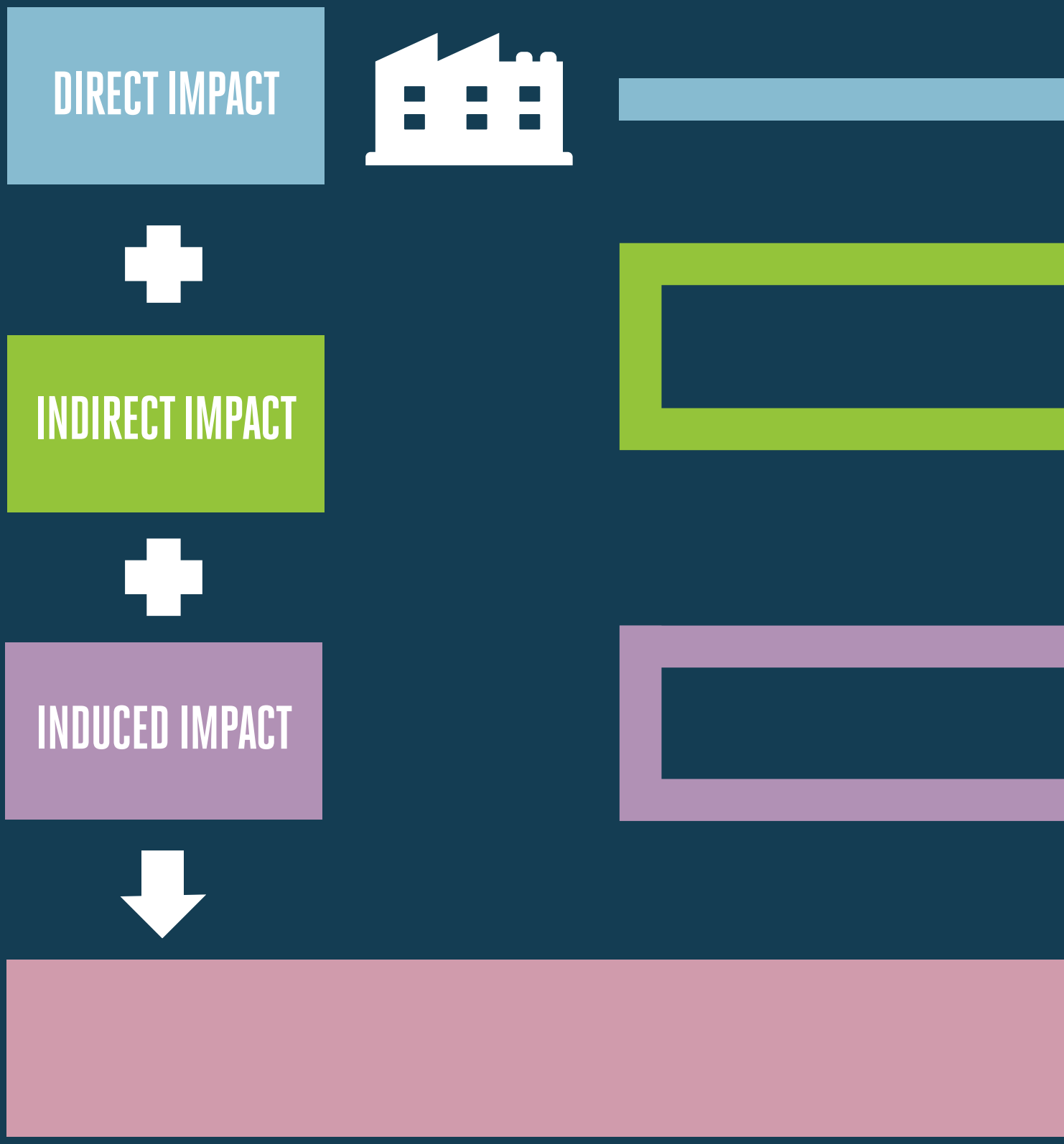
Table 27: Seaweed culture output and employment in 2021

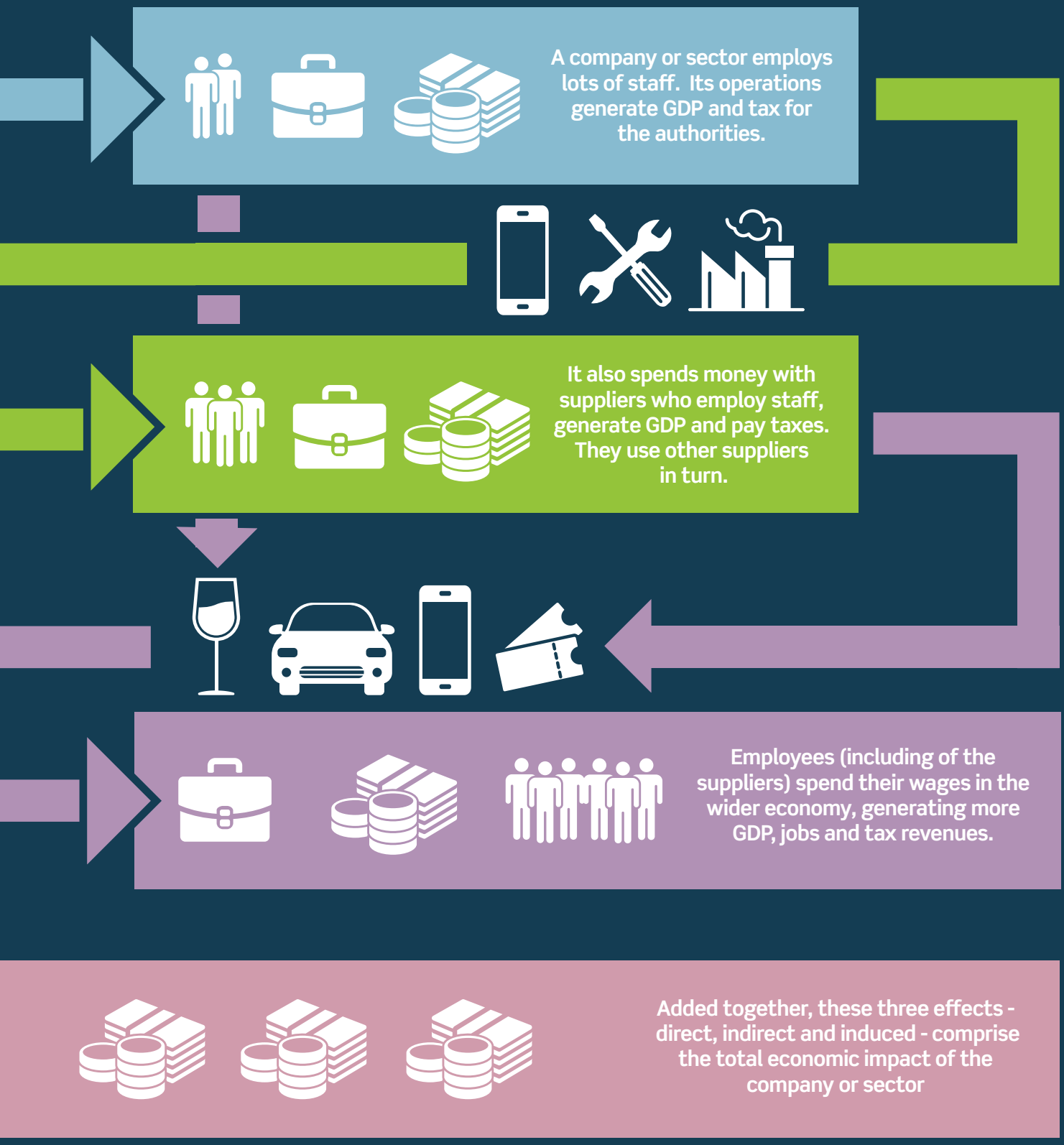
Variables	Values
Sales value (€)	467,200
Total Employed	23
Total FTE	15
Sum of Production units	11
Number of Structures Used	181

3.5.3.2 Seaweed aquaculture costs profile

Wages and salaries make up the most significant costs. Seaweed seed production costs are currently receiving state assistance and this is expected to end later in 2022.

Economic Impact Assessment




A company or sector employs lots of staff. Its operations generate GDP and tax for the authorities.
It also spends money with suppliers who employ staff, generate GDP and pay taxes. They use other suppliers in turn.
Employees (including of the suppliers) spend their wages in the wider economy, generating more GDP, jobs and tax revenues.
Added together, these three effects - direct, indirect and induced - comprise the total economic impact of the company or sector

A study of the total socio-economic effects of the aquaculture industry on the local and national economy for the year 2020 was run throughout 2021. 11 representative bays were chosen based on region, catchment population, representation of aquaculture categories, turnover and employment to derive an independent dataset to that of BIM's annual economic survey. The data from the survey was used to create multipliers that when applied to the direct benefits of aquaculture, as measured in the annual BIM survey, create estimates of the total economic benefits of the industry locally and nationally. The study findings described the underlying socio-economic characteristics of each bay sampled and of the study area as a whole, to give context to the benefits measured using Turnover, Employment, GVA and Taxable value.

The study findings are disseminated in 12 reports: One over-arching report of the total study area and a report on the findings for each of the 11 bays surveyed (i.e., Bantry Bay, Carlingford Bay, Clew Bay, Dingle Bay, Donegal Bay, Dungarvan Bay, Kenmare Bay, Kilkieran Bay, Mulroy Bay, Roaringwater Bay and Trawenagh Bay).

These are available at:
https://bim.ie/publications/aquaculture/

Table 28: Irish aquaculture economic multipliers by sub-sectors (2020).

Segment	GVA (€ MIllions)	Employment	Wages (€ Milions)
Finfish farming	1.9	3.3	3.2
Oyster farming	1.6	1.3	1.8
Mussel & others	1.6	1.2	1.8
Study Area	1.7	1.5	2.2

Appendices:

Appendix 1: Aquaculture output tonnage by culture Groups, 2012 to 2021

Culture Groups	2012	2013	2014	2015	2016
Bottom Mussel	6,484	5,527	3,206	5,697	6,475
Penned Salmon*	12,440	9,125	9,368	13,116	16,300
Minor Finfish	831	988	886	848	720
Other Bottom Bivalves	322	500	581	521	413
Other Minor Cultures	9	43	72	72	52
Rope Mussel	8,744	9,834	8,169	10,318	9,770
Salmon Hatchery	451	473	488	527	610
Farmed oyster	7,362	8,146	8,939	8,953	9,459
National value	**36,643**	**34,636**	**31,709**	**40,052**	**43,798**

* Sea units only

Culture Groups	2017	2018	2019	2020	2021
Bottom Mussel	7,491	4,697	4,894	4,354	5,865
Penned Salmon*	18,342	11,984	11,333	12,870	12,844
Minor Finfish	647	557	608	604	537
Other Bottom Bivalves	241	250	256	233	443
Other Minor Cultures	96	97	73	75	215
Rope Mussel	8,582	9,541	10,460	10,375	11,762
Salmon Hatchery	545	256	400	462	522
Farmed oyster	9,990	10,196	9,899	8,763	10,624
National value	**45,934**	**37,577**	**37,923**	**37,735**	**42,812**

* Sea units only

Appendix 2: Aquaculture Sales value by culture groups

Culture Groups	2012	2013	2014	2015	2016
Bottom Mussel	6,156,585	9,173,400	4,181,450	6,015,030	5,858,497
Penned Salmon*	75,700,913	55,679,943	57,725,266	89,835,735	104,478,116
Minor Finfish	2,753,149	3,301,950	3,132,950	2,727,910	2,038,910
Other Bottom Bivalves	1,572,894	2,665,300	2,995,525	2,816,550	2,417,250
Other Minor Cultures	16,000	281,000	280,500	377,500	347,500
Rope Mussel	5,114,152	5,736,008	5,394,809	6,672,827	6,479,047
Salmon Hatchery	5,686,650	3,261,000	3,202,500	4,845,079	4,166,600
Farmed oyster	34,437,719	37,108,687	39,297,661	34,961,262	41,175,352
National value	**131,438,062**	**117,207,288**	**116,210,661**	**148,251,893**	**166,961,272**

* Sea units only

Culture Groups	2017	2018	2019	2020	2021
Bottom Mussel	8,829,931	6,074,218	7,885,878	7,067,211	9,141,696
Penned Salmon*	133,519,265	95,742,392	108,721,367	118,942,346	106,108,320
Minor Finfish	1,970,910	1,635,000	1,674,425	1,882,885	1,762,045
Other Bottom Bivalves	1,387,150	1,375,000	1,238,650	853,850	2,047,000
Other Minor Cultures	342,400	346,600	260,200	271,265	753,115
Rope Mussel	5,774,665	6,069,065	6,906,938	6,200,213	8,078,215
Salmon Hatchery	5,345,605	5,118,322	3,393,079	7,831,331	3,437,000
Farmed oyster	43,727,845	44,609,884	44,057,456	36,735,163	47,551,477
National value	**200,897,771**	**160,970,480**	**174,137,992**	**179,784,263**	**178,878,868**

* Sea units only

Appendix 3: Aquaculture employment number by culture groups

Culture Groups	2012	2013	2014	2015	2016
Bottom Mussel	150	130	120	107	114
Penned Salmon*	172	129	131	141	160
Minor Finfish	33	32	29	26	23
Other Bottom Bivalves	408	487	502	462	507
Other Minor Cultures	8	25	20	21	26
Rope Mussel	294	273	260	256	262
Salmon Hatchery	59	54	53	50	51
Farmed oyster	577	675	725	772	811
National value	**1,700**	**1,805**	**1,840**	**1,835**	**1,954**

* Sea units only

Culture Groups	2017	2018	2019	2020	2021
Bottom Mussel	124	112	102	110	98
Penned Salmon*	149	179	194	170	223
Minor Finfish	19	20	22	22	21
Other Bottom Bivalves	491	505	524	376	273
Other Minor Cultures	31	29	32	29	35
Rope Mussel	240	228	226	249	228
Salmon Hatchery	63	51	49	47	48
Farmed oyster	823	847	837	850	1024
National value	**1,940**	**1,971**	**1,986**	**1,853**	**1,950**

* Sea units only

Appendix 4: Aquaculture Economic performance 2012 to 2021

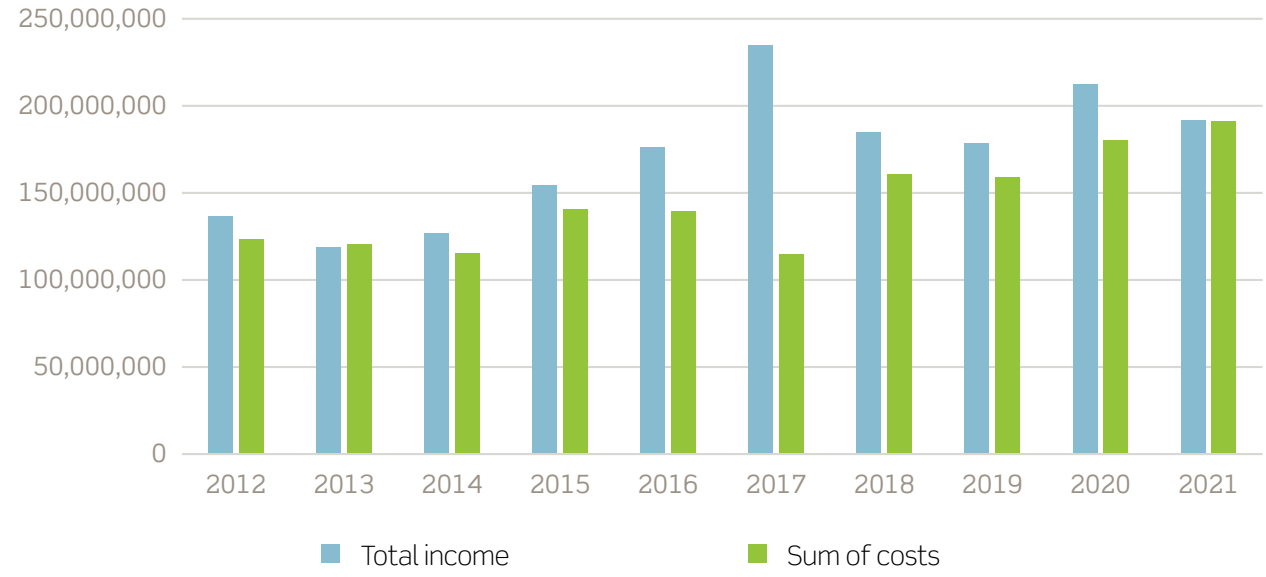
Variable	Years				
Culture Groups	**2012**	**2013**	**2014**	**2015**	**2016**
Turnover	130,349,969	117,724,288	116,298,661	148,594,293	167,724,372
Subsidies	517,216	782,533	1,719,820	1,816,919	4,316,202
Other income Total	517,216	782,533	1,719,820	1,816,919	4,316,202
Total income	136,543,333	118,741,434	126,521,383	154,505,319	176,106,777
Wages and salaries	37,911,057	23,556,423	28,256,803	30,872,908	27,854,618
Imputed value of unpaid labour	2,396,209	1,347,506	1,789,891	1,517,451	1,416,301
Energy costs	10,186,902	11,053,024	3,782,682	4,160,373	4,988,212
Raw material costs: Livestock costs	13,704,060	14,632,886	14,678,690	28,504,784	16,886,284
Raw material costs: Feed costs	22,299,924	23,465,062	24,903,003	20,100,628	36,196,864
Repair and maintenance	10,551,902	11,409,961	7,034,956	9,412,331	9,851,804
Other operational costs	18,633,923	26,211,630	25,238,866	29,141,074	33,084,156
Depreciation of capital	8,058,174	6,926,407	5,028,579	9,132,866	5,745,397
Financial costs, net	2,097,932	3,025,541	6,367,228	8,979,875	4,877,908
Extraordinary costs, net	0	365,602	6,997,236	40,242,642	4,914,061
Sum of costs	123,443,874	120,280,934	115,290,807	140,304,839	139,485,242
Total value of assets	189,743,450	165,109,019	199,768,441	175,865,728	190,942,888
Net Investments	2,338,292	3,893,007	20,441,417	3,833,551	7,208,575
Debt	125,647,212	85,266,379	85,968,019	76,138,898	84,362,877
Raw material volume: Livestock	15,221	15,598	15,866	17,592	15,612
Raw material volume: Feed	16,165	11,049	17,030	13,333	23,883
Total sales volume	36,197	34,667	31,659	40,128	44,018
Male employees	1,571	1,716	1,692	1,713	1,798
Female employees	137	124	129	118	150
Total employees	1,708	1,840	1,821	1,830	1,948
Male FTE	887	891	871	917	950
Female FTE	69	66	70	67	78
FTE	956	956	941	983	1,027
Number of enterprises <=5 employees	191	198	197	200	194
Number of enterprises 6-10 employees	62	58	49	48	61
Number of enterprises >10 employees	26	27	31	31	34

* Provisional

Variable	Years				
Culture Groups	**2017**	**2018**	**2019**	**2020**	**2021**
Turnover	200,017,543	179,455,531	175,288,680	179,962,851	178,878,868
Subsidies	1,724,345	2,769,867	1,720,133	9,538,153	2,346,621
Financial income	32,269,404	776,749	989,726	5,971,344	468,186
Other income	979,456	1,688,522	3,387,468	16,700,557	10,207,811
Other income Total	34,973,205	5,235,137	6,097,327	32,210,055	13,022,618
Total income	234,990,748	184,690,669	178,143,158	212,172,906	191,901,487
Wages and salaries	26,830,773	29,820,207	31,027,724	34,331,124	30,426,288
Imputed value of unpaid labour	852,315	1,966,961	309,763	3,480,619	2,309,814
Energy costs	2,693,931	9,564,373	2,736,982	3,689,535	5,197,619
Raw material costs: Livestock costs	14,280,006	12,317,040	18,623,317	14,679,024	31,391,823
Raw material costs: Feed costs	31,099,907	23,658,466	21,733,606	30,536,557	37,635,860
Repair and maintenance	9,721,112	9,397,921	5,949,501	7,777,028	8,910,791
Other operational costs	18,099,786	65,402,360	64,917,632	60,710,589	59,709,480
Depreciation of capital	9,057,950	9,346,213	12,488,705	10,030,618	8,563,817
Financial costs, net	3,084,344	1,355,238	1,301,243	18,300,472	9,286,772
Extraordinary costs, net	47,924,575	5,308,483	2,110,405	0	0
Sum of costs	114,867,810	160,861,817	158,778,709	180,054,946	191,122,449
Total value of assets	194,431,686	240,470,462	315,087,657	315,087,657	272,061,842
Net Investments	7,639,443	10,548,856	11,130,926	11,130,926	15,923,149
Debt	66,635,403	79,492,327	70,675,213	70,675,213	102,624,955
Raw material volume: Livestock	14,083	860,790	3,361,766	12,138,047	17,004
Raw material volume: Feed	22,576	16,347	20,113	20,388	24,157
Total sales volume	45,726	37,201	38,289	37,822	42,812
Male employees	1,773	1,709	1,824	1,665	1,760
Female employees	150	149	162	188	190
Total employees	1,923	1,858	1,986	1,853	1,950
Male FTE	950	1,006	999	926	1,021
Female FTE	78	77	81	90	106
FTE	1,026	1,083	1,080	1,016	1,127
Number of enterprises <=5 employees	185	181	200	208	217
Number of enterprises 6-10 employees	67	68	48	61	53
Number of enterprises >10 employees	30	32	40	41	43

Economic Indicators					
	2012	2013	2014	2015	2016
Total sales volume	36,197	34,667	31,659	40,128	44,018
Total income	136,543,333	118,741,434	126,521,383	154,505,319	176,106,777
Gross Value Added (GVA)	46,765,242	45,799,427	46,397,303	66,772,520	86,114,597
Operating Capital Flow (OCF)	17,579,417	8,177,835	14,123,481	28,219,114	43,178,637
EBIT	9,521,243	1,251,428	9,094,902	19,086,248	37,433,241
Net Profit	7,423,311	-2,139,715	-4,269,563	-30,136,269	27,641,271
Return on investment (ROI)	0.1	0.0	0.0	0.1	0.2
Financial Position	0.5	0.9	1.3	1.3	1.3
FTE	956	956	941	983	1027
Subsidies	517,216	782,533	1,719,820	1,816,919	4,316,202
Labour productivity	48,912	47,883	49,285	67,903	83,887
Capital productivity	0.2	0.3	0.2	0.4	0.5
Running cost to turnover ratio	87	94	89	82	77
EBIT to turnover ratio	7	1	7	12	21
GVA per FTE	48,912	47,883	49,285	67,903	83,887

Economic Indicators					
	2017	2018	2019	2020	2021
Total sales volume	45,726	37,201	38,289	37,822	42,812
Total income	234,990,748	184,690,669	178,143,158	212,172,906	191,901,487
Gross Value Added (GVA)	160,086,131	109,330,583	107,264,378	128,936,666	87,249,897
Operating Capital Flow (OCF)	132,265,233	34,530,302	36,397,245	60,449,050	18,629,626
EBIT	123,207,282	25,184,089	23,908,540	50,418,432	10,065,809
Net Profit	72,198,363	18,520,369	20,496,893	32,117,960	779,037
Return on investment (ROI)	0.6	0.1	0.1	0.2	0.0
Financial Position	1.9	2.0	3.5	3.5	1.7
FTE	1,026	1,083	1,080	1,016	1,127
Subsidies	1,724,345	2,769,867	1,720,133	9,538,153	2,346,621
Labour productivity	156,027	100,952	99,293	126,906	77,418
Capital productivity	0.8	0.5	0.3	0.4	0.3
Running cost to turnover ratio	51	84	83	84	97
EBIT to turnover ratio	52	14	13	24	5
GVA per FTE	156,027	100,952	99,293	126,906	77,418



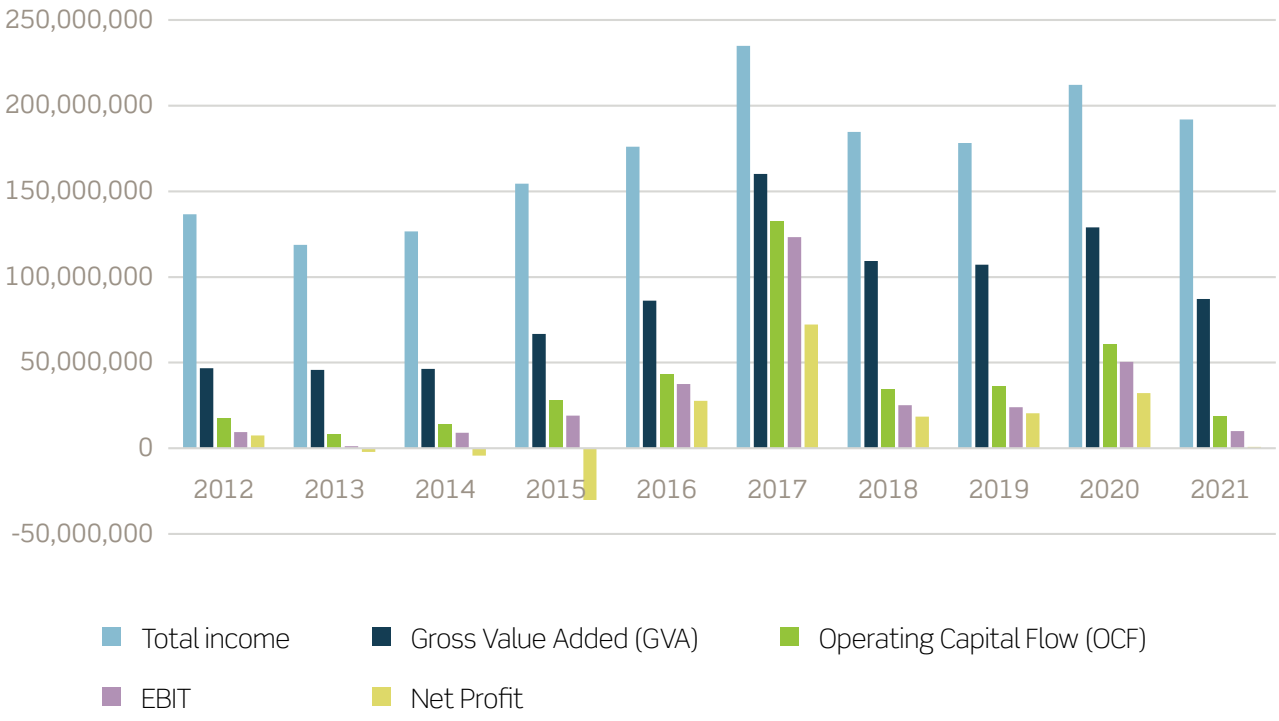


Figure 25: Total Income versus costs (2012-2021) and key economic indicators (2012-2021)

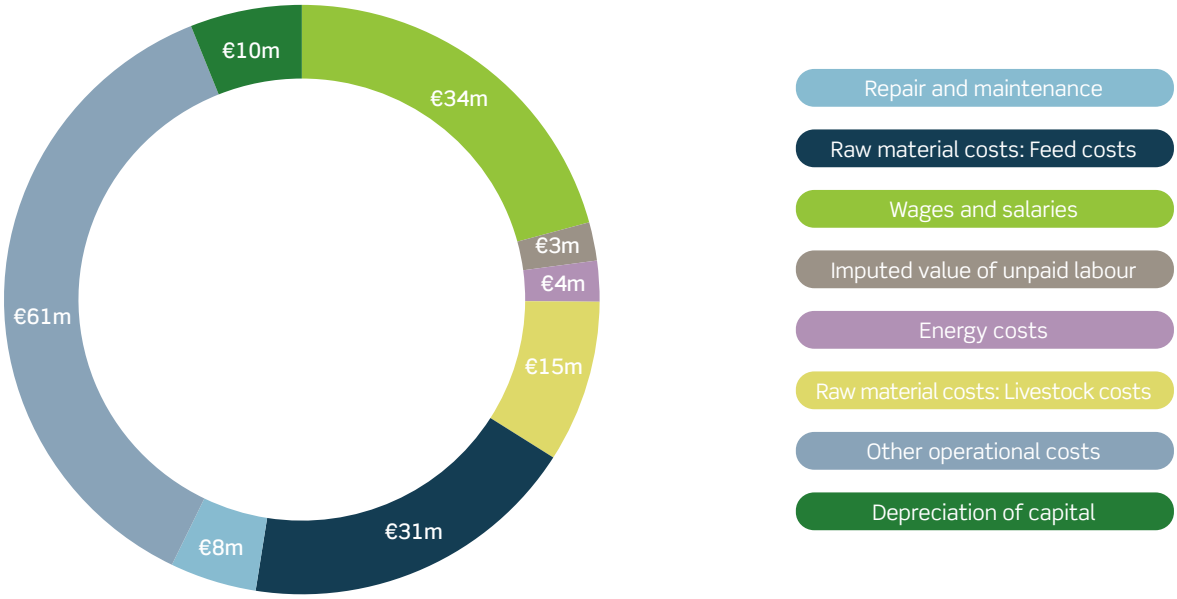


Figure 26: Aquaculture costs by variable in 2019

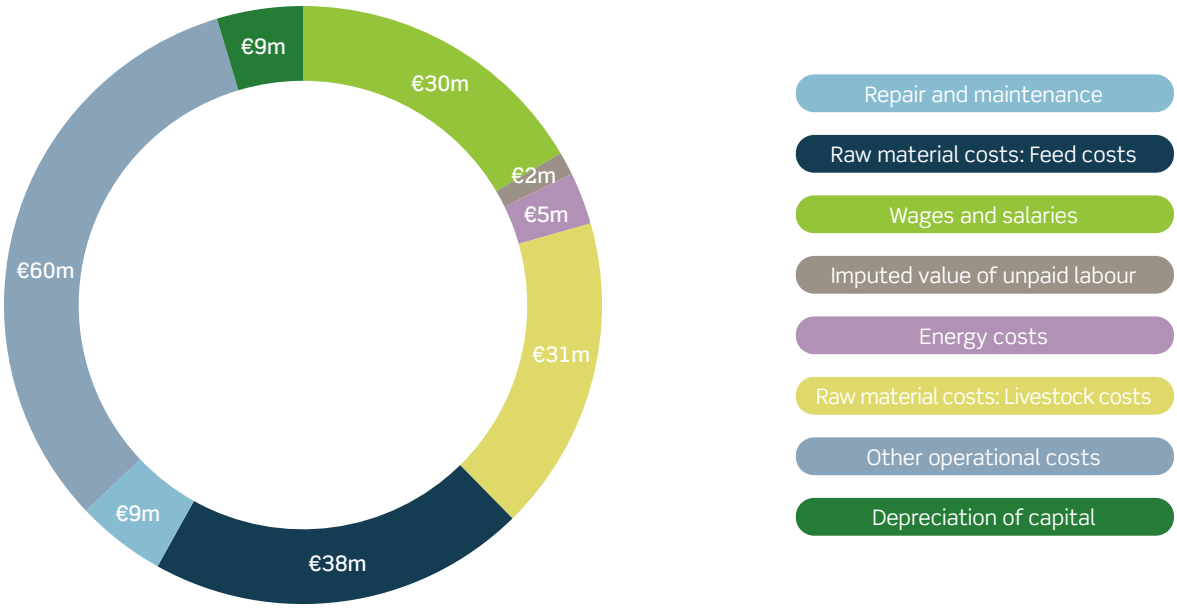


Figure 27: Aquaculture costs by variable in 2020

Appendix 5: Concepts, terms, and definitions

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 Revenues: 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.

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Herbie Dennis

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