The Economic Impact of the Seafood Sector:

Ros an Mhíl

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Foreword

The Economic Impact of the Seafood Sector: Ros an Mhíl

In 2019, BIM completed the project to evaluate Ireland's top ten seafood ports and assess the importance of the seafood sector directly and downstream in these ports, their hinterlands and at the regional and national levels. The seafood sector is a primary driver of rural economies around the coastline of Ireland and acts as an anchor in these locations around which other supporting service sectors develop. This report reveals the results of this project for the port of Ros an Mhíl and its hinterland. Ros an Mhíl is an important seafood port in Ireland with high volumes of Dublin Bay prawns landed here annually and is the major port in the west of Ireland.

Ros an Mhíl is located in the west of Ireland in the Connemara region. This region is characterised as mountainous with poor soil quality and marginal agricultural land. The Connemara region is a popular tourist attraction and thousands of tourists get ferries to go to the Aran Islands from the port each year. Connectivity of the port is good with a regional road connecting the port to Galway (37km), with Dublin at a distance of 208km (by motorway from Galway). The hinterland of Ros an Mhíl extends up to the frontiers of Galway city, therefore, there is a significant commuter belt aspect to the area. For these reasons, the seafood sector is an important driver of the local economy after the manufacturing, mining and utilities sector, the public sector, tourism and professional services sectors.

In this report, it is shown that the seafood sector has important multiplier effects in terms of gross value added, employment and wages downstream in the local economy. In total, 9% of the Ros an Mhíl hinterland economy can be attributed to the seafood sector encompassing direct, indirect and induced effects. Direct employment of the seafood economy in the region is 440 with a further 155 full-time employees generated downstream. The sector generates €8.2 million in wages and salaries directly with a further €5.3 million generated indirectly and through induced effects of the seafood sector at the regional level. Further downstream effects occur outside the region at the national level.

Participation in this survey by seafood producers in Ros an Mhíl was very high with 48% of the target audience responding. Special thanks are owed to all participants in the survey and particularly to Sean Griffin (Galway and Aran Fishermen's Co-operative) and Seamus Breathnach (BIM) for their assistance in this project. Richard Curtin, Economic and Strategic Services Unit, BIM, would also like to recognise the excellent work carried out by Oxford Economics and Perceptive Insight in the course of this project.

Executive summary

The seafood sector at the port

The seafood sector makes an important contribution to the Ros an Mhíl economy. In 2018, we estimate that the sector directly generated €50 million in turnover, supporting nearly 440 direct jobs. Aquaculture is the largest of the three seafood sub-sectors, generating an estimated €25 million in turnover, followed by fish processing (€15 million) and commercial fishing (€9 million). When translated into GVA, the seafood sector directly contributes an estimated €24 million to the local port economy.[1]

€24m

Direct GVA in 2018

The seafood sector makes a significant contribution within the local port economy.

€34m

Total GVA contribution to the West economy in 2018

The seafood sector makes an even larger contribution to the wider regional economy.

Our survey also identified the key characteristics of the local seafood industry and the business environment for those based at Ros an Mhíl. The industry is well established, with nine in ten firms established for at least a decade. Turnover also appears to be stable or increasing for most local businesses, whilst 30% of operators invested in capital in 2018. The rate of investment for the port is strong and averages that of other Irish ports. The outlook for the port of Ros an Mhíl is positive if investment remains at this level.

Nearly three quarters of sectoral employees (72%) originally hail from the port hinterland, while 16% are originally from overseas. Ros an Mhíl is also notable in that almost all of its produce goes to domestic markets rather than exports. The local hinterland consumes around half of the output.

Analysing the survey results allows us to quantify the port seafood sector's value within the regional economy. Once the indirect and induced effects are calculated, we estimate that the total economic contribution of the seafood sector at Ros an Mhíl equated to €34.1 million of GVA across the West economy in 2018. The port's seafood sector supported an estimated 595 jobs across the region and generated €4.3 million in tax revenues.

Fig. 1. The estimated benefits of the port seafood sector, West

Port seafood sector	West		
	GVA (€m)	Employment	Wages (€m)
Direct	23.7	440	8.2
Indirect	7.0	110	3.6
Induced	3.4	45	1.7
Total	**34.1**	**595**	**13.6**

Source: *Oxford Economics, Perceptive Insight, CSO*
Note: *May not sum due to rounding*

1 Gross Value Added (GVA) is the difference between the value of goods and services produced by a business or a sector, and the cost of raw materials and other inputs which are used in production. It is essentially a measure of the value added to the services or products provided by a sector or firm.

The role of the individual seafood sub-sectors

Our analysis of the seafood sector at the port produces the following headline findings throughout the region (which again will include the combined direct, indirect and induced impacts).[2]

- Activity in the commercial fishing sub-sector has been estimated to sustain 205 jobs, €2.9 million of wages and €7.7 million of GVA;
- Activity in the aquaculture sub-sector has been estimated to sustain 245 jobs, €8.5 million of wages and €19.7 million of GVA;
- The processing sub-sector has been estimated to sustain 200 jobs, €4.2 million of wages and €10.7 million of GVA.

Socio-economic characteristics

Sectors which are closely aligned with the seafood sector support around a quarter of jobs within the Ros an Mhíl economy. Commuting data suggests that outside of these industries, local employment opportunities could be more limited. Ros an Mhíl also struggles with poor qualification attainment and negative population and working age population growth, while economic inactivity rates are high.

Whilst the local economy is more diversified than other coastal economies there are some limitations to growth. Ros an Mhíl and its hinterland suffer from a demographic deficit and has an ageing population, with above average share of those aged 45 and over. This may act as a barrier to development of new opportunities and job creation in the future and may place reliance on the seafood sector to provide employment opportunities to the older cohort. The educational profile is notably weaker than the national average, 21% of residents identify as having only primary education or lower. The provision of lesser-skilled occupations in the agricultural, forestry & fishing sector is therefore an important source of employment for the sizeable population with lower qualification levels.

As a result, the seafood sector is likely to be play a significant role in the local port economy through its provision of direct jobs, supply chain spending in local businesses and the consumer spending it supports. Looking forward, a vibrant and growing local seafood sector will be important for the economic and demographic health of the local area.

2 Summing the benefits of all three elements within our definition of the seafood sector (fishing, aquaculture and processing) will overestimate the indirect and induced impacts, and as a result, overall impacts. This is because the supply chain of the processing sub-sector will likely contain a proportion of the port's fishing sub-sector and its supply chain. To get the direct totals (for employment, GVA and wages), we add all the three sub-sectors. However, for the indirect and induced totals, we sum those of the processing sub-sector with a proportionate share of the fishing and aquaculture (according to the proportion of sales not destined for local processors and informed by the interview process). The remainder of the fishing and aquaculture indirect and induced impacts will already be accounted for within that of the processors.

1. Introduction

1.1 About the study

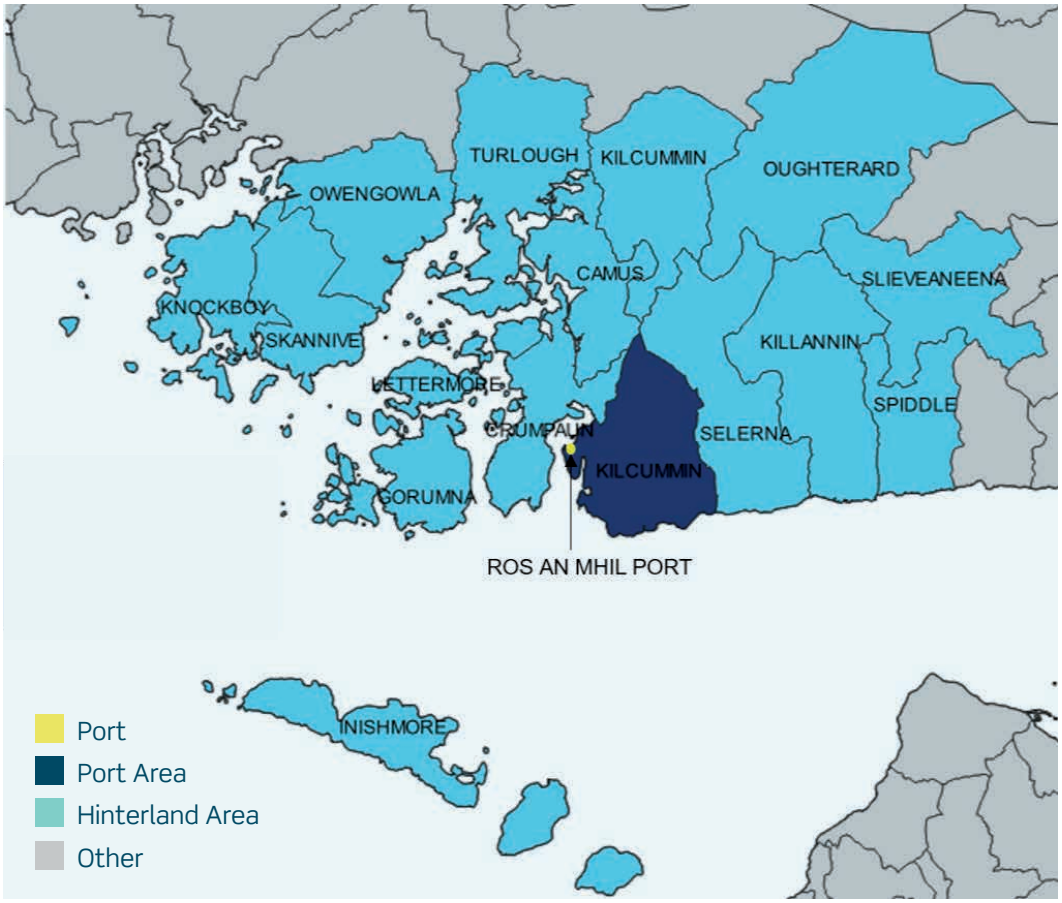
The Irish seafood sector is an important component of the Irish economy. It is, however, more important to coastal communities around the country given its concentration at Ireland's ports and the relatively lower level of alternative economic activity in these economies. In addition, as economic and employment growth is increasingly driven by office-based activity which favours urban areas, the seafood sector's role in providing labour market opportunities, wages and local demand in these local areas is arguably rising.

Against this backdrop, Bord Iascaigh Mhara (BIM) commissioned Oxford Economics and Perceptive Insight to estimate the economic contribution of the seafood sector in ten of Ireland's ports.

1.2 The port area

Ros an Mhíl is a fishing and ferry port on the Irish west coast. Located just along the coast from Galway city the village is the key mainland terminal for the outlying islands. In this report we define the local port economy as the District Electoral Division (DED) of Kilcummin and those surrounding it, which constitute its hinterland – informed by BIM and shown in the below figure.

Fig. 2. Map of port area and hinterland



To inform the analysis, a comprehensive seafood-related survey exercise was carried out across Ireland's main ports. We worked closely with BIM in order to, firstly, understand the seafood population at each of the 10 ports. Following this, the market research firm Perceptive Insight collected information concerning the characteristics of the local seafood sector through both telephone and electronic surveys.

In total, there were close to 470 individual responses from seafood-related businesses across Ireland. Of this total, close to 330 unique responses were recorded from seafood operators based in the 10 port areas – a response rate of close to 40%, relative to the known seafood population. The study also draws on published data were available to better understand the sectoral composition of coastal areas within the country. Peripheral economies tend to face significant challenges from which Ros an Mhíl is not exempt. **Appendix 1** of this report includes a summary discussion of the pertinent issues facing the local port economy.

1.3 The key elements of the local seafood sector

In this paper, we present our estimates of the size of the local seafood sector and how it impacts the regional economy. Our analysis therefore estimates the direct activity associated with the commercial fishing, aquaculture and fish processing sub-sectors at the port by drawing on the survey findings and information held by BIM. We then estimate their wider impacts within the local NUTS3 region. These wider impacts include those associated with the seafood sector's supply chain and the consumer spending of those employed as a result of the direct and indirect activity – see **Box 1** for more detail concerning our methodology.

Our analysis is also careful to identify where the three different seafood sub-sectors appear in the supply chains of the other sub-sectors. The most obvious example is commercial fishing appearing within the supply chain of fish processing. Our analysis has isolated the benefits to avoid instances of double counting (see **Appendix 2** for further information concerning the model approach).

BOX 1: INTRODUCING ECONOMIC IMPACT ANALYSIS

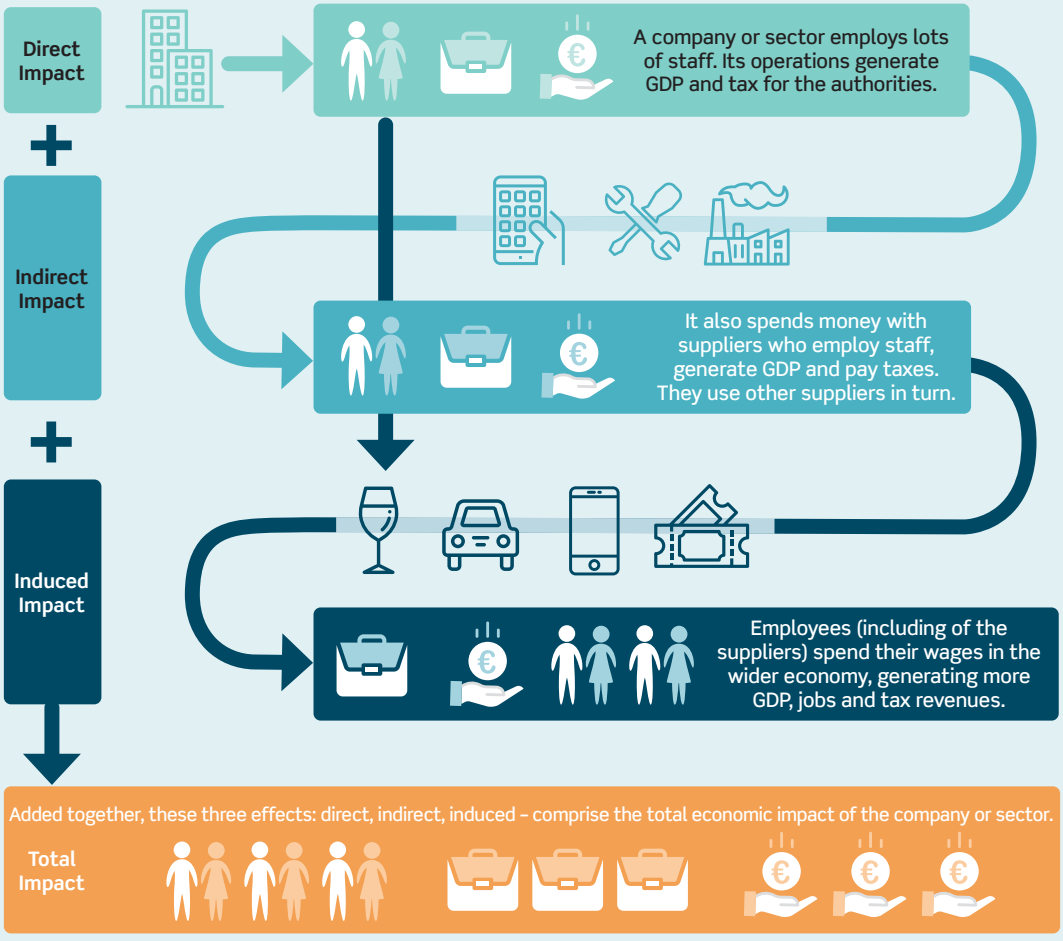
The economic impact of a sector is measured using a standard means of analysis called an economic impact assessment. The report quantifies the three 'core' channels of impact that comprise an organisation/sector's 'economic footprint':

- **Direct impact,** which is the economic activity the seafood sector generates because of its operations;
- **Indirect impact,** or supply chain impact, that occurs because the sector buys inputs of goods and services from Irish businesses; and the
- **Induced impact,** which relates to the wider economic benefits that arise when employees of the local seafood sector and its supply chain spend their wages in the consumer economy, for example, in local retail establishments.

We analyse these channels of impact using three core metrics:

- **Employment,** measured on a Full-Time Equivalent (FTE) headcount basis. This is comprised of both full-time employment and a proportion of part-time working component – where two part-time roles equate to a full-time position;
- **Gross value added** contribution to GDP; and
- **Tax receipts** generated by the Irish activity and employment supported by the seafood sector.

Fig. 3: Economic impact assessment



1.4 Report structure

This report breaks down the characteristics of the collective seafood sector within the port area. It then goes on to show the economic impact this activity creates across the West economy.

The report takes the following structure:

- An analysis of the seafood sector within the local port economy;
- A breakdown of the economic benefits associated with the port's seafood sector across the regional economy;
- A summary of the overall benefit associated with the port's seafood sector at the regional level; and
- Finally, we present the report's conclusions.

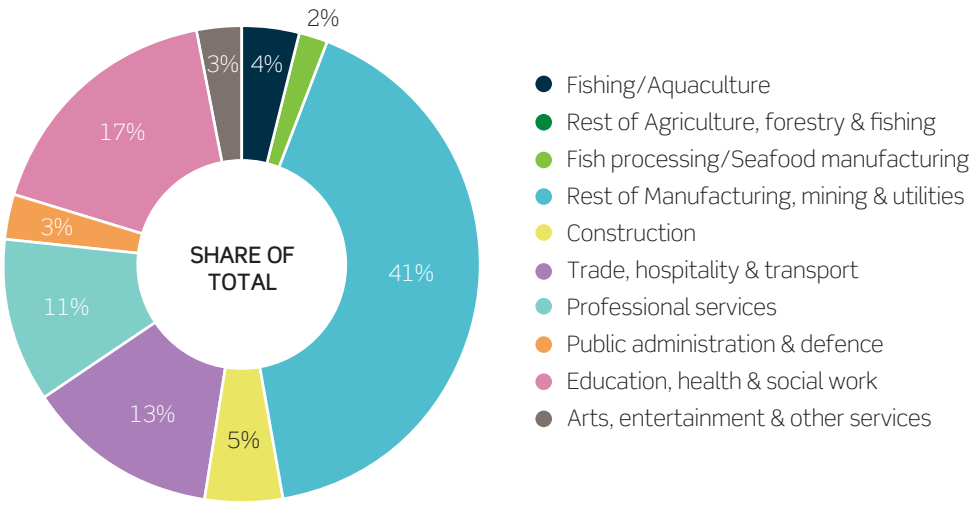
2. The seafood sector at the port

2.1 The importance of the local seafood sector

Before we present the total benefits associated with the port's seafood sector, it is important to first understand the size and characteristics of the sector at the port level – the **direct** activity.

Unsurprisingly, the seafood sector forms a significant component of Ros an Mhíl's economy. The latest Census (2016) provided workplace employment data at a sectoral level for small area District Electoral Divisions (DEDs) across Ireland. By combining this employment data with our regional productivity estimates we can quantify the economic footprint of the port economy. We therefore estimate that Ros an Mhíl's economy made a GVA contribution to GDP of €375 million in 2018.[3] We estimate that the seafood sector within the port represented €23.7 million of this GVA total. Seafood therefore represented 6% of the port economy. The largest sectors in GVA terms were the 'manufacturing, mining & utilities' and 'education, health & social work' sectors which represented 43% and 17% of the local economy respectively.

Fig. 4. GVA by sector, Ros an Mhíl, 2018



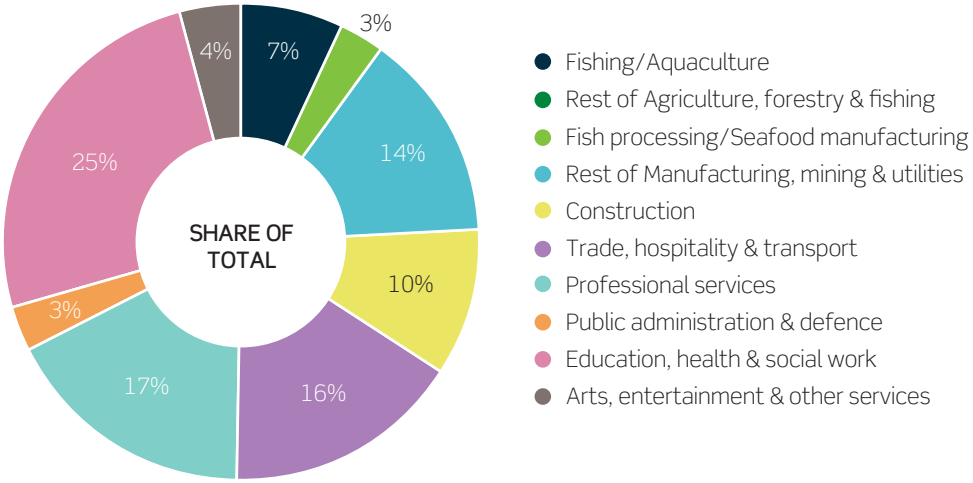
Source: *Oxford Economics, Perceptive Insight, CSO*

In employment terms, seafood is more important within the port economy. Combined commercial fishing, aquaculture and fish processing are estimated to directly sustain approximately 10% of workplace employment across the port area in 2018.[4] Commercial fishing and aquaculture represented close to all of local agriculture, forestry & fishing related employment and fish processing accounted for close to a fifth of local manufacturing, mining & utilities jobs.

3 When estimating the size of the port economies we use the most recent workplace sectoral employment data from the 2016 Census. This employment data relates to workplace zones, which are slightly smaller than DEDs. The workplace zones are therefore mapped across to closely represent the DEDs which cover to the port areas. We then supplement this data with the current snapshot of the local seafood sector as estimated through the survey exercise. Finally, we subtract the commercial fishing and aquaculture activity from the broader 'Agriculture, forestry & fishing' sector to get an indication of its prominence locally. A similar approach is adopted with fish processing in relation to the 'Manufacturing, mining & utilities' sector.

4 The latest available sectoral employment data for the port area economies was for 2016. Therefore, both the GVA and employment estimates shown for the port economies combine this data with the current snapshot of the seafood sector.

Fig. 5. Employment by sector, Ros an Mhíl, 2018



Source: *Oxford Economics, Perceptive Insight, CSO*

2.2 Characteristics of the seafood sector

At Ros an Mhíl, aquaculture was the largest direct contributor to the local seafood industry. In 2018, this sector generated €12.1 million in GVA to the local economy, higher than both fish processing (€7 million) and commercial fishing (€4.7 million).

However, commercial fishing made the largest contribution to employment, sustaining 170 full-time jobs in 2018 across 103 different port operators. Fish processing was not far behind, supporting 140 direct jobs across eight different firms. The disparity in average number of employees per operator reflects the economies of scale present in fish processing plants. Aquaculture added a further 130 jobs to the local port economy. Despite employing the fewest people, turnover for aquaculture firms was higher than in commercial fishing. This sub-sector also generated €4 million in wages for local employees, almost twice that received by fish processing workers despite having similar levels of employment.

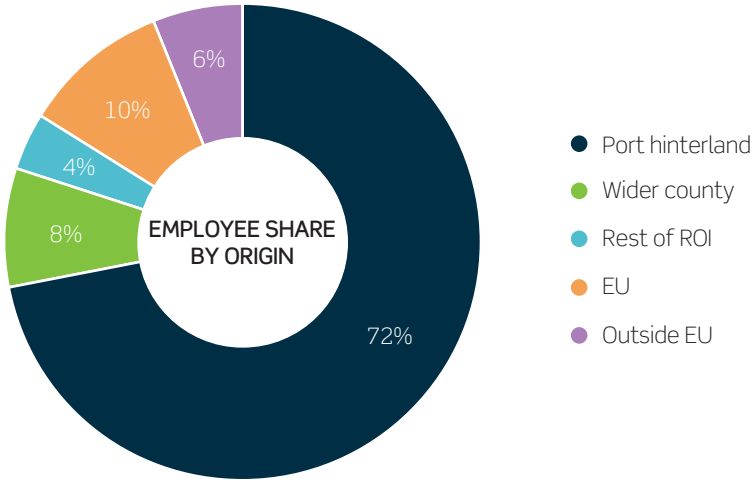
Fig. 6. Headline direct economic contribution of the seafood sector, Ros an Mhíl, 2018

	Turnover (€m)	Jobs	Wages (€m)	Seafood operators
Commercial fishing	9.2	170	1.6	103
Aquaculture	25.5	130	4.4	5
Fish processing	15.4	140	2.2	8
Total	**50.0**	**440**	**8.2**	**116**

Source: *Oxford Economics, Perceptive Insight, BIM*
Note: *May not sum due to rounding*

Our analysis has also drawn on a survey of local seafood operators to quantify the business environment that Ros an Mhíl firms faced in 2018. To put employment in the context of the regional and national economies we asked about the composition of the workforce at the port. We found that 72% of local employees originated from the port hinterland itself, 10 percentage points higher than the average across all ports. This suggests that the local seafood industry has a prominent employment role for the local community at Ros an Mhíl. Another 12% of workers came from elsewhere in Ireland while one in ten were originally from elsewhere in the European Union.

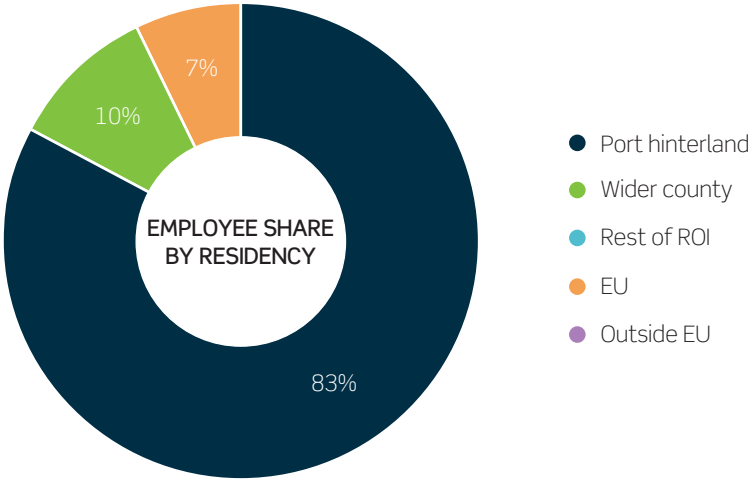
Fig. 7. Workforce origin, Ros an Mhíl, 2018



Source: *Oxford Economics, Perceptive Insight*

The international element to the seafood workforce was concentrated in commercial fishing crews, which typically draw on a wider pool of labour. The fish processing and aquaculture workforces were composed primarily of local workers from the port hinterland or the wider county. Given the majority of employees originally come from the port hinterland most also continue to live in the local area.

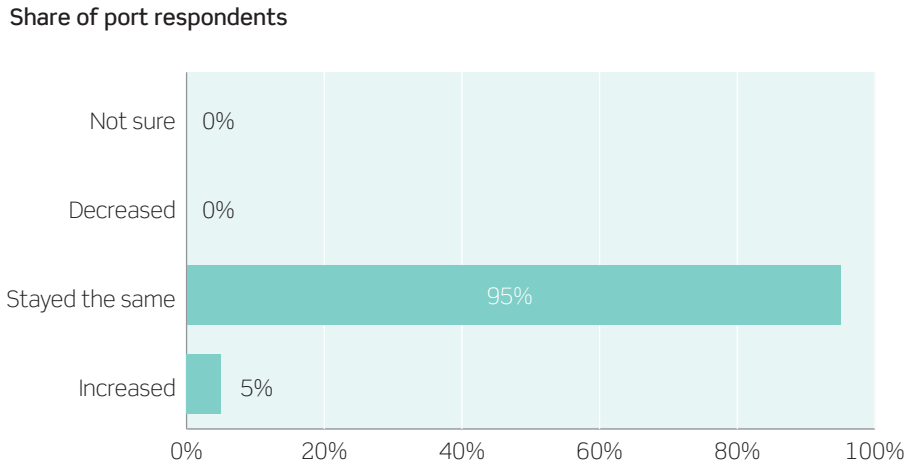
Fig. 8. Workforce residency, Ros an Mhíl, 2018



Source: *Oxford Economics, Perceptive Insight*

When questioned about the size of their workforce over the previous 12 months, 95% of respondents in Ros an Mhíl reported it had remained unchanged over the previous 12 months. The remaining 5% said that they had increased their number of employees. This reflects the broad picture seen across most of the other ports in our sample, with the majority seeing stability in their workforce size in 2018.

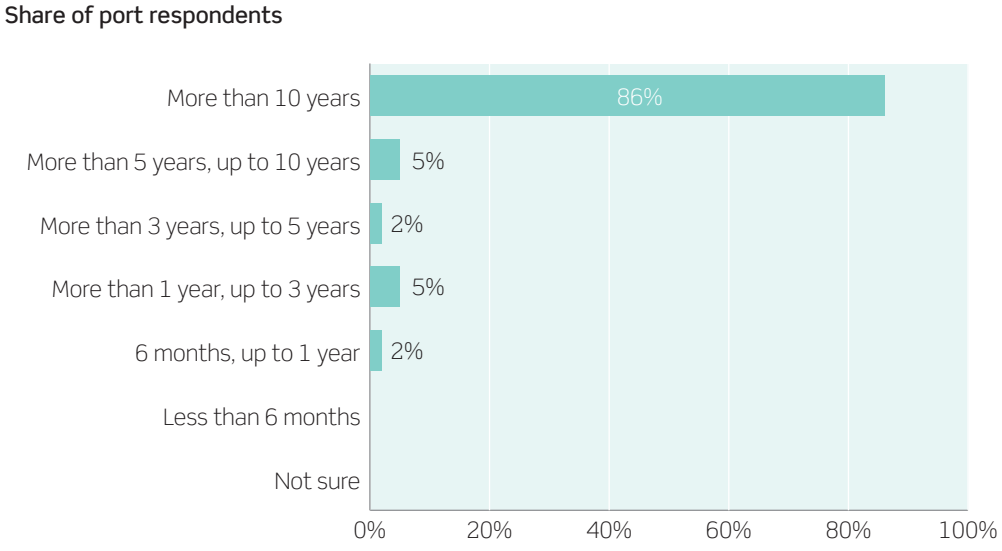
Fig. 9. Change in workforce size, Ros an Mhíl, 2018



Source: *Oxford Economics, Perceptive Insight*

With a high reliance on local workers it is no surprise that the seafood industry at Ros an Mhíl is well established. In examining the current state of the seafood industry our survey looked at the maturity of firms operating from the port. Business longevity is high at Ros an Mhíl, 86% of firms have been established for at least ten years. A further 7% had been operating for at least three years as of 2018. The sample sizes when broken down to the sub-sectoral level are small, but they show a similar degree of maturity across all three industries with most of the new entrants joining the commercial fishing fleet.

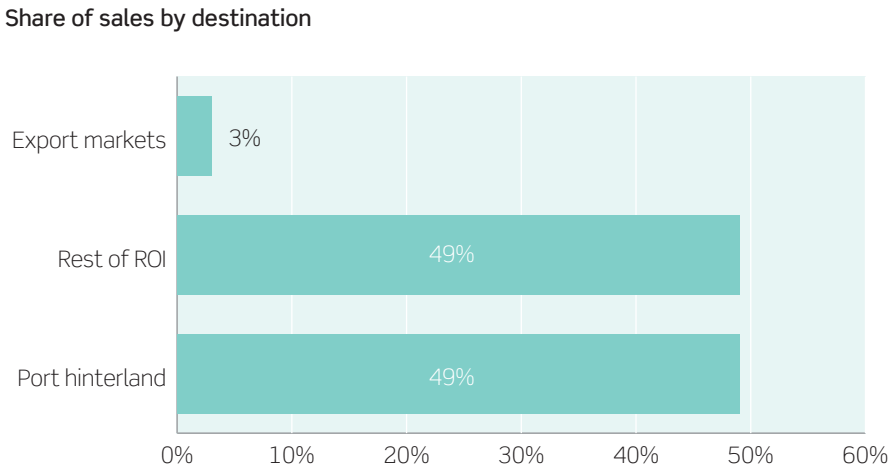
Fig. 10. Seafood sector maturity, Ros an Mhíl, 2018



Source: *Oxford Economics, Perceptive Insight*

Whilst the hinterland remains the key location for the workforce the survey also explored the key markets for sale of goods. Sales to the immediate hinterland made up 49% of total sales at Ros an Mhíl; above the average for all ports by 16 percentage points. The rest of Ireland took an equal share of sales in 2018, leaving just 3% of seafood produce for the export market. This is significantly lower than the average from our sample and strongly indicates that Ros an Mhíl caters heavily for the domestic market.

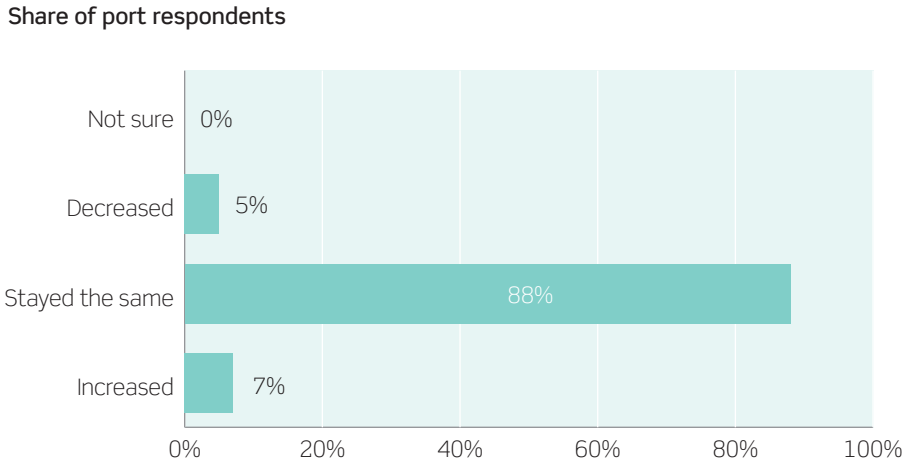
Fig. 11. Sales by destination, Ros an Mhíl, 2018



Source: *Oxford Economics, Perceptive Insight*

Looking at the performance of these operating firms our survey addressed turnover and investment in the seafood industry. Overall, the industry appears to be performing well at Ros an Mhíl; turnover was reported to have stayed flat over the last 12 months for 88% of respondents in 2018. An extra 7% reported an increase in turnover over the previous 12 months. Just 6% of seafood operators reported a decrease in their turnover, below the average rate for all ports in the survey. The sample sizes at the sub-sectoral level are too small to report but indicate stability across the whole seafood industry.

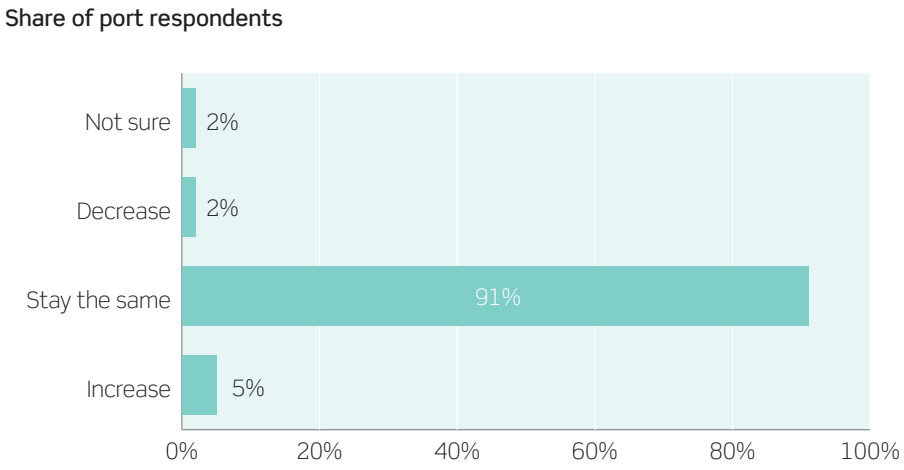
Fig. 12. Turnover in the past 12 months, Ros an Mhíl, 2018



Source: *Oxford Economics, Perceptive Insight*

Turning our eye to what businesses perceive the future holds we asked about turnover expectations for the next 12 months. Nine in ten respondents believed their turnover would stay about the same over the next year and 5% thought it would increase. Whilst the sample sizes are small when broken down at the sub-sectoral level, the results indicate expectations to mirror latest turnover patterns.

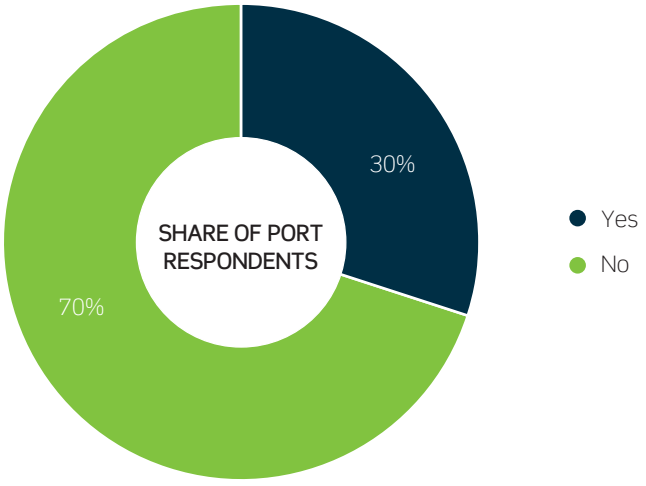
Fig. 13. Turnover expectations for next 12 months, Ros an Mhíl, 2018



Source: *Oxford Economics, Perceptive Insight*

Increases in turnover are often linked to business investment: increased productivity and turnover as a result of improvements to the stock of capital at a firm's disposal. However, investment can reflect either a positive outlook for future growth or a result of deteriorations to existing capital stock requiring additional spending. Our survey results suggest the latter predominates investment decision making. Despite only 5% of respondents expecting turnover to increase, 30% have already spent money on capital investment in the last financial year. Annual investment averaged €239,000 for Ros an Mhíl operators. Of total investment, half was spent within the hinterland with the other half spent elsewhere in Ireland.

Fig. 14. Capital investment, Ros an Mhíl, 2018

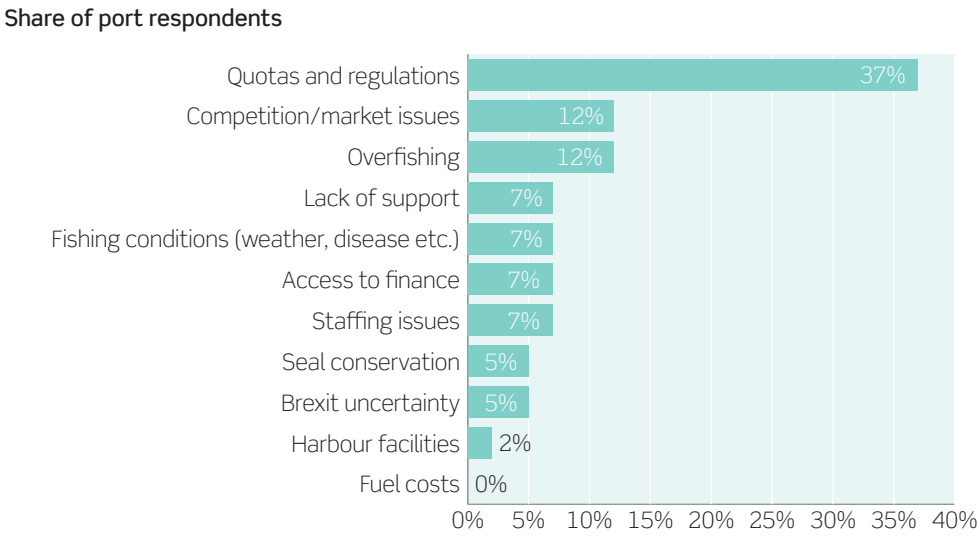


Source: *Oxford Economics, Perceptive Insight*

To better understand the decision making behind these investment decisions our survey also explored the perceived constraints on growth within the seafood sector. The biggest cap on growth was reported as quotas and regulations (37% of respondents). However, when asked whether an increase in quotas by 20% would lead operators to hire more staff, 74% of respondents said it would not – higher than the all ports average.

The problems of overfishing and market competition were the second most mentioned constraints, each receiving 12% of local responses in our survey.

Fig. 15. Main constraint on growth, Ros an Mhíl, 2018



Source: *Oxford Economics, Perceptive Insight*

2.3 Conclusion

Our survey also identified the key characteristics of the local seafood industry and the business environment for those based at Ros an Mhíl. The industry is well established, with nine in ten firms established for at least a decade. Turnover also appears to be stable or increasing for most local businesses, whilst 30% of operators invested in capital in 2018. The rate of investment for the port is strong and averages that of other Irish ports. The outlook for the port of Ros an Mhíl is positive if investment remains at this level.

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3. The impact of the seafood's sub-sectors

In this section, we estimate the wider economic footprint of Ros an Mhíl's seafood sector on the regional economy.

3.1 Commercial fishing

Commercial fishing operations at Ros an Mhíl contributed €7.7 million in GVA to the West economy in 2018; of which €4.7 million was a direct impact on the sector itself. This direct impact represented just under 20% of seafood direct total within the local port economy. Commercial fishing generated an additional €2.1 million in GVA through supply chain links, with an extra €900,000 generated via consumer spending arising from the employment the direct activity supports across the West.

Commercial fishing is estimated to support 205 jobs across the region, with 80% of this total belonging to the direct fishing activity itself. An additional 25 jobs were generated along the supply chain throughout the region. These supply chain jobs appear to take place in more highly productive roles, generating over three times as much GVA per worker than the direct fishing related jobs at the port. Together this combined workforce supports an additional 10 jobs across the economy via local spending on goods and services.

Fig. 16. Benefits of the commercial fishing sub-sector, West, 2018

Port commercial fishing	West		
	GVA (€m)	Employment	Wages (€m)
Direct	4.7	170	1.6
Indirect	2.1	25	0.9
Induced	0.9	10	0.5
Total	**7.7**	**205**	**2.9**

Source: *Oxford Economics, Perceptive Insight, CSO*
Note: *May not sum due to rounding*

The Agriculture, forestry & fishing sector accounts for just under two thirds of GVA total generated by commercial fishing activities, equivalent to €4.8 million in 2018. This overall GVA contribution represents an additional €100,000 on the direct contribution to the sector, implying that broader agriculture and fishing sector enjoys relatively few of fishing's indirect and/or induced benefits. It however remains the main beneficiary in employment terms, supporting 175 jobs in 2018, or 85% of the regional total.

Of the impact of commercial fishing on other sectors, wholesale & retail received the largest GVA contribution (€1.1 million) – primarily as a result of the induced consumer spending – while manufacturing (€700,000) receives the next largest contribution, as a result of its role in the commercial fishing supply chain.

Fig. 17. Total benefits by sector, West, 2018

Port commercial fishing	West		
	GVA (€m)	Employment	Wages (€m)
Agriculture, forestry & fishing	4.8	175	1.7
Mining & quarrying	0.0	0	0.0
Manufacturing	0.7	<5	0.1
Electricity, gas, steam	0.0	0	0.0
Water supply	0.0	0	0.0
Construction	0.0	0	0.0
Wholesale & retail	1.1	15	0.5
Transportation & storage	0.1	<5	0.1
Accommodation & food	0.1	5	0.1
Information & communications	0.0	0	0.0
Financial & insurance	0.1	<5	0.0
Real estate	0.3	<5	0.1
Professional, scientific & technical	0.2	5	0.2
Administration & support	0.0	0	0.0
Public administration	0.0	0	0.0
Education	0.1	<5	0.0
Human health	0.1	<5	0.1
Arts, entertainment & recreation	0.0	0	0.0
Other service activities	0.0	0	0.0
Total	**7.7**	**205**	**2.9**

Source: *Oxford Economics, Perceptive Insight, CSO*
Note: *May not sum due to rounding*

3.2 Aquaculture

Aquaculture was the largest seafood related sub-sector at Ros an Mhíl, adding an estimated €19.7 million in value added to the regional economy. Once again, the majority of this total GVA impact belonged to the direct aquaculture activity taking place within the port area (€12.1 million). Furthermore, aquaculture directly supported an estimated 130 direct jobs within the port area. After considering both the indirect and induced impacts, this sub-sector goes on to support a total of 245 jobs across the West region, generating €8.5 million in wages across a range of sectors.

Aquaculture therefore has the strongest employment multiplier (1.9) of the three seafood elements within the port economy, with every direct job nearly supporting one additional job elsewhere within the regional economy.

Fig. 18. Benefits of the aquaculture sub-sector, West, 2018

Port aquaculture	West		
	GVA (€m)	Employment	Wages (€m)
Direct	12.1	130	4.4
Indirect	5.1	85	2.8
Induced	2.5	35	1.3
Total	**19.7**	**245**	**8.5**

Source: *Oxford Economics, Perceptive Insight, CSO*
Note: *May not sum due to rounding*

A significant proportion of the total employment benefit is focused within the agriculture, forestry & fishing sector with 190 FTE jobs sustained in 2018. This accounts for close to 80% of the jobs total supported across the region. The remaining employment benefits are more widely spread, with wholesale & retail (10 jobs), accommodation & food (10 jobs) and transport & storage (10 jobs) all gaining some benefit. Unsurprisingly, the agriculture, forestry & fishing sector also gained most of the total value added resulting from aquaculture activity, supporting an estimated €15.1 million in GVA, an extra €3 million over and above aquaculture's direct impact.

Fig. 19. Total benefits by sector, West, 2018

Port aquaculture	West		
	GVA (€m)	Employment	Wages (€m)
Agriculture, forestry & fishing	15.1	190	6.3
Mining & quarrying	0.0	0	0.0
Manufacturing	0.7	5	0.1
Electricity, gas, steam	0.0	0	0.0
Water supply	0.0	0	0.0
Construction	0.0	<5	0.0
Wholesale & retail	0.8	10	0.4
Transportation & storage	0.4	10	0.3
Accommodation & food	0.3	10	0.2
Information & communications	0.1	<5	0.0
Financial & insurance	0.2	<5	0.1
Real estate	1.1	5	0.4
Professional, scientific & technical	0.4	5	0.3
Administration & support	0.1	<5	0.0
Public administration	0.0	0	0.0
Education	0.2	<5	0.1
Human health	0.2	5	0.1
Arts, entertainment & recreation	0.1	<5	0.0
Other service activities	0.0	<5	0.0
Total	**19.7**	**245**	**8.5**

Source: *Oxford Economics, Perceptive Insight, CSO*
Note: *May not sum due to rounding*

3.3 Fish processing

The fish processing sub-sector at Ros an Mhíl supported a total of 200 jobs, €10.7 million of GVA and €4.2 million in wages across the West in 2018. Direct fish processing employment represented 140 jobs of this employment total, with an additional 40 being supported along the supply chain, while a further 15 are the result of spending supported by this employment.

Likewise, processing's direct GVA contribution of €6.9 million supported a further €3.8 million across the region through the subsequent supply chain and induced consumer spending impacts. The regional multiplier impacts resulting from Ros an Mhíl's fish processing activity tend to belong in higher productivity industries. Indeed, the indirect employment supported within the supply chain on average produced €60,000 of GVA per job in 2018, compared to €49,000 per job in the direct aquaculture related activity.

Fig. 20. Benefits of the fish processing sub-sector, West, 2018

Port fish processing	West		
	GVA (€m)	Employment	Wages (€m)
Direct	6.9	140	2.2
Indirect	2.5	40	1.3
Induced	1.2	15	0.6
Total	**10.7**	**200**	**4.2**

Source: *Oxford Economics, Perceptive Insight, CSO*
Note: *May not sum due to rounding*

The manufacturing sector (of which fish processing forms a part), is the largest beneficiary from processing direct activity, receiving a €7.3 million boost to GVA and 145 full-time equivalent jobs. These employees received €2.2 million in wages in 2018. The agriculture, forestry & fishing sector received the next largest slice of the total economic benefits, accounting for 13% of total GVA impact (€1.4 million) and generating 30 jobs. The wholesale & retail sector experienced the next most significant benefit – supporting €700,000 in GVA and €300,000 in wages across the region.

Fig. 21. Total benefits by sector, West, 2018

Port fish processing	West		
	GVA (€m)	Employment	Wages (€m)
Agriculture, forestry & fishing	1.4	30	0.8
Mining & quarrying	0.0	0	0.0
Manufacturing	7.3	145	2.2
Electricity, gas, steam	0.0	0	0.0
Water supply	0.0	0	0.0
Construction	0.0	0	0.0
Wholesale & retail	0.7	10	0.3
Transportation & storage	0.2	5	0.2
Accommodation & food	0.1	5	0.1
Information & communications	0.0	0	0.0
Financial & insurance	0.1	0	0.0
Real estate	0.4	5	0.1
Professional, scientific & technical	0.1	<5	0.1
Administration & support	0.0	0	0.0
Public administration	0.0	0	0.0
Education	0.1	<5	0.1
Human health	0.1	<5	0.1
Arts, entertainment & recreation	0.0	0	0.0
Other service activities	0.0	<5	0.0
Total	**10.7**	**200**	**4.2**

Source: *Oxford Economics, Perceptive Insight, CSO*
Note: *May not sum due to rounding*

3.4 Conclusion

In conclusion, Ros an Mhíl's aquaculture sector has the largest economic footprint of the three seafood related sub-sectors. We estimate that it supported 245 jobs, €8.5 million in wages and over €19.7 million in GVA throughout the West economy in 2018.

4. Total impact of the overall port seafood sector

4.1 Seafood sector activity at the port

This section takes the estimates presented in the preceding sections of the report and calculates the total economic impact resulting from the activities of the seafood sector within the port area.

However, simply summing the respective benefits of all three elements (commercial fishing, aquaculture and fish processing) will inevitably overestimate the indirect, induced and as a result, total impacts. This is because the supply chains of the fish processing element contain a proportion of the commercial fishing/aquaculture sub-sectors and their supply chains. Therefore, adding everything together would result in double counting some of the impacts. See **Appendix 2** for further detail on our approach.

We have therefore laid out the following approach to calculate total impacts for GVA, employment, wages and tax:

Direct impacts

- Calculated by summing the direct impacts from the three elements of the seafood sector for GVA, employment, wages and tax.

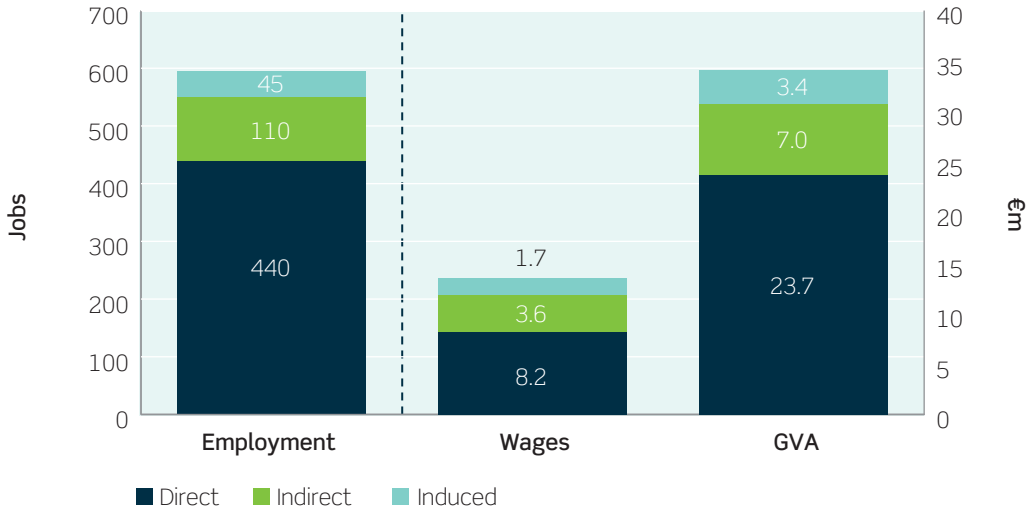
Indirect and induced impacts

For GVA, employment, wages and taxes, the total indirect and induced impacts are calculated by summing the indirect and induced impacts of fish processing and a 67% and 52% share of the indirect and induced impacts from the respective aquaculture and commercial fishing sub-sectors (as information from the survey interviewees suggest that exports and domestic sales outside the port area's own processors account for 67% and 52% of the respective aquaculture and fishing production). The remainder of the commercial fishing/aquaculture sub-sectors' indirect and induced impacts will already be accounted for in the indirect and induced impacts from the fish processing sub-sector.

4.2 Regional estimates

Overall, we estimate that the Ros an Mhíl seafood industry generated €34.1 million in GVA for the West regional economy in 2018. This activity supported 595 jobs across a range of sectors and generated €13.6 million in wages to employees.

Fig. 22. Benefits of the seafood sector, West, 2018



Source: *Oxford Economics, Perceptive Insight, CSO*

Most of the impacts from the industry were seen directly, with €23.7 million in direct GVA representing 70% of total GVA impact across the West economy. The remaining 30% were actualised via supply chain links or induced spending impacts, adding an extra €10.4 million in regional GVA and 155 jobs in 2018. The bulk of wage benefits came directly from the seafood industry, representing €8.2 million of total regional wage benefits (€13.6 million).

Fig. 23. Total seafood sector benefits, West, 2018

Port seafood sector	West		
	GVA (€m)	Employment	Wages (€m)
Direct	23.7	440	8.2
Indirect	7.0	110	3.6
Induced	3.4	45	1.7
Total	**34.1**	**595**	**13.6**

Source: *Oxford Economics, Perceptive Insight, CSO*
Note: *May not sum due to rounding*

The agriculture, forestry & fishing sector is the largest beneficiary from the seafood sector at Ros an Mhíl. With 370 full-time equivalent jobs it represents 62% of the total employment benefits. It also accounted for €20.2 million in GVA in 2018 and €8.2 million in wages. Given the size of the fish processing industry within the port economy the manufacturing sector received the second largest contribution to value added. In 2018, it accounted for €8.1 million of regional value added and benefited from 145 full-time jobs (25% of the seafood supported total) and 17% of the resulting wages (€2.4 million).

Wholesale & retail is the next largest beneficiary in GVA terms (€1.8 million), supporting an estimated 25 jobs, followed by real estate (€1.3 million) which benefited from consumer spending in the local area from employees linked or directly employed in the seafood sector.

Fig. 24. Total benefits by sector, West, 2018

Port seafood sector	West		
	GVA (€m)	Employment	Wages (€m)
Agriculture, forestry & fishing	20.2	370	8.2
Mining & quarrying	0.0	0	0.0
Manufacturing	8.1	145	2.4
Electricity, gas, steam	0.1	0	0.0
Water supply	0.0	0	0.0
Construction	0.1	<5	0.0
Wholesale & retail	1.8	25	0.9
Transportation & storage	0.5	10	0.4
Accommodation & food	0.4	10	0.3
Information & communications	0.1	<5	0.1
Financial & insurance	0.3	<5	0.1
Real estate	1.3	10	0.4
Professional, scientific & technical	0.5	5	0.4
Administration & support	0.1	<5	0.0
Public administration	0.0	<5	0.0
Education	0.2	5	0.2
Human health	0.3	5	0.2
Arts, entertainment & recreation	0.1	<5	0.0
Other service activities	0.1	<5	0.1
Total	**34.1**	**595**	**13.6**

Source: *Oxford Economics, Perceptive Insight, CSO*
Note: *May not sum due to rounding*

4.3 Taxation estimates

Seafood activity at the port provides further benefits through the generation of tax revenues to the Revenue Commissioners. These fiscal impacts can again be split into their direct, indirect and induced components depending on what channel of activity they originate from. We estimate that port seafood sector's direct tax contribution equated to €3.4 million in 2018, consisting of both the labour-based tax paid by the sector's employees (income tax, PRSI etc) and corporation tax receipts.

The indirect fiscal benefits represent the same taxation components as above but are generated within the sector's wider supply chain, in addition to net taxes on input purchases and sectoral taxation on production less subsidies. Combined, these represent a net fiscal deficit of €1.2 million, mainly because of agriculture's prominence within the fish processing supply chain. However, the indirect deficit is compensated for by the consumption related tax the sector supports across the economy. As those employed in the sector and within its supply chain spend their wages, this supports further jobs and activity within the Irish economy. We estimate this induced activity supported a further €2.1 million in tax revenue.

Therefore, in total, Ros an Mhíl's seafood sector is estimated to have supported €4.3 million in fiscal benefits in 2018. This total was made up of €4.2 million in employment/labour related tax, €0.8 million in corporation tax, €1.3 million in taxation associated with the spending of wages, and a net tax deficit of €2 million through taxation on inputs and production.[5]

5 Net tax position refers to taxes less subsidies.

Fig. 25. Fiscal impacts by taxation type, Ireland, 2018

Port seafood sector	Total tax estimates (€m)				
	Labour tax	Corporation tax	Production tax	Input purchases tax	Tax on consumption
Agriculture, forestry & fishing	1.9	0.4	-2.8	0.3	0.0
Mining & quarrying	0.0	0.0	0.0	0.0	0.0
Manufacturing	1.6	0.2	0.0	0.0	1.1
Electricity, gas, steam	0.0	0.0	0.0	0.0	0.0
Water supply	0.0	0.0	0.0	0.0	0.0
Construction	0.0	0.0	0.0	0.0	0.0
Wholesale & retail	0.1	0.1	0.0	0.0	0.0
Transportation & storage	0.0	0.0	0.0	0.1	0.0
Accommodation & food	0.1	0.0	0.0	0.0	0.1
Information & communications	0.0	0.0	0.0	0.0	0.1
Financial & insurance	0.0	0.1	0.0	0.1	0.0
Real estate	0.1	0.0	0.1	0.0	0.0
Professional, scientific & technical	0.1	0.0	0.0	0.0	0.0
Administration & support	0.0	0.0	0.0	0.0	0.0
Public administration	0.0	0.0	0.0	0.0	0.0
Education	0.1	0.0	0.0	0.0	-0.1
Human health	0.1	0.0	0.0	0.0	0.0
Arts, entertainment & recreation	0.0	0.0	0.0	0.0	0.0
Other service activities	0.0	0.0	0.0	0.0	0.0
Total	**4.2**	**0.8**	**-2.6**	**0.6**	**1.3**

Source: *Oxford Economics, Perceptive Insight, CSO*

4.4 Conclusion

In calculating the overall impact of the local seafood sector, we consider the degree to which output from aquaculture and commercial fishing can appear in the supply chain of local fish processors.

Therefore, our analysis shows the Ros an Mhíl's overall seafood sector supports 595 jobs and €34.1 million in GVA throughout the regional economy. Furthermore, the sector generates €4.3 million in tax revenues towards the public purse.

5. Conclusions

5.1 The seafood sector in Ros an Mhíl

The seafood sector makes an important contribution to the Ros an Mhíl economy. In 2018, the direct seafood sector at the port generated an estimated €50 million in turnover, supporting nearly 440 direct jobs and represented 6% of local port economy in GVA terms. Aquaculture is the largest seafood related activity at the port, generating €25.5 million in turnover, followed by fish processing (€15 million) and commercial fishing (€9 million). When translated into GVA, the seafood sector directly contributes €23.7 million to the local port economy.

Our survey also identified the key characteristics of the local seafood industry and the business environment for those based at Ros an Mhíl. The industry is well established, with nine in ten firms established for at least a decade. Turnover also appears to be stable or increasing for most local businesses, whilst 30% of operators invested in capital in 2018. The port sits in the middle of the pack for average investment levels, reflecting a positive outlook for the future.

Nearly three quarters of sectoral employees (72%) originally hail from the port hinterland, while 16% are originally from overseas. Ros an Mhíl is also notable in that almost all of its produce goes to domestic markets rather than exports. The local hinterland consumes around half of the output.

5.2 The Aquaculture sub-sector is the main contributor

The aquaculture sub-sector makes the strongest contribution to the West economy. In 2018, it alone generated €19.7 million of GVA, of which €7.6 million is linked to indirect (€5.1 million) and induced (€2.5 million) effects. The aquaculture sector also enjoys the strongest employment multiplier of the three seafood sub-sectors, with every direct job supporting a further 0.9 jobs within the West region. The aquaculture sub-sector is estimated to provide benefits of the following size:

- 130 direct jobs and €4.4 million of wages, producing €12.1 million of GVA;
- 85 indirect jobs and €2.8 million of wages, producing €5.1 million of GVA; and
- 35 induced jobs and €1.3 million of wages, producing €2.5 million of GVA.

5.3 Though the other components remain significant

Although the fish processing sub-sector's economic footprint is smaller than that of the aquaculture sector, its economic multipliers remain significant. Accordingly, our analysis shows the economic impact of fish processing was of the following size in 2018:

- 140 direct jobs and €2.2 million of wages, producing €6.9 million of GVA;
- 40 indirect jobs and €1.3 million of wages, producing €2.5 million of GVA; and
- 15 induced jobs and €0.6 million of wages, producing €1.2 million of GVA.

Furthermore, our analysis shows that the economic impact of the port's commercial fishing sector equates to the following benefits across the West economy:

- 170 direct jobs and €1.6 million of wages, producing €4.7 million of GVA;
- 25 indirect jobs and €0.9 million of wages, producing €2.1 million of GVA; and
- 10 induced jobs and €0.5 million of wages, producing €0.9 million of GVA.

Therefore, we estimate that the port's collective seafood sector supported 595 jobs, €13.6 million in wages and €34.1 million in GVA within the regional economy in 2018. This activity was enough to sustain €4.3 million in tax revenues towards the public accounts.

5.4 Seafood supporting peripheral economies

Sectors which are closely aligned with the seafood sector support around a quarter of jobs within the Ros an Mhíl economy. Commuting data suggests that outside of these industries, local employment opportunities could be more limited. Ros an Mhíl also struggles with poor qualification attainment and negative population and working age population growth, while economic inactivity rates are high.

Whilst the local economy is more diversified than other coastal economies there are some limitations to growth. Ros an Mhíl and its hinterland suffer from a demographic deficit and has an ageing population, with above average share of those aged 45 and over. This may act as a barrier to development of new opportunities and job creation in the future and may place reliance on the seafood sector to provide employment opportunities to the older cohort. The educational profile is notably weaker than the national average, 21% of residents identify as having only primary education or lower. The provision of lesser-skilled occupations in the agricultural, forestry & fishing sector is therefore an important source of employment for the sizeable population with lower qualification levels.

As a result, the seafood sector is likely to play a significant role in the local port economy through its provision of direct jobs, supply chain spending in local businesses and the consumer spending it supports. Looking forward, a vibrant and growing local seafood sector will be important for the economic and demographic health of the local area.

Appendix 1: Ros an Mhíl's economic challenges

Economic activity and structure

The latest available data indicates that Ros an Mhíl's labour market is underperforming relative to both the West region and national picture. The local unemployment rate stood at 19.6% in 2016.[6] By comparison, the equivalent unemployment rate throughout the West and Ireland overall was 12.9% that same year.

Furthermore, the local employment rate was also relatively weak (45.1%) compared to the regional and national averages **(see Fig. 26)**. Linked to this, the census data reveals that the economic inactivity rate[7] among those residents aged 15 and over stood at 43%, again, well above the West (40.3%) and Ireland (38.8%) averages. Relatively high economic inactivity can represent a significant drag to the productive capacity of any local economy.

Fig. 26. Headline economic indicator comparisons, 2016

	Unemployment rate	Employment rate	Economic inactivity
Ros an Mhíl	19.6%	45.1%	44.0%
West	12.9%	52.0%	40.3%
Ireland	**12.9%**	**53.3%**	**38.8%**

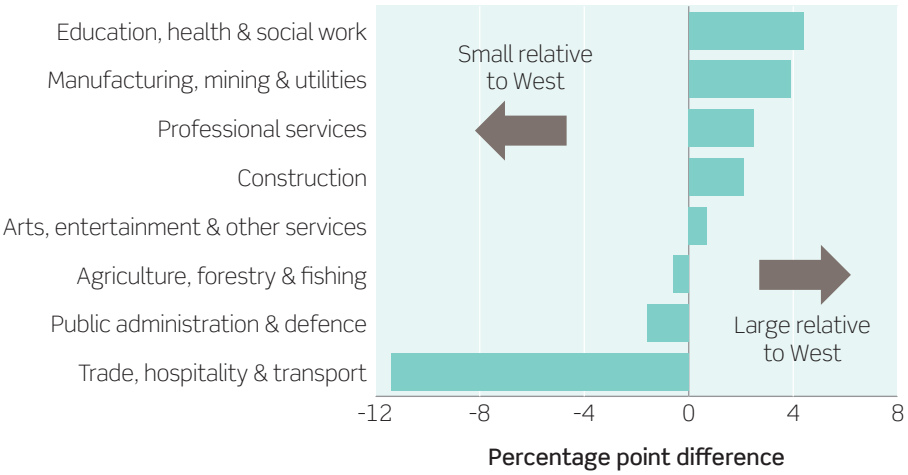
Source: *CSO*

The latest Census in 2016 showed there were over 4,500 people employed within the port area and its hinterland. Meanwhile, there were close to 6,200 residents of the area employed in jobs based either in the local economy or elsewhere. This difference represents the level of net outward commuting from residents taking up employment outside of the port area and can often be viewed as an indicator of health of the local jobs market.

A sectoral breakdown of workplace employment within the port and its hinterland suggests a diverse sectoral structure. The data shows that the agriculture, forestry & fishing sector's share of employment is relatively similar to that of the region overall (7%). However, both the education, health & social work and manufacturing, mining & utilities sectors are relatively concentrated locally, collectively accounting for over 40% of all workplace jobs.[8] Likewise, the sectors which are most associated with seafood activity account for close to a quarter of all workplace employment in the port area (Agriculture, forestry & fishing and manufacturing, mining & utilities). The port and its hinterland also supports a relatively large professional services sector which represents 16% of local employment, a share almost three percentage points larger than the regional average **(see Fig. 27)**.

6 Defined as a share of the labour force aged 15 years and over.
7 Economic inactivity represents the share of the population aged 15 and over who were neither employed nor looking for employment.
8 Commercial fishing and aquaculture fall within the 'Agriculture, forestry & fishing' sector. Fish processing related activity is classified within the industry grouping of 'Manufacturing, mining & utilities'.

Fig. 27. Employment share differences, Ros an Mhíl vs region, 2016



Source: *Oxford Economics, CSO*

Demographics

The population of the local port economy contracted by 2% in the five years between 2011 and 2016, despite overall growth across the West region (1.3%) and Ireland (3.8%). Over the same period the working age population fell by 7% resulting in a working age population share below that of Ireland as a whole.

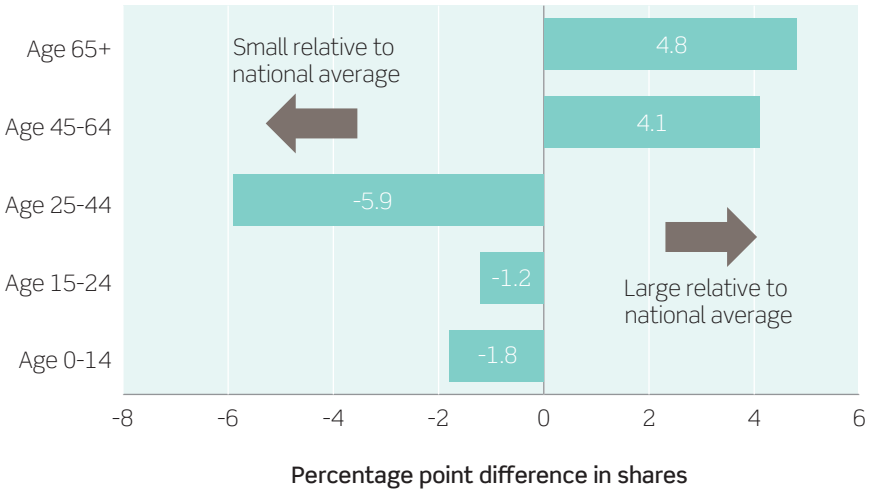
Fig. 28. Population indicators, 2016

	Growth (2011-16)		2016	
	Population	Working age	Population	Working age share
Ros an Mhíl	-2.0%	-7.0%	17,200	62.4%
West	1.3%	-2.0%	446,100	64.2%
Ireland	**3.8%**	**1.4%**	**4,761,900**	**65.5%**

Source: *CSO*
Note: *Working age is defined as those aged between 15 and 64*

An analysis of port area's population by age cohorts relative to the national picture shows that the distribution is skewed at both the younger working age and older ends. Those aged 65 and over accounted for close to 18% of all residents – five percentage points above the national average in 2016. On the other hand, all younger aged groups were under-represented within the local population relative to the national average.

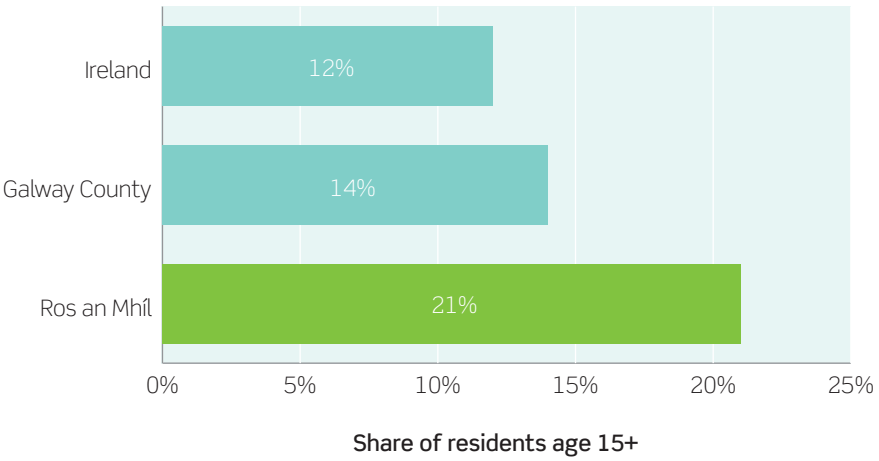
Fig. 29. Age group comparisons, Port area vs Ireland, 2016



Source: *CSO Ireland*

Qualification attainment within the port area tends to be much weaker than observed at the national level. Those with a third level degree or above represented 26% of residents aged 15 and over, compared to 28% across Ireland. Similarly, lower level attainment among the port hinterland's residents was much higher than the national average. Those with no formal or primary education as their highest achieved, accounted for 21% of those aged 15 and over in Ros an Mhíl, compared to 12% on average across Ireland.

Fig. 30. No formal or primary level attainment, 2016



Source: *CSO*

Summary

Sectors which are closely aligned with the seafood sector support around a quarter of jobs within the Ros an Mhíl economy. Commuting data suggests that outside of these industries, local employment opportunities could be more limited. Ros an Mhíl also struggles with poor qualification attainment and negative population and working age population growth, while economic inactivity rates are high.

Whilst the local economy is more diversified than other coastal economies there are some limitations to growth. Ros an Mhíl and its hinterland suffer from a demographic deficit and has an ageing population, with above average share of those aged 45 and over. This may act as a barrier to development of new opportunities and job creation in the future and may place reliance on the seafood sector to provide employment opportunities to the older cohort. The educational profile is notably weaker than the national average, 21% of residents identify as having only primary education or lower. The provision of lesser-skilled occupations in the agricultural, forestry & fishing sector is therefore an important source of employment for the sizeable population with lower qualification levels.

As a result, the seafood sector is likely to be play a significant role in the local port economy through its provision of direct jobs, supply chain spending in local businesses and the consumer spending it supports. Looking forward, a vibrant and growing local seafood sector will be important for the economic and demographic health of the local area.

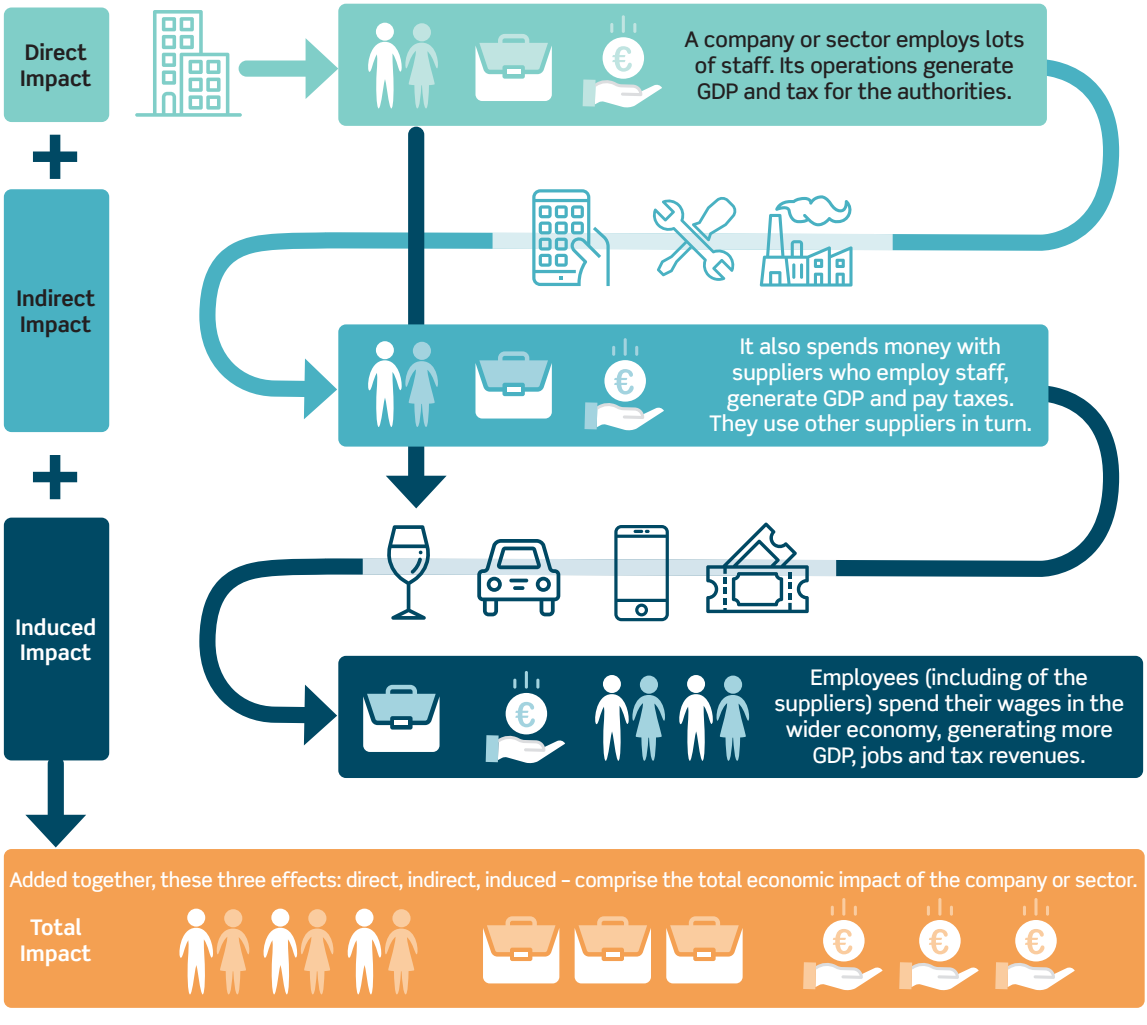
Appendix 2: Model approach

*(**Note:** Feels too long for a summary/port specific report. We could summarise or point to the main report for reference)*

Understanding economic impact assessments

An economic impact assessment quantifies the total economic benefit created by a sector through a range of different channels. For the seafood sector at the ports, this arises in four main ways. The first three are the standard channels through which economic impact is usually quantified: direct operational effects, supply chain effects, and the impact of employees spending their wages in the wider consumer economy. The fourth channel, known as 'catalytic' or 'dynamic' benefits represent the wider benefits that society and/or other industries derive from the original economic activity.

Fig. 31. Overview of economic impact methodology



Our report uses three main metrics to quantify each of the channels by which the seafood sector could contribute to the regional[9] and national economy:

- **Gross value-added** contribution to Gross Domestic Product (GDP)[10]: This measured the value of goods and services produced in an area, industry or sector of an economy and is equal to output minus intermediate consumption;
- **Employment:** Employment is presented in terms of persons in employment as defined in the report, the combination of workplace employment by full-time and part-time status; and
- **Wages** is the total value of remuneration offered to the workers associated with the local seafood sector.

All the data used was either provided by BIM (for example recent seafood operator registrations/industry data), the seafood sector survey carried out by Perceptive Insight or published government website data and industry standards from the likes of CSO Ireland and Oxford's own economic databases. Finally, in the absence of data, reasonable assumptions based on best judgement are clearly rationalised in the study. For example, in the absence of port specific data we will use published sources for comparator geographies as a proxy estimates were appropriate.

Estimating the direct economic contribution

The first step was to understand the **direct** activity associated with the local seafood sector at each of the 10 ports in 2018.

The survey

The seafood survey was designed to provide the evidence base from which to estimate the local seafood sector's contribution to the regional/national economy. Responses from the sector were analysed according to common characteristics (sub-sector, turnover band, main port area etc) and cross-referenced with the most recent full snapshot of the local seafood sector population.[11]

Sample estimates were then 'grossed' up to that of the total population. This was done by drawing on the BIM database of the seafood sector population in each port which contained fields on sector and turnover band. Knowing indicative turnover levels for firms not captured in the survey, we were able to apply the average ratio of jobs to turnover level in that sector and apply average sectoral wages, etc. In other words, we utilised knowledge of the sectors and turnover of the missing companies and applied the ratios and averages of those covered in the survey to estimate their activity. The resulting total seafood related turnover estimate is then split into the different sectors of the economy ('Agri, forestry & fishing' and 'Manufacture of food products').

This turnover figure is essentially the value of output within the local seafood sector and encompasses intermediary demand, wages and profits. Using the sectoral ratios of output to GVA in the Irish input-output tables we estimated the direct sectoral GVA contributions to GDP in the local economy. Both direct employment and gross wages paid within the local port seafood sector are again informed by the survey findings and grossed to the population total based on shared characteristics.

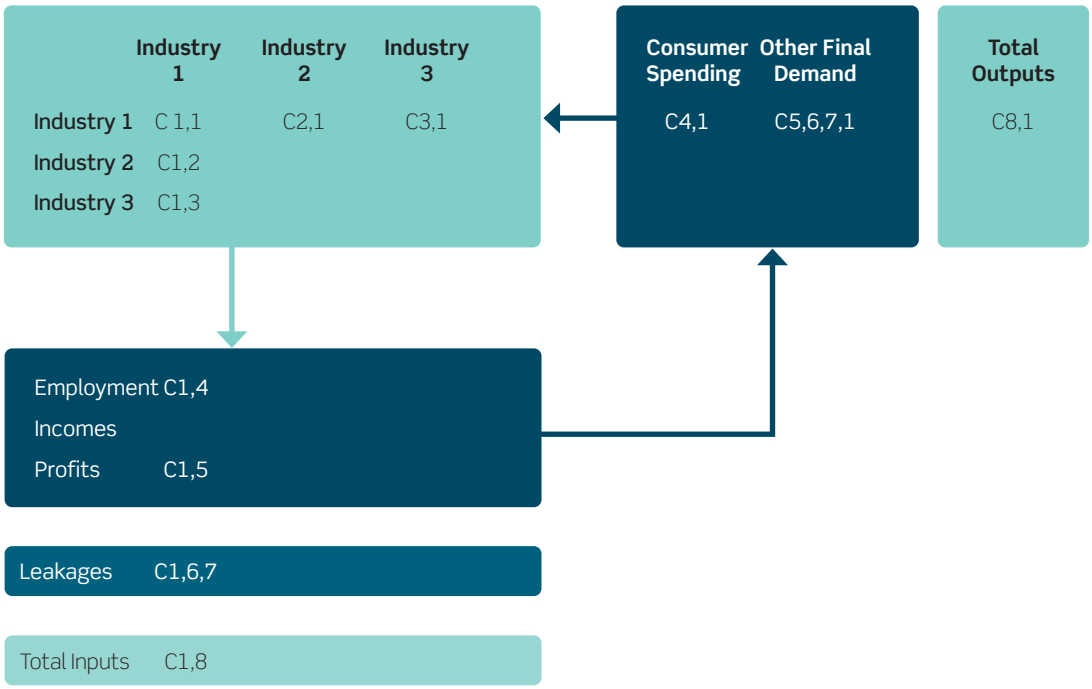
With an estimate of direct wages, we then applied income tax rates and estimated the income tax that will be collected by the Revenue Commissioners.

9 Ideally, we would quantify the impacts of the seafood sector on the port hinterlands, however, there is not enough published sectoral employment, GDP and wage data. Sufficient data is only available at regional level to produce sub-national impacts.
10 GDP is the main summary indicator of economic activity in Ireland. GDP can be defined as GVA plus taxes on products less subsidies on products. References to economic growth (or when the economy enters recession) typically relate to the rate of change of GDP. All references in this report relate to GVA; also known as GDP at 'basic prices'; and they exclude taxes and subsidies.
11 Provided by the client and informed by the most recent fishery registrations and activity listings in the aquaculture and processing sectors. Turnover bands were also assigned to the local seafood population based on returns when available, and when not, estimated by BIM based on shared characteristics.

Estimating indirect and induced impacts

To estimate the indirect and induced impacts we have built an input-output model. Figure 32 presents a stylised version (showing just three sectors for presentation purposes) of our input-output model which is a model that traces how economic activity flows through an economy as one sector makes purchases from another sector.

Fig. 32. Stylised input-output model



We have used the latest Irish input-output tables for the analysis, but have adjusted these in line with academic guidelines (Flegg, A. T. and Tohmo, T. (2013) "Regional input-output tables and the FLQ formula: A case study of Finland") to account for the size and structure of the local economy.[12] The technique involves constructing sub-national input-output models by applying Location Quotients (LQs) and sub-national size adjustments to the standard Ireland input-output tables. The result is that geographies with higher concentrations of industries receiving procurement or household expenditure have larger impacts. In addition, we have used information gathered from the survey to further isolate the procurement spend locally, thereby strengthening the overall modelling assumptions.

MODELLING SUPPLY CHAIN IMPACTS

The survey provided us with information on the size of supply chain spending relative to turnover, its allocation to specific parts of the economy/goods/services and its location (local/national/international). Using this information, we were able to construct a more detailed picture of the first round of supply chain spending than the published input-output tables would otherwise provide.

12 Due to data availability, the local seafood sector's economic impact can only be localised to the regional level (NUTS 3).

We then used the impact model to estimate all the **rounds of supply chain or indirect spending** of the local seafood sector. The input-output tables provide us with an estimate of indirect output by sector. We then convert this output back into sectoral GVA and into sectoral jobs to provide a range of sectoral impact measurements. Applying average sectoral salaries allowed us to estimate the income effect.

The induced impact is economic activity and employment supported by those directly or indirectly employed spending their income on goods and services in the wider economy. This helps to support jobs in the industries that supply these purchases, and typically includes jobs in retail and leisure outlets, companies producing consumer goods and in a range of service industries. Again, our input-output model were used to estimate the induced impacts.

Overcoming double-counting

Throughout the analysis the impact estimates are presented for the core elements of the seafood sector – commercial fishing, aquaculture and processing. However, when estimating the total impact of the overall port seafood sector, simply summing the respective benefits of all three elements will inevitably over-estimate the indirect and induced and as a result, total impacts. This is because the supply chains of the processing element contain a proportion of the fishing/aquaculture sub-sectors and their supply chains. Therefore, adding everything together would result in the double counting some of the impacts.

We have, therefore, the following approach to calculate total impacts for GVA, employment, wages and tax:

Direct impacts:

- Calculated by summing the direct impacts from the three elements of the seafood sector for GVA, employment and wages.

Indirect impacts:

- For GVA, employment and wages, total indirect impacts are calculated by summing the indirect impacts of processing and a share of the indirect impacts from the fishing and aquaculture sub-sectors (as indicated by survey responses showing the extent to which local processors account for their total sales). The remainder of the fishing/aquaculture sub-sectors' indirect impacts will already be accounted for in the indirect impacts from the processing sub-sector. Furthermore, at this stage a proportional share of fishing and aquaculture direct impacts were also removed as they fall within the local processing supply chain.

Induced impacts:

- For GVA, employment and wages, total induced impacts are calculated by summing the induced impacts of the local processing sector and a share of the induced impacts from the fishing and aquaculture sub-sectors (as indicated by survey responses showing the extent to which local processors account for their total sales). The remainder of the fishing and aquaculture sub-sectors' induced impacts will already be accounted for within the induced impacts from the processing sub-sector.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