



# A Top-Down Estimation of the Downstream Employment Generated by the Irish Seafood Sector

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**Richard Curtin**

Fisheries Development Section

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## Direct, indirect and induced employment in Ireland's seafood sector

The history behind the study of multiplier effects dates back to the 1920s to Wassily Leontief (1905-1999) who formalised the process of potential value added through the value chain. He realised that any final product moves through the supply chain for goods and services from primary production, (mining, agriculture, fishing, forestry etc), through secondary production (manufacturing and similar value-adding activities), via the distribution network of the tertiary sector (transport, wholesaling, retailing, catering, and the ancillary services such as banking and insurance) before reaching the final consumer.

This paper will describe the methodology used to estimate the downstream employment generated by Ireland's seafood sector following Leontief's approach. Employment is generated **directly** in the fisheries, aquaculture, and seaweed harvesting and processing sectors. Employment is generated **indirectly** by firms supplying and servicing these sectors such as vessel repair and maintenance companies, engineering firms, net-makers, equipment suppliers, fuel providers, logistics, wholesalers, export agents among myriad other service providers. Employment is finally **induced** from the existence of the former direct and indirect seafood employment to cater for the consumption of the workforce. This induced employment occurs across economic sectors catering for the needs and wants of the seafood workforce.

At the primary level the Irish seafood sector directly employs fishermen and women working on board fishing vessels catching and landing seafood. The aquaculture sector directly employs aquaculture workers to farm seafood. The processing sector directly employs people to gut and fillet and prepare fish products in processing plants. Workers are also directly employed cutting seaweed along the Irish shoreline.

Indirect employment is generated to service the direct seafood activity, with the fishing, aquaculture and processing sectors in some cases requiring specialised services and in others, common ones. The ancillary sector for fisheries involves building and repairing vessels, producing fishing equipment, fishing nets, the availability of port facilities, the provision of fuel, ice, salt, food, electricity, shelter, bait, unloading security, education, training, research, accounting, management, insurance, certification, sorting, transport, auction, storage, pre-sale processing among other services. The ancillary sector for aquaculture would additionally provide specialised expertise on cages, ponds, raceways, feed and filter installations, veterinary services, fertilisers, sewage processing, slaughtering, bivalve depuration, handling and packaging. The ancillary sector for processors provides further additional specialised services required for that sector.

The aforementioned direct and indirect employees of the seafood sector earn salaries and spend on essentials, such as rent, mortgages, fuel, electricity, home heating and food, and non-essentials, such as leisure activities, hospitality, cultural events etc. Work is therefore provided in the wider economy by the value and employment generated in the seafood economy.

## Methodology

Socioeconomic surveys have been carried out on three Irish fishing ports where multipliers for the ancillary sector (indirect) have been estimated. However, only one of the reports (Ros a Mhíl) includes a multiplier for the whole downstream sector composed of the direct, indirect and induced employment and value added. A thorough EU study on the ancillary sector in the European Union was carried out recently (Capgemini 2016) which analysed the vast literature on the sector published and carried out a number of case studies. The results were compared with international studies carried out in other important fishery countries of the world such as Iceland, Norway, United States, Australia and New Zealand among others.

Multiplier effects for the ancillary sector were estimated for the fisheries and aquaculture sectors in the case study examples around the European Union<sup>1</sup>. The results of the study concluded that on average the ancillary multiplier for the fishing sector in the European Union to be 0.3 FTE for every 1 FTE engaged in fishing activity while the aquaculture sector had a higher multiplier of 0.6 due to the more specialised equipment required.

To estimate the size of the ancillary sector in Ireland a top-down approach is taken. Here, an indirect multiplier of 0.48 is applied to employment in the fisheries sector as per the socioeconomic report of Ros an Mhíl to estimate employment in the fisheries ancillary sector. For the aquaculture and processing sectors the indirect multiplier of 0.6 is applied as per the Capgemini study to estimate employment in their ancillary sectors. An estimate already exists for direct and indirect employment in the Irish seaweed industry (Marine institute, 2011). Finally, the full downstream employment and value impact of the Ros an Mhíl fishing and processing sectors were estimated, showing induced employment multipliers of 0.76 and 1.35 on the direct and indirect employment at the regional and national level respectively.

## Results

In 2016 over 9,000 people were estimated to be employed directly in the seafood sector in the fisheries, aquaculture and processing sectors. Applying the indirect multipliers mentioned in the methodology section to these sectors gives an estimated employment in the seafood ancillary sector of 5,400. Together, direct and indirect total employment in the seafood sector is estimated to be 14,800. Applying the regional induced employment multiplier to Irelands direct and indirect seafood employment gives an estimate of 11,200 extra total employees downstream. Applying the national induced multiplier gives an estimate of 19,900 extra total employees downstream. Regionally it is estimated that 26,000 are employed through the seafood sector. Nationally it is estimated that 34,700 are employed downstream.

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<sup>1</sup> 11 case studies were carried out in Denmark, Estonia, Finland, France, Greece, Hungary, Spain, Italy, Poland, the Netherlands and the United Kingdom.

## Seafood Sector Total Employment

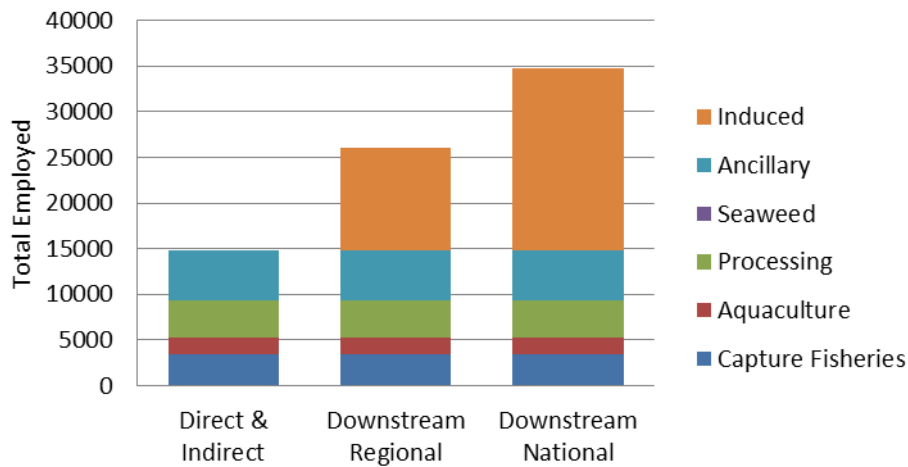


Figure 1: estimates of downstream total employment of the seafood sector

Full time employment in 2016 was estimated at 6,700 for the Irish seafood sectors of fishing, aquaculture and processing. Applying the multipliers chosen the estimated FTE in the ancillary sector is 3,800. Therefore directly and indirectly it is estimated that 10,500 are full time employed in the Irish seafood sector. At the regional level the estimates show an induced FTE effect of 8,000 while at the national level the estimates show an induced effect of 14,200 FTEs. As can be seen in figure 2 the overall downstream FTE estimates for the Irish seafood sector are 18,500 and 24,700 FTEs at the regional and national levels respectively.

## Seafood Sector Full-Time Employment

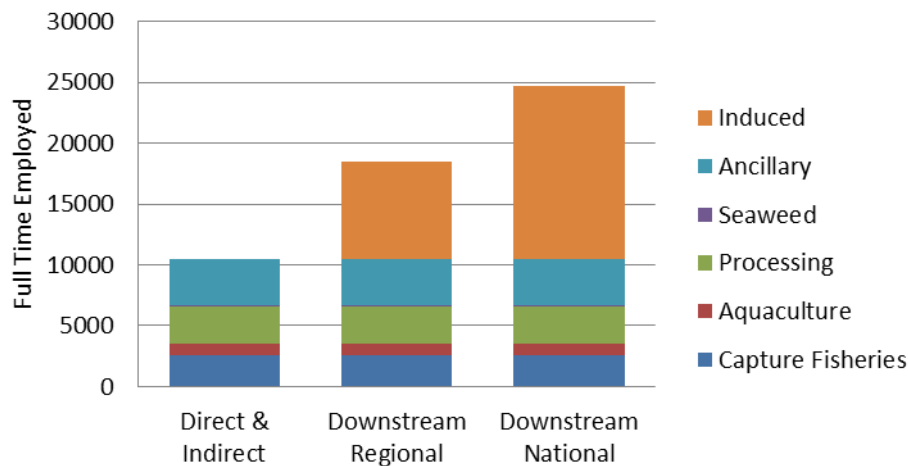


Figure 2: estimates of downstream full-time employment of the seafood sector

## Conclusion

The final results shown here correlates with international studies carried out on the downstream effects of the seafood sector. For instance, in Iceland, where 8,600 are employed in the fishing and processing sectors, indirect employment was estimated at 7,225 jobs with a further 9,175 jobs estimated to be created through induced effects, giving total employment of 25,000 in 2010 (Capgemini 2016).

In this study, the revised estimate for ancillary services (3,800 FTE – 5,400 total employees) is deemed by the author to be valid and in line with EU norms and represents a significant improvement on the previous estimate of 1,700 total employees.

Estimates for induced effects contain much higher levels of uncertainty due to the difficulty in tracking the flows of value throughout the value chain of the economy. There is undoubtedly an induced effect from primary activities such as fishing and aquaculture that creates value and employment up to the point of seafood being consumed by people. The magnitude of this effect is clearly difficult to estimate. To err on the side of caution the author recommends the use of the regional downstream effect estimated here (18,500 FTE - 26,000 total employees) rather than the national effect until further studies are carried out to give a clearer picture of the extent of the induced employment effect.

This study represents a top-down desk-based research estimate of the magnitude of the ancillary sector to the Irish seafood sectors. Future work to be carried out by BIM will involve a bottom-up estimate of the magnitude of the ancillary sector involving primary data collection at the ten main fishing ports of Ireland.

## References

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