

The Economic Contribution of Open Cage Salmon Aquaculture to Scotland

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Executive Summary

Open cage salmon aquaculture, as currently practised in Scotland, is damaging our marine environment¹. At the same time, the Industry has an ambitious growth strategy that envisages a near doubling of farmed salmon production by 2030.

In deciding how best to serve Scotland as a whole, the Scottish Government faces a difficult question; **“is further damage to Scotland’s inshore environment a price worth paying to realise the economic benefits from salmon aquaculture expansion?”**

Currently, the Scottish Government supports industry expansion, with ministers regularly citing empirical estimates relating to the economic contribution of salmon aquaculture to the Scottish economy. Since the Scottish Government’s support for expansion seems evidence based, it is crucial the evidence used is fit for purpose.

Some stakeholders, worried about further damage to the inshore marine environment, have concerns and uncertainties about the evidence, and how that evidence seems to have influenced the Scottish Government. In commissioning this work, they are seeking re-assurance.

The conclusion of this study is that, having reviewed the evidence, we cannot provide that reassurance.

There are five reasons for our concerns about the apparent basis on which the Scottish Government currently supports a very substantial expansion of salmon aquaculture.

1. It would be difficult for the Scottish Government to claim that, in deciding to support industry expansion, it has demonstrably considered the best interests of Scotland as a whole. The problem is that the Scottish Government’s support for industry expansion relies exclusively on estimates about income and employment creation. The reality is that the consequential damage to the marine environment will result in many other stakeholder groups being worse off. At no time, has the Scottish Government sought even to identify the stakeholder groups who would be worse off and to articulate why. The Scottish Government should consider undertaking a Cost Benefit Analysis (CBA). When using economics to evaluate the impact of a policy across our entire society, CBA is very much the cornerstone. A CBA would at least identify who is better off and who is worse off from industry expansion.

2. The actual income and employment evidence cited by the Scottish Government does not describe the net impact on income and employment for Scotland as a whole. The Scottish Government has considered only the income and employment generated by industry expansion.² Various stakeholders are concerned about the adverse effects on expansion on their income and employment. These include

¹ See the Environment, Climate Change and Land Reform (ECCLR) Committee Report on The Environmental Impacts of Salmon Farming. March 2018.

² In reality, the evidence relates to the industry’s total contribution and not its additional contribution (see point 4 below).

businesses providing services for salmon and sea trout anglers, recreational divers, recreational sea anglers, sea safaris, marine wildlife tourism as well as general tourism and commercial fishing in coastal areas. In the absence of an analysis of all income and employment effects, the Scottish Government should be more circumspect and avoid creating the impression that income and employment increases it cites are net gains to Scotland. The reality is that net expansion of income and employment is completely unknown.

3. The actual estimates cited by Ministers are either, large estimates that cannot be reconciled with official data (Imani 2017), or large estimates (e.g. £2bn) which do not relate to any coherent indicator of economic (impact) activity (Marsh 2019). For over forty years, Scotland has been carrying out detailed surveys/censuses of businesses in Scotland and has been identifying flows of products between industries. The data collected are used to construct Scotland's Input-Output Transactions Tables. These tables are regarded as the "Gold Standard" and fortunately, one of the industrial sectors is Aquaculture. Imani (2017) largely eschewed a traditional approach and internationally agreed protocols and relied on much data from the industry itself, rather than official Input-Output data. In our view, Imani (2017) was procedurally opaque, but produced impressively large estimates on income and employment. Unfortunately, these cannot be reconciled with official statistics.

We calculate that Gross Value Added (GVA), which has been extensively quoted and relied on by Highlands and Islands Enterprise and Marine Scotland, is possibly exaggerated by 124%, whilst employment could be overestimated by a massive 251% (see Table 6).

4. It is inappropriate to propose that more resources should be devoted to an industry simply because of the size of its current economic contribution. Since in the real world, relationships are not linear, a doubling of production does not necessarily mean a doubling of GVA and employment. The case for expansion has to focus explicitly on the additional benefits and costs that the expansion will deliver. No such analysis has been undertaken.

5. Marsh (2019) followed a traditional Input-Output based approach but did not estimate total employment. Marsh (2019) produced a much-quoted figure of £2bn for turnover. Since this figure does not relate to any coherent economic performance indicator it should not influence public policy.

In summary:

- The available economic evidence is **partial**. This is because it is limited to income and employment effects.
- The income and employment evidence itself is **incomplete**. This is because it does not include the loss of jobs and income in other marine based businesses.
- The income and employment evidence is **unreliable**. This is because opaque and non-standard estimation procedures were used. These appear to have generated significant over-estimates of income and employment.
- In public debate, estimates of income and employment (and the irrelevant £2bn turnover estimate) are being used **inappropriately** to justify salmon aquaculture expansion.

Faced with an evidence base that is partial, incomplete, unreliable and even irrelevant, it is difficult to understand how the Scottish Government can sensibly address the question of whether further damage to Scotland's marine environment is a price worth paying.

Pending further evidence, the Scottish Government should consider suspending its support for additional salmon production.