

FINAL REPORT

June 2019

# Evaluating the Social and Economic Impacts of the SSC North Arran Aquaculture Development

Scottish Salmon Company

ASSESSING OPERATIONAL IMPACT THROUGH A SUSTAINABLE LIVELIHOODS APPROACH

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***Disclaimer:***

This report provides social and economic impact analysis to support parallel planning assessments (Scoping Report, EIA, and other documents), and for maximising positive impacts and mitigating negative impacts across the supply chain.



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## EXECUTIVE SUMMARY

The report sets out the anticipated social and economic impacts of a new Scottish Salmon Company (SSC) site in North Arran to identify positive strategies for SSC, communities and policymakers, in both the planning process and future engagement through their operations. For planning purposes, it should be read in conjunction with other assessments including the Scoping Report and Environmental Impact Assessment.

## KEY FINDINGS

- **Positive economic and social impact:** The site will have a significant positive, inclusive impact across Scotland's aquaculture supply chain in Arran, Argyll and Bute, North Ayrshire and the Central Belt. GVA contribution to Scotland is calculated to be at least £8.61m per year.
- **Employment:** In total it is projected to support a total of 61 jobs (FTE): 51 in the sector, and a further 10 in wider economic stimulus. Most of these jobs would be year-round and well paid (including engineering, farm management, manufacturing, and services).
- **Arran's economic resilience:** A lack of economic diversity and resilience therefore threatens sustainable community development in Arran, and without support will continue to exclude young working people with a low asset base: tourism risks creating low-security employment and driving out activities that could improve year-round use of social and physical assets (schools, medical care, accommodation). The 2011 census saw a 16% decline in working age population during a period of economic growth.
- **Benefit to Arran:** The degree of social and economic benefit to Arran depends largely on the affordability of physical housing stock on the island, its effect on available labour, and the effectiveness of stakeholders in addressing constraints (including positive support from SSC as an option).
- **Natural capital:** As long as environmental compliance is achieved through the EIA and the site is managed in accordance with best practice, optimal husbandry / welfare standards, and emerging regulatory frameworks, there appear to be no significant impacts on the natural capital of Arran, and a positive case can be made for the site's positive contribution to low carbon animal protein production.
- **Adding value:** There are ways in which SSC can improve and mitigate current challenges on Arran, for example through upgrading coastal path infrastructure, supporting housing development, and supporting the business case for better ferry services through increased commercial traffic.

## KEY FIGURES

Measure of impact	Annualised Figure
Expected economic value to Scotland (including Arran and Clyde region)	<b>£8.61m</b> (GVA to Scotland) Supporting <b>61 jobs</b> across the supply chain and wider economy
Total revenue per year	<b>£14m</b>
OPEX per year (maintenance contracts, transport, feed, etc)	<b>£10.8m</b>
CAPEX in start-up phase (construction of equipment)	<b>£8.5m</b>

*The total medium term (to 2030) GVA is £36m from direct site production, and a total of £94m across production, supply chain and the wider Scottish economy.*



## POTENTIAL FOR MITIGATION AND CAPITAL ENHANCEMENT

### ***Financial impacts (increased income, any detriment to other income sources, access to finance)***

- SSC can be relatively neutral about how the direct farm jobs are filled – the jobs may benefit other communities by as much if not more, through increased income, than if the employees were based 100% in Arran. SSC could use their access to finance to support the financing of Arran housing initiatives.

### ***Physical capital infrastructure (housing, ferry use, roads, communications)***

- SSC should where possible support Arran's efforts to improve access to housing for workers, and could support improving the physical infrastructure of the local site area, e.g. information boards, path maintenance, boat tours etc. as part of an integrated good neighbour approach.

### ***Natural capital (effects on, and, of the natural resource in relation to the development)***

- Beyond complying with regulatory requirements, SSC should consider (as they are) how to demonstrate a Best-in-Class approach to local Arran stakeholders. This is not just for the planning process but for ongoing social licence to operate.

### ***Social capital (social impacts of the development, including population, social amenities, income)***

- SSC should where possible support housing and jobs on Arran (even for those not directly employed but may be crucial for Arran, such as key workers), but also consider the potential social impacts across the Highlands and Central Belt.

### ***Human capital (possible impacts of training, skills, career, and location)***

- Site employment will entail training and up-skilling, and rural, year-round career options. However, it will also play a role in developing manufacturing jobs in the Highlands (and likely directly in Arran).

## IMPACT SUMMARY

There are both benefits and costs to sustainable livelihood 'capitals' associated with the development. The magnitude of the benefits will comfortably outweigh the magnitude of the costs.

- ***Without implementing any mitigation measures or recommendations:*** the overall impact of the site on Sustainable Livelihoods is net positive, taking into account concerns of residents and mildly negative impacts; and despite the uncertainty around where farm employees are based as a result of housing issues.
- ***With mitigation measures:*** the overall impact of the site on Sustainable Livelihoods may be strongly positive by mitigating negative impacts and existing economic blockers, and enabling Arran and other Scottish regions to meet their strategic objectives.

## DISCUSSION

### **Arran's Economy**

It is currently unknown how many of the direct farm jobs will be taken up by Arran workers: given the current housing and related labour constraints, it is possible that those jobs can be filled by people from other areas by accessing the site by sea. Based on the assessment of Arran and wider area Clyde region linkages, it may be advantageous if it offers positive employment opportunities for other areas with more demand for jobs, for example Ardrossan or the Loch Fyne area where SSC has a cluster of operations. Key worker jobs (in particular health and social care workers and teachers) are unable to find affordable housing in Arran, necessitating many to commute from the mainland, or those jobs remain vacant. This is detailed in numerous Arran



Economic Group (AEG) and other reports<sup>1</sup>. Nevertheless, the jobs are considered positive in providing competitive, year-round salaries that would help diversify the Arran economy.

### **North Ayrshire and Scottish Supply Chain**

The wider socio-economic impact of the proposed development has been considered, including that of additional jobs in the North Ayrshire Council region, and across Scotland. One example of the wider job creation would be W&J Knox in Kilbirnie (within the North Ayrshire region) has been one of the biggest private employers in the town, with a current complement of 77/78 employees and a turnover of around £11m. Should Knox be successful in obtaining the contract for supplying nets and maintenance to the North Arran site, it would amount to around £500,000 in initial purchasing (CAPEX) and around £500,000 in maintenance contracts over 5 years. This would equate to around 1-2 extra jobs (or Full Time Equivalents) or £120,000 per year (turnover) in Kilbirnie. However, overall around 95% of the Knox business relates to the aquaculture sector, meaning that over 70 jobs there are reliant on the sector.

Construction of the barge and pen system by Gael Force Group would take place in Corpach, Fort William (for the barge), with pen work likely in or between the Oban area (Barcaldine) and Inverness. The SeaQure system is seeking to be the best-in-class model to minimise negative impacts cited in recent reports (primarily the 2018 Parliamentary Inquiry<sup>2</sup>) and which were reflected as a concern amongst many Arran residents, driving some negative perceptions of the sector which in turn has affected views about this site.

### **Wider Supply Chain Impacts for Scotland**

SSC have highlighted their work with Arran Workboats (Kiscadale Engineering), based in Whiting Bay. While it is unclear whether the firm will secure a contract to produce workboats directly relating to the proposed site (though it is likely to be the case), it is important to consider their links with the rest of the sector. Arran Workboats have won contracts to supply SSC with workboats being delivered to Lewis and across the Highlands, and supplying the sector is now their core business.

While these income and employment streams to Arran Workboats are not relating directly to the proposed site, they are an illustration that economic impacts work both ways – there are indirect benefits to Arran from the aquaculture sector throughout Scotland, and equally there will be indirect impacts in areas elsewhere in Scotland throughout the supply chain from the production emanating from the proposed site. These are likely to include supporting and/or creating jobs and GVA in:

- Fort William, Inverness and Kilbirnie (equipment supply – Gael Force and Knox);
- Larkhall (distribution – DFDS);
- Grangemouth / Bathgate (feed – Biomar, EWOS);
- Arran (transport and engineering – Kiscadale, Arran Haulage, Paddy McHale); and
- Cairndow (processing – within SSC processing operations).

The geographic spread of these wider supply chain impacts are illustrated visually in the diagram overleaf.

### **Supporting Arran's Objectives**

It is important to acknowledge that the unlocking of this value is due to Arran's and North Ayrshire's willingness to utilise the site – for Arran and North Ayrshire's direct interests and to recognise their strategic importance for Scotland. Understanding the total value of Arran's knock-on contribution to the Scottish economy, and their integration with it, would make a clearer case for investment in ferry services which involve public service obligations (PSO) and other local priorities. This would in turn improve utilisation of limited housing stock – if it is to be used for tourism, it should be as fully used, year-round, as possible. Such virtuous circles could be possible with continued engagement in the relationship between fish farming and communities.

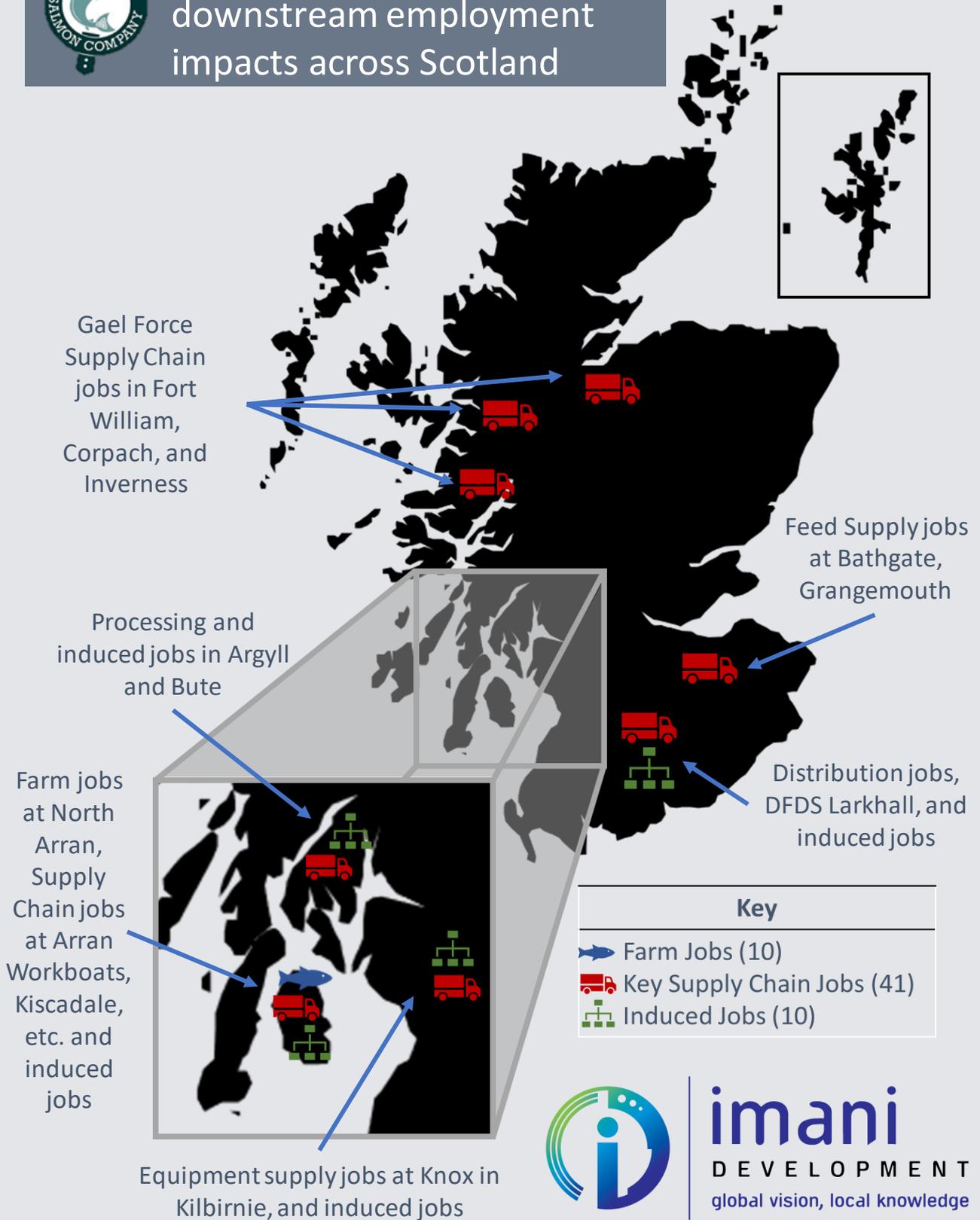
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<sup>1</sup> E.g. North Ayrshire Local Housing Strategy, 2018-2022: <https://www.north-ayrshire.gov.uk/Documents/PropertyServices/HousingBuilding/local-housing-strategy.pdf>

<sup>2</sup> <https://www.parliament.scot/parliamentarybusiness/CurrentCommittees/107585.aspx>



## Geographic spread of up and downstream employment impacts across Scotland



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It is recommended that any North Arran development firmly commits to this best-in-class approach which is more consistent with Arran's approach to being a progressive and responsible island. This should help some who are not reconciled to the development to find a degree of consolation that the development might further the efforts of the industry to address environmental challenges. In order to demonstrate this SSC should implement Environmental Management Plans and agreed monitoring plans to demonstrate effective site management, but separately to the site also consider any conservation initiatives of interest in Arran (an initiative relating to wild salmon in rivers was mentioned in public consultation).

## INTERACTION WITH OTHER SECTORS

### Tourism

The AEG is careful not to criticise the tourism sector and reflected a willingness to explore whether the North Arran site might be included in the tourism offer, for example offering boat tours of the farm, as a demonstration of a diverse economy.

Clearly, the Arran economy is significantly focused on tourism, and that sector drives many of the social and economic impacts of the island. An estimated 25% of the island's housing is now used for tourism, and many homes are occupied by retirees outside of employment. A combination of those with strong financial assets entering the property market, and the rental potential of properties ongoing, means that house prices are now unaffordable for many on the island. It is therefore not a given that any negative impact on tourism numbers is always negative for the island's rebalancing or diversification away from this trend – however, allowing for this and based on interviews and discussions during this study, it is not clear or considered likely that tourism would be adversely affected by the fish farm. This is therefore likely to be a negligible impact if any at all – but a brief assessment of options to mitigate any concerns might be an opportunity to demonstrate mutual use of the coastline. It is expected that any visual impacts on the circular walk around Arran, or similar, could be turned into net benefits with appropriate investment in either maintaining or upgrading the path around the site, setting out information boards, or investing in the nearby ruins. It should be explored whether boat trips or similar could combine a tour of the fish farm and ruins.

### Fishing, Shipping

SSC have contacted other stakeholders regarding negative impacts on fishing and shipping. We are not aware of any significant negative impacts that would materially affect the development adding economic value to the area.

## KEY POINTS FOR IDENTIFYING SUSTAINABLE LIVELIHOOD STRATEGIES ON ARRAN

- **Additional jobs are not the key priority for Arran, though overall there is a desire to have more young working families.** This is helpful in some respects because it is not clear how many of the prospective SSC farm jobs may be filled by people elsewhere, for example in Loch Fyne or Ardrossan. If social and economic impacts go to these other areas, that may be a net benefit compared to feeling obliged to put them in Arran. Indeed, the AEG suggests that 'any additional job should come with a house'.
- **Housing is the key issue defining local impact.** Consultation suggests that any measures taken to help address the housing issue could strongly influence the views of many in Arran who are focused on the island's development. Supporting the development of affordable housing could be linked to the new farm jobs.
- **Impacts across the supply chain are likely to bring economic and social benefit:** Arran's economic strategy deserves support and this can be achieved through working with the community to solve problems and alleviate concerns. However, there are strong wider benefits in developing the Highland (also Arran-based) manufacturing base as well as scale benefits in relatively less socially and economically well-off communities in the Central Belt.



## 1. INTRODUCTION

Figure 1: Isle of Arran, viewed from the departing Brodick-Ardrossan ferry



### 1.1. PURPOSE AND APPROACH

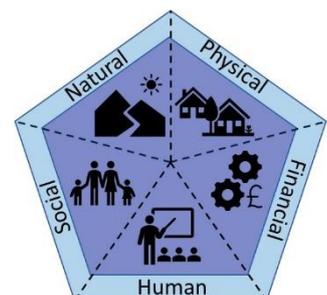
The report sets out the anticipated social and economic impacts of a new Scottish Salmon Company (SSC) site in North Arran to identify positive strategies for SSC, communities and policymakers, in both the planning process and future engagement through their operations.

Imani Development has used the Sustainable Livelihoods Approach (SLA) to identify a holistic set of impacts, recognising those across the Scottish supply chain as well as effects local to Arran. This is in line with the general assessment format set out for the Aquaculture Industry Leadership Group (AILG) from Recommendation 9 of the industry's Vision 2030. The approach recognises that industry- and region-specific characteristics will play a part in determining the impacts and outcomes of an economic activity.

The report has considered views from the public and community organisations in Arran over two consultation events (Lochranza on 2<sup>nd</sup> April and Brodick on 27<sup>th</sup> May 2019), along with interviews with SSC, supply chain company representatives, the Arran Economic Group, and North Ayrshire Council

The North Arran Development will consist of **two banks of 10, 120m circumference pens**, arranged in a 5x2 formation.

The farm is anticipated to have a **total biomass of 5,000 tonnes**, with the first fish entering the system in 2021 and the first harvest in 2022.





### 1.1.1. SUSTAINABLE LIVELIHOODS APPROACH

The Sustainable Livelihoods Approach (or Framework)<sup>3</sup> considers the local community, regional and national ‘asset base’, and anticipated impacts on those assets, including:

- Financial impacts (increased income, any detriment to other income sources, access to finance)
- Physical capital infrastructure (housing, ferry use, roads, communications)
- Natural capital (effects on, and of, the natural resource in relation to the development)
- Social capital (social impacts of the development, including population, social amenities, income)
- Human capital (possible impacts of training, skills, career, and location)

The objective is to describe the risks, opportunities and prospective impacts and determine a sustainable and inclusive growth strategy. A suitable account of sustainability therefore takes into account the vulnerability and policy frameworks around people’s livelihoods and strives for the most beneficial and (ideally) resilient current status and future for communities.

Figure 2: Sustainable livelihoods assessment framework<sup>4</sup>



Taking a livelihoods approach provides alternative ways of thinking about the objectives, scope and priorities for developing an industry within a community context – essentially it puts people and their priorities at the centre of development. People are given the opportunity to improve their well-being, avoid economic and environmental vulnerability, and face a viable future livelihood. This approach requires looking beyond raw economic GVA data and identifies what health, social, risk-avoidance and environmental factors are also to be considered. Even food security (usually relevant for poorer societies than Scotland) is important when considering the challenges of low carbon, affordable and predictable provision of protein when fish stocks are under pressure and agricultural meat production faces higher ratios of feed conversion.

<sup>3</sup> This summary reflects the industry social and economic template for the sector under its Vision 2030 recommendations. For more information see [https://www.soas.ac.uk/cedep-demos/000\\_P530\\_RD\\_K3736-Demo/unit1/page\\_23.htm](https://www.soas.ac.uk/cedep-demos/000_P530_RD_K3736-Demo/unit1/page_23.htm)

<sup>4</sup> DFID. (1999). *Key Sheets for Sustainable Livelihoods: Sustainable Livelihoods Overview*. DFID, London.



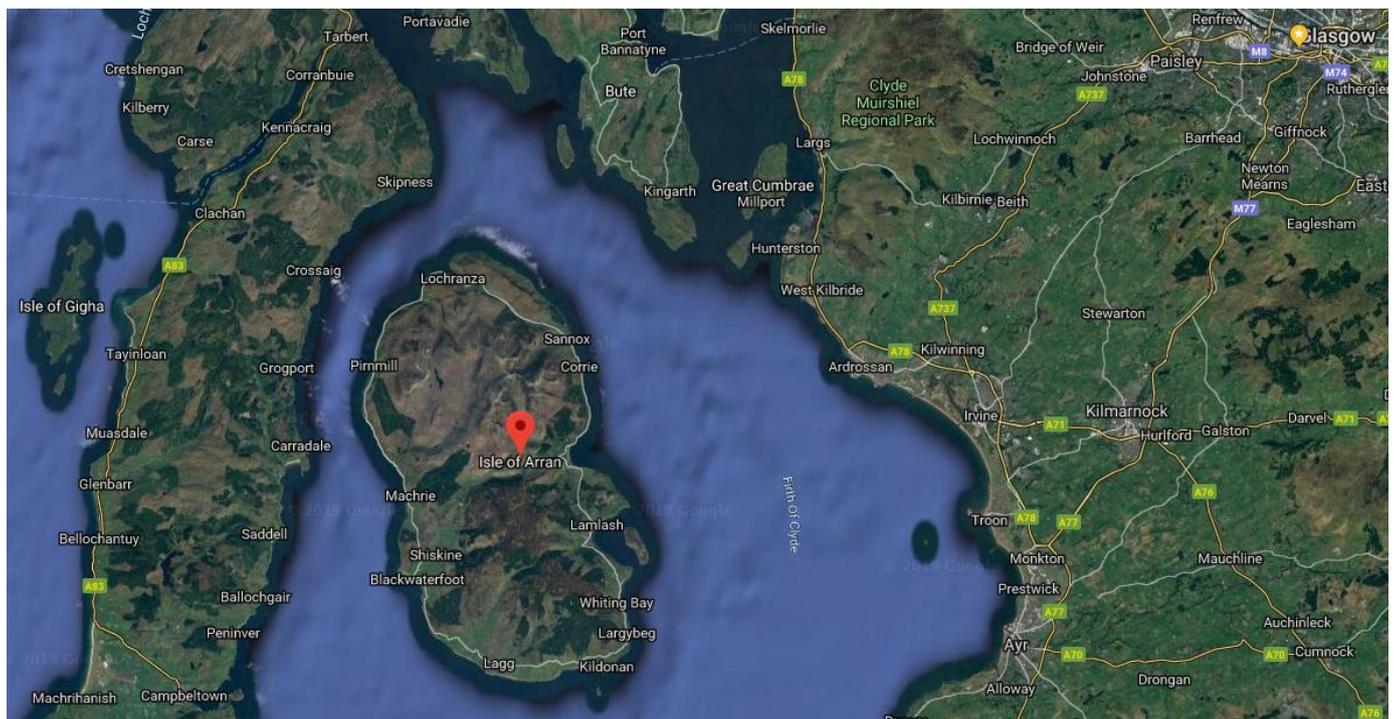
## 1.2. SOCIO-ECONOMIC PROFILE OF ARRAN

Figure 3: Brodick shoreline, looking North



The Isle of Arran lies within the Firth of Clyde and is home to around 4,500 permanent residents – comprising under 5% of the total population of North Ayrshire. The island is around 20 miles wide and 10 miles across, with a circumference of 55 miles. The Highland Boundary Fault – a geological fault line running across the centre of the island between Brodick and Blackwaterfoot – separates the more mountainous and hardy north from the relatively lower-lying South. It is characterised by its mountain ranges and historic settlements dotted along its coastline. Its natural aesthetics, coupled with its proximity to Glasgow and Road Equivalent Tariff (RET) ferry service, has made Arran an extremely popular destination for tourists regionally and from abroad. Tourism is now the dominant driver of Arran’s economy, making use of Arran’s natural land and sea assets.

Figure 4: Arran and the Surrounding Region (Google Maps)





Arran's population is both falling and ageing. Residents over the age of 65 comprised around a third (1 in 3) of Arran's total population, with this figure expected to rise to half (1 in 2) in 2026. In contrast, the working-age population (16-64) was expected to comprise only 40% of total residents in 2026, meaning only 10% would be of strictly school-going age<sup>5</sup>.

The Scottish Index of Multiple Deprivation (SIMD) identifies small area concentrations of multiple deprivation across all of Scotland in a consistent way and ranks these areas (called data zones) from most disadvantaged (ranked 1) to least disadvantaged (ranked 6,976). The SIMD is made up of information on income, employment, health, education, housing, access to services, and crime levels. Nevertheless, island economies can be very fragile and based on a narrower set of industries than other places – and are vulnerable to funding and / or market changes.

While demographics and housing affordability are acute challenges, in the Scottish Index of Multiple Deprivation (SIMD) Arran's overall scores are in the upper (positive) 50-70% in Scotland<sup>6</sup>. This sits in stark contrast to the significantly more negative SIMD scores of Ardrossan – Arran's primary connection to the mainland via the CalMac ferry service to Brodick – as well as other notable mainland populations in North Ayrshire, such as Kilbirnie. A demographic breakdown of Arran is found in the Social Capital section.

The towns are well resourced and supported. For example, Lamlash has various amenities and resources including council offices, a hospital and a medical centre. The island is well connected by road, with Lochranza to the North accessible from the Brodick ferry in 25 minutes, and Lamlash around 10 minutes to the south and Whiting Bay 4 miles further on. Brodick has a large Co-Op, and there is a large ASDA in Ardrossan which is often used by those travelling to Arran to 'stock up'. To the north of the island, Lochranza forms the terminal for the ferry to the mainland from Claonig in the summer and Tarbert during winter. This is seen as a useful ferry for travelling to Oban and tends to be more reliable.

Arran High School is currently the only high school in the Isle of Arran and is open to all surrounding villages in Arran. The closest primary schools in the Lochranza district are Pirnmill Primary School and Corrie Primary school. In terms of tertiary infrastructure, there is currently one college in operation – Argyll College UHI. The University of the Highlands and Islands comprises 13 colleges across Scotland and mainly provides trainings in technical skills such as Business and Computing, Catering and Hospital and Land Based Industries.

#### **Sustainable Livelihoods 'vulnerability context': risk and resilience**

Depopulation is a challenge in Arran, and belies some risks created by having a dominant tourism economy. This may be mitigated by having competitive salaries from alternative sectors, and greater access to affordable housing for workers. If key workers are unable to fill health and social care posts, this is likely to increase vulnerability to change.

#### **Clyde development and National Strategy**

The Clyde Marine Planning Partnership report cites the Scottish economic objectives as follows:

**'Scotland's Economic Strategy (SES)** has a number of key references to the marine economy and marine planning. **SES** sets out an economic development framework for growing the Scottish economy. The focus is on raising the competitiveness and productivity level across the Scottish economy, and addressing inequality, with a focus on key 'growth sectors' as well as a focus on 'innovation', 'investment', 'inclusive growth' and 'internationalisation'. The SES sets out how the overarching purpose of the Scottish Government can be achieved, the overall purpose being *'To focus government and public services on creating a more successful country, with opportunities for all to flourish, through increasing sustainable economic growth.'*<sup>7</sup>

The report considers the USP of marine resources for the Clyde, and this emphasis is considered in this report, not only in relation to aquaculture but in the potential interactions with Arran's USP of (coastal) tourism.

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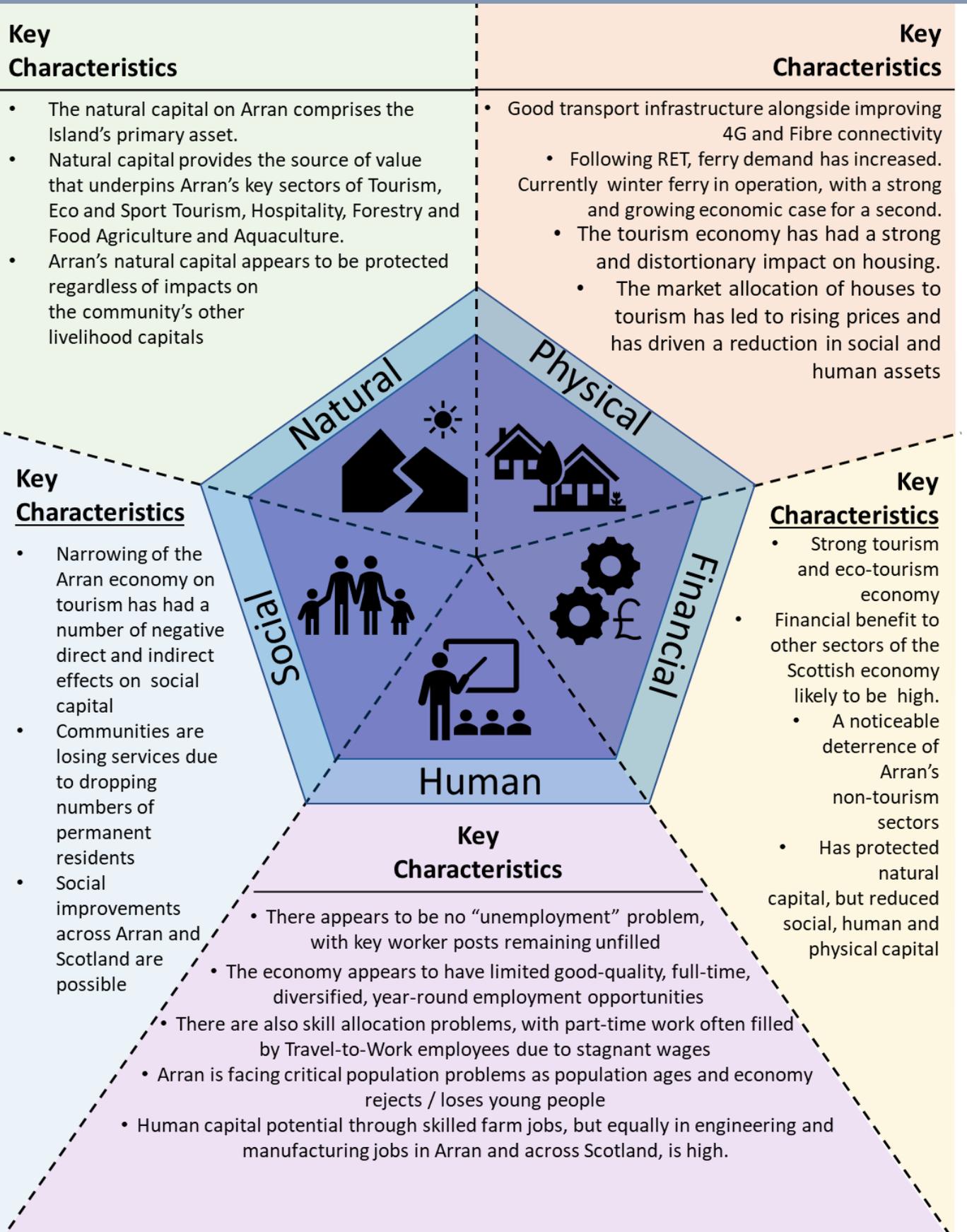
<sup>5</sup> North Ayrshire Community Planning Partnership, September 2017, Locality Profile: Arran, accessed at: [http://d1xcj1909sd1jp.cloudfront.net/wp-content/uploads/sites/60/2018/02/Locality-Profile\\_Arran\\_Final\\_Version\\_Sept2017.pdf](http://d1xcj1909sd1jp.cloudfront.net/wp-content/uploads/sites/60/2018/02/Locality-Profile_Arran_Final_Version_Sept2017.pdf)

<sup>6</sup> Scottish Index of Multiple Deprivation (2016), accessed at: <https://jamestrimble.github.io/imdmmaps/simd2016/>

<sup>7</sup> Clyde Marine Planning Partnership: Socio Economic Regeneration in the Clyde Marine Region (2018). Prepared by MK Economics



1.3. SOCIAL AND ECONOMIC BASELINE





# Livelihoods Assessment



## 2. FINANCIAL CAPITAL

Figure 5: Brodick shoreline, looking North towards Goat Fell



### 2.1. OVERVIEW

The economy of Arran has shifted significantly towards the tourism sector which has had a profound impact on other sectors of the economy. Tourism is a valuable driver of expenditure and demand in Scotland's rural and island economies, but equally it presents challenges in competing for housing resources against other industries and key public services.

The Road Equivalent Tariff (RET) has contributed to this through significantly reduced ferry prices, with fares on the Ardrossan – Brodick route falling by 46% for passengers (£6.75 to £3.65) for passengers and 64% for cars (£49.50 to £14.85), and on the Claonaig / Tarbert – Lochranza route by an even greater 55% for passengers (£6.15 to £2.75) and 65% for cars (£27.00 to £9.25)<sup>8</sup>. The biggest changes have been in car use. On the one hand, the RET has made it significantly more cost-effective for Arran locals and businesses to access the mainland, but on the other, the island has opened up access to non-resident travellers, mainlanders, businesses, labour and tourists / eco-tourists, etc., in a way that it never before has been.

#### Wider Scottish financial context

Scotland is currently experiencing low (nominal) unemployment, but continues to face challenges of insecure employment, underemployment, and wider economic insecurity posed by Brexit. Scotland also has remote rural populations alongside urban social deprivation. It is recognised that aquaculture jobs are well remunerated; the average annual salary in the fish farming sector is around £34,000, and many of the jobs are on the periphery of the country, where there are no alternative opportunities of that type.<sup>9</sup> It is useful to note that since much of the income relies on the initial site volumes

<sup>8</sup> Transport Scotland, 2017, Evaluation Of The Impact Of Road Equivalent Tariff On Arran, Accessed at:

<https://www.transport.gov.scot/media/33631/ts-amfc-ret-arran-final-report.pdf>

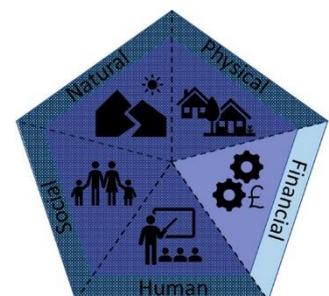
<sup>9</sup> Fergus Ewing, Statement on Sustainable Aquaculture (2019),

<http://www.parliament.scot/parliamentarybusiness/report.aspx?r=12164>

*“The site would stimulate investment in boatbuilding and manufacturing in Arran and across the Highlands”*

(Report findings)

Operations at the site will support **61 jobs** economy-wide, and create around **£8.6m in GVA** for the Scottish economy every year





produced at farm level, there is a high dependency for upstream, downstream, wider rural and urban value chain jobs on the site approval.

## 2.2. NORTH ARRAN PROPOSED DEVELOPMENT

The North Arran site will provide social and economic opportunities (employment, commercial contracts) for the nearby Arran and Clyde area, but for boat-building and manufacturing across the Scottish Highlands (Corpach, Argyll, Forres, Inverness) and the Lowlands (netmaking and servicing in Kilbirnie, feed supply in Grangemouth, distribution in Larkhall). The site's contribution to the financial capital of Arran itself will partly depend on how the direct employment is distributed, which is not yet known.

Larger financial impacts will be spread across the Scottish parts of the aquaculture supply chain. The financial impacts will comprise salaries, supplier spend and in turn supplier salaries and purchasing, and beyond that an *induced* economic impact from the increased economic activity which does not directly relate to aquaculture purchases.

The direct employment is expected to be within the wider proximity of the site – on Arran, or across a nearby geography of Argyll and Bute, and North Ayrshire. However, if there is a shift pattern established it may allow for farm workers to be based beyond local boundaries.

### 2.2.1. HEADLINE IMPACTS

Table 1 below provides an overview of the key forecasted economic figures for SSC's proposed development in North Arran. The periods analysed are short term (the annual average over every two-year production cycle) and medium term (an inflation and growth-adjusted cumulative estimate for impacts over the first 10 years of operation). Economic value is derived from the initial capital investment (CAPEX) and the ongoing operational expenditure and revenue of annual production (OPEX, revenue). Gross Value Added (GVA) is the value relating to Scottish value after accounting for non-Scottish value (i.e. it nets out imported value to reflect value to Scotland).

***The total medium term (to 2030) GVA is £36m from direct site production, and a total of £94m across production, supply chain and the wider Scottish economy.***

#### Local spend in the Clyde region

The total amount of annual spend in North Ayrshire is currently £4.22m before the introduction of the new development: this includes CAPEX spend of £3.75m and equipment hire from Kilmarnock of £245,000. The total spend for Argyll and Bute, which would have operational linkages to the site including processing facilities, is £12.4m, including £1.37m in repair and maintenance and £2.28m on construction. These are total contract values to companies. The projections of impact for the new site are as follows, based on 2,500T annual production (from a 5,000T site).

Table 1: Financial Impact Summary

Impact Category	Description	Short-Term (Annualised Average <sup>10</sup> )	Projected Medium-Term (2021 – 2030) <sup>11</sup>
Economic Investment and Headlines	Total Capital Expenditures (CAPEX) relating to North Arran operations	£8.5m	N/A
	Total Equivalent Revenue (Volume equivalent of North Arran relevant to total SSC operations)	£14m	£153,296,094
	Total Operational Expenditures (OPEX) relating to North Arran operations, per annum	£10.8m	£118,274,255

<sup>10</sup> The farm model run by SSC carries production cycles (including scheduled down time) of around 24 months. To not over- or underestimate points of value creation, two-year cycles are averaged to fit financial cycles.

<sup>11</sup> This assumes consistent CAGR inflationary and company-level growth with previous 5 years (2015-2019)



Impact Category	Description	Short-Term (Annualised Average <sup>10</sup> )	Projected Medium-Term (2021 – 2030) <sup>11</sup>
Value for Scotland (and North Ayrshire)	Direct GVA from North Arran Operations to Scottish economy	£3.31m	£36,265,093
	Indirect (supply chain) GVA to Scottish economy	£3.97m	£43,518,111
	Induced GVA to Scottish Economy	£1.32m	£14,506,037
	<b>Total contribution to Scottish GVA (direct + indirect + induced impacts)</b>	<b>£8,611,109</b>	<b>£94,289,241</b>
New and Supported Employment relating to North Arran	New employment (direct jobs) required to operate North Arran site	10	10
	Supply chain employment (indirect jobs) required to support volume generated at North Arran	41	41
	Wider economy employment (induced jobs) relating to economic activity generated by North Arran	10	10
	<b>Total employment across the Scottish economy relating to economic activity generated at North Arran</b>	<b>61</b>	<b>61</b> <i>(may reduce with greater automation)</i>
New and Supported Remuneration relating to North Arran	New remuneration (salaries and benefits) accruing to people employed at North Arran	£295k	£3,230,168
	Supply chain remuneration (indirect salaries and benefits) relating to economic activity at North Arran	£1.23m	£13,468,157
	Remuneration across the wider economy (induced salaries and benefits) relating to economic activity at North Arran	£214k	£2,343,240
	<b>Total salaries and benefits across the Scottish economy relating to economic activity generated at North Arran</b>	<b>£1.74m</b>	<b>£19,052,515</b>

### 2.2.2. ECONOMIC IMPACTS RELATING TO CAPITAL EXPENDITURES (CAPEX)

The North Arran site constitutes a larger-than-usual capital outlay due to the fact that a) it is to be positioned in a more exposed site, b) it is relatively larger than the average fish farm in Scotland, and c) it is bringing recent industry operational technologies and innovations together. This is broken down in Table 2 below.

**Table 2: Breakdown of Capital Expenditures**

CAPEX List	£ Value	Wider Strategic and Economic Values
<b>TOTAL</b>	<b>£8,500,000</b>	At least 25-30 FTE CAPEX jobs will be associated per site investment across Scotland during the setup phase. This would be conservative given that North Arran is a larger setup than average.  The CAPEX phase would make a significant contribution to manufacturing capacity in the Highlands.  <i>e.g. Gael Force Group establishing barge construction facilities in Fort William</i>
Barge	£3,527,500	
Pens	£2,337,500	
Grower Nets	£680,000	
Grid Moorings	£595,000	
Cameras	£340,000	
Barge Moorings	£255,000	
Site Small Open Boat	£255,000	



CAPEX List	£ Value	Wider Strategic and Economic Values
Spreaders	£170,000	There is also additional spinoff demand generated along existing SSC supply chain, particularly in engineering, monitoring, transport, etc. <i>e.g. Gael Force Group, W&amp;J Knox, based in Kilbirnie, Arran Haulage</i>
Top Nets & Shade Nets	£85,000	
Moorings Install	£85,000	
Feed Pipe	£85,000	
Aeration Infrastructure	£68,000	
Scales	£17,000	

Contracts relating to capital outlays in specified sub-sectors are generally accruing to specialised companies, in this case Scottish based manufacturers, and this will translate into ongoing maintenance contracts. These ongoing business relationships (i.e. capital service followed by operational service) can capture social and economic impact almost equivalent to that created within SSC.

### 2.2.3. ECONOMIC IMPACTS RELATING TO OPERATIONAL EXPENDITURES (OPEX)

The Operating Expenditures (OPEX) of a new development are one of the best indicators of ongoing economic and financial flows. OPEX is also one of the better indicators of estimating **geographically where**, and **physically whom** is benefiting on an ongoing basis. A summary of financial capital and supply chain impacts is provided in the table below and expanded on thereafter.

**Table 3: Breakdown of Operational Expenditure**

Category	Description	Amount	Local Examples
<b>Total OPEX (Annualised)</b>	<b>Total (annual average over two years)</b>	<b>£10,801,577</b>	<b>E.g.</b>
<b>Breakdown of Ongoing Expenditure (Annualised)</b>	Time-loss of value (Depn)	£433,333	<b>Kiscadale Engineering (Whiting Bay, Arran)</b>
	Feed	£6,250,723	
	General	£766,661	<b>Arran Haulage Services (Arran, Ardrossan)</b>
	Labour	£514,442	
	Medicines	£496,754	<b>McHale Engineering (Arran)</b>
	Net Maintenance	£173,307	
	Smolt	£2,469,674	<b>Bay Garage (Arran)</b>
	Wellboat	£316,797	
	Other	£758,118	<b>Billy Bowie (Kilmarnock)</b>

SSC smolt production takes place in nearby Argyll, and the Western Isles. Annual net maintenance would likely be provided by W&J Knox of Kilbirnie. Feed supply (£6.25m) would likely come from either Biomar (Grangemouth) or EWOS (Bathgate) – note that in the specific case of feed, a lower than average Scottish content is added to sourced feed ingredients. However, of the £6.25m the GVA is calculated to be approximately £1m (15-20% of turnover) within the total impact.



**Supply Chain Impacts: financial linkages**

(Supply chain linkages are covered here in detail, and repeated where necessary in other sections of this report, including Human Capital.)

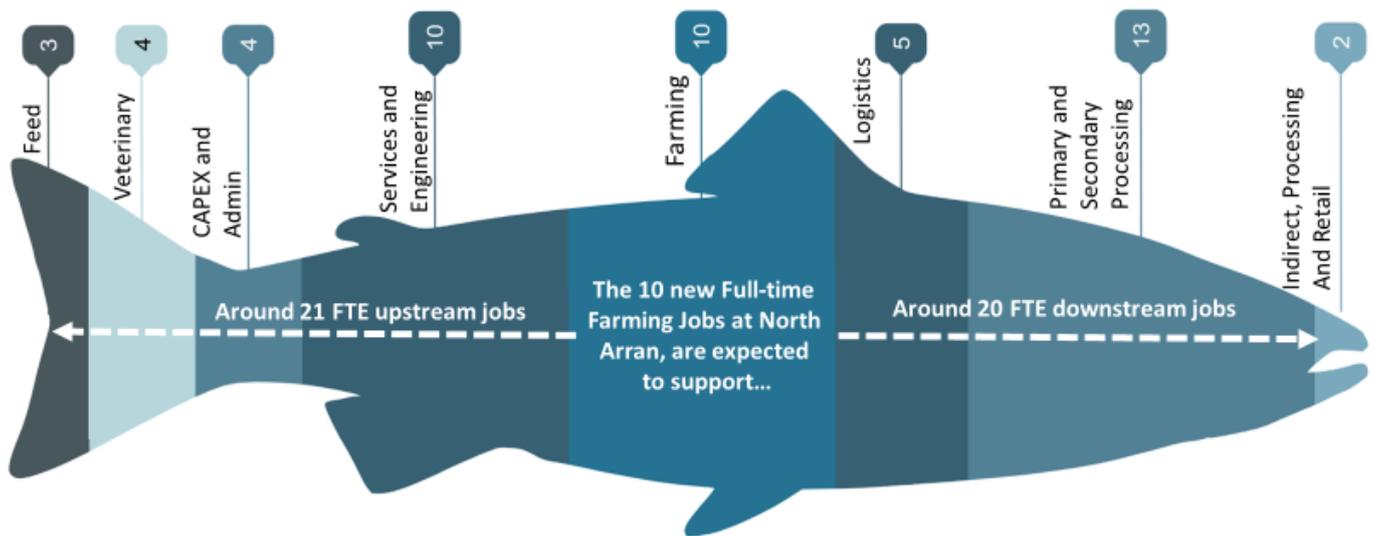
In the North Ayrshire Council region it would likely create or continue to support jobs in Kilbirnie through demand for net production at W&J Knox. The new development would produce significant supply chain impacts for Gael Force manufacturing employees in Inverness, Oban (Barcaldine) and Fort William (Corpach) through barge and pen construction. Feed and distribution jobs are supported in the Central Belt. Processing jobs would be distributed across Argyll and Bute, and possibly secondary processing jobs across Scotland and England.

In the local Arran supply chain, it is expected that the demand for engineering, maintenance, couriering and general transport services will increase.

Arran Workboats (Kiscadale Engineering) have previously secured a contract to provide 6 Rigid Inflatable Boats (RIBs) to SSC for their operations across Scotland. While not directly caused by the North Arran site, it highlights the degree of geographic demand for Arran engineering services and illustrates why an excessively local causal chain in industry scale and development can be reductive. One of the boats, for example, is destined for Lewis – local supply of RIBs there may not be possible but if it were, a focus on local-only jobs would have denied Arran the demand created by Lewis fish farm operations.

There is, therefore, a clear rationale not to focus on the hyperlocal nature of the jobs servicing the site, and for Arran stakeholders to consider the reverse – what Arran is generating in opportunities for other areas (both locally in their council region, and further afield), as well as the similar benefit to Arran of aquaculture elsewhere through Arran Workboats and SSC being able to achieve scale. Although of course essential to consider local impacts and benefits, particularly in relation to socio-economics, it is also important to consider wider national impact and growth of aquaculture supply chain and the role Arran can play in that development.

**Figure 6: Fish farming supply chain in Scotland**



It is also projected that the development will support around 10 further induced jobs across the wider economy in Scotland



*W&J Knox, Kilbirnie (founded 1778)*

Figure 7: Servicing nets at Knox site, Kilbirnie, North Ayrshire



Production on the new site would provide opportunity for W&J Knox in Kilbirnie (North Ayrshire). Knox builds on over 250 years of tradition in Kilbirnie and providing significant private sector employment.

Over 70 employees of Knox's 78-person workforce are supported by the servicing and supply of fish farm nets. The majority are engaged in the ongoing servicing of nets: repairs, cleaning and anti-fouling for re-use.

Servicing the North Arran site could support around 3 FTE jobs in Kilbirnie and around £100,000-120,000 in revenue (Kilbirnie is in the top 15% least well-off areas in SIMD terms nationally – see Social Capital section).<sup>12</sup> Knox derive around 95% of their income from contracts in aquaculture: if they expect N Arran to boost their operations by 5%, this means the N Arran site is responsible for supporting 2 (equivalent) jobs at this factory alone.

Similarly, areas such as Larkhall, where almost all the distribution of SSC salmon takes place, is heavily represented by top 10% least socially well-off areas

nationally.<sup>13</sup> Strengthening their financial capital through increased salmon production volumes should be viewed as an important benefit.

*Gael Force (Inverness, Corpach & Argyll)*

The North Arran site would provide high quality technical, manufacturing and engineering jobs across the Highlands.

Figure 8: Gael Force Boatbuilding, Corpach



Gael Force is a Scottish company based in Inverness, with roots in the Western Isles. For the North Arran site, it plans to:

- **Build a state-of-the-art barge in Corpach (Fort William).** It will bring new boat-building jobs to the area, requiring 10-15 people to be employed in the barge's construction. It would also pivot investment in a new £1.5m slipway and create opportunities for future boat and barge construction.

<sup>12</sup> <http://www.northayrshire.community/wp-content/uploads/sites/60/2016/05/SIMD16-Presentation-CPP-Seminar-2016-12-07.pdf>

<sup>13</sup> <http://simd.scot/2016/#/simd2016/BTTTTT/14/-3.9613/55.7300/>



- **Construct fish pens in Argyll.** Fusion Marine at Barcaldine near Oban joined Gael Force over the past year and are set to construct pens, likely to support 2-3 employees during construction phase.
- **Feed systems in Forres.** A team of 4 in Forres at Gael Force Marine Tech works on feed systems which seek to minimise the use of feed – it is expensive and it is strongly in the interests of companies to minimise feed waste through automated systems.
- **Ongoing services.** Technical support for the site ongoing would likely require an additional role in the servicing team.

#### 2.2.4. TOTAL ESTIMATED GROSS VALUE ADDITION OF THE NORTH ARRAN DEVELOPMENT

The table below uses the 2015 Scottish Government Type I and Type II Industry Multipliers, as derived from the Scottish Supply Use and Analytical Input Output Tables, to estimate supply chain and induced GVA accruing to the Scottish economy as a result of SSC's operations at North Arran.

Table 4: Annual GVA generated by operations at North Arran

	GVA, Direct Production	GVA, Supply Chain	GVA, Wider Economy	Total GVA
<b>Average Annual (2021-2022) GVA derived from the operational activity and volumes produced at North Arran</b>	<b>£3,311,965</b>	<b>£3,974,358</b>	<b>£1,324,786</b>	<b>£8,611,109</b>
<b>Of which is GVA generated internally by SSC</b>	£3,311,965	£3,057,366	£0	£6,396,331
<b>Of which is GVA generated externally of SSC</b>	£0	£916,992	£1,324,786	£2,241,778

The financial value to Scotland of SSC's proposed site is £8.61m annually at full production.

Supply chain activities may be outsourced or delivered in-house depending on the company. In the case of SSC, it has been assumed to be relatively vertically integrated and GVA calculations have been based on farm-level production. Under less conservative assumptions the GVA for Scotland would comfortably exceed £10m including profit to attract reinvestment.

#### 2.3. POTENTIAL FOR MITIGATION AND FINANCIAL CAPITAL ENHANCEMENT

The affordability of housing affects the financial value of farm salaries in two ways: 1) a higher than average salary from a well-paid job improves the chances of a worker being able to secure a house on the island, and 2) a given salary may have a proportionately bigger impact in other local areas. For example, if a worker was based in Ardrossan, the farm salary would go further due to lower living costs, notwithstanding the requirements for travel to and from the site.

The wider fish farming sector has provided demand for Arran engineering skills, with the island 'exporting' boats out to the rest of Scotland.

Due to the remote location of the site and limited visual impact, there is a small risk that some economic opportunities in tourism are negatively impacted – these are considered easily mitigated through supporting and enhancing the infrastructure on the route past the proposed site, including:

- Footpaths
- Viewing Points
- Information Boards



### 3. SOCIAL CAPITAL

Figure 9: Lochranza Castle, from the village shoreline



#### 3.1. OVERVIEW

The social capital of Arran is driven strongly by the tourism and lifestyle industry, with many either visiting as tourists or retiring to Arran. This has had an impact on the demographics of the island, and in turn requirements for health and social care, schooling and what community priorities exist.

Arran’s social capital is significantly affected by the economic and housing constraints on Arran, in particular second home ownership for rental. One reported effect is in Lochranza, where as a resident explained during consultation, the local shop was forced to close due to falling numbers of customers. Whilst the town’s houses might be “occupied” at certain times of the year, many houses may be seldom actually lived in. A lack of economic diversity and resilience therefore threatens sustainable community development in Arran, and without support will continue to exclude young working people with a low asset base: tourism risks creating low-security employment and driving out activities that could improve year-round use of social and physical assets (schools, medical care, accommodation).

The Arran Economic Group (AEG) summarised this succinctly in their 2017 Annual Report, pinpointing housing and depopulation as key concerns:

*“[Arran] has strong levels of economic growth and a high quality of life, and we have added and are adding significant public and private infrastructure which will help secure sustainable growth. However, our primary challenge is rapid population decline. This will not change until we translate house building plans into actions. The Arran Development Trust will have this as its primary focus for 2018.”<sup>14</sup>*

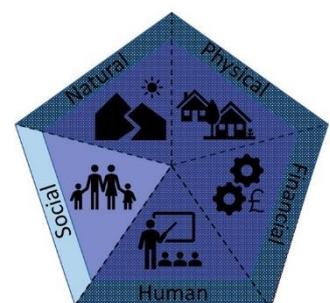
Another component of this, however, is the fact that the main driver on the housing crisis is the nature of jobs created by an increasingly concentrated, one-sector tourism economy. The fundamentals of this position are that a) the tourism sector is pitched around exploiting Arran’s natural capital in a way that does not rapidly deplete it, b) the population involved in tourism will have significant interest in preserving Arran’s natural state and therefore the economic status quo, and c) an ageing, retiree population will also have less and less need for good quality jobs (though they will need a range of key worker services such as healthcare and transport).

<sup>14</sup> P.5, [http://www.arrancommunitycouncil.org.uk/files/AEG\\_Annual\\_Report\\_2017.pdf](http://www.arrancommunitycouncil.org.uk/files/AEG_Annual_Report_2017.pdf)

*“Our primary challenge [in Arran] is rapid population decline. This will not change until we translate house building plans into actions.”*

(Arran Economic Group)

Opportunities and incomes will accrue to areas in North Ayrshire ranked among the **15% most socially disadvantaged in Scotland**





This was quite clearly observed during consultation. Many older residents remarked how they saw no benefits at all from the development, especially considering Arran wasn't in need of new jobs. To encapsulate this point, one resident went so far as to say: "We don't need the jobs; they can do something else."

Arran's society is very seasonal, with a large influx of visitors (to the extent that population overall is significantly affected) in the summer months, creating a demand for temporary workers in tourism related and hospitality sectors. This seasonality has become more pronounced following the introduction of the Road Equivalent Tariff (RET). It is thought, however, that were sufficient ferry services made available in the winter months, this seasonality could be tempered, and a more consistent flow of visitors would become the norm. Nevertheless, this kind of population and social volatility can be damaging to social cohesion and can greatly affect community constructs.

Arran is one of the least deprived areas on the Scottish Index of Multiple Deprivation (SIMD). The Scottish Index of Multiple Deprivation (SIMD) identifies small area concentrations of multiple deprivation across all of Scotland in a consistent way and ranks these areas (called data zones) from most deprived (ranked 1) to least deprived (ranked 6,976). The SIMD is made up of information on income, employment, health, education, housing, access to services, and crime levels. Nevertheless, island economies can be very fragile and based on a narrower set of industries than other places – and are vulnerable to funding and / or market changes.

**Table 5: Demographic breakdown of Arran, by SIMD datazones**

SIMD Data Zone, Incl. town of:	Total Population	Of which working age	Of which income deprived	Of which employment deprived
Lamlash (including the Corriegills)	1104	612	75	50
Brodick	859	454	60	30
Whiting Bay	620	314	40	10
North Arran (including Lochranza)	420	202	45	15
West Arran (including Machrie)	832	451	60	25
South Arran (including Lagg)	754	422	55	30
<b>Total</b>	<b>4589</b>	<b>2455</b>	<b>335</b>	<b>160</b>
<b>% of Total</b>		<b>53.5%</b>	<b>7.3%</b>	<b>3.5%</b>
Source: <a href="http://www.gov.scot/Topics/Statistics/SIMD">http://www.gov.scot/Topics/Statistics/SIMD</a>				



### 3.2. NORTH ARRAN PROPOSED DEVELOPMENT

The North Arran development could bring new working age people to the island (10 posts would be created though they may not be recruited from the island), and often this brings demand for school and other family services. While this might be welcome, it does not address the challenges of filling key worker posts for which it may increase demand unless it includes mitigating or support initiatives.

Beyond Arran, many areas in the North Ayrshire region fall statistically amongst the most socially disadvantaged areas in Scotland. Kilbirnie, where there is likely to be a modest financial and employment benefit should the North Arran development go ahead, is one such area, in the top 15% least well-off areas nationally as measured by the SIMD indicators.<sup>15</sup>

The operations of W&J Knox in Kilbirnie, who supply and service fish farm nets, build on over 250 years of experience in textiles in the town. Retention of staff is very high, and most people walk to work (i.e. it is a key local employer in the town). Servicing the North Arran site could create a further job in Kilbirnie and around £100,000 in annual revenue.

Similarly, areas such as Larkhall, where almost all the distribution of SSC salmon takes place, is heavily represented by top 10% most socially disadvantaged areas nationally as measured by the SIMD.<sup>16</sup>

Other areas such as Grangemouth, Fort William and Inverness, where there would likely be economic impacts through the supply chain and CAPEX spending, have areas in the top two deciles in the SIMD (i.e. some of the most disadvantaged areas). Should the development go ahead, there would be increased scope for social benefit in these areas.

Comments from consultation on Arran highlighted perceived broader cultural impacts of the development.

- **Historical relevance:** One person referred to the historic farm buildings that mark the Highland Clearances and that it would be disrespectful to put a fish farm operation in such a location.
- **Water use:** Concern was expressed about water quality for water users, though the distance between farm and shoreline should allow this to be mitigated. One comment about kayakers having a look at the farms could suggest positive potential for tourism and education initiatives.
- **Distance from human habitation:** The remoteness is perceived as a disadvantage since it is an area not currently impacted by human activity. There were concerns expressed about walkers seeing it – but it is not accessible during a 30 minute walk, it would require a round trip of some hours, and likely to not be used all the way along except rarely. It is unlikely that viewing a fish farm for a short period of the walk would deter visitors, though one resident objected to fish farming on principle and would find the presence of one nearby as negative in itself.
- **Arran's society seeing itself as an eco-friendly and progressive island.** It is clear that many residents have decided to live on Arran as an environmentally progressive place. This is important for SSC to consider when seeking to develop the North Arran site, since they are promoting the technology and delivery model as a way of addressing many of the environmental concerns about the industry outlined in the recent Parliamentary Inquiry<sup>17</sup>. Should the development go ahead, it is important to demonstrate to those who may prioritise environmental concerns that the site is a blueprint for the Best in Class and most effective stewardship of fish and the environment. This may be some consolation to those who currently view fish farming negatively.

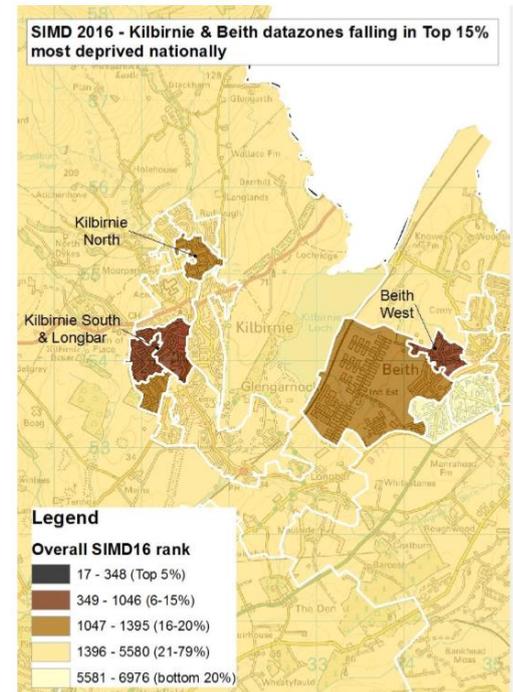


Figure 10: Social Index of Multiple Deprivation, Kilbirnie (2016)

<sup>15</sup> <http://www.northayrshire.community/wp-content/uploads/sites/60/2016/05/SIMD16-Presentation-CPP-Seminar-2016-12-07.pdf>

<sup>16</sup> <http://simd.scot/2016/#/simd2016/BTTTTT/14/-3.9613/55.7300/>

<sup>17</sup> <https://www.parliament.scot/parliamentarybusiness/CurrentCommittees/107588.aspx>



### 3.3. POTENTIAL FOR MITIGATION AND SOCIAL CAPITAL ENHANCEMENT

Options for Social Capital Improvement through the SSC development – SSC should consider the following social capital enhancing measures:

- 1) Support key workers as well as staff on the island.** New employment opportunities through farm jobs and the supply chain will not address some of Arran's social capital requirements alone – they may simply increase demand for key workers. Help the housing crisis for working age populations.
- 2) Work with local bodies to capture increased demand for services.** These will range from social and health care, to schooling, to training needs. These will help make the case for improved housing and social investment.
- 3) Enhance and upgrade the experience for coastal users.** Identify any negative effects on water or coastal users and find ways to improve their experiences (for example, upgrading access to the area or supporting events that open up access). The fish farm could be a visitor attraction focusing on its Best in Class objectives.
- 4) Support the case for increased year-round ferry services.** This is likely to be possible by demonstrating the increased commercial demand for Arran Haulage and other services. This will at least increase the utilisation of current housing stock through the winter months even if it is not fully solved.
- 5) Demonstrate to communities that the site is a beacon for the highest industry standards.** SSC note the regulatory standards and compliance frameworks the industry adheres to (and which are being strengthened in the near future); and what SSC is doing to develop the most effective management models. Efforts to demonstrate these steps could improve relations with nearby communities (and lobbying groups).

It is believed that in context of Arran's balance of livelihood assets, the North Arran development could have significant positive impacts on social capital. Even if not in the short-run, the medium to long-run prospects of the 10 direct farming jobs being filled on Arran are reasonable, if supported to overcome capacity constraints on the island. The social impact of even 10 new young workers (potentially joined by family) on Arran could have positive social effects (i.e. relieving pressure on schools by contributing students, etc).

In the short term, the housing sector still acts as a blocker to this being realised. Any intervention to unlock this preferable and more virtuous economic cycle, should be explored by SSC. The development would help diversify the economy, but people need to be on Arran to help these social capital benefits being realised on Arran. Providing affordable housing may be key to this.

Further, the social capital benefits of drawing these jobs from elsewhere in North Ayrshire – especially in towns like Ardrossan where social issues are significantly more pronounced – would likely be significant, and potentially even more so than if they were situated on Arran. This is important to capture, since there may be a tendency to value the degree to which these jobs land on Arran, when they could benefit other communities too.



## 4. NATURAL CAPITAL

Figure 11: North Sannox Burn, off the North Sannox Bridge



### 4.1. OVERVIEW

Arran’s ‘Natural Capital’ (or natural environment) now drives most activity in Arran (eco-tourism, sport tourism, heritage tourism, forestry, aquaculture, hospitality, crofting and sheep farming, etc.). Arran’s residents are keen to protect the natural capital from anything that they believe may damage or deplete it unsustainably.

It is the definition of sustainability that often seems to be a barrier to finding common ground, as by being in opposition to any development that has any level of impact on the Natural Capital on Arran may limit developments that have welfare-improving social, economic or infrastructural benefits in Arran and across North Ayrshire and Scotland. Equally, aquaculture is increasingly recognised as a critical pillar for sustainable food production globally.

### 4.2. NORTH ARRAN PROPOSED DEVELOPMENT

The standard considerations for impacts on Natural Capital are covered by statutory requirements through the Scoping Statement and Environmental Impact Assessment: these include modelling of benthic impacts, wild fish interactions and visual impacts.

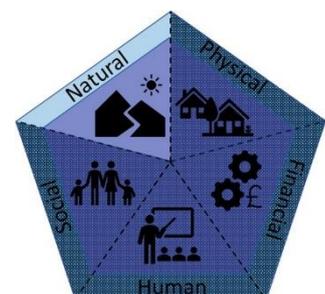
The response to the submitted scoping document highlights some areas requiring further elaboration, but from the perspective of social and economic impacts there do not appear to be any significant or disproportionate risks. The site is in the Firth of Clyde which has been used extensively for a variety of uses including industrial and energy sites. This history suggests that even relatively remote or beautiful areas need to be contextualised within a working water body. It is very unlikely that there are any significant economic or social issues arising from the visual appearance of the site.

Concerns have been raised in consultation about the use of the use of the coast on open-water swimmers (one-off), kayakers (sporadic) and coastal walkers (more regular). Since the remoteness makes such interactions likely to be quite low in magnitude, and fleeting given the short time users would be passing the site, it is not considered likely that there would be a significant negative impact on the value to those users, and indeed there may be an opportunity to enhance access to this area.

*“The site’s contribution to low carbon food production and tolerable impacts through innovative management could provide a net gain in global natural capital”*

(Authors’ findings)

Salmon farming has a **lower carbon footprint** (tCO<sub>2</sub>e per ton of edible product) **than most meat production**





Public consultation reflected a *general* and non-site-specific concern about environmental impacts – while it may be argued that these are not relevant, they are relevant in that they may lead to potential objections to planning approval, and long-term acceptance of the site.

During consultation, statements like “*I don’t care about the economic impacts, I only care about the environmental ones*” were fairly common, and, when viewed through the lens of the SLA, are somewhat typical of a community prioritising one asset stock over another, and finding themselves in a losing livelihood strategy with negative livelihood outcomes.

In other words, focussing so heavily on preserving one capital stock (natural capital) has caused significant depreciation to the other capital stocks (economic capital, and in turn physical and human capital, and in turn social capital). There is a contradiction at play as both parties are presenting arguments to protect the natural capital at and around North Arran: on the one hand this means “completely preserve the asset”, and on the other hand this means “sustainably farm the asset”. On the basis of potential to overcome challenges and comply with requirements, such a positive strategy can be pursued for mutual benefit:

‘All marine salmon producers will continue to follow the code of good practice for Scottish fin-fish aquaculture, which includes points of compliance on sea lice and national treatment standards. Adherence to the code, alongside voluntary monitoring and early intervention by salmon producers, as well as investment in new technologies, has resulted in 2018 having the lowest annual average reported sea lice levels since records started to be made available, which was back in 2013.’<sup>18</sup>

Salmon farming has a lower carbon footprint (tCO2e per ton of edible product) than most meat production:



Salmonids: includes farmed salmon and trout.

Figure 12: Comparative Carbon Footprint of Salmon Farming<sup>19</sup>

This is relevant to highlight because the demand for protein is growing rapidly globally<sup>20</sup>, and while vegetable proteins would often (not always) have the lowest carbon footprint, meat production is likely to be subject to much stronger social and regulatory requirements in future.

In respect of the economic or social impacts of wild fish interactions, two arguments are can be considered here: 1) whether wild fish populations are affected, and what economic impact this might have on recreational fishing, and 2) whether this has an impact on the consumption of wild fish which has economic value.

In respect to the first issue, it remains contested as to the degree of impact, but wild fish conservation efforts in Arran could be supported if such assistance is welcomed by those involved. A recent statement on Sustainable Aquaculture by Fergus Ewing reports that ‘[t]he reasons for the declines are multifactorial. We have identified 12 major groups of pressures that are

<sup>18</sup> Fergus Ewing, Statement on Sustainable Aquaculture (2019), <http://www.parliament.scot/parliamentarybusiness/report.aspx?r=12164>

<sup>19</sup> <https://globalsalmoninitiative.org/en/sustainability-report/protein-production-facts/#carbon-footprint>. Carbon footprint is measured in tons of carbon dioxide equivalent (tCO2e) per ton edible protein of the product.

<sup>20</sup> [https://www.who.int/nutrition/topics/3\\_foodconsumption/en/index4.html](https://www.who.int/nutrition/topics/3_foodconsumption/en/index4.html)



impacting on wild salmon stocks, and we recognise that aquaculture is one of the pressures. Sea lice are, of course, ubiquitous in the marine environment and have the potential to impact on wild and farmed fish. That is why we established a salmon interactions working group, which is making good progress in collating recommendations for a future approach to managing farmed and wild fish interactions.<sup>21</sup>

On the second, it is arguably better to favour significantly improved low carbon meat production through fish farming than limiting access to such fish when wild fish stocks are very limited. The quantity of wild fish that goes into salmonid feed is a relevant consideration, but efforts to substitute this for other protein sources (a lower cost option, and welcomed by the industry), or indeed using such wild fish for human consumption (less realistic), would counteract some of these concerns.

Salmon mortality rates and animal welfare were raised by local residents as concerns. While this may appear to be beyond the scope for the natural capital assessment of this site, they are relevant and could have a material effect on the social license to operate. There are a number of factors involved in these topics, including the comparison of mortality rates and welfare in other animal husbandry and wild fishing – a useful discussion published by the Farm Animal Welfare Committee (FAWC) can be found online<sup>22</sup>, and it is the conclusion of the authors that the Scottish industry have taken these considerations seriously and must deliver the objectives of the Farmed Fish Health Framework and industry code of good practice.<sup>23</sup>

Further, it is understood that new plans for a statutory regulation approach, providing tighter sea lice regulation, and a new regulatory framework under SEPA.<sup>24</sup> These are welcomed in order to ensure that impacts on natural capital are demonstrably managed.

#### 4.3. POTENTIAL FOR MITIGATION AND NATURAL CAPITAL ENHANCEMENT

- 1) Mitigate and where possible enhance experiences for other users.** There are options for enhancement of and access to the natural environment. Where there are concerns about using the coastline, these should be mitigated or addressed (i.e. they do not appear significant barriers but should nevertheless be addressed).
- 2) Point out the environmental benefits of salmon production.** The global demand for, and attitude to, food is changing and sustainable animal protein is a critical issue. While there are valid concerns about comparing different food systems, fish farming is seen as central to sustainable food production and this macro perspective should be brought to policy discussions.
- 3) Demonstrate commitment to, and enhance, Arran's environmentally responsible credentials.** This could be done by being as transparent with stakeholders so they may understand fish farming operations and the standards, compliance and monitoring that the site must adhere to. Additionally, highlighting the new SEPA sector plan to ensure that growth is delivered sustainably.<sup>25</sup> Specifically regarding the North Arran site, if it is intended to be Best in Class, as proposed through the SeaSure model, this should be promoted (as it has been in public consultation). Should this be achieved it may give some comfort to those who prioritise environmental concerns in that they are setting a benchmark to be emulated through the industry – however, most stakeholders would likely need a high degree of evidence and communication of data to be shared.

<sup>21</sup>Fergus Ewing, Statement on Sustainable Aquaculture (2019), <http://www.parliament.scot/parliamentarybusiness/report.aspx?r=12164>

<sup>22</sup>FAWC, Opinion on the Welfare of Farmed Fish, (February 2014), Available online at: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/319323/Opinion\\_on\\_the\\_welfare\\_of\\_farmed\\_fish.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/319323/Opinion_on_the_welfare_of_farmed_fish.pdf)

<sup>23</sup> <https://www2.gov.scot/Topics/marine/Fish-Shellfish/Strategic-Framework>

<sup>24</sup> <https://www.undercurrentnews.com/2019/06/06/scottish-govt-sepa-introduce-tougher-lice-regulations-for-farmers-in-2020/>

<sup>25</sup> <https://www.sepa.org.uk/regulations/water/aquaculture/>



## 5. PHYSICAL CAPITAL

Figure 13: Lochranza Arran Ferry Terminal, looking towards Lochranza Castle and coastal houses



### 5.1. OVERVIEW

While it the natural capital of Arran that is the key driver of its tourism opportunity, the outcomes of this for the island’s economy (and the surrounding council regions) are in turn strongly determined by Arran’s physical capital, and crucially its housing stock. Further, access to Arran is limited largely to ferry services. Ferry infrastructure and regularity of services are crucial to the island’s economy, and not least in the ability for it to supply a workforce from the mainland. The AEG also highlight digital connectivity as a key pillar of the island’s social and economic development.

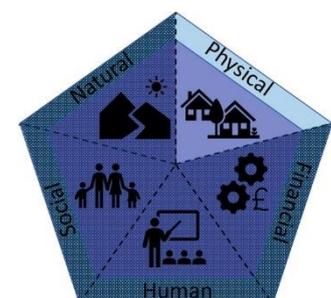
In 2017, the median house price on Arran, at £195,000, was more than double the median house price in North Ayrshire overall (£90,000)<sup>26</sup>. Affordability of housing, however, is captured through a ratio between median house price and median gross household income. Arran’s housing affordability ratio is around double that of North Ayrshire’s overall – 3.70 and 6.24 respectively. This indicates that median incomes on Arran have remained stagnant alongside the rising house prices: houses are both doubly expensive and doubly unaffordable for workers on Arran vs. workers in the rest of North Ayrshire.

Some houses are now listed on Airbnb<sup>27</sup> and other short-term rental platforms for significant portions of the year, and only occasionally lived in by the owners. Despite this, however, occupancy levels are low and many are not lived in, particularly through the winter time when the tourism season has ended, though this is improving as the RET and changing tourism trends extend the season.

*“The SSC site could support Arran’s objectives to improve capacity of both housing and ferry services”*

(Authors’ findings)

**22% of houses on Arran are now owned as second homes, and 59 homes on the island are vacant – despite being fully owned**



<sup>26</sup> North Ayrshire Community Planning Partnership, September 2017, Locality Profile: Arran, accessed at: [http://d1xcj1909sd1jp.cloudfront.net/wp-content/uploads/sites/60/2018/02/Locality-Profile\\_Arran\\_Final\\_Version\\_Sept2017.pdf](http://d1xcj1909sd1jp.cloudfront.net/wp-content/uploads/sites/60/2018/02/Locality-Profile_Arran_Final_Version_Sept2017.pdf)

<sup>27</sup> At the time of writing (May 2019), 147 homes on Arran were listed on Airbnb.



Nevertheless, the AEG estimate that almost 1 in 4 houses on Arran (22%) are now owned as second homes, and 59 homes on the island – despite being fully owned – are not lived in at all<sup>28</sup>.

It is usually observed that higher median house prices dictate higher median salaries (and vice versa), in effect holding the housing affordability constant through periods of economic growth and contraction. Between 2017 and 2018, for example, an average increase across all Scottish cities in house prices of 3.7% translated to an increase in average earnings of 3.3% - this has kept the housing affordability ratio fairly constant, at 5.36 and 5.38<sup>29</sup>. On Arran, despite house prices continuing to rise, average earnings remain stagnant.

Again, this is likely attributable to the types and nature of jobs generated by the tourism sector, and demand for accommodation by the tourism sector.

To some extent, the housing issue is not necessarily one of over or under supply, but more likely one of fairly strong allocation in favour of use by visitors. Combined with limited house building (indeed, there appear to be shortages of trades and this could be a barrier to development in itself), this has a distortionary effect on other sectors of the economy. Market forces on Arran currently incentivise high-end property and accommodation over the kind of housing needed to attract people of working age to the island.

### Challenge:

The lack of affordable housing is restricting current and will restrict future economic growth on Arran and is a fundamental causal effect of a reducing working age population. This is not new; the Craigforth Study identified the need for 105 to 185 affordable homes in 2007. Between 2007 and 2011, only 30 affordable homes were built. The 2011 census saw a 16% decline in working age population during a period of economic growth. The supply of affordable homes is the major unfunded infrastructure improvement which could significantly reduce economic development and community viability and is now being addressed as a matter of urgency.

A 2016 Housing Study to identify housing requirements based on economic need was commissioned by the AEG, completed and presented in October 2016. The Study was asked to provide analysis of the problem and recommend solutions. The findings from the study, subsequent enabling responses and solutions are highlighted below:

- A chronic lack of affordable housing is impacting and will continue to impact on Arran's ability to sustain or grow its current level of economic and social activity. The AEG commissioned four feasibility studies on sites suitable for the construction of affordable homes; two sites in Brodick and two sites in Lamlash. Combined, these sites could provide up to 191 affordable 2 and 3 bed units including self-build plots.
- There is a requirement for 200 affordable homes now. [...]
- 22% of homes on Arran are second homes and a further 59 empty homes have been identified. Based on the Study findings, workers required to sustain, grow services and the economy are priced out of the Arran housing market. This impacts all sectors but specifically problematic are the Health & Social Care, Education and Tourism sectors.<sup>30</sup>

[...] 'Engagement to encourage the 59 Empty Homes owners identified to bring vacant properties back into use as Affordable Homes, utilising financial incentives available through North Ayrshire Council Empty Homes Fund. The AEG have engaged with the community on several occasions to identify specific properties and are now working with NAC Housing Department on the potential of introducing a "buy-back" scheme allowing the AEG/ADT to purchase, renovate and bring back into use some of these properties for affordable rent or future sale for Island Workers.'<sup>31</sup>

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<sup>28</sup> Arran Economic Group Annual Report 2017:

[http://www.arrancommunitycouncil.org.uk/files/AEG\\_Annual\\_Report\\_2017.pdf](http://www.arrancommunitycouncil.org.uk/files/AEG_Annual_Report_2017.pdf)

<sup>29</sup> Bank Of Scotland, February 2019, Scotland's most and least affordable cities revealed, accessed at: <https://www.lloydsbankinggroup.com/globalassets/documents/media/press-releases/bank-of-scotland/2018/bank-of-scotland-affordable-cities-2019-final.pdf>

<sup>30</sup> P. 15, AEG

<sup>31</sup> P. 16, AEG



## Ferries

The RET has significantly reduced the costs of travelling between Arran and the mainland (by around 50% overall), with the effects felt most significantly on the more remote and previously unfrequented parts of the island, with tens of thousands of vehicles accompanying tourists on trips to the island every year.

Transport Scotland note that:

*“The step-change in demand for the Arran ferry services has [...] given rise to growing capacity issues on the Ardrossan – Brodick route. The operator carryings data highlights emerging capacity issues on this route, with a quarter of all sailings in 2015-16 being defined having a car deck utilisation greater than 80%). There are particular concentrations of peak sailings around the weekend and in the high summer months. The emerging capacity issues were also highlighted in the surveys, with a significant proportion of island residents and visitors reporting occasions when they could not secure a vehicle booking on the ferry. Businesses also expressed concerns that capacity issues could, if not addressed, stymie the positive impacts of RET.”*

The benefits of the RET are felt in more remote areas of the island (like the West Coast) because increased vehicle access improves visitor mobility around the island.

## 5.2. NORTH ARRAN SITE DEVELOPMENT

For the reasons above, the relevance of the housing stock on the potential benefits of any new jobs that the SSC site brings to the island is very strong. If new jobs are taken up by people seeking to live on Arran (this is not necessarily the case) then all things being equal there will be a compounding of the challenge of limited housing stock for workers.

The increase in demand for year-round ferry services is likely to be modest (many bulky items might be delivered by sea, which would create demand for boat and harbour infrastructure elsewhere, though this may be welcome in itself). However, increased demand for e.g. Arran Haulage or similar transport during construction and operations could support the commercial case for improving winter ferry services.

There are likely to be improvements in physical infrastructure in more remote areas of the supply chain. It is likely that the North Arran contract could help catalyse the construction of new slipway infrastructure in Fort William / Corpach. There would likely be negligible impact in Kilbirnie other than supporting the infrastructure at Knox, though they are also seeking to upgrade their recycling facilities.

There is likely to be little impact on digital connectivity or other infrastructure, however it would likely be in SSC's interests to ensure they are adequate.

## 5.3. POTENTIAL FOR MITIGATION AND PHYSICAL CAPITAL ENHANCEMENT

SSC should consider the following measures:

- 1) As a matter of priority, support efforts for worker housing in Arran.** This should be done regardless of how many workers are located on the island, and be seen as a 'good neighbour' policy as well as a practical measure. This could take the form of soft loans (likely to be most consistent with financing housing), grants, or even through a mechanism related to North Arran volumes (though if this fluctuated in returns it would expose the housing income to risk that may be inappropriate). Key workers need support for housing on Arran – ideally, this site could help stimulate worker housing for staff but over and above that contribute to the island's key workers. The most likely solution would be to work with the Arran Development Trust to identify the most appropriate mechanism since they are tackling this issue – being considered are new homes and purchasing existing underutilised stock.
- 2) Support the case for better winter ferry services.** This should help SSC's logistics but more importantly better utilise the existing housing stock which remains seasonal.
- 3) Support the case for upgrading roads and digital connectivity.** These are not likely to be priorities but will be in the interests of SSC operations.



- 4) **Relating to the use of the coastline, consider information boards and improved pathways.** There is likely to be scope for enhancing the coastal pathway, provide information boards, and even consider supporting access to the nearby historic site. Presumably these would be suitable interventions and need not be excessively costly.



## 6. HUMAN CAPITAL

Figure 14: W&J Knox, Kilburnie, where a large workforce repairs aquaculture nets



### 6.1. OVERVIEW

Arran’s population has been gradually falling and ageing with time. Since the last census in 2011, Arran’s total population has decreased by around 2.7%. This decrease is characterised by the decline in younger residents. For example, over this period, while the population of residents under 18 years of age has fallen by 10%, the number of residents over 65 years of age has actually increased by 4%<sup>32</sup>. This means that statistically speaking, the population is ageing at an even faster rate than it is declining. This has had (and will have an increasingly) negative impact on the island’s Human Capital stock.

The constraints in the housing market have meant a reduction in the number of people (and their families) moving to Arran to live and work, which has lowered the number of people on the island that may be looking to take up full or part time work. This constraint on human capital is a key issue and is relevant in determining the degree to which extra demand for workers (either through direct employment or through additional demand in the supply chain) will benefit the local area.

Between 2006 and 2011, the Arran Economic Group (AEG) note that despite going through a period of economic growth, the working age population declined by 15% - which they conclude is again associated to the lack of affordable housing on the Island (only 30 affordable homes were built over this 5 year period)<sup>33</sup>.

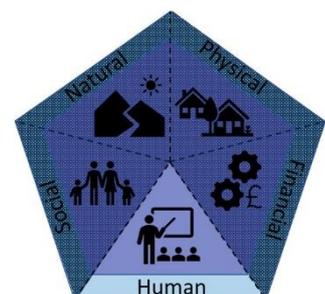
The “dependency ratio” – which measures the ratio of non-economically active residents of an area to economically active residents – provides a useful measure of the local economic capacity of an area.

*“Despite going through a period of economic growth (between 2006 and 2011), the working age population declined by 15%”*

(Arran Economic Group)

Arran Workboats employ **4 engineers under the age of 30**, including ‘returnees’ from Glasgow and Edinburgh

(Consultation finding)



<sup>32</sup> North Ayrshire Community Planning Partnership, September 2017, Locality Profile: Arran, accessed at: [http://d1xcj1909sd1jp.cloudfront.net/wp-content/uploads/sites/60/2018/02/Locality-Profile\\_Arran\\_Final\\_Version\\_Sept2017.pdf](http://d1xcj1909sd1jp.cloudfront.net/wp-content/uploads/sites/60/2018/02/Locality-Profile_Arran_Final_Version_Sept2017.pdf)

<sup>33</sup> Arran Economic Group Annual Report 2017: [http://www.arrancommunitycouncil.org.uk/files/AEG\\_Annual\\_Report\\_2017.pdf](http://www.arrancommunitycouncil.org.uk/files/AEG_Annual_Report_2017.pdf)



Arran's dependency ratio of 0.81 is the highest of any locality in North Ayrshire, and over 30% higher than the North Ayrshire average<sup>34</sup>. 2014 National Records of Scotland (NRS) population projections predict that if current demographic trends continue, Arran's dependency ratio will rise to 0.96 by 2026. An increasing dependency ratio suggests that a) a declining proportion of the population is engaged in paid work, and in turn fewer people are actively creating new financial value for the local economy, and b) that there is upward pressure on taxation, as fewer people and businesses contribute tax money to the fiscus, and simultaneously, there is greater pressure to fund health, education and pensions<sup>35</sup>. An increasing dependency ratio is not necessarily unique to Arran in the UK context, but the rate at which this is increasing should be a serious cause for concern – and is a clear sign of a losing livelihood strategy within an SLA context.

In this context, retaining and attracting working age individuals and families should be considered a priority on Arran, as the cost of not doing so could have serious negative implications for Arran's Human Capital, its Social Capital, and ultimately its Financial Capital as the costs of doing business (even tourism business) in Arran become increasingly expensive.

There is an opportunity for the site to support high quality jobs in engineering and manufacturing. Arran Workboats employ 4 engineers under the age of 30, including 'returnees' from Glasgow and Edinburgh.

Figure 15: Arran Workboat employees alongside a new SSC workboat



Consultees pointed out that the attraction of these jobs is the opportunity to have careers in rural areas as well as simply salaries. Nevertheless, the salaries were considered valuable in being able to compete in the housing market, though affording a house was still the significant challenge young workers faced on Arran.

<sup>34</sup> North Ayrshire Community Planning Partnership, September 2017, Locality Profile: Arran, accessed at:

[http://d1xcj1909sd1jp.cloudfront.net/wp-content/uploads/sites/60/2018/02/Locality-Profile\\_Arran\\_Final\\_Version\\_Sept2017.pdf](http://d1xcj1909sd1jp.cloudfront.net/wp-content/uploads/sites/60/2018/02/Locality-Profile_Arran_Final_Version_Sept2017.pdf)

<sup>35</sup> North Ayrshire Community Planning Partnership, September 2017, Locality Profile: Arran, accessed at:

[http://d1xcj1909sd1jp.cloudfront.net/wp-content/uploads/sites/60/2018/02/Locality-Profile\\_Arran\\_Final\\_Version\\_Sept2017.pdf](http://d1xcj1909sd1jp.cloudfront.net/wp-content/uploads/sites/60/2018/02/Locality-Profile_Arran_Final_Version_Sept2017.pdf)



## 6.2. NORTH ARRAN PROPOSED DEVELOPMENT

The SSC proposed site would not automatically need to be sourced from the existing Arran workforce, though it may be advantageous for some employees who seek a year-round job and potentially a career outside tourism. Should workers be employed from the wider Clyde area, there could be strong advantages for towns like Ardrossan in accessing such jobs. However, it is not clear whether they would be at an advantage in gaining those jobs by being near the ferry terminal, i.e. if the farm jobs are delivered in shifts then in theory they could be competing with a large geographic area.

The supply of engineering skills on Arran seems to be limited compared to demand – this is likely to be due to the same constraints on housing and affordability outlined elsewhere in this report. However, engineering and equipment manufacturers such as Kiscadale Engineering / Arran Workboats demonstrate that there is potential to diversify into manufacturing and engineering services subject to such constraints.

## 6.3. POTENTIAL FOR MITIGATION AND HUMAN CAPITAL ENHANCEMENT

- **Training and careers:** In the event of more engineering and aquaculture demand on Arran, it would be invaluable for SSC to explore how the Arran workforce could be supported in training, possibly through collaboration with UHI Arran.
- **Housing:** as per other areas in this report, the key to improving human capital development is in attracting people to live in Arran, which depends on housing.
- **Other areas beyond Arran:** decision-making should take note of the skills and quality jobs opportunities beyond the island, because as a national picture the human capital benefits can be significant, even in North Ayrshire (Kilbirnie).



## 7. SLA FINDINGS

The SLA has set out the relevant economic and social drivers on Arran and across the Scottish supply chain. For example:

- **Tourism:** The sector is seen as a boon for the economy that should be protected at all costs, but it has also introduced negative social and economic drivers that require mitigation and diversification for a sustainable island economy on Arran
- **Housing:** House prices are going up, and population is going down. There is clear aspiration to attract people and businesses to Arran, however, the housing supply and current utilisation are inappropriate to achieve this.
- **Job Creation:** Consultation set out reasons why job creation is not a priority in Arran – in fact it is the availability of workers that is the problem, as the tourism sector is creating many jobs that remain unfilled. However, job quality, seasonality and pay are likely to be relevant factors: the tourism sector is largely seasonal, part-time and low paid – with many people taking on two to three jobs. It is difficult to both work in the tourism sector and afford to live on Arran permanently. There is an apparent scarcity in jobs where people can easily afford to live on the island and raise a family – jobs (direct and indirect) in the aquaculture sector through the site should support these objectives.
- **Social impact of housing:** Tourism has greatly affected the housing market with around 1 in 4 houses on Arran owned as second homes (some of which owned by residents, some of which owned by non-residents). Tourism is viewed positively in Arran but the pressures it places on the economy require strong mitigation measures.
- **Key workers and demographics:** All of these factors are working against young, working people and their families and preventing other working people from moving to Arran, including key workers. This in turn means that fewer people are available for full-time work on Arran: already teaching, nursing, etc. posts are cited as vacant.
- **Primacy of natural capital:** Natural capital provides the foundation for almost all economic activity in Arran in some way – whether directly or indirectly. The more a population and economy is geared towards retirement and tourism, the less important high-quality and full-time opportunities (i.e. those needed by younger working families) become.
- **Travel to Work:** All of these factors push the economy towards a Travel-to-Work model, where employment opportunities are flexible, part-time and seasonal. Financial capital enters Arran via tourists and people moving to Arran for retirement, whilst salaries and human capital investments create economic value outside of Arran.
- **Social change:** Arran runs the risk of perpetuating a growth path which is difficult to change, with cyclical depreciating effects on social, human, physical and financial capital. The AEG are clearly setting out to mitigate negative social effects. It is unclear whether or not protecting and growing Arran's natural capital is an appropriate trade-off for Arran and its people, but from an SLA perspective, this will greatly distort the islands asset base

The development, while not enough to change this dynamic permanently, will be expected to act as a counter-cyclical force to this, and would be seen as a positive first step towards:

- **Economic Diversification** – building demand and GVA created by non-tourism sectors
- **Resilience** to exogenous shocks (e.g. currency fluctuation associated with Brexit) to tourism industry
- **Year-round jobs:** Creation of employment and career opportunities that are non-seasonal and full-time.
- **Support island capacity:** Increase drivers to support new permanent dwellings, and associated services and consumption

There are benefits and costs to sustainable livelihood 'capitals' associated with the development. The magnitude of the benefits will comfortably outweigh the magnitude of the costs.

- **Without implementing any mitigation measures or recommendations:** the overall impact of the site on Sustainable Livelihoods is net positive, taking into account concerns of residents and mildly negative impacts; and despite the uncertainty around where farm employees are based as a result of housing issues.
- **With mitigation measures:** the overall impact of the site on Sustainable Livelihoods may be strongly positive by mitigating negative impacts and existing economic blockers, and enabling Arran and other Scottish regions to meet their strategic objectives.



## 8. OPTIONS FOR ONGOING CAPITAL ENHANCEMENT AND MITIGATION

Below is a summary of the relevant economic and social drivers in Arran and across Scotland which are relevant to the site. Where necessary, options to improve impact or mitigate risks are given.

Dimension	Drivers of Impact	Enhancement and Mitigation Options
<p><b>Social</b></p> 	<ul style="list-style-type: none"> <li>- One-sector (tourism) economy has affected house prices and depopulation</li> <li>- House price competition means job creation is less of a concern</li> <li>- Arran populace has a cultural and social outlook that values the island's natural capital</li> <li>- Other areas in the supply chain (Kilbirnie, Highlands, Lanarkshire) face pockets of deprivation</li> </ul>	<ul style="list-style-type: none"> <li>- Provide employment (direct, supply chain) opportunities that are competitive to afford housing</li> <li>- Support housing initiatives</li> <li>- Support a natural capital agenda that promotes best practice in aquaculture and is consistent with Arran's tourism and outlook</li> <li>- Include impacts across Scotland in determining impacts of Arran development</li> </ul>
<p><b>Physical</b></p> 	<ul style="list-style-type: none"> <li>- Housing stock is limited, or at best allocated in favour of tourism</li> <li>- Ferry services are the lifeblood of Arran but are more limited in winter. SSC activities likely to be modest but can make the case for year round services</li> <li>- Little other impact envisaged – though improvements in the coastal path could provide a positive impact</li> </ul>	<ul style="list-style-type: none"> <li>- Commit to supporting housing initiatives for SSC workforce and for improving access to housing for key workers</li> <li>- Support year round ferry services, through increased commercial and social demand for services in winter</li> <li>- Consider tourism-improving measures such as investing in the coastal path, signage, etc.</li> </ul>
<p><b>Financial</b></p> 	<ul style="list-style-type: none"> <li>- Arran is a relatively high income area</li> <li>- Arguably increased salaries helps access housing but does not solve the housing constraint</li> <li>- Financial benefit not the key priority for Arran</li> <li>- Financial benefit to other areas (Kilbirnie, Highlands, Lanarkshire) potentially significant</li> </ul>	<ul style="list-style-type: none"> <li>- Focus on wider financial benefit but not solely on what is likely to 'land in Arran'</li> <li>- Use SSC's financial capacity to support housing initiatives to 'make the case' for development as a good neighbour policy</li> </ul>
<p><b>Natural</b></p> 	<ul style="list-style-type: none"> <li>- Natural capital defines Arran's economy and local approaches to new development</li> <li>- Concerns about negative impacts on natural capital are a blocker, including visual impact</li> </ul>	<ul style="list-style-type: none"> <li>- Consider positive measures to raise awareness of salmon farming's carbon footprint and sustainable food production</li> <li>- Support other natural capital-enhancing initiatives</li> </ul>
<p><b>Human</b></p> 	<ul style="list-style-type: none"> <li>- Demographic changes in Arran are a threat to sustainability</li> <li>- Skilled jobs and careers in manufacturing are possible in Arran through the development (and Scottish aquaculture in general)</li> <li>- Job impacts upstream and downstream in Scotland total around 51 in addition to direct farm jobs</li> </ul>	<ul style="list-style-type: none"> <li>- Consider a balanced Arran workforce through supporting wider economic measures (e.g. support key workers to access housing)</li> <li>- Demonstrate to Arran stakeholders (and representatives) that they are creating opportunities elsewhere</li> </ul>



## ANNEX 1: METHODOLOGY

This paper is underpinned by a composite methodology positioned to assess impacts across various strata, through different analytical lenses. The social and economic impact study for SSC identifies the anticipated impacts of the proposed development. To describe this, traditional input-output and multiplier modelling is accompanied by industry and local context.

This factors in, but contextualises, traditional input-output and multiplier modelling of direct and financial GVA and employment impacts, also considering the Scottish supply chain linkages and wider impacts within the Arran island economy through Value Chain Analysis (VCA) and Market Systems Approach (MSA). The study incorporates a Sustainable Livelihoods Approach (SLA) to better understand potential interactions within and between sectors that are infrastructural (e.g. housing, ferry), demographic, strategic, political, social, services related, use of natural capital, skills, other sectors, etc.

In turn, the approach taken by Imani is to first map out the contextual drivers of Arran's social economy, and then frame the social and economic impacts within this context. We believe that the combination of the SLA and the standard economic quantitative models provide a more holistic and convincing assessment.

### **Sustainable Livelihood Approach (SLA)**

The Sustainable Livelihoods Approach was used to map economic impacts including financial impacts, identify interlinkages with other sectors, social provision (schools, maintaining rural populations) and physical infrastructure (making the economic case for ferries, bus, road upgrading), human capital (training, career development in remote places), de-risking populations, and an assessment of the natural capital. The SLA is a holistic approach – it demonstrates the payoffs for communities and brings all factors onto the same platform.

The use of SLA techniques is often considered to be standard practice in International Development (used by FAO and DFID, for example). It is a conceptual framework in which to include qualitative and quantitative data – but more than that, it is a checklist of impacts that industry and policymakers can use internally to work through different impact considerations.

Contextualising a sustainable livelihoods model is essential: for example, a community or individual may experience an improvement in welfare due to improved human capital (e.g. skills), or social capital (e.g. support for community projects, family remaining in the local area) or financial capital (e.g. increased wealth through paid employment) but those improvements or impacts may be vulnerable to change or dependent on one company's decisions, or changes to an industry's policy framework. This is the case for aquaculture's impact on local communities in island 'fragile areas'. A suitable account of sustainability therefore takes into account the vulnerability and policy frameworks around people's livelihoods and strives for the most beneficial and (ideally) resilient current status and future for communities.

There are 5 types of capital or livelihoods assets to consider within the SLA methodology:

- **Human** i.e. employment / skills / education / health. *Note - Employment is often included in financial capital, however in this instance the consideration was the opportunity to participate in the workforce as opposed to level of financial remuneration*
- **Social** i.e. family / community life
- **Financial** i.e. income / earnings for business
- **Environmental** i.e. land / water / wildlife / biodiversity
- **Physical** i.e. infrastructure / shelter / water / energy / communication

The vulnerability context is a key consideration when working with fragile communities and so is important when looking specifically at the benefits of aquaculture to rural areas.

### **Gross Value Addition (GVA)**

The GVA base year is taken as 2018 – as the most recent year for which reliable Direct SSC-wide GVA can be estimated. At this stage forecasted revenues and expenses to 2023 are not available.

We have used the established ScotGov GVA Type I and II multipliers for the Aquaculture sector to remain consistent with the Scottish Government input-output methodology. Given the complete 2018 dataset at company level, we are confident in our calculation for the total GVA for SSC and are satisfied that they are reliable and conservative.



### **Site-Level GVA**

Production volumes have been used as the most appropriate basis for wider impacts - particularly when a) there is a new site where up-front operating and capital expenses can be weak predictors of future operating and capital expenses, and b) in a sector where turnovers and profits are not realised (as physical £ sterling) in the geography in which they are generated. To calculate GVA, therefore, we have relied upon the relationship between company-level production and gross profit to proximate site-level production and gross profit.

### **Site-level Production**

Bearing in mind the production cycle of a salmon farm site, annualised production of adult salmon for processing is taken as the average annual production over the production cycle. An assumption here is that aggregate SSC production per annum is fairly consistent - despite being extracted from alternate sites every other year. The implication is that it is reasonable to aggregate annualized (annual averages of) production of all active sites within any given year.

As SSC operates a vertically integrated value chain, flows between traditional sectors - production and processing, for example - are not likely to involve market transactions. It is more circular, with financial inflows covering site-level expenses (including staff pay), and product moving physically onto harvesting. This product aggregates with product from other sites, and moves through SSC's system to the point that it earns revenue. This revenue in turn circles back to cover site-level expenses (amongst other things), etc. In such an integrated value chain, therefore, production volume is the best available basis for allocating revenues.

The ratio of annualised production at each site is used to proxy the turnover, and in turn, gross profit at each site. This methodology is not a perfect predictor of attributable revenues, but has proven to be accurate on average and more accurate than alternatives such as employment, earnings and operating expenses. Applying a metric of £/tonne to calculate revenue is another option that can be used to proximate site-level revenue, but can be more vulnerable to exogenous factors.

### **Site-level Earnings**

Site-level earnings (salaries plus other components of staff pay) are the most prominent component of site-level GVA. These constitute the core component of GVA that directly impacts at a very local level. Site-level earnings can be estimated using industry benchmarks for GVA and OPEX calculations, but are more reliable through validation and consultations on the ground.

### **Site-level Jobs**

Using industry data in Westbrook 2017 – in collaboration with Imani - we have employed average industry ratios of employment across the value chain to predict average employment effects of changes in the workforce. We then use contextual and localised data where available to correct for any inconsistencies. For example - highly mechanised and integrated companies will create a significantly lower number of processing jobs relative to volume than those that rely on labour-intensive processes. In other words, the average number of created processing jobs will carry wide variance. The majority of other sectors in the industry - veterinary, transport, engineering, management, etc. - allow for less variance.

We therefore use processing as the major control against biasing economy-wide effects of expansion on the production side.

### **Processing-Level Impacts on Employment**

Using the total harvesting and processing volume that goes through factories every year as a base, we use annualised site-level production volumes to estimate attribution. For example, if every year on average 10% of the volume processed at Cairndow is produced at Lamlash, and 50 people are permanently employed at Cairndow to process the total volumes, it is logical to suggest that Lamlash operations directly support 5 FT jobs at Cairndow.

This logic was applied to calculate the changing attribution of FTE employment in Ardyne and Cairndow in light of the significant growth in volumes from North Arran in 2023.



## ANNEX 2: MAJOR ECONOMIC IMPACTS

Financial / Employment Impact	Source and Method	Reference
SSC is looking to recruit an additional 10 full-time equivalent (FTE) site-level jobs.	The job number is a conservative estimate of Full Time Equivalent (FTE) jobs provided by the SSC Production and Finance teams. 10 jobs was chosen as the best working estimate in discussion with SSC, though as many as 17 jobs may be developed under some scenarios to service the site.	SSC, 2019
Based on industry-wide impact analysis, the Development is estimated to support a further 41 jobs across the Scottish supply chain, plus another 10 jobs in the wider Scottish Economy.	<p>Job estimates are based on industry employment averages through the aquaculture supply chain (based on work published by HIE in 2017 “The Value of Aquaculture to Scotland”) and SSC-specific data. Other jobs will be spread across different functions in the Scottish components of the industry including processing, transport, animal health, feed, etc.</p> <p>Supply chain and wider economy jobs to be supported by this development are discounted at processing level due to specific FT jobs cited by SSC Production and Finance teams. This adjusts the industry average down where company-specific information was available.</p>	<p>SSC, 2019</p> <p>HIE &amp; Marine Scotland. (2017). <i>The Value of Aquaculture to Scotland: A Report for Highlands and Islands Enterprise and Marine Scotland</i>. Inverness: Scottish Government.</p>
This will give a total Scotland-wide economy contribution of 61 jobs and a total GVA contribution expecting to exceed £8-10 million per year.	<p>Jobs are based on HIE 2017 report industry average and on the calculation as above. GVA covers total contribution of the site across SSC, supply chain and wider economy (induced) impacts, i.e. not just the nominal GVA at the site level. It is calculated using three methods to a) distinguish SSC productive value creation from its other value creation, and b) to produce upper and lower bounds for overall GVA:</p> <ol style="list-style-type: none"> <li>1. Using a GVA base year of 2018, total GVA for the new site at North Arran is calculated with a production : GP ratio plus total projected earnings (salaries). This allowed us to estimate the total GVA that would be created within SSC.</li> <li>2. Using a method developed to calculate GVA in the 2017 HIE report: This method significantly discounts total GVA by the amount of financial value that does not necessarily enter the economy (in this case, Gross Profit). Using this model on a volume basis (still conservative but which we consider more a reflection of the site) the range is from £8m to £9.5m.</li> <li>3. Once we were comfortable with the GVA estimates associated with the site and predicted volumes, we used the latest available (2015) Scottish Government multipliers to evaluate up and downstream effects as well as induced effects.</li> </ol> <p>The GVA range of £8-10m is therefore a consistent estimate based on relatively conservative assumptions. The total GVA of £8.61m referenced in the report is in line with this, and is consistent with the latest industry-wide GVA data.</p>	<p>HIE &amp; Marine Scotland. (2017). <i>The Value of Aquaculture to Scotland: A Report for Highlands and Islands Enterprise and Marine Scotland</i>. Inverness: Scottish Government.</p> <p>ScotGov <a href="#">Multipliers</a> (accessed 2019)</p>



**imani**

DEVELOPMENT

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