



Public preferences and aquaculture site selection: a survey of attitudes to salmon farming in Scotland

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Background and aim of the study

Current research within the EU funded ECASA project plans to elicit the importance that the general public and other relevant stakeholders attach to socio-economic versus environmental objectives of salmon farming in Scotland (Figure 1). In Scotland salmon farming has contributed considerably to the economic development of rural areas but has also generated controversies about its environmental performance (Whitmarsh and Wattage 2006).

Establishing the social acceptability of salmon farming development in different coastal communities and between different stakeholder groups may:

- contribute to reduced social conflicts and opposition to salmon farming development
- support policy makers in the selection of the most suitable sites for salmon farms.

Figure 1 Objectives of salmon farming in Scotland

Major objective	Specific objective
Maximise socio-economic benefits	Sustaining employment and livelihoods
	Enhancing edible supply of fish
	Contributing to national tax revenue
Minimise environmental damage	Minimising pollution and water quality impacts
	Minimising visual intrusion and landscape impacts
	Minimising impact on wild salmon stocks

The Analytic Hierarchy Process

Preferences for different salmon farming objectives will be elicited using the Analytic Hierarchy Process (AHP) (Saaty 1980). This is a multi-criteria technique that allows different aspects of performance of an object to be expressed in a common scale of measurement. The method enables individual preferences for different objectives to be made explicit and for trade-offs between them to be evaluated (Figure 2).

The results show not only an ordinal ranking of objectives in terms of their importance but also numerical scores on a ratio scale. Specifically, the method measures the importance individuals attach to the socially beneficial effects of aquaculture (e.g. increase in employment) and the possible negative effects associated with environmental degradation.

Figure 2 The AHP scale

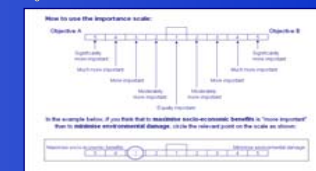
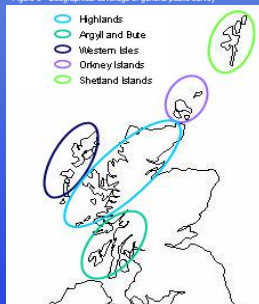


Figure 3 Geographical coverage of general public survey



The general public survey

The AHP questionnaire will be administered by mail to random samples of residents of coastal areas where salmon farming is already developed and likely to develop further in the future (Figure 3):

- Highlands
- Argyll and Bute
- Western Isles
- Orkney Islands
- Shetland Islands

Stakeholder groups

A number of stakeholders' representatives will be invited to take part in the survey. These will include:

- Policy makers and regulators
- Economic development agencies
- Producer organisations
- Environmental organisations
- Wild fish interest groups
- Research organisations

References

ECASA project: <http://www.ecasa.org.uk>

Saaty TL (1980) *The Analytic Hierarchy Process*. New York: McGraw-Hill

Whitmarsh D and Wattage P (2006) Public attitudes towards the environmental impact of salmon aquaculture in Scotland. *European Environment*, 16: 108-121

Acknowledgements

This poster has been prepared with support by the European Commission project ECASA (Ecosystem Approach for Sustainable Aquaculture), Contract No. 006540

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In Scotland salmon farming has contributed considerably to the economic development of rural areas but has also generated controversies about its environmental performance.

Establishing the social acceptability of salmon farming in different coastal communities and between different stakeholder groups may contribute to reduced social conflicts and opposition to salmon farming development and support policy makers in the selection of the most suitable sites for salmon farms.

To this end, it is necessary to identify the costs and benefits of salmon aquaculture that affect local communities and their stakeholders.

The selection of performance indicators for salmon farming in Scotland is based on policy documents concerning the European Union and national government strategy towards aquaculture as well as other publications dealing with the major issues concerning marine fish farming in general and salmon farming in particular.

The performance indicators reflect the major objectives of salmon farming from a societal point of view (maximisation of socio-economic benefits and minimisation of environmental damage). These are made up by a number of sub-objectives that define salmon farming performance at a more specific level (Figure 1).

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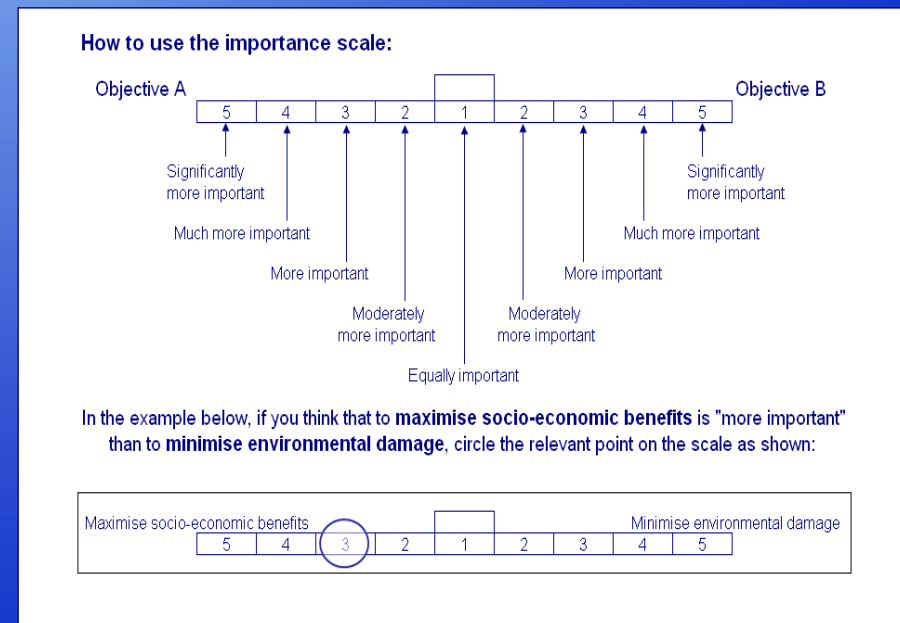
This method uses a number of pairwise comparisons between objectives to assess their relative importance. The intensity of preference for a given objective compared to another is conventionally measured on a 1-9 scale, though in this project a 1-5 scale is adopted following pilot testing (Figure 2).

Criteria are clustered in a value tree allowing small sets of pairwise comparisons to be undertaken within segments of the tree and then between sections at a higher level in the hierarchy.

The responses to the pairwise comparisons form the basis of the pairwise comparison matrix. Deriving a set of weights which gives the “best fit” to the relativities stated in the matrix can be done in a number of ways (e.g using matrix algebra to derive the eigenvector associated with the maximum eigenvalue of the matrix).

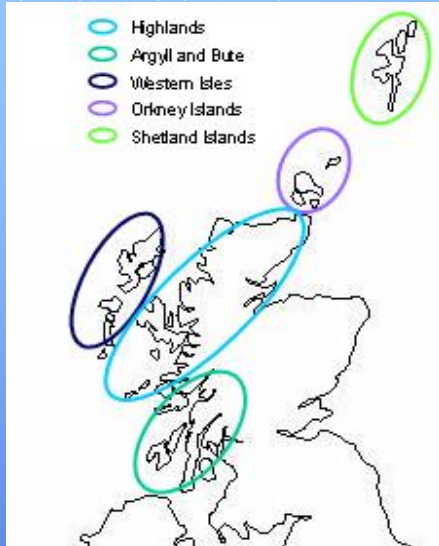
The AHP method can be used to define priority weights for different stakeholder groups. After computing the individuals' relative weights of the decision elements, the group weights for each homogenous interest group can be calculated by aggregating individual judgements.

Figure 2 The AHP scale



The general public survey

Figure 3. Geographical coverage of general public survey



The AHP questionnaire will be administered to random samples of residents of coastal areas where salmon farming is already developed and likely to develop further in the future (Figure 3). These include the Highlands, Argyll and Bute, the Western Isles, the Orkney Islands, and the Shetland Islands.

Samples will be selected using the Electoral Registers as sampling frames. The AHP questionnaire will be administered by mail. Mail surveys are deemed suitable for addressing a geographically dispersed population at a feasible cost.

In addition to completing the AHP questionnaire, respondents will also be asked to express their attitudes towards the future development of salmon farming in Scotland and to answer a set of questions relating to socio-economic characteristics that could be significantly associated with attitudes and preferences.

Stakeholder groups

A number of stakeholders' representatives will be invited to take part in the AHP survey.

The justification of this approach is that some of these groups might have conflicting objectives. The inclusion of stakeholder preferences in the decision making process might enable policy makers to justify decisions based on priorities explicitly expressed by stakeholders.

These will include:

- Policy makers and regulators
- Economic development agencies
- Producer organisations
- Environmental organisations
- Wild fish interest groups
- Research organisations