Economic assessment tool for fish farming in Swedish conditions

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Baltic Sea Region Programme 2007–2013

Part-financed by the European Union (European Regional Development Fund and European Neighbourhood and Partnership Instrument)

AQUABEST

Finnish Game and Fisheries Research Institute, Helsinki
2014

ISBN 978-952-303-081-7

AQUABEST

Reports from Aquabest project 6 / 2014

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Abstract

In northern Sweden, there are many regulation reservoirs that are suited to cage farming. Aquabest has identified the most suitable in the county of Jämtland. In spite of the great potential for aquaculture, there are few aquaculture companies and of the volume of char and rainbow trout produced, a few farmers represent largely all production. Despite the fact that there are few farmers, aquaculture has more than doubled its production in recent years.

Vattenbrukscentrum Norr AB has been tasked by Aquabest to produce an economic calculation basis and a financial model for the purpose of being able to assess a new establishment or the economic viability of existing farming. The model also aims to facilitate matters for external financiers such as banks, venture capital loans and risk capital by ensuring that both the entrepreneur and the financier have an adequate economic and financial decision basis. The financial model has therefore been worked out in cooperation with the most significant intended financiers to ensure that the model is firmly established and accepted by affected parties.

The calculation basis is based on the species Char (Arctic Superior), which is the species that has almost exclusively been used for the farming of char.

The model includes instruction, a checklist, a calculation basis that focuses on biomass, sales budget, financing budget and cash flow budget. The model is structured to cover three operating years as this represents a production lifecycle for Arctic Superior.

All financial actors who have participated in the process will utilise the model and calculation basis and recommend that the companies use the same before a credit proposal.

Working on the basis of the positive response given by the financiers, there are good conditions for an increase aquaculture in northern Sweden.

Keywords
Char, bank, risk capital, investors, calculation models, financial model

Publications internet address
http://www.aquabestproject.eu/reports.aspx

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Additional information

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1. Introduction

1.1. Background

In northern Sweden, there are many regulation reservoirs that are suited to cage farming. Aquabest has identified the most suitable in the county of Jämtland. In spite of the great potential for aquaculture, there are few aquaculture companies. A few farmers represent largely all production of char and rainbow trout produced. There are a few companies that produce stock fish and some that refine their products. Despite the fact that there are few farmers, aquaculture has more than doubled its production in recent years.

The number of fish farms producing rainbow trout has fallen steadily over the past ten years. On the other hand, the number of fish farms that produce char has remained fairly stable. Västerbotten, Västernorrland and Jämtland represent around 70 per cent of the volume produced.

Norrbotten's production is only small but there are good conditions for producing large volumes of farmed fish. There are few farms that have annual production of between 40 and 500 tonnes. This is the size of establishments to which the economic calculation model is most applicable.

During the 1980s, a substantial upturn was seen in the number of fish farms, but only a few of these remains. In many cases, farming took place in unsuitable places due to lack of knowledge and the majority of the farmer's experienced financial problems. Due to these failures, entrepreneurs in the industry have had difficulty securing finance for their operations or establishments, although larger establishments have received external equity capital from those who saw the potential of fish farming. The financing has come principally from foreign investors.

Swedish banks have for some time had a relatively negative outlook as regards the financing fish farms. A few farmers have also been granted venture capital loans.

Since setting up an establishment requires relatively substantial initial investments and also cannot demonstrate positive cash flows in the first few years following its establishment, a bank cannot usually lend requisite capital. Other supplementary financial actors who can take risks and see a yield on invested capital over a longer period are needed. An establishment that is financially sound, full or part owner has considerably greater options of lending money, both initially and in later stages of their business.

1.2. Aquabest

Aquabest is a project within the Baltic Sea region (Baltic Sea Region Programme 2007-2013) whose aim is to stimulate the development of sustainable aquaculture in the Baltic Sea region. The project consists of several work packages whose aim is to:

1. Compile, compare and analyse different national methods for aquaculture licensing and to provide proposals for new models with strong incentive for environmental consideration.
2. Develop methods to identify suitable methods for fish and mussel farming within the Baltic Sea region.
3. Produce alternative types of food in cooperation with the fish feed industry.
4. Develop and spread knowledge of fish farming recirculation systems.

1.3. Purpose of the assignment

Vattenbrukscentrum Norr AB has been tasked by Aquabest to produce an economic calculation basis in the form of a model to facilitate matters for both new establishments and existing aquaculture companies that intend to expand their operations. The model focuses primarily on small and medium-sized farms and does not include processing. The purpose of the model is to provide a pedagogic and adequate calculation basis prior to the meetings with intended external financiers and to be able to calculate the company investment or the potential of the new establishment and minimise the risk of becoming established on erroneous financial grounds. It will also be possible to use the model in calculating financial risks in aquaculture.

The model also aims to facilitate matters for external financiers such as banks, venture capital loans and risk capital by ensuring that both the entrepreneur and the financier have an adequate economic and financial decision basis. The financial model has therefore been worked out in cooperation with the most significant intended financiers to ensure that the model is firmly established and accepted by affected parties.

2. Method

2.1. Production of economic calculation basis and financial model

The economic calculation basis and the financial model have been drawn up in Microsoft Office Excel. Emphasis has been placed on creating a simple, pedagogic model that will satisfy the needs of both entrepreneurs and financiers for an economic calculation basis and financial information.
The calculation basis is based on the species Arctic Superior, which is the sub species that is used almost exclusively for the farming of char.

In creating a financial model that also includes the economic calculation basis, the entrepreneur and the financier gain access to the same decision basis. The advantage of both parties having the same model and basis is that the form and function of the basis is recognised and understood by both of them, which will reduce the risk of misunderstandings. The fact that the model is established with a financier also helps the financier to ask the right questions of the entrepreneur to ensure that all fundamental conditions for a successful establishment are satisfied. If the right conditions are present, this increases the possibility for the person who requested a credit proposal to receive a positive decision. Working with one and the same basis that applies to both entrepreneur and financier has therefore been extremely important.

2.1.1. Production of variables

Purchase cost for stock fish

Stock fish are purchased mainly in weights of 10 grams, 20 grams, and 100 grams and these weights are therefore used in the calculation basis.

The purchase cost differs between the various purchase weights. The price levels indicated in the calculation basis are based on the current pricelist for Arctic Superior but can vary depending on volume and supplier.

The cost of feed and feed coefficient

The cost of feed varies according to purchase volume and feed supplier. A of 1.2 has been used to calculate the feed intake, but the feed coefficient can be varied in the model to show the economic effects of adjustments.

Price of slaughter and demand for slaughter weight

In the model, the recommended price of slaughter is SEK 63 per kg, which is based on the current market price.

Demand for slaughter weight is based on filleted fish for restaurants.

Growth patterns and sorting

The growth pattern that forms the basis for the model is verified by existing farmers. The growth pattern in the calculation basis is slightly simplified but gives an adequate picture of growth in biomass during the number of operating years that are included in the basis. The same applies to sorting.

2.1.2. Other tabs in the model

Instruction

The instruction gives the user a clear description of the model and the structure and use of the calculation basis.

Checklist

The checklist includes many of the factors that ought to be safeguarded prior to a new farming establishment, which reduces the risk of erroneous establishment.

Sales, results, financing and cash flow budget

Calculation templates for the budgets have been designed in accordance with standardised principles but the content has been adapted to fish farming.

Comments

Throughout the basis, headings have been selected to be clarified by means of comments that are hidden in the cells; this is to make things easier for the user of the model and the calculation basis.

2.2. Establishing the economic calculation basis and financial model

The task within the assignment was to establish the model with relevant intended financiers such as bankers, venture capital loans and risk capital. Since the potential for large-scale aquaculture is primarily in the regulation reservoirs in Norrland's inland areas, emphasis has been placed on reaching out to financiers who are active within this geographical area.

The history, current status and future potential of aquaculture were presented. The presentation consisted largely of the economic potential and conditions for cage farming.

In order to establish the financial model and create an understanding of conditions for aquaculture, each meeting with every one of the financiers lasted for two to four hours. The external financiers were visited at least once.

The objective was to create a dialogue with the financier to create participation in the process. Emphasis in the following points was primarily placed on:

Experiences of previous failures

The importance of the right farming locality, the importance of being able to work with living stocks and the importance of a correct economic calculation basis.

Cash flow

About the substantial cash flow problems that usually arise in the initial years and how the different actors can or cannot provide working capital.

Profitability

The profitability for the industry is deemed to be satisfactory following the establishment years. However, there are no industry-specific key ratios to assess profitability.

Securities

Since in most cases the properties are situated in sparsely-populated areas, their value as a security are very low, so the focus is then on the question of what can be considered to be real property as opposed to chattels. This question was discussed mainly with the banks.

Risk

Review of financial and non-financial risks.

Valuation

The way in which the financier and the entrepreneur value the stock and the way in which a farm in production is valued, and the difficulty in valuing fish in the cages.

2.2.1. Financial actors

The banks that were selected are represented in the geographical focus area and have over time worked with green industries, of which aquaculture is counted as one.

The companies offering venture capital loans and which were selected for the establishment of the model were Norrlandsfonden and Almi Företagspartner AB. Venture capital loans means loans that can be offered to companies where the lender normally takes a greater risk than a bank. Can also in some cases pledge supplementary securities to a bank.

The risk capital companies that were selected for the establishment of the model were Ekonord Invest AB, Saminvest Mitt AB, Inlandsinnovation AB and Polarrenen AB.

The common factor for these is that they are active in northern Sweden. These normally invest to become part-owners.

3. Results

3.1. Economic calculation basis and financial model

The model includes instruction, a checklist, a calculation basis that focuses on biomass, sales budget, financing budget and cash flow budget. The model is structured to cover three operating years as this represents a production lifecycle for Arctic Superior.

The checklist is a basis for both entrepreneurs and financiers for the purpose of ensuring that the fundamental conditions required for a business to be run are satisfied. The fundamental conditions include economic calculation and a simple business plan, parameters for location, the licensing process for establishment and the securing of finance. The questions contained in the checklist ought to be safeguarded before a decision is made with regard to establishment. Each establishment is unique, so there may also be other parameters that ought to be safeguarded.

Arctic Superior's growth pattern forms the basis for the calculation model. The growth pattern has been used to be able to calculate the incoming and outgoing biomass (measured in kilogrammes) for the number of operating years that are included in the model, and the annual growth in biomass which forms the basis for the calculation of the annual feed intake. A feed coefficient of 1.2 has been used to calculate the feed intake, which may be varied to show things such as the economic effects of adjustments.

Additional variables that may be varied in the model are slaughter weight, purchase price of stock fish, slaughter charge and the cost of feed. The figures that are included in the variables are recommendations based on the current values.

The calculation of the biomass also provides a basis to calculate how many kilos of fish that can go to slaughter each year, which forms the basis for the calculation of the company's income.

Both income and expenses (direct expenses for the purchase of stock fish and the cost of feed) are automatically transferred from the calculation of biomass to the sales, financial and cash flow budget to make things easier for the user and reduce the risk of the incorrect manual entry of the values.

3.2. Establishing the financial model

All financiers thought that the model constituted a good tool for the establishment or expansion of small and medium-sized fish farms. Some adjustments were made to the original the model following the meetings where the financier pointed out the need for supplementary information in the model.

The general question concerning what can be considered to constitute chattels on a fish farm was not solved. This reduces the possibility of using property to finance part of the farm equipment.

Financiers understood the importance of establishing the farming in a suitable place and having an adequate calculation basis that was understood and recognised by the financier and the entrepreneur alike.

The cash flow problems at the time of establishment are difficult to avoid but the parties can be proactive by making these visible at an early stage.

Generally speaking, the financiers who participated in the local involvement process were positive towards cage farming in northern Sweden.

4. Discussion

4.1. Economic calculation basis and financial model

The intention of the calculation basis is to facilitate a decision on the establishment of cage farming. The calculation basis can also demonstrate that setting up an establishment is unsuitable. We have consciously chosen to create a calculation basis that does not include all variables that an experienced and established farmer uses. Despite this, we think that the calculation basis and the model include sufficient information to be able to make a decision on whether or not an establishment ought to be set up.

4.2. Establishing the financial model

The model is locally established among the leading financial players in northern Sweden. However, the model is not locally established among all banks that are in the geographical area of northern Sweden.

5. Conclusion

The objective of the assignment was to produce a financial model for new establishments and for existing aquaculture companies which intend to expand their operations and to be able to calculate the potential of the company investment or of the new establishment and minimise the risk of establishment on erroneous financial grounds.

An economic calculation model was created on the basis of the assignment plus a checklist of non-financial factors, giving the entrepreneur a complete tool to be able to assess the potential of the company investment or the new establishment, and to present this to intended financiers. The calculation model produced has been accepted by entrepreneurs within the area and by intended financiers.

All financial actors who have participated in the process will utilise the model and calculation basis and recommend that the companies use the same before a credit proposal.

Working on the basis of the positive response given by the financiers, there are good conditions for an increase aquaculture in northern Sweden.