



Pre-course Reading

Safeguarding the Future

sustainable development training
for the professional business



Aquaculture for the Future

sustainable development
training for the Aquaculture
sector

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Aquaculture for the Future

A training programme for use in workshops to help small and medium-sized businesses integrate sustainable development principles into their business practice.

Pre-course reading

You should read and act upon these notes prior to the workshop. They provide background information about some of the topical issues that might affect your business. They also pose a few questions for you to think about beforehand.

Purpose of the workshop

Thank you for signing up to find out more about sustainable development and ways in which your business might respond to the challenges it presents. The Welsh Assembly Government is obliged to promote sustainable development, and is planning actions that will affect everyone in Wales, including large and small businesses. Working towards sustainability presents many business opportunities and can improve profit margins, but businesses may also find it necessary to change the way they operate to meet more exacting government requirements.

The workshop will help you to integrate sustainable development principles into your business practice. You will be able to keep ahead of the increasing demands to operate in more sustainable ways. In particular you will be more competent to:

- Explain the terms 'sustainable development' and 'sustainability' to your colleagues and customers
- Assess how challenges from government, employers and customers for sustainable development might impact on your business
- Apply 'joined-up' thinking to working out solutions to business and sustainability issues
- Apply techniques that help you integrate sustainable development principles into your business planning
- Prepare a sustainable development action plan
- Obtain further advice and support.

Aquaculture Industry Information

The internationally-accepted definition of aquaculture is that of the UN Food and Agriculture Organization (FAO): *"the farming of aquatic organisms: fish, molluscs, crustaceans, aquatic plants, crocodiles, alligators, turtles, and amphibians. Farming implies some form of intervention in the rearing process to enhance production, such as regular stocking, feeding, protection from predators, etc. Farming also implies individual or corporate ownership of the stock being cultivated."*

A rapid expansion in world aquaculture has taken place in recent years. Fish farming has become the fastest growing sector in world food production. Today, aquaculture production amounts to almost one fifth in volume and around one third in value of world production of fish and shellfish.

Aquaculture in the European Union

There is a long tradition of fish and shellfish farming in some European countries, which helps to explain its diversity, ranging from the artisanal business to the industrial-scale multinational company.

According to the EU aquaculture website¹, European Community aquaculture comprises three main activities: sea fish farming, marine shellfish farming and freshwater fish farming.

A sector of growing importance

Aquaculture, or fish farming, in the European Union plays a role similar to that of the fishing industry. By supplying the market with fish and shellfish it helps reduce the imbalance in the EU between imports and exports of fish products. It also generates jobs in areas which generally lack other industries. Consumers benefit from the variety of aquaculture products which complement those available from fishing. The aquaculture industry of the enlarged Union (EU-25) produces a total of 1.3 million tonnes of fishery products a year for a value of about 3 billion Euros. It is estimated that EU aquaculture provides some 80,000 full or part-time jobs, equivalent to 57,000 full-time jobs.

¹ http://ec.europa.eu/fisheries/cfp/aquaculture_processing/aquaculture_en.htm

Four species dominate EU production in terms of volume: trout, salmon, mussels and oysters. As a result of greater expertise in the needs of farmed fish and advances in technology, fish farmers have been turning their attention to more exotic species such as sea bass, sea bream and turbot. Diversifying the range of species available makes them better equipped to face world competition...

The Welsh Aquaculture Producers Association (WAPA) has recently been formed by industry members to promote the industry and liaise with Government.

The scope of the industry in Wales is indicated by the following table, taken from the Welsh Assembly Government's consultation document *Wales Fisheries Strategy 2007*².

Aquaculture in Wales

Wales has a long-standing aquaculture sector which currently includes marine and freshwater land-based finfish, and marine shellfish enterprises. Wales also cultures other aquatic invertebrate species for a variety of non-food purposes.

Summary of main aquaculture categories

Description	Species	Method	Sites
Marine shellfish aquaculture	Mussels	Bottom cultivation spat collection, movement and on-growing	Menai Strait Swansea Bay
	Oysters	Off bottom cultivation - tray & trestle	Menai Strait
Marine finfish aquaculture	Turbot, sea bass	(RAS) Recirculation aquaculture systems	Anglesey, Gwynedd
Marine invertebrate aquaculture		Sand-filled raceways	Neath Port Talbot, Carmarthenshire
Freshwater table production & recreational fishing	Rainbow and brown trout	Tanks ("flow-through") and ponds	Various
Freshwater re-stocking	Atlantic salmon, brown trout	Tanks ("flow-through")	Environment Agency, Mid- and South Wales
Other, minor	Freshwater and marine ornamental fish	Tanks, ponds	Various, small scale

Farmed shellfish production (tonnes) in Wales in 2006 is shown in the table below, indicating the significance to the UK of this industry in Wales.

² <http://new.wales.gov.uk/consultations/?lang=en>

Shellfish	Wales	UK Total
Pacific oyster	12.5	1,290
Native (flat) oyster	0	86
Scallops	-	42
Queens	-	64
Mussels	10,157	27,557
Clams	-	9
Cockles	-	1.2
Estimated value (£millions)	7.5	23.5

Production of Rainbow Trout, a key aquaculture species in England and Wales (2006)³, is shown in the table below:

	Environment Agency Region	Wales	England + Wales
Number of sites	Total number	21	171
	Table Production	1	21
	Restocking / on-growing production	12	101
	Both (table and restocking)	8	49
Rainbow Trout Production	Table (tonnes)	205	4,866
	Restocking / on-growing (tonnes)	158	2,445
	Fry (thousands)	1,970	27,233

Trout farms in Wales have constituted a major sector in the past. In 1999 trout farms produced 532 tonnes of rainbow trout for table consumption and a further 279 tonnes of rainbow and brown trout were produced for re-stocking of fisheries and for on-growing. In recent years, that situation has changed due to a combination of driving forces. The greatest of these has been the increasing strength of major UK retailers who now provide over 85% of all table trout to consumers. This development has required very high levels of productivity to achieve the low production costs needed to compete in the market. Trout farming businesses in Wales are small scale and in combination with the logistic challenge that they face in

³ <http://www.cefas.co.uk/publications/finfishnews/ffn5.pdf>

relation to distance from the main UK markets, Welsh trout farms focus on restocking and other niche markets. (from 'Study into Inland and Sea Fisheries in Wales' Nautilus Consultants, 2000).

It is difficult to determine the total impact of these sectors on the Welsh economy, but the following facts and figures give an indication.

	Turnover (£m)	Employment (full time equivalent)
Finfish aquaculture	4.0	99
Game angling	8.2	171
Coarse angling	39.4	90
Totals	51.6	360

Table 1: Contribution to the Welsh Economy

(Adapted from 'Study into Inland and Sea Fisheries in Wales' Nautilus Consultants (2000)

Fisheries in Wales have the potential to support a sustainable food supply. Investing in the ecology that underpins the business in order to produce a viable economic return is one of the keys to achieving sustainability in the fisheries sector

Questions to think about:

Does the FAO definition include your own business activities?

You may find that you cannot decide, because the definition leaves some grey areas. The FAO recognises this situation, and therefore offers the following help⁴.

In consultation with pertinent bodies, FAO and the Coordinating Working Party on Fishery Statistics have formulated a working definition of aquaculture activities: "For statistical purposes, aquatic organisms which are harvested by an individual or corporate body which has owned them throughout their rearing period contribute to aquaculture, while aquatic organisms which are exploitable by the public as a common property resource, with or without appropriate licences, are the harvest of capture fisheries." And: "To help in classifying ambiguous practices it should be noted that:

⁴ This, and further information on aquaculture definitions can be found at <http://www.fao.org/fishery/cwp/handbook/J>. The FAO aquaculture Glossary is available at <http://www.fao.org/fi/glossary/aquaculture/default.asp>

(a) by sea-ranching is understood the harvest of enhanced capture fisheries, i.e. the raising of aquatic animals, mainly for human consumption, under extensive production systems, in open space (oceans, lakes) where they grow using natural food supplies. These animals may be released by national authorities and re-captured by fishermen as wild animals, either when they return to the release site e.g. salmon, or elsewhere (sea breams, flatfishes).

(b) the production of wild-caught fish raised temporarily in holding facilities is considered as enhanced capture.”

Why might the definition matter to your business?

The FAO definition is often invoked, including for European-level strategic and funding programmes. Therefore, it is conceivable that if your business falls outside the FAO definition of aquaculture, your activity could be rendered irrelevant to a strategic context and potentially ineligible for funding.

In 2002 the European Commission published 'A Strategy for the Sustainable Development of European Aquaculture'⁵. At the time of writing, the Strategy is under review (public consultation launched May 2007).

Challenges

In spite of its rapid growth in recent years, aquaculture has run into a number of problems.

- Food production is becoming an increasingly competitive market. This situation is made worse by fluctuation in demand, a problem shared with agriculture
- Greater public awareness of the need to protect natural resources and increase food safety has resulted in a more heavily regulated environment. New aquaculture projects as well as some day-to-day operations require permission from various authorities
- Technical problems and risk from disease also add to the vulnerability of the enterprises. In addition, the market for aquaculture products has become saturated for some species which has resulted in lower prices and thus lower profits for aquaculture producers.

What are the potential environmental impacts?

Fishing and aquaculture businesses can have a number of impacts on the environment:

- **waste disposal**, such as dead fish, shells and packaging
- **effluent disposal**, suspended solids, and nitrate and phosphate loading in water have potential negative impacts on the environment through contamination of ground water.

(http://www.feap.info/aquaetreat/presentation/billund_en.asp)

A strategy for further development

The EU Commission's strategy is based on three objectives:

- Creating secure employment particularly in fisheries dependent areas: the target is the creation of 8,000 to 10,000 full-time job equivalents over the period 2003-2008
- Providing safe and good quality fisheries products and promoting animal health and welfare standards
- Ensuring an environmentally sound industry.

To meet these objectives, the Commission proposes the following measures:

- Secure employment: increasing production, applying integrated coastal zone management, stimulating the market and improving governance
- Improve the safety of aquaculture products and animal welfare: ensuring a high level of public and animal health as well as animal welfare
- Ensure an environmentally sound aquaculture: reducing the impact of waste, tackling the problem of alien species and genetically modified organisms, preventing pollution and conducting environmental impact assessments”.

Questions to think about

Do you agree with the analysis of the challenges for Aquaculture, as described in the EU Commission Strategy? Would you add any more?

⁵ <http://eur-lex.europa.eu>

Do the stated objectives of the strategy match your own view of what issues a sustainable aquaculture industry should address?

How would you describe your own vision of a sustainable aquaculture company?

Where will the fish meal and fish oil come from to sustain a growing global aquaculture industry when stocks from the wild fishery are already fully exploited?

<http://ec.europa.eu>

You will find other up-to-date information here about the direction of European aquaculture.

Sustainable development in Wales

The Welsh Assembly Government is the principal agency among others responsible for inland fisheries management in Wales. The Government of Wales Act 1998 placed a duty on the Welsh Assembly Government to promote sustainable development. The Assembly published its Sustainable Development Scheme *Learning to Live Differently* in November 2000. This was followed by an action plan to implement the Scheme in March 2001. Since then annual reports monitoring performance have been published and following a consultation exercise, a revised Sustainable Development Scheme *Starting to Live Differently* was published in 2004.

Starting to Live Differently 2004 states, "the principles and vision of the Sustainable Development Scheme will drive everything we do. We will integrate these into our work and actively require or influence others, for example local authorities, public bodies, business, the voluntary sector and communities, to do the same to deliver change. We will seek to enable them to do so."

The Assembly has an ambitious vision of a sustainable Wales that will require all people to take part if it is to succeed. The Assembly states its plans will be based on:

- Promoting a diverse, competitive, high added-value economy, with high skills and education, that responds to sustainable development opportunities, minimises demands on the environment and maximises the distribution of the benefits

- Action on social justice that tackles poverty, poor health, and consequences of disadvantage and provides people and their communities with the means to help themselves break out of the poverty trap
- Action in our built and natural environment that enhances pride in the community, promotes biodiversity, promotes local employment and minimises waste generation, energy, water and transport demands
- Strengthening Wales' cultural identity and helping to create a bilingual country, while looking confidently outwards and welcoming new cultural influences
- Creating a place which values its children and where young people want to live, work and enjoy a high quality of life, and where future generations enjoy better prospects in life and are not landed with a legacy of problems bequeathed by us
- Supporting people to live healthy and independent lives, irrespective of income, location or disability
- Valuing everyone in society and promoting equality of opportunity
- Promoting openness, partnership and participation, so that people can play a part in taking decisions that affect them
- Contributing to sustainable development at a global level as well as locally and taking account of the global impacts of decisions made in Wales.

*Sustainable development is often seen as an environmental issue but it is just as much about wealth creation and tackling poverty and injustice*⁶.

Question to think about

What actions could the Welsh Assembly Government take that would support inland fisheries in Wales?

⁶ <http://wales.gov.uk/topics/sustainabledevelopment/publications/startlivedifferently/?lang=en>

Wales and SMEs⁷

- Small and Medium-sized Enterprises, or SMEs, are defined as employing between zero and 249 employees. In the UK there are 3.75 million active businesses, 85% of them in England. In all the regions of the UK, SMEs make up over 99% of businesses
- In the UK as a whole, 55% of the workforce works in SMEs. SMEs account for 51% of turnover
- In Wales, 67.1% of the workforce works in SMEs and they account for 61.4% of turnover. Agricultural businesses are highly represented. This is to be expected, as 78% of Wales is agricultural land, 14% forestry and only 8% urban land
- SMEs providing goods and services to the public and private sectors are likely to find their operations will be required to meet certain sustainability targets in the future. This workshop will place businesses in a better position to integrate sustainable development principles into their activities and hence meet these requirements.

Questions to think about

- Could the growing demand for local food supply increase the demand for table fish?
- Could carp become a table fish again?
- Is the recent upsurge in interest in healthier lifestyle choices having an impact on Aquaculture?
- What are the three main challenges facing your business?

About the project

This initiative being delivered by a team of academics based in Swansea University's School of the Environment and Society, aims to benefit SMEs.

Professional Practice for Sustainable Development – PP4SD for short – is a national project that has designed and published training materials, and runs training courses for professionals in sustainable development.

The Swansea project has targeted four business sectors over a one-year project: (Aquaculture, Environmental Management, Fisheries Management and Agricultural Manufacturing) and can be adapted to any SME in the land-based sector.

As part of the Higher Education sector's commitment to working with industry and the wider community, the aim of the PP4SD project at Swansea is to assist Small and Medium-sized Enterprises (SMEs) in Wales to become more confident in putting sustainable development principles into their working practice.

Project Director, Dr Jane Claricoates, said:

“PP4SD can help SMEs to move towards complying with increasingly stringent legislation about employment, health and safety, and the environment, as well as with increasing demands from customers and consumers for environmentally-friendly practices and products. Sustainable approaches to business planning and reporting can help small businesses to become more efficient, cost-effective and competitive.

The PP4SD project was another mark of Swansea University's commitment to sustainable development, and is just one of a number of initiatives taking place on campus.”

The PP4SD project was supported by the Welsh Assembly Government's Knowledge Exploitation Fund (KEF) and the European Social Fund under Objectives 1 & 3.

In addition, the Swansea-based project worked closely with Lantra, the Sector Skills Council advising the government on training for environmental and land-based industries.

For further information on PP4SD and the Swansea University project, please visit <http://www.pp4sd.org.uk/>

⁷ SME statistics from Small Business Service at Department of Trade and Industry