

A Sustainable Aquaculture Strategy for England - Workshop Summary Cefas Weymouth 13-14 October 2009.

Statement

A workshop on sustainable English aquaculture at Cefas Weymouth 13-14th October 2009 (attended by aquaculture industry, scientists, retailers and policy makers) reviewed different aspects of aquaculture and concluded that this area of food production could continue to increase in importance if better supported. Various factors combine to make this an urgent and timely message including the increasing UK population, the health benefits of eating fish and shellfish (recommendations from the FSA) and the need for food from demonstrably sustainable sources. The government definition of food security highlights access to affordable safe and nutritious food. The UK is a modern trading nation and so enjoys a high degree of food security although one sector identified as “very unfavourable” in a recent assessment is the security of global fish stocks. Increased UK aquaculture production could help to contribute to increased food security and local production as a means of securing future supply in a way which is carbon efficient and fits local economies.

Participants at the workshop indicated that Welsh and Scottish Aquaculture has had strong political support and this had done much to help the industry to grow. It is notable that whilst UK salmon aquaculture production is concentrated in Scotland production of other species and shellfish is distributed throughout the UK. The majority of consumption is focussed in England. The ability of English Aquaculture to contribute to food security in a sustainable manner would be enhanced by clear support and a policy in this area. The industry will facilitate such dialogue through an English Aquaculture Producers Link Organisation (covering production of trout, carp, tilapia, shellfish, new species and novel applications).

The workshop discussed surging interest in the areas of recirculation system aquaponics (a whole ecosystem approach to food production), recirculation systems and the need for greater consideration of “offshore” and “inshore” locations for all aquaculture production, including for sustainable biofuel productions (where production had a number of advantages over land based biofuel production) and demonstrated the need for government support to all aquaculture endeavours. Although some questions related to the sustainability of fish meal and oil remain, increasing reliance on aquaculture production should decrease the pressure on wild capture fisheries. Globally aquaculture is the fastest growing animal farming sector and, in comparison to other animal farming, represents the most efficient use of feed resources.

Proceedings of the aquaculture workshop Cefas Weymouth 13-14th October 2009

Representatives of the aquaculture industry, policy makers, regulators, retailers, NGOs, pressure groups and scientists held a workshop at Cefas Weymouth Laboratory from 13-14 October 2009 to discuss sustainable aquaculture production in England. The workshop comprised a series of presentations and discussion sessions. The following lists some of the key points in the different areas covered at the workshop.

Experience from Wales

The Welsh aquaculture strategy (developed by the Welsh Assembly Government) invested in regionally distinct, sustainable aquaculture technologies. The strategy was the result of a 10 year dialog with stakeholders and several strategy documents. Many different departments were involved and clear funding mechanisms implemented recognising the long term socio- economic potential for aquaculture in Wales.

Overview from Defra

Policy drivers were food security, population growth and public interest. In 2006, the English finfish farmed production was £23.5M, with shellfish contributing an additional £20M. A government sponsored assessment of all food supplies classed them as very secure with the exception of wild-fish supplies which was classified as “very unfavourable” (reflecting the decline in capture fisheries). Aquaculture now accounts globally for 47% of all fish consumed. The UK population is forecast to grow to 71M by 2035. The FSA recommends 2 portions of fish per week (one oily). If this recommendation was followed, it would require an additional 20 million portions of fish (or shellfish) per week – to which aquaculture would have to make a significant contribution (a view supported by the FAO). The price of most finfish (fresh and frozen) for the consumer continues to increase. Government needs to understand the role that English aquaculture can play in addressing these needs.

Tilapia

Tilapia is a fresh water herbivore/ omnivore species originating in Africa that has been farmed for 4000 years. It is well suited to aquaculture as it is hardy and adapts to a wide range of culture systems, is easy to breed and fast growing. Globally the production is second only to carp (2.8 mt in 2008 with production mainly in Asia) and is forecast to rise to 3M mt by 2010. It has a wide consumer demand, genetic diversity to allow the development of a better fish and its production raises few environmental concerns. It can feed on algae, bacteria and detritus, is resistant to disease, tolerant to poor water

quality and is recommended by NGOs and aid agencies. It can be fed on agricultural by products (e.g. rice bran). Global Tilapia sales are forecast to be \$5 billion in 2009.

Today, there are 11 tilapia farms in the UK, one UK hatchery, and 5 academic research facilities, + another 12 small buyers of tilapia fry for backyard operations or integrated aquaponics units. Total production for the UK (under optimum conditions and based on the farm sizes) should be 800 tonnes, but due to some teething troubles, actual production at the moment is nearer 300 tonnes. Cost of production in comparison with the retail price of frozen imported fillets is an issue. There is demand for organic and green Tilapia products, value added (i.e. frozen meals) and an increasing demand in Europe. By-products from Tilapia production are being used for fertiliser, fish meal, bio diesel etc.

Trout

The English trout industry (£20M pa) comprising table and restocking) is market led and at present demand outstrips supply (with some of the shortfall being met by imports) although the price achieved for product remains consistently low and there is little profitability in the sector. The nutritional and health benefits of trout are well documented. The value of the trout fisheries for angling is £150M (England and Wales). 80% of table trout farmed in the entire UK is consumed in Southern England. The industry is well supported by the devolved administrations and an emerging trend is for branded national production (e.g. farmed in Scotland). Trout meet the Defra (low carbon footprint of production) and FSA (consumption of oily fish) guidelines. Denmark has re invented its trout industry by moving to various recirculation systems as a way of meeting environmental constraints, reducing unit price and making the industry more cost effective. Start up costs are high as are running costs in some partial recirculation systems, but the Danish model may have applications in some English sites. The industry needs to look at additional strategies to improve efficiency and production and to achieve a more competitive price at market.

Carp

Carp production is an ideal sustainable method of protein production. It is suited to organic production and can be tailored to small scale production for local or household consumption. Carp are eaten extensively round the world and are relatively easy to farm sustainably. In the UK carp is not widely viewed as a table fish but demand can be generated and there are enthusiastic UK producers.

Shellfish

The trade body for shellfish in the UK is the Shellfish Association of Great Britain (SAGB). Production methods for shellfish in the UK are a continuum from cultured to enhanced fisheries to wild capture. UK shellfish wild capture production represents 35% of the volume and 51% of the value of UK

fisheries landings, whilst UK shellfish cultivation production is £20M with English production (mainly mussels and pacific oysters) being £4.5M. The shellfish industry already has the Seafish-funded, SAGB-facilitated UK Shellfish Industry Development Strategy (SIDS). This plan was recognised by Defra in their 2009 Marine Programme Plan as a “Priority Project” for achieving their 2027 Fisheries Vision. The strategy has 3 work streams which link with the strategy. These are (1) giving managers the ability to manage shellfisheries appropriately (2) raising the profile of UK shellfish (3) security of tenure. Under theme (2) promotional films, the nutritional properties of shellfish and shellfish recipes have been publicised.

Major limiting factors include over-zealous Nature conservation organisations limiting potential production areas (MPAs, MCZs, NTZs, HPMRs), the classification of pacific oysters as “non-native invasives”, water quality and the need for real Government support if shellfish aquaculture production potential of England is to be explored and realised.

Recirculation systems

Recirculation systems are defined as systems that recycle and renovate water for the culture of aquatic organisms. These systems are in world wide use. Some advantages of recirculation systems are:

- Allows controlled product growth rates
- More efficient food conversion
- Predictable harvest routines
- Allows production all year round
- Biosecurity and environmental advantages
- Enclosed environment means production free of predators and other damaging wildlife
- Allows efficient inventory control
- Allows economies of scale, leading to higher production per unit area.
- Allows waste to be handled in an environmentally friendly manner, including use of waste in hydroponics applications.
- Allows the production of non traditional fish culture.

Some challenges associated with recirculation systems include:

- High Initial Investment (compared to other production methods)

- Financing can be an issue because investors often want fast returns and see no positive support (even verbally) from Government to encourage investors)
- Technology is not well known (but is getting better)
- Very short system resilience any downtime may lead to major losses (i.e. reliability of electricity supply critical)
- Lack of track record (failures are common – often linked to mismanagement of system or producing an inappropriate species)
- Hard to finance. Mostly entrepreneurial self funding Not as yet able to compete with larger scale aquaculture production
- Most Recirculation farms are under 500 tonnes in size
- Do not yet have the economies of scale to realise cheaper production volume
- Supermarket product volume requirements often above production of a single unit

Food and labour still represent the largest costs but energy costs could be offset by using renewable energy supplies. A sound business plan plus system backups and use of proven system designs and species all increase the chances of success.

Recirculation systems have been successful using both fresh water and salt water and high value species e.g. turbot, sole, shrimp, sea bass etc have been cultured. Attention is needed to select the best technical system, the choice of species, temperature, biosecurity, salinity, sales strategy, production capacity, water issues and sound finances.

Aquaponics

Aquaponics is the integration of hydroponics and aquaculture either involving water, wastes or energy (e.g. wastes from aquaculture provide nutrients on which to culture plants.) Harvesting is driven by demand due to fast production cycles. Aquaponics provides the ability to culture high value crops, with productivity 3-18 times greater compared to the same crops in soil. Feed sustainability of the cultured fish can be improved by substitution of pelleted feed with off cuts from the plant culture or worms (grown on composted off-cuts). It is an ecosystem approach to food production.

Potential for mariculture

Offshore or inshore both may provide opportunities for aquaculture although the costs in offshore are considerably greater. Factors affecting off shore developments include wave climate and current speed, the physiological

requirements of stock, health and welfare, benthic impacts, carrying/assimilative capacity, wild interactions, UK/EU/International regulatory environment, financial viability and the technical challenges of cages/ pens (whether they are surface or submerged) and their remote operation. It is worth noting that no real commercial scale open ocean technology exists for aquaculture at present. However, there is now clear evidence that marine cage fish farming is taking place in more exposed locations – some of which would be analogous to areas around the coast of England. This trend is likely to continue and England should seek to capitalize on this potential. Shellfish production may be more adapted to offshore production compared to fin fish, and there is the potential to develop culture systems in association with offshore renewable energy sites. Large scale continuous long line production of mussels is already taking place in sea conditions that are similar to those occurring along parts of the English coastline. Shellfish production may be more adapted to offshore production compared to fin fish, and there is the potential to develop culture systems in association with offshore renewable energy sites. Offshore production of biofuels have gained considerable publicity and have the advantage compared to land biofuel production of being more efficient and producing cleaner biofuels. Production of biofuels should be part of any aquaculture strategy as it is unlikely that land biofuel production will meet EU targets.

Feed

The sustainability of fish feed is being addressed from multiple perspectives. Firstly, in the light of limited annual availability of fishmeal and oil, fish feed compounders are investigating alternatives to these two commodities. Secondly, given that fishmeal and oil will remain highly desirable feed materials as sources of long-chain omega-3 PUFAS, the industry is engaging with stakeholders to secure sustainably fished and processed marine feed materials. This has led to the adoption of numerous codes of practice and rigorous selection criteria throughout the fishing, farming and retail chain. Thirdly, feed compounders are engaging with the suppliers of agricultural commodities to assure that they too are responsibly sourced. Over-arching these activities is the principle that fish farming is fundamentally resource efficient due to the low feed conversion ratios (FCRs) achievable by fish. However, there is scope for further improvement and feed producers and farming companies devote considerable attention to maximising returns per unit of feed fed. The legacy of food and feed scares has led to conservatism in Europe and particularly, the UK, with regards what constitutes a natural feed ingredient for fish. As a result, having rejected many of the feed materials used widely in the global agriculture industry, there have been missed opportunities with regards partial replacement of fishmeal and oil in salmon and trout feeds. This conservatism is expressed largely through retailer specifications and independent quality schemes.

View from WWF

Fundamentally, WWF is a conservation organisation: reliance on aquaculture production will lead to decreased pressure on wild stocks providing that

marine derived feed ingredients are sourced sustainably and production is managed sustainably.

Aquaculture is the fastest growing animal farming sector. Globally, farmed fish represented 12% of animal production in 2006, and it is anticipated that this will rise to 20% over the coming years. Aquaculture is the most efficient animal farming sector, with 1 tonne of feed producing almost 1 tonne of fish (compared to 150 Kg beef, 300 Kg pork and 500 Kg chicken). Aquaculture can have environmental and social concerns as well as questions about the sustainability of feed. To this end, WWF has instigated the “Aquaculture Dialogues” a series of roundtable discussion groups involving over 2000 stakeholders. These dialogues are aimed at developing environmental and social performance-based standards, measurably reducing the critical impacts of aquaculture and helping to strengthen the economic viability of aquaculture. Both the Dialogues and Aquaculture Stewardship Council (ASC) will be approved by the International Social and Environmental Accreditation and Labelling alliance (ISEAL).

One means of advancing sustainability objectives is the setting up of certification and QA schemes. Whilst recognising other schemes, WWF is setting up the ASC which will offer farm level certification to endorse environmental, social and chain of custody values, concentrating on 10-12 core aquaculture species. WWF see this in conjunction with retailer support and consumer awareness, as a mechanism to encourage positive change.

Key points from discussion work groups

- Government support is considered essential – preferably in the form of a long term enabling strategy for aquaculture. Such a strategy should include the welfare needs of farmed fish.
- It is important that aquaculture is recognised and facilitated as a strategically important source of food and non-food goods and services.
- A government champion (a policy focus for the aquaculture area) would be advantageous for all stakeholders.
- A strategy for England should build on previous Scottish and Welsh experiences whilst recognising the differences between these countries.
- Production of any policy or strategy for England should build on the previous Scottish and Welsh experiences whilst recognising the different drivers for any strategy between countries.
- The industry needs nurturing and better organisation in order to better market and develop aquaculture opportunities.
- Public attitudes need to be changed to give a more realistic public profile for aquaculture. Better understanding of the industry by policy makers, influencers, retailers, chefs and journalists was recommended. Labelling (in retail outlets, restaurants) would help to raise the industry’s profile. In

order to change eating habits in the longer term to increase fish / shellfish consumption (see FSA recommendations) the rising generation must embrace sea food consumption.

- The industry was hampered by inflexible regulations and more consultation with policy makers was suggested prior to the implementation of any new regulations.
- The move to linking energy sources (e.g. wind farms in the marine environment linked to mariculture, recirculation systems linked to cooling plants in terrestrial power production) should be encouraged by policy makers.
- Technical developments in aquaculture could and should mitigate any concerns from environmentalists.
- The aquaculture sector has always been entrepreneurial and would prefer to make the industry more profitable leading to further investment back into the industry rather than rely on government funding. Such profitability would lead to greater interest by investors and more attractive financial instruments.
- The industry is keen to establish an English Producers Link Organisation to act as a focus for English Aquaculture in general.

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