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Background

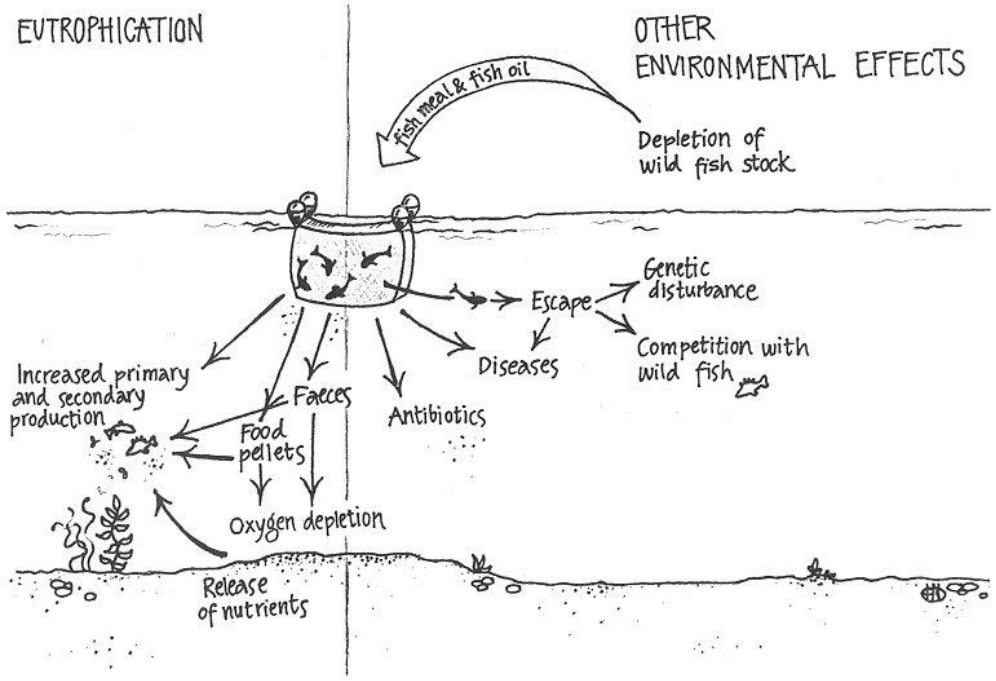
This document contains a position paper on principles and requirements for Sustainable Aquaculture in the Baltic Sea Region by Coalition Clean Baltic (CCB).

Action required

The Meeting is invited to take note of the information.

Coalition Clean Baltic
FOR PROTECTION OF THE BALTIC SEA ENVIRONMENT

Coalition Clean Baltic (CCB) position paper on principles and requirements for Sustainable Aquaculture in the Baltic Sea Region



From Nordvarg, L., 2001. Predictive models and eutrophication effects of fish farms. Acta Universitatis Upsaliensis. Comprehensive Summaries of Uppsala Dissertations from the Faculty of Science and Technology 602. 44 pp. Uppsala. ISBN 91-554-4932-8.

Summary

- CCB considers open cage systems placed in marine areas are laden with too many environmental problems and risks and CCB does not consider such operations as a sustainable option in the Baltic Sea, nor do they represent BAT for fish production in seawater
- Selection of species used must be based on principles of risk management in relation to genetic risks, needs for medicine, chemicals, type of feed needed (herbivore/carnivore/omnivore) and risks related to the spreading of diseases and parasites and escapees.
- Increases in aquaculture production of carnivorous fish increase the pressure of wild fish stocks and this link must be cut, alternative fish or organisms must be used or new feed must be in place before production can sustainably increase
- All aquaculture installations, also small-sized, must always have an environmental permit before the activity start, preceded by a thorough environmental impact assessments process
- Operational permits given for aquaculture production must contain e.g. elements of self-control, type and content in used feed, nutrient book keeping and species selections
- Permit for aquaculture operations shall include regulations on: Requirements/goals for zero escapes for all aquaculture species; monitoring programs for escapees (e.g. in cooperation with other installations and institutions); requirements to withdraw the permit if evidence of multiple escapees due to negligence or poor handling.
- Public financial support, subsidies, shall not be used to support construction and operation of aquaculture. Public money should only be used for measures and programs for technical development, innovations and research to alleviate problems caused by aquaculture

Introduction

About every second fish we eat comes from aquaculture, and it is one of the fastest growing food sectors globally. In Europe, aquaculture accounts for about one fifth of the total fish production. The growth of the aquaculture sector is likely to continue, increasing the need of a development of sustainable aquaculture.

The European Commission has declared that it is set to stimulate an increased aquaculture to fill out the gap between demand and supply of fish in the EU. This will be implemented in the framework of the new Common Fisheries Policy. The production should be environmentally, socially and economically sustainable.[1] Member States are currently developing national aquaculture strategies and this paper can be used as input to those strategies both nationally but also to form a Baltic regional approach to aquaculture.

The Commission has identified four priority areas to unlock the potential of EU aquaculture:

- a reduction of administrative burdens
- improved access to space and water
- increased competitiveness
- better exploitation of the competitive advantages deriving from high quality, health and environmental standards.

The focus on increasing, improving and aiding aquaculture is not unproblematic and there are several risks involved, especially in the semi-enclosed Baltic Sea. Here, eutrophication is already a problem and unless increased aquaculture activities follow a set of strict rules the problem will increase. Ambitions from Member States and the Commission are clearly focusing on increased production; and in OECD/FAO publication "Agricultural outlook 2011-2020", expect at least a 35% increase in production by 2020.

Aquaculture has a bad environmental reputation and there is good reason for that since sea based aquaculture farms has been known to harm the surrounding environment by excessive leakage of nutrient, escapees and by spreading of diseases, parasites, medicines and alien species. The problem of aquaculture is however not just a local problem as overfishing of fish stocks for aquaculture feed is usually taking place somewhere in the global south. To rely on imported fish from aquaculture outside the European Union is problematic and in fact irresponsible as production may act under less strict environmental policies and results in long transportation of fresh food. However this cannot be used as a valid argument to support and allow thoughtless operations in the EU.

[1] European Commission, COM (2013) 229

Defining sustainable aquaculture for the Baltic region

Sustainable aquaculture should apply to environmental, economical, social, fish and human welfare aspects, with methods that preclude negative impact on the environment. The best available technology that already exists today is a big improvement compared to older open cage systems, and such new technology must be the basis of all new operations. Aquaculture in the Baltic region must address and meet the demands and challenges listed in this paper to be sustainable. There are active farms in some places in the Baltic region that already do. Aquaculture activities must always be in line with the Water Framework Directive (WFD) and the Marine Strategy Framework Directive (MSFD) not to undermine the possibility of reaching Good Environmental Status.

What is the problem

In the Baltic, more or less all stakeholders and scientists acknowledge the major environmental problems connected to aquaculture, and several research projects have been set up so solve some of them.[2]

Major challenges and problems are:

- Loss of nutrients, disbursement of organic matter and the resulting local impacts
- The feed used and pressure on wild fish stocks
- Leakage of chemicals and pharmaceuticals
- Spreading of diseases and parasites
- Spreading of alien species and genetic information to wild relatives
- Animal welfare

Economic support via public money

For the definition of sustainable aquaculture, economic viability without dependence of subsidies, is highly relevant and must be a prerequisite for any public support given to individual companies. The EU is at risk of creating a new subsidies driven industry dependent on public support. CCB considers that public money should not be used as operational support and never as a base for calculating future profits. Support could be given to technical development, innovations and research to alleviate problems caused by aquaculture. Monitoring programs set up to control aquaculture production (escapes, disease etc) may only in part be paid for by public money.

-Public financial support, subsidies, shall not be used to support construction and operation of aquaculture. Public money should only be used for measures and programs for technical development, innovations and research to alleviate problems caused by aquaculture

Differences between open and re-circulating systems

Aquaculture in re-circular and controlled systems has many advantages to systems with open cages. One of the most important one when it comes to the Baltic is the ability to significantly reduce nutrient losses from the farms. But also the problems with discharge of chemicals, risk of escapes and spread of parasites and diseases can be better controlled in re-circulatory systems. Considering these problems and the already too high nutrient loads in the Baltic Sea, CCB can only consider an increase

[2] See for example the Aquabest project http://www.aquabestproject.eu and Aquafima project: http://www.aquafima.eu

in feed-driven aquaculture in the Baltic Sea region in land based re-circular systems as being sustainable. For species that do not need added feed, such as mussels and algae, such limitations do not exist, nor does many of the finfish problems listed above. The problem of finding suitable locations is also alleviated if land based systems are used, especially new systems that are close to being almost completely closed.

Location and permits

As the Baltic Sea drainage basin has a major eutrophication problem and alarming increases of anoxic bottom areas, the general approach must be that no aquaculture installations in the Baltic Sea or affecting the Baltic Sea, should be allowed to further intensify the problems. It may be acceptable to allow discharge of nutrient as long as the same input is compensated for by reduction of other nutrient sources to the same water area, leading to no increase of nutrient loads.

1. All aquaculture installations, also small-sized, must always have an environmental permit before the activity start.

2. Thorough environmental impact assessments (EIA) with links to WFD and MSFD (incl. water environmental status, nutrient-balanced performance, risk of spreading non-indigenous species, risk of genetic pollution of native species etc.) are key requirements for a mandatory permission process. Operational permits should always contain a monitoring program, including self-monitoring requirement covering nutrients, escapes, chemicals etc.

3. Spatial planning and the Strategic Environmental Assessments (SEA) are essential for aquaculture location and permits. Especially relevant are responsibilities for member states to monitor effects of national aquaculture plans and transboundary consultations under the SEA Directive.

4. Permits should include set limits of chemical and nutrient loads to the environment (according to environmental water quality standards and Water Framework Directive requirements) with direct legal force, meaning that if loads are exceeded, operation must halt.[3]

5. Production permits should set requirements on the content of the feed to be used. In the Baltic Sea catchment, fish protein/fat in feed should only come from the Baltic Sea catchment to reduce unnecessary nutrient import and to increase possibility to control origin of aquaculture feed.

6. A harmonized system of monitoring impacts of aquaculture established and decided upon, by e.g. BALTFISH, should be in place in the Baltic region. The use of Environmental DNA monitoring[4] (where DNA-analyses from water sampling can give info on up-stream/neighboring fish species/genetics) should be a mainstreamed tool to control escapes of farmed fish to the wild.

[3] Such legally binding requirements are in force in operations in Sweden, in Jämtland County, Vattudals Fisk. Land and Environmental Court Östersund, Sweden, environmental case M-2139-11.

[4] Environmental DNA is a cost effective method of monitoring large areas for the presence of alien or native species via water sample testing and should be used in lake and river systems, but is also applicable in marine areas. For example, detection upstream a aquaculture farm can be evidence of escaped fish: http://pubs.usgs.gov/fs/2012/3146/

7. Evidence of escapes from finfish aquaculture to the wild must be linked to actions such as temporary halting, or if frequent incidents occur, stopping production.

8. No feed driven fish aquaculture can be allowed in protected areas (e.g. Natura 2000) or in areas of importance to fish reproduction (Recovery Areas, art. 8 in CFP Basic Regulation).

Alternative fish feed to reduce pressure on wild fish

The fish feed needed for aquaculture is a key issue, perhaps the most difficult one. To use wild fish for aquaculture, fish that could be used for direct human consumption, is poor use of resources. Fish-components in aquaculture feed should never threaten or compete with fish that already today are used as food resource. If such wild fish originates from other parts of the world where consumption patterns are different from here, and the wild fish targeted for fish feed production is already clearly used for human consumption it is unacceptable.

Alternative fat and protein sources are already available and ideas to only use fish or other input resources from the Baltic Sea are a way to stop importing more nutrients to the Baltic Sea region. However, plans to increase aquaculture production in the Baltic region will even with the best alternative feed available today cause an increased pressure on wild fish stocks. Delinking aquaculture and the feed used from dependency on wild fish is of utmost importance. The industry chain from fisheries, via feed producers to aquaculture plants must show that this delinking is taking place in practice to be sustainable. It is therefore reasonable to commit to this change and pushing feed development from a few showcase examples to mainstream by connecting aquaculture production permits to feed content and by that clearly show the origin and the content of the feed.

Requirements to use only Baltic fish feed in Baltic aquaculture can potentially limit nutrient loading to the Baltic Sea. Import of nutrient-rich feed for Baltic aquaculture from other sea areas would bring "new" nutrient loading to the Baltic Sea, which is unacceptable and unnecessary. Requirements to use only Baltic fish feed in the Baltic Sea is also a good way to proper control that fish feed always come from sustainable fisheries.

New fishery regulations will now require all the formerly discarded fish to be landed. This bycatch and the potential to sell it for fish meal/oil production must not become an option to accept unsustainable fisheries with unacceptable high bycatch levels. Focus must remain on reducing bycatch at sea and not on how to utilize is when it is landed.

Unless it is mandatory to use the best and local/regional feed, these new and potentially sustainable feeds will remain good ideas and desktop products.

1. Alternative feed components such as insects, mussels, microbial meal etc must be developed and also utilized in all feed used. The use of plant-based feeds should also be maximized and be produced from sustainable agriculture.

2. Fish waste from fishing vessels and fish-processing is a good product that should be used for fish-aquaculture fodder.

3. Any wild fish used for production of fish feed for Baltic aquaculture must come from Baltic Sea fish stocks that are harvested sustainably, at least according to MSY, and not in conflict with ecosystem considerations under the Marine Strategy Framework Directive and the CFP.

4. Fisheries targeting stocks without a fishing quota and without scientific stock assessments, with the main purpose to use such fish as raw materials for fish fodder production cannot be accepted.

5. Landed bycatch, formerly discarded fish in Baltic fisheries should not be used for Baltic fish-feed production, if this counteracts the pressure to minimize bycatch in Baltic fisheries.

6. Input to fish feed production must never threaten food resources for people living in areas where fishing for wild fish occurs.

7. Fish and fish waste used for fodder production must guarantee low content of toxic substances in the fodder product.

8. No GMOs should be used in fish feed.

Nutrient loads & chemicals

Both nutrients and use of chemicals and pharmaceuticals represent problems that can be greatly reduced or compensated.

Nutrient loads (eutrophication) shall not increase, i.e. increased nutrient load require compensation corresponding to an equal reduction from other sources in the same geographical catchment area or Baltic Sea sub basin. Possible compensatory methods for nutrient load can include farming of algae or shellfish or establishment of land based wetlands for nutrient removal.

The need for antibiotics has been reduced greatly in the aquaculture industry already and the use of antibiotics should be stopped in open-cage systems.

Chemicals used for cleaning, disinfecting and anti-fouling must be used with great care. A list of acceptable substances should be developed and used in the Baltic region based on chemicals with documented effects that are biodegradable, have low persistence and toxicity and are not bioaccumulative. The use of chemicals in industries, recreational boating etc is something modern society has worked hard to reduce or remove, and we cannot have a growing aquaculture adding to the problem.

Open cage systems in marine areas, lakes and rivers

1. Nutrient load discharges from aquaculture shall always require compensation measures, corresponding to an equal reduction from other nutrient sources in the same geographical catchment area or Baltic Sea sub basin.

2. Open cage systems cannot be accepted in Baltic Sea sub-basins classified with eutrophication problems.

3. Open cage systems can be allowed without nutrient compensation measures in rivers and lakes in Baltic Sea catchment, if ecological water quality criteria, according to Water Framework Directive, are met, and no additional nutrient load will reach lower river catchment and the Baltic Sea.

4. Aquaculture must be nutrient balanced and reliable nutrient budgets must be developed and be a required part of aquaculture permits.

5. Antibiotics in open cage systems should not be allowed at all.

6. Use of chemicals for anti-fouling, disinfection etc. must be reduced. Only chemicals with known effects and side effects may be used and be subject to changes if new facts arise.

Land based recirculation systems

1. The use of antibiotics can be allowed if under strict control in closed systems if no residue is dispersed.

2. Control of nutrients is simpler in closed systems, and monitoring of possible discharge can be controlled.

3. Recirculation systems do normally not require nutrient load compensation, as excess nutrients can be removed via filtration techniques and recycled. Combining aquaculture and agriculture should be supported thus maximizing the resources and improve energy efficiency.

Species used in aquaculture

Escaped fish (with risk for genetic mixing and competition) cause depletion of the genetic variability of wild stocks and spread of diseases and parasites to the wild are two problems that depending on location and species can be catastrophic. Salmon farming in many parts of the world has led to serious impact on wild salmon and other species. Escaped fish are turning up as spawners in faraway river systems, for example on the Swedish west coast in the river Göta Älv where a genetic study has shown that 40% of all salmons are of unknown origin and most likely are farmed salmon from Norway[5]. Salmon farming in Norway has now set up goals of zero escapes from farms and the Baltic Region must set that as the only acceptable level, even though that figure is impossible in reality.

In the Baltic region, using native Baltic salmon and trout in aquaculture in marine areas is highly inappropriate. There are several and potentially severe risks to the wild stocks, related to genetic pollution of escaped fish and the spreading of parasites and diseases.

The Baltic Sea brackish water ecosystem is sensitive to the introduction of alien species and aquaculture must be based on a zero tolerance of using such potential invasive species. The problem of alien species is potentially amplified by climate change and changes in aquatic species biogeographical range may give way for new species to survive and thrive. Carnivorous fish are predominant in our region but increased focus on herbivores or omnivores is desirable and efforts to increase rearing and market such fish should be welcomed.

1. Species selection used must be based on principles of risk management in relation to genetic risks, needs for medicine, chemicals, type of feed needed (herbivore/carnivore/omnivore) and risks related to the spreading of diseases, parasites and escapees.

2. Suitable species in open cage operations should have no or low risk of mixing genetically with wild fish present in the ecosystem.

3. The use of genetically modified species or treatments with hormones to sterilize fish etc. is not acceptable.

[5] Swedish genetic study made by Swedish University of Agricultural Sciences for the County Administrative Board of Västra Götaland in 2011, http://www.lansstyrelsen.se/vastragotaland/SiteCollectionDocuments/Sv/publikationer/2011/2011-50.pdf

4. Atlantic/Baltic salmon and sea-trout cannot be accepted in today's open-cage aquaculture system in the Baltic Sea. There are several and potentially severe risks to the wild salmonid stocks, related to genetic pollution of escaped fish and the spreading of parasites and diseases.

5. Requirements/goals must be set to zero escapes for aquaculture species in open cages and dams.

6. Climatic changes must be taken into account both regarding risk management in general, i.e. storm safety etc but also to carefully consider biogeographical changes.

7. Aquaculture in closed re-circulation systems do not have the same problem with escapes, parasites and disease and could therefore potentially farm different species, including native fish stocks. However strict control of live fish is needed to preventing releases to wild habitats.

Animal welfare aspects

Too high densities in any animal farm is problematic both from the perspective of animal welfare and disease control. The latter is often more or less self-regulating as experienced aquaculture farmers know that quality and growth will be impaired if densities are too high. Common rules to use best available technique when slaughtering fish should be established to keep a level playing field among producers and to secure ethical principles to avoid stress and pain.

1. Transports of all live fish should be minimized.

2. Slaughtering methods should use either percussive or electric stunning.

3. Develop recommendations for fish densities to reduce stress and maximize welfare of the reared fish.

4. Transport of fish between farms should be controlled to avoid spread of parasites and disease. There must be both a national and international control of transfer of live fish and eggs.

References

European Commission 2013. Strategic Guidelines for the sustainable development of EU aquaculture. Communication from the commission to the European Parliament, the council, the European economic and social committee and the committee of the regions.COM (2013) 229 http://ec.europa.eu/fisheries/cfp/aquaculture/official_documents/com_2013_229_en.pdf

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