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## **Preparation of this document**

Fisheries and aquaculture are facing nowadays several challenges worldwide so as to meet public regulations concerning food safety and security which are more and more strict and to face the growing demand of responsible, sustainable, high quality and high nutritional intake products.

Concerns about the sustainability of capture fisheries and aquaculture has been raised several times during the last GFCM sessions. New approaches dealing with those issues have included the certification of fisheries harvested by sustainable means and the ecolabelling of fish and seafood products from certified fisheries and/or aquaculture farms.

The purpose of this document is to provide an overview about certification and ecolabelling in the aquaculture industry and to give guidance to the countries of the competence area of the GFCM with regards to this subject in order to improve sustainability in the sector.

## Abbreviations and acronyms

AB	accreditation body
ACC	Aquaculture Certification Council
ASC	Aquaculture Stewardship Council
B2B	business to business
B2C	business to consumer
BAP	Best Aquaculture Practices
BMP	best management practice
BRC	British Retail Consortium
CCRF	Code of conduct for Responsible Fisheries
Code	FAO Code of Conduct for Responsible Fisheries
COFI	FAO Committee in Fisheries
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FOS	Friend of the Sea
FSMS	Food Safety Management Scheme
GAA	Global Aquaculture Alliance
GAP	good aquaculture practice
GFCM	General Fisheries Commission for the Mediterranean
GFSI	Global Food Safety Initiative
GMO	Genetically Modified Organism
HACCP	Hazard Analysis and Critical Control Point (system)
ICCAT	International Commission for the Conservation of Atlantic Tunas
IFOAM	International Federation of Organic Agriculture movements
IFS	International Food Standard
ILO	international Labor Organization of the United Nations
ISO	International Organization for standardization
NGO	Non-Governmental Organization
OECD	Organization for Economic Co-operation and Development
OIE	World Organization for Animal Health
UICN	Union internationale pour la conservation de la nature
UNCED	United Nations Conference on Environmental Development
UNCLOS	United Nations Convention on the Law of the Sea
UNFSA	United Nations Fish Stocks Agreement
USEPA	United States environmental Protection Agency
WHO	World Health Organization of the United Nations
WWF	World Wide Fund for Nature

## **Terms and definitions**

### ***Accreditation***

Procedure by which a competent body gives formal recognition that a qualified body or person is competent to carry out specific tasks

(Based on ISO/IEC Guide 2:1996, 12.11)

### ***Accreditation body***

Body that conducts and administers an accreditation system and grants accreditation.

(Based on FAO technical guidelines on aquaculture certification)

### ***Certification***

Procedure by which an official certification body or officially recognized certification body gives written or equivalent assurance that a product, process or service conforms to specified requirements. Certification may be, as appropriate, based on audit activities that may include continuous audit in the production chain.

### ***Certification body***

Competent and recognized body that conducts certification. A certification body may oversee certification activities carried out on its behalf by other bodies.

(Based on ISO guide 2, 15.2)

### ***Certification scheme***

The processes, systems, procedures and activities related to standard setting, accreditation and implementation of certification, including the labeling of practices, operations and products.

### ***Chain of custody***

The set of measures that verify that a certified product originates from a certified aquaculture production chain, and is not mixed with non-certified products. Chain of custody verification measures should cover the tracking/traceability of the product all along the production, processing, distribution and marketing chain, the tracking of documentation, and the quantity concerned. (Based on FAO/COFI technical guidelines on aquaculture certification)

### ***Product certification***

Verification that a certain product has passed performance and/or quality assurance tests or qualification requirements stipulated in standards or regulations or that it complies with a set of criteria governing quality and/or minimum performance requirements.

### ***Responsible aquaculture***

Aquaculture conducted according to the principles provided in the FAO Code.

### ***Stakeholder***

An individual or group of individuals, whether at institutional or personal level, who has an interest or claim that the potential of being impacted by or having an impact on a given activity. This interest or claim can be stated or implied and direct or indirect. Stakeholders or stakeholder groups can be at the household, community, local, regional, national, or international level.

### ***Standard***

Document approved by a recognized body organization entity, that provides, for common and repeated use, rules, guidelines or characteristics for products or related processes and production methods, with which compliance is not mandatory under international trade rules. It may also include deal exclusively with terminology, symbols, packaging, marking or labeling requirements as they apply to a product, process or production method.

(Based on TBT agreement, Annex 1, Para. 2)

### ***Third party***

Person or body that is recognized as being independent of the parties involved, as concerns the issue in question, and involves no conflict of interest.

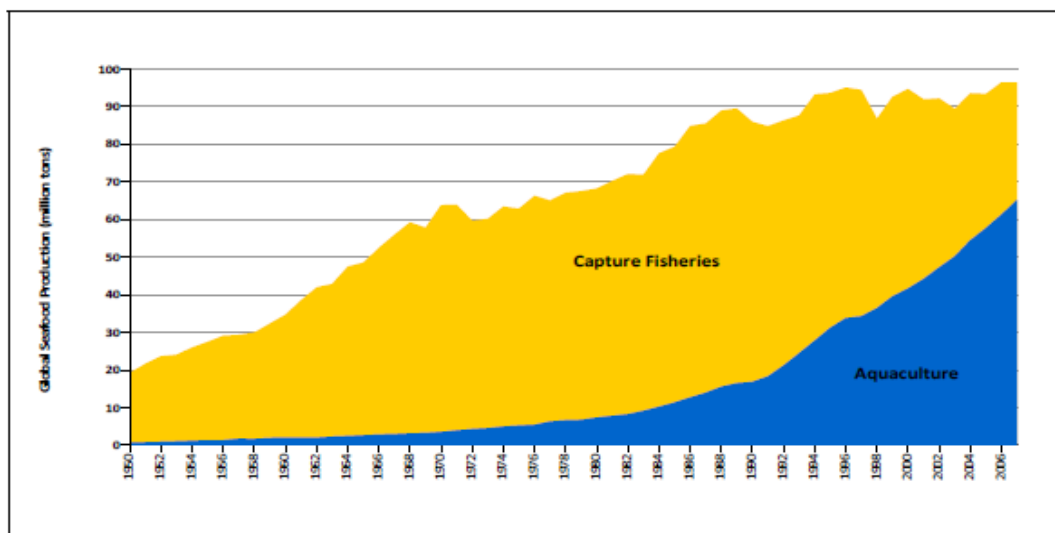
(ISO/IEC Guide 2: 1996; Ecolabelling Guidelines)

## Introduction:

The seafood industry is a vital sector that provides food and protein, employment and income to billions of people worldwide. The United Nations Food and Agriculture Organization (FAO) estimates that fisheries and aquaculture support the livelihood of 540 million people (8 percent of the world population) (FAO2010).

Aquaculture is considered by the United Nations as the fastest-growing food-production sector worldwide, its contribution in fish and fishery products supply in 2008 represented 36.9 percent, and the production reached 52.5 million tons, this trend is not only the result of the global demand for seafood, but also of falling captures of wild fish.

Figure 1: total world capture fisheries and aquaculture 1950-2006



Source: FAO (2008), elaborated by APROMAR

## Main aquaculture species in international trade (2008)

Aquaculture species	Production (1000t) 2008
Shrimp	3.450
Tilapia	2.500
Salmon	1.540
Pangasius	1.375
Channel catfish	350
Trout	320
Seabream	160
Seabass	150
Other flatfish	125

Barramundi	45
Cobia	40
Atlantic cod	23
Oysters	4.320
Clams, cockles, arkshells	1.62
Mussels	1.620

Food and Agriculture Organization of the United Nations 2008

### Top aquaculture producing countries (2008)

Countries	Production (1000t) 2008
China	32.736
India	3.479
Vietnam	2.469
	1.374
Thailand	
Indonesia	1.690
Bangladesh	1.006
Chile	843
Japan	732
Norway	844
Philippines	741
Egypt	694
Myanmar	675
USA	500
Rep of Korea	474
Taiwan PC.	324

Food and Agriculture Organization of the United Nations 2008

Aquaculture activity is defined as the farming of aquatic organisms including fish, molluscs, crustaceans and aquatic plants. It involves farming aquatic organisms under different cultivation environments (inland or marine and capture or not capture).

In the Mediterranean region, aquaculture is an ancient activity which started many centuries ago and which is experiencing a growing trend nowadays. The origin of this activity which started during the ancient Egyptian civilization and practiced also in the 5<sup>th</sup> century BC by the Greeks, conditioned the beginning of the modern Mediterranean aquaculture, which started about 4 decades ago.

Looking closely at the annual growth rate, it can be observed that total aquaculture production in the region including all categories and species totaled 1 228 457 tonnes in



2007, which represents an increase of 252 % from 1995 (487 488 tonnes) and an annual growth of 21% during this period.

The species group that has shown the fastest growth rate of production in the GFCM area has been the marine Finfish especially Gilthead Seabream and European Seabass increasing from 188 815 tonnes on 2003 to 281 606 tonnes in 2007. (Based on GFCM studies and reviews No. 88)

As in other parts in the world, the aquaculture sector in the Mediterranean is facing a series of constraints; international competition, regulations and standards which are different from a country to another, evolution of the markets also, as well as constraints of infrastructure and human resources, but recently aquaculture industry starts facing the challenge of meeting the increasing demand of high quality seafood products in local and international markets. Nowadays, Mediterranean population is more aware consumers, more educated and health conscious and questioning about the food they are eating. Those consumers are not only interested in the quality of the food but also about the way the seafood production impacts on the environment. In order to satisfy this increasing demand and to avoid any environmental disturbance, the Mediterranean aquaculture needs to develop in a sustainable manner.

Therefore, standards and practices for farming, processing and selling of aquaculture products should be adapting to meet those new demanding criterion-that of sustainability.

As a response to these global awareness new approaches to improving the environmental sustainability of aquaculture farms, processing plants and distributors have been established, including an increasing number of ecolabelling and certification schemes for fish and fishery products from both capture fisheries and aquaculture.

### **What are seafood certification, certification schemes and ecolabelling?**

Certification is a procedure made by an official certification body to recognize that a product, process or service conforms to specified standards or regulations. Certification procedure should give a written or an equivalence assurance that the product, the process or the service has passed performance and/or quality assurance or qualification requirements stipulated in the standards and the regulations.

Certification schemes are all the activities related to standard setting, accreditation and implementation of certification, including the labelling of practices, operations and products.

Ecolabelling is a market-based tool to promote the sustainable use of natural resources. Ecolabels are seals of approval given to products that are deemed to have fewer impacts on the environment than functionally or competitively similar products.

As has been identified by the international organization for standardization (ISO), the overall goal of these labels and declarations is:

*"...through communication of verifiable and accurate information, that is not misleading, on environmental aspects of products and services, to encourage the demand for and supply of those products and services that cause less stress on the environment, thereby stimulating the potential for market-driven continuous environmental improvement".*

The purpose of ecolabelling and certification schemes is to influence the purchasing decisions of consumers, the procurement policies of producers and retailers, and to reward responsible fisheries and aquaculture farms.

A range of ecolabelling and certification schemes exists for fish and fishery products, each with its own specifications, standards, levels of transparency and sponsors, and can cover different aspects going from environmental aspects, or animal welfare to social and economical development aspects.

The developers of standards and certification schemes also vary; non-governmental organizations (WWF), Governments (E.U, France, Iceland), companies (Carrefour), etc

### **Origins of ecolabelling in fisheries and aquaculture:**

The ecolabelling schemes have emerged in reference to national, regional and international measures for fisheries and aquaculture sustainability at the early 1980s, which are:

- The United Nations Convention on the law of the Sea (UNCLOS) (1982);
- The FAO Code of Conduct for Responsible Fisheries(CCRF)(1995);
- The United Nations Fish Stocks Agreement(UNFSA) (1995);
- Various regional fisheries management organizations(RFMO's) i.e. ICCAT
- The FAO Guidelines for the Ecolabelling of Fish and Fishery Products from Marine capture Fisheries.
- The FEAP Code of Conduct for European Aquaculture (FEAP 2006)

Ecolabelling was first recognized at an international level in 1992, during the United Nations Conference on Environment which was held in Rio de Janeiro. This type of certification, originally defined simply as "making relevant environmental information available to appropriate consumers" (USEPA 1993)

### **Objectives of ecolabels and certification schemes:**

- Communicate verifiable and accurate information
- Encourage demand and supply of eco-friendly products and services
- Reduce ecosystem's degradation

- Stimulate market-driven continuous environmental improvement

## **FAO Technical guidelines On Aquaculture certification.**

FAO, in collaboration with the network of Aquaculture Centers in Asia-Pacific (NACA), developed guidelines for the development, organization and implementation of credible aquaculture certification schemes.

The guidelines cover 4 ranges of issues which are considered as relevant for certification In aquaculture, and an aquaculture certification scheme may address one or all of these issues:

1. Animal health and welfare
2. Food safety and quality
3. Environmental integrity
4. Social responsibility

The following section represents an overview of the principles and the minimum criteria and requirements for aquaculture certification published by FAO commission on fisheries (COFI) in the Technical Guidelines on Aquaculture Certification document.

### ***Principles:***

#### ***1. Aquaculture certification schemes:***

- a. Should be based on international standards or guidelines, where applicable, and must recognize the sovereign rights of states and comply with relevant local, national and international laws and regulations. They must be consistent with relevant international agreements, conventions, standards, codes of practice and guidelines.
- b. Should recognize that any person or entity undertaking aquaculture activities is obliged to comply with all national laws and regulations.
- c. Should be developed based on the best scientific evidence available, also taking into account traditional knowledge, provided that its validity can be objectively verified.
- d. Should be developed and implemented in a transparent manner and should ensure that there is no conflict of interest among the entities that are responsible for standards setting, accreditation, and certification. These entities should facilitate mutual recognition, strive to achieve harmonization and recognize equivalence, based on the requirements and criteria outlined in these guidelines.
- e. Should be opened to scrutiny by consumers, civil society, and their respective organizations and other interested parties, while respecting legitimate concerns to preserve confidentiality.

- f. Should be credible and robust, should be fully effective in achieving their designated objectives.
- g. Should promote responsible aquaculture during production as outlines in the FAO Code of Conduct for Responsible Fisheries, in particular the Article 9, Aquaculture Development.
- h. Should include adequate procedures for maintaining chain of custody and traceability of certified aquaculture products and processes.
- i. Should establish clear accountability for all involved parties, including the owners of certification schemes, accreditation bodies and the certification bodies, in conformity with international requirements, as necessary.
- j. Should not discriminate against any group of farmers practicing responsible aquaculture based on scale, intensity of production, or technology; promote cooperation among certification bodies, farmers and traders; incorporate reliable, independent auditing and verification procedures; and should be cost-effective to ensure inclusive participation of responsible farmers.
- k. Should strive to encourage responsible trade, consist with the FAO Technical guidelines of Responsible Fish Trade, and should provide the opportunity for aquaculture products to enter international markets without obstacles of trade.
- l. Should ensure special considerations are provided to address the interests of resource-poor small-scale farmers, especially the financial costs and benefits of participation, without compromising food safety.
- m. These aquaculture certification guidelines should recognize the special needs of farmers and governments in developing countries. These guidelines should also recognize the special role of FAO in assisting developing countries in devising an implementation framework which is both attainable and measurable. Similarly, FAO should facilitate the assessment of the capacity of farmers and governments to meet the proposed requirements of aquaculture certification schemes and to develop realistic expectations with regard to the farmers and governments meeting these requirements.

### ***Minimum substantive criteria for aquaculture certification.***

2. Minimum substantive criteria for developing aquaculture certification standards are provided in this section for a) animal health and welfare, b) food safety, c) environmental integrity and d) socio-economic aspects. The extent to which a certification scheme seeks to address the issues in all or some of these four areas depends on the objectives of the scheme. Development of certification schemes should consider the importance of being able to measure performance of aquaculture systems and practices, and the ability to assess conformity with certification standards.

### **Animal health and welfare<sup>1</sup>**

3. Aquaculture activities should be conducted in a manner that assures the health and welfare of farmed aquatic animals, by optimizing health, minimizing stress, reducing phases of the production cycle.

### **Minimum substantive criteria for addressing aquatic animal health and welfare in aquaculture certification schemes:**

4. Aquaculture facilities/operations should prepare and implement an aquatic animal health management program in compliance with relevant national and international legislation.
5. Trade in aquatic animals, animal genetic material and animal products should comply with the provisions in the OIE Aquatic Animal Health Code to prevent introduction and/or transfer of diseases and infectious agents pathogenic to aquatic animals.
6. Movement of live aquatic animals and setting up of health management programs should take into account the practices described in the FAO CCRF Technical Guidelines on Health Management for Responsible Movement of Live Aquatic Animals.
7. Preference should be given for the use of aquatic animals certified healthy and/or free of serious pathogens in aquaculture.
8. Maintenance of an healthy culture environment at all phases of the production cycle to reduce risks of aquatic animal disease before they occur by:
  - Thorough preparation of the culture facilities before stocking (e.g. system disinfection and fallowing according to the OIE Aquatic Animal Health Code).

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<sup>1</sup> For the purpose of these guidelines, reference to animal welfare applies only insofar as it affects animal health consistent with current and future OIE.

- Maintenance of optimal environmental conditions through management of stocking densities, aeration, feeding, water exchange, phytoplankton bloom control, etc., as appropriate.
  - Employment of effective quarantining where necessary
  - Implementation of health management practices that reduce animal stress.
  - Routine monitoring for early detection of aquatic animal health problems.
  - Implementation of management practices that avoid or reduce the likelihood of disease transmission within and between aquaculture facilities or to the natural aquatic fauna.
9. Minimal and responsible use of veterinary drugs and antibacterials, and implementation of management strategies that avoid or reduce the release of excess quantities of chemicals, drugs, antibacterials and vaccines into the surrounding environment.
  10. Treating any disease immediately and effectively using recommended efficient procedures, with the minimal use of permitted chemicals, veterinary drugs and antibacterials.
  11. Careful consideration of species use in polyculture or integrated multi orphic aquaculture to reduce potential stress and suffering of culture species.
  12. Implementation of measures to reduce unnecessary stress and suffering of animals during culture, harvest, in transit, at market or at a place of slaughter, as appropriate.
  13. Workers should be trained on good aquatic animal health management practices to ensure they are aware of their role and responsibility in maintaining aquatic animal health and welfare in aquaculture.

### **Food Safety and Quality**

14. Aquaculture activities should be conducted in a manner that ensures food safety and quality by implementing appropriate standards and regulations as defined by FAO/WHO *Codex Alimentarius*, and in related codes of practice and guidelines developed within the context of the *Codex Alimentarius* Commission and any other relevant organizations.

#### ***Minimum substantive criteria for addressing food safety and quality in aquaculture certification schemes:***

15. Aquaculture facilities should be located in areas where the risk of contamination by biological, chemical, or physical food safety hazards is minimized and where sources of pollution can be controlled. Potential sources of contamination from the surroundings (e.g. agricultural farms, industries, sewage) should be evaluated and considered and management measures should be put in place to control risks. Aquaculture should not be carried out in areas where the presence of potentially

harmful substances would lead to an unacceptable level of such substances in aquaculture products.

16. Where feed is used, aquaculture operations should include procedures for avoiding feed contamination and promoting efforts that improve selection and use of appropriate feeds and feed additives. Aquaculture operations should use feeds and feed ingredients which do not contain unsafe levels of pesticides, biological, chemical and physical contaminants and or other adulterated substances. This should be assured by the feed producer or subjected to hazard analysis. Feeds should be handled and stored in such a way to prevent spoilage, mould growth and contamination. If fish silage, trash fish and offal from fish are used as feed, these should be properly treated to eliminate potential hazards to human health.
17. Apart from major nutritional ingredients; feed which is manufactured or prepared on the farm should contain only substances permitted by the competent national authority. Such substances include feed additives, growth promoting substances, fish flesh colouring agents, anti-oxidizing agents, anti-caking agents or veterinary drugs. Medicated feeds should be clearly identified in the package and stored separately, in order to avoid misapplication.
18. All veterinary drugs and chemicals for use in aquaculture should comply with national regulations and international guidelines. Wherever applicable, veterinary drugs and chemicals should be registered with the competent national authority. Control of diseases with drugs should be carried out only on the basis of an accurate diagnosis. Products should only be prescribed and distributed by personnel authorized under national regulations. Authorized veterinary drugs and chemicals or medicated feeds should be used according to the instructions of the manufacturer or other competent authority, with particular attention to withdrawal periods. Banned antibacterials, veterinary drugs and/or chemicals should not be used in aquaculture production, transportation or product processing.
19. Water used for aquaculture should be of a quality suitable for the production of food which is safe for human consumption. Farms should not be sited where there is a risk of contamination of the water in which animals are reared by chemical or biological hazards.
20. If wastewater is used, the WHO guidelines for the use of wastewater in aquaculture should be followed.
21. The source of broodstock and seed for culture (larvae, post larvae, fry and fingerling, etc) should be such to avoid the carryover of potential hazards (e.g. antibiotics, parasites, etc.) into the growing stocks.
22. Traceability and record keeping of farming activities and inputs which impact food safety should be ensured by documenting, *inter alia*:



- The source of inputs such as feed, seed, veterinary drugs and antibacterials (dosage and withdrawal times), additives, chemicals.
  - The use of inputs.
  - Type, concentration, dosage and withdrawal times of veterinary drugs and antibacterials.
23. Aquaculture facilities and operations should maintain good culture and hygienic conditions, including:
- Good hygiene practices in the farm surroundings should be applied aiming at minimizing contamination of growing water, particularly from waste materials or faecal matter from animals or humans.
  - HACCP principles should be applied during culture to ensure good hygienic culture conditions and safety and quality of aquaculture produce.
  - Farms should institute a pest control program, so that rodents, birds and other wild and domesticated animals are controlled, especially around feed storage areas.
  - Farm grounds should be well maintained to reduce or eliminate food safety hazards.
  - Equipment such as cages and nets should be designed and constructed to ensure minimum physical damage of the animals.
  - All equipment and holding facilities should be easy to clean and to disinfect and should be cleaned and disinfected regularly and as appropriate.
  - Diseased aquatic animals should be quarantined when necessary and appropriate and dead animals should be disposed of in a sanitary manner.
  - Appropriate techniques for harvesting, storing and transportation of aquaculture products should be applied to minimize contamination, physical damage and stress.
24. Identification, classification and monitoring programs should be implemented in bivalve mollusks growing areas to prevent contamination from microbiological and chemical hazards and from biotoxins.
25. Workers should be trained on good hygienic practices to ensure they are aware of their role and responsibility for protecting aquaculture products from contamination and deterioration.

### **Environmental Integrity**

26. Aquaculture should be planned and practiced in an environmentally responsible manner, in accordance with appropriate national and international rules and regulations.
27. Aquaculture can impact on the environment in various ways including: a) biodiversity, habitats and ecosystems, b) genetic diversity including GMOs, c) endangered species, exotic species, alien and migratory species, d) natural fish stocks and species and the associated ecosystems, and e) water, soil and air quality.

Aquaculture certification schemes should ensure these impacts are identified and managed or mitigated to an acceptable level.

28. Management practices that address environmental impacts of aquaculture differ substantially for different types of scale of aquaculture and for different aquaculture farming systems. Certification schemes should not be overly prescriptive, but set measurable benchmarks that encourage improvement and innovation in environmental performance of aquaculture.
29. Certification should consider application of the “precautionary approach”, i.e. the absence of adequate scientific information should not be used as a reason for postponing or failing to take corrective (or appropriate) measures to address environmental impacts.
30. Use of “Risk Analysis”, i.e. relevant uncertainties should be taken into account through a suitable scientific method of assessing the likelihood and magnitude of impacts.  
Appropriate reference points should be determined and remedial actions taken if reference points are approached or exceeded.
31. “Polluter Pays” principle, i.e. those who cause pollution or contamination are responsible for its effects and compensate for the damage incurred and/or rehabilitation efforts and by taking measures to avoid creating further pollution, which apply up to the limits prescribed by national and international laws.

***Minimum substantive criteria for addressing environmental integrity in aquaculture certification schemes:***

32. Certification schemes should identify and support management of the most probable adverse environmental impacts.
33. Environmental impact assessments should be employed, according to national legislation, prior to approval of aquaculture operations.
34. Aquaculture planning, development and operational practices should ensure that associated environmental integrity issues are effectively and adequately addressed.
35. Routine monitoring of on-farm and off-farm environmental quality, combined with good record keeping, use of appropriate methodologies and community participation.
36. Evaluation and mitigation of the impacts on surrounding natural ecosystems including fauna, flora and habitats of high conservation value.

37. Efficient water extraction and use and responsible effluent management measures to reduce impacts on surrounding land and water resources.
38. Encourage restoration of damages impacted by previous uses of the aquaculture site.
39. Responsible use of hatchery produced seed for culture, where possible. Seed from the wild should only be used when collected using responsible practices.
40. Minimize escape of all cultured species into natural habitats.
41. Encourage the use of native species where appropriate, whilst minimizing their escape to the wild.
42. Exotic species are only used when they pose low potential risk to the natural environment, biodiversity and ecosystem health.
43. Non-use of GMOs that risk compromising biodiversity and human health.
44. Responsible construction of infrastructure and disposal of waste from aquaculture.
45. Responsible use of feeds, feed additives, manure and fertilizer that improves net energy conversion and economic viability.
46. Responsible use of chemicals, veterinary drugs and antibacterials.
47. Responsible use of energy to reduce negative environmental impacts.

## **Social Responsibility**

48. Aquaculture should be conducted in a socially responsible manner, within national rules and regulations, to benefit aquaculture workers, local communities, investors and the country. Aquaculture should contribute effectively to rural development, poverty alleviation and food security and deliver benefits to the local community and surrounding resource users.

### ***Minimum substantive criteria for addressing social responsibility in aquaculture certification schemes:***

49. Certification should seek to support development among rural farming communities, and not lead to marginalization of small-scale aquaculture farmers or exclusion from market chains and trade of certified aquaculture products from small-scale farmers.

50. Socio-economic issues should be considered at all stages of aquaculture planning, development and operation, in order to maximize benefits and equity and to minimize any negative economic consequences to workers and/or communities.
51. Gender and generation issues, impacts on women and youth, and opportunities for women and youth should be identified, evaluated and addressed during planning, development and operation of aquaculture.
52. Workers must be treated responsibly within the national labor rules and regulations and international labor conventions as appropriate. Child labor should never be used outside of the existing ILO conventions and standards.
53. Workers should be paid wages and provided other welfare facilities according to national rules and regulations.
54. Special efforts should be made to ensure participation of resource poor small-scale farmers in certification schemes.
55. Social requirements should not create unnecessary obstacles to trade, and should facilitate market access.
56. The special concerns and interests of resource poor small-scale farmers should be considered, especially the financial costs and benefits of participation.
57. Investment in the costs of transition for small-scale farmers to enter and participate in certified market chains by public and private sectors should be facilitated.
58. The importance of corporate social responsibility in engaging small-scale farmers and other small-scale stakeholders in market chains should be recognized.

As we discussed earlier, some ecolabels are regionally specific, while others are global; and some have stricter criteria than others. Compounding the problem is a lack of good quality standardized and comparable information worldwide. According to a European market research study (OECD, 2006), marketing, consumer confusion and competition between similar schemes has caused low market penetration for some ecolabels.

The following section lists a number of certification schemes related to aquaculture practices, some of them deal with sustainability issues, some with food safety issues and others concern the certification of organic aquaculture.

## Aquaculture certification schemes:

### ***Certification A: The global aquaculture alliance:***

#### **Background:**

The global aquaculture alliance (GAA) is an international non-profit organization (NGO) created in 1997 and dedicated to advancing environmentally and socially responsible aquaculture and a safe supply of seafood to meet growing world food needs.

To promote responsible practices across the aquaculture industry, the Global Aquaculture Alliance coordinates the development of Best Aquaculture Practices (BAP) certification scheme, one of the most significant aquaculture schemes in terms of volumes and global coverage for hatcheries, farms, processing facilities and feed mills for large number of countries we can list among those countries China, India, Bangladesh, Vietnam, Thailand, USA, Ecuador, Indonesia, Colombia, Nicaragua, Guatemala, Malaysia, Honduras. The BAP program drives continued improvements via high standards that deliver significant benefits for aquaculture industrials and processors. It covers currently aquaculture facilities for shrimp, tilapia, channel catfish and *Pangasius*. Additional standards for salmon farms are under development.

The BAP certification mark is a trademark of the Global Aquaculture Alliance that is licensed to the Aquaculture Certification Council (ACC)<sup>2</sup> for use only by BAP-certified facilities. Certified facilities may use this certification mark on retail packaging only if it contains aquaculture product (currently only shrimp, tilapia or channel catfish raised in ponds), farmed and/or processed in accordance with Best Aquaculture Practices standards, as affirmed by site inspections and auditing procedures implemented by the Aquaculture Certification Council. Certified facilities may include the mark in advertising and retail packaging only as provided in the Facility Certification Agreement and referenced publications. The BAP mark reflects process certification only.

#### **Standards:**

The GAA standards cover certification of seafood processing, shrimp hatcheries and, shrimp, tilapia, channel catfish, *pangasius*, and salmon farms.

For example, guidelines for BAP standards concerning shrimp farming include:

#### **Community:**

Standard 1: property right and regulatory compliance:

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<sup>2</sup> [www.aquaculturecertification.org](http://www.aquaculturecertification.org), accessed 1 June 2011

Farms shall comply with local and national laws and environmental regulations, and provide current documentation that demonstrates legal rights for land use, water use, construction and operations.

**Standard 2: community relations:**

Farms shall not deny local communities access to public areas, fishing grounds or other public resources.

**Standard 3: Worker safety and employee relations:**

Farms shall comply with local and national labor laws to assure adequate worker safety, compensation and living conditions at the facility.

**Environment:**

**Standard 4: environmental mangrove conservation and biodiversity protection:**

Shrimp farms shall not be located in mangrove areas, seagrass beds or other coastal wetlands. Farm operations shall not damage wetlands or reduce the biodiversity of coastal ecosystems. Mangroves removed for allowable purposes shall be replaced by replanting an area three times as large.

**Standard 5: effluent management:**

Farms shall monitor effluent at the frequency specified to confirm that water quality complies with BAP criteria and those of applicable government permits.

**Standard 6: sediment management:**

Farms shall contain sediments from ponds, canals and settling basins and not cause salinization or other ecological nuisance in surrounding land and water.

**Standard 7: soil/water conservation:**

Farm construction and operations shall not cause soil and water salinization or depletion ground water in surrounding areas.

**Standard 8: postlarvae sources:**

Certified farms shall use wild postlarvae and shall comply with governmental regulations regarding the importation of native and non native shrimp seedstock.

**Standard 9: storage and disposal of farm suppliers:**

Fuel, lubricants, and agricultural chemicals shall be stored and disposed of in a safe and responsible manner. Paper and plastic refuse shall be disposed of in a sanitary and responsible way.

**Food safety:**

**Standard 10: drug and chemical management:**

Banned antibiotics, drugs and other chemical compounds shall not be used. Other therapeutic agents shall be used as directed on products labels for control of diagnosed diseases or required pond management, not prophylactic purposes. Shrimp shall be periodically monitored for residues of suspect pesticides, PCBs and heavy metals that are confirmed in the vicinity.

**Standard 11: microbial sanitation:**

Human waste and untreated animal manure shall be excluded from shrimp growout ponds. Domestic sewage shall be treated and not contaminate surrounding areas.

**Standard 12: harvest and transport:**

Shrimp shall be harvested and transported in a manner that maintains temperature control and minimize physical damage and contamination.

Shrimp treated with sulfites and other allergens shall be labeled accordingly.

**Traceability:**

**Record-keeping requirement:**

To establish product traceability, the following data shall be recorded for each pond and each production cycle:

- Pond identification number
- Pond area
- Stocking data
- Quantity of postlarvae stocked
- Source of postlarvae (hatchery)
- Antibiotic and drug use
- Herbicide, algicide and other pesticide use
- Manufacturer and lot number if each feed used
- Harvest quantity
- Sulfite use and protocol
- Processing plant or purchaser

***Compliance with FAO guidelines:***

The BAP standards and certification processes are following the FAO aquaculture certification guidelines for all certified activities (channel catfish, tilapia, *pangasius* and salmon farming) except standards for shrimp farms and hatcheries which do not mention and deal with animal welfare criteria.

**Activities certified:**

- Seafood processing
- Shrimp farming
- Tilapia farming
- Channel catfish farming

- *Pangasius* farming
- salmon farming
- shrimp hatchery



## ***Certification B: Friend of the Sea (FOS):***

### **Background:**

Friend of the Sea (FOS) is a non-profit non-governmental organization (NGO) registered in Italy with offices in India, Switzerland and the USA, and a branch in Canada.

FOS organization was founded by Dr Paolo Bray - European Director of the Earth Island Institute's Dolphin-Safe Project- in 2006. The Dolphin-Safe Project saved millions of dolphins from dying in the tuna nets and started the sustainable seafood movement.

Certification of products from sustainable fisheries and aquaculture is the main activity of the organization. In addition of certifying seafood products, the FOS organization certifies also products such as fish oil, fishmeal, and fish feed and omega-3 supplements.

Friend of the Sea report in its website the certification of a large number of species including anchovy, fish meal, caviar, salmon, seabass, seabream, cod, meager, shrimp, mussels,... and a large number of producers from different countries: Australia, Belgium, Brazil, Canada, Chile, Costa Rica, Denmark, Ecuador, Estonia, Finland, France, Germany, India, Ireland, Italy, Madagascar, Malaysia, Maldives, Morocco, Netherlands, Norway, Peru, Philippines, Portugal, Scotland, Senegal, Singapore, South Africa, Spain, Sri Lanka, Sultanate of Oman, Sweden, Switzerland, Tasmania, Tunisia, Turkey, UK, USA, Vietnam.

Dr Paolo Bray the Director of FOS organize every year a FOS day to promote their certification scheme and get more in touch with the different stakeholders.

### **Standards:**

FOS claims the conservation of marine habitat; she proceeds to this mission by certifying sustainable seafood and products from sustainable fisheries and aquaculture.

FOS standards include social and environmental criteria and deals as well with organic issues.

For sustainable aquaculture, certification covers the following areas:

- Management of sustainable aquaculture installation
- Site location and environmental impact assessment
- Infrastructure
- Fattening
- Feeding
- GMOs and growth hormones
- Disease prevention and the use of drugs
- Water and waste management
- Hazardous substances
- Energy management
- Social accountability
- Traceability



**Compliance with FAO guidelines:**

The aquaculture criteria established by FOS cover the most aspects of FAO technical guidelines on aquaculture certification except for food safety and quality.

**Species certified by FOS:**

Atlantic halibut, Atlantic salmon, black tiger shrimp, black tilapia, caviar, cod, gilthead seabream, goldlined seabream, meagre, mussels, *pangasius hypopthalmus*, pike perch, rainbow trout, red drum, scallops, seabass, seabream, silver seabream, snubnose pompano, striped bass, turbot, white sturgeon, witheleg shrimp.

## ***Certification C: GLOBALG.A.P***

### **Background:**

GLOBALG.A.P is a private sector body that sets voluntary standards for the certification of production processes of aquaculture and agricultural products anywhere in the world. The GLOBALG.A.P certification scheme is a business to business scheme; there is no label that is visible to consumer.

The GLOBALG.A.P set of standards serves as a practical manual for Good Agricultural Practice (G.A.P) and is designed to assure consumers by ensuring food safety, minimizing environmental impacts of farming operations, providing guidelines for animal welfare, and maintaining a responsible approach to worker health and safety.

Today GLOBALG.A.P offers the industry the best tool on the market to rely on as a business to business (B2B) certification system, covering the entire production chain ranging from the brood stock, seedlings and feed suppliers, to the farming, harvesting and processing stages.

GLOBALG.A.P believes in the “Think Global, Act local” principle and has established the National Technical Working Groups (NTWG) worldwide in order to develop a national interpretation of guidelines and address identified specific local adaptation and implementation challenges.

### **Standards:**

GLOBALG.A.P standards cover the following control points related to their aquaculture module:

#### **Site management:**

- Legislative framework
- Documentation

#### **Reproduction:**

- Broodstock sources
- Broodstock specifications
- Seedling sources
- Hatchery management
- Brood fish stripping (if brood fish are stripped this should be done with consideration of the animal's welfare)
- Feed at hatcheries
- Fingerling movement (if done in containers)

#### **Chemicals:**

- Chemical storage
- Empty containers and non-used chemicals
- Transport of chemicals (refer to principles - chemicals)

#### Occupational health and safety

- Training
- Health and safety

#### Fish welfare, management and husbandary

- Traceability at farm
- Fish health and welfare
- Treatment
- Treatment records
- Vaccination
- Mortality
- All pens in water bodies
- Ponds
- Biodiversity (in addition to food defense requirement of all farm module)
- Condition of boats

#### Harvesting:

- Method of packing/ dispatch
- Labelling/traceability of harvested fish
- Sampling and testing

#### Feed management:

- General
- Feed records
- Storage of aquaculture feed
- Pest control

#### Environmental and biodiversity management:

- Environmental management
- Predator control
- Escapes
- High conservation value areas

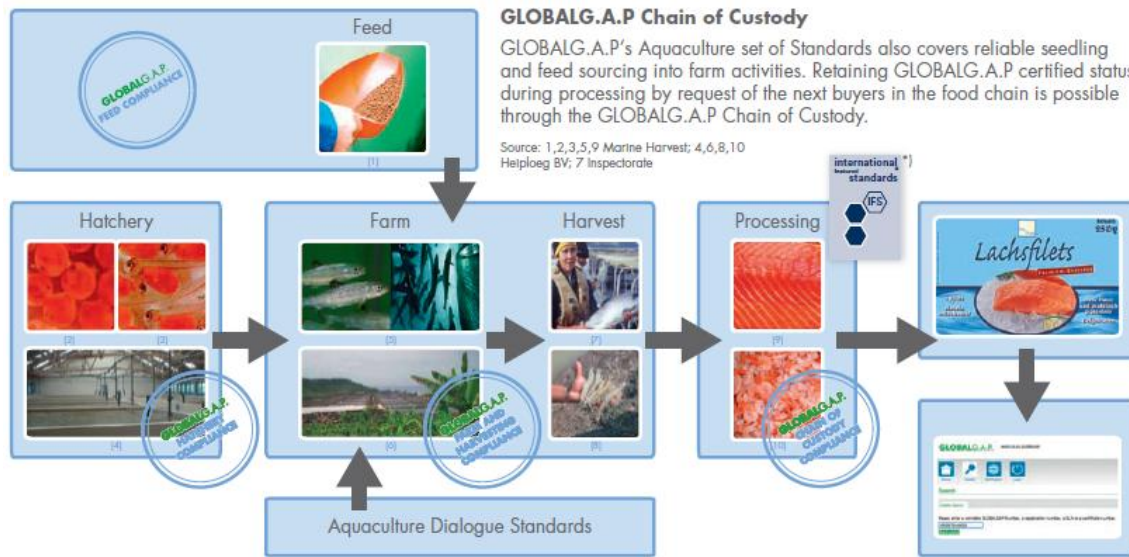
#### Water usage and disposal (cross-reference with the environmental management plan AB10.1.5)

- General
- Effluent

#### Post harvest-mass balance and traceability:

- Documented control system
- Confirmation of inputs
- Separation

**GLOBALG.A.P traceability program**



**Compliance with FAO guidelines:**

The establishment of GLOBALG.A.P standards for aquaculture has been done against the FAO guidelines; the new cycle of aquaculture certification covers all the criteria developed by FAO:





## ***Certification D: WWF “Aquaculture Dialogues” and the aquaculture stewardship council (ASC):***

### **Background**

The world wide fund for nature is an international non-governmental organization created in 1961 and having as a supreme mission the conservation of the nature by using the best available scientific knowledge and advancing that knowledge where it can and the preservation of the diversity and the abundance of life on Earth and the health of ecological systems.

After founding in 1997 both a certification of sustainable forestry (forestry stewardship council) and sustainable wild-capture fisheries (Marine stewardship council), WWF has developed new standards this time for sustainable aquaculture. This initiative came true after several roundtables called “Aquaculture Dialogues”, roundtables that WWF worked through with several stakeholders (farmers, NGOs, retailers, experts...) which led to the definition of standards for responsible aquaculture and the creation of a new organization, the Aquaculture Stewardship Council (ASC).

The Aquaculture Stewardship Organization will be working with independent, third party entities to certify farms which are in compliance with its standards.

### **Standards**

The Aquaculture Stewardship Organization will be working with independent, third party entities to certify farms which are in compliance with its standards.

For example, the criteria of the international standards for responsible tilapia aquaculture established by WWF are the following:

#### **Principle 1: obey the law and comply with all national and local regulations:**

- Evidence of legal compliance

#### **Principle 2: manage the farm site to conserve natural habitat and local biodiversity**

- Site information
- Presence of natural or established tilapia species
- The effects of eutrophication
- Water quality in oligotrophic receiving waters
- Receiving water monitoring
- Wetland conservation

#### **Principle 3: conserve water resources:**

- Nutrient utilization efficiency
- Groundwater salinization

#### **Principle 4: conserve species diversity and wild populations:**



- Use the wild fish of feed (fishmeal and oil)
- Preference for better feed manufacturers
- Energy use

**Principle 5: manage fish health and welfare in an environmentally responsible manner:**

- Stocked tilapia recovery
- Chemicals
- Mortalities
- Fish health management

**Principle 6: be socially responsible:**

- Child labor
- Forced, bonded, compulsory labor
- Discrimination in the work environment
- Health and safety of workers
- Wages, overtime and working hours
- Freedom of association and right to collective bargaining
- Disciplinary actions
- Action response plans/policies
- Living conditions for employees
- Community relations and interaction

WWF estimates in its website that the standards created by the Aquaculture Dialogues and applied to the Aquaculture Stewardship Organization will be credible because of the following points:

The standards will be:

- Science-based: the Dialogue Standards are being developed with input from the world's leading aquaculture scientists and will be updated over time to reflect the newest scientific findings.
- Performance-based: the standards will not tell the producers what practices to use to reduce or eliminate the impacts of aquaculture. Rather, the standards will provide targets to reach if producers want to address the impacts. How they do so will be their choice. This will encourage innovation and continual improvement on the farm.
- Metrics-based: by being measurable, the standards will be objective and, therefore, more credible.
- Created by a diverse and balanced group of stakeholders. More than 1,000 people are participating in the Dialogues because they want something different- and more sustainable- than what is out there. They have a stake in the outcome.
- Focused on minimizing or eliminating the key environmental and social impacts of aquaculture, not a laundry list of impacts.



## ***Certification E: Fairtrade Foundation:***

### **Background:**

The Fairtrade Foundation describes its self as an independent non-profit organization that licenses use of the Fairtrade Mark on a huge variety of products in the UK in accordance with internationally agreed Fair trade standards.

The federation's mission is to work with business, community groups and individuals to improve the trading position of producer organization in the South and to deliver sustainable livelihoods for farmers, workers and their community.

On the 15/04/2011 the Fairtrade Foundation international released for public comment the Draft Fairtrade standard for shrimp and small producer organizations and the Draft standards for factories processing Fairtrade shrimp.

The setting of Fairtrade standards for shrimp certification was based on certain internationally recognized standards and conventions, particularly those of the International Labour Organization (ILO). At the same time the Federation requires from the producer organizations to always abide by national legislation on the topics covered by the standards whenever the legislation sets highest requirements than these standards.

### **Standards:**

The standards include 5 sections, which section focuses on different and specific aspects. The sections for shrimp and small producer organizations are the following:

#### **General requirements:**

Certification

Members are small producers shrimp

You are the part of the community

Managing your members compliance with this standard

#### **Trade:**

Traceability

Sourcing

Contracts

Labelling

Premium payments

#### **Environmental protection:**

Progressive improvement

Use of Antibiotic Therapeutants

Pest management

Safe handling of pesticides

Soil and water

Waste

GMO

Feed

Biodiversity

Energy

Animal welfare

**Labour conditions:**

Freedom from discrimination

Freedom from labour

Child labour and child protection:

Freedom of association and collective bargaining

Conditions of employment

Occupational health and safety

**Business and development:**

Development Potential

Democracy, participation and transparency

Non discrimination

## ***Certification F: World organization for animal health OIE***

### **Background:**

The OIE is the intergovernmental organization responsible for animal health worldwide created by the international agreement of 25 January 1924, it is recognized as a reference by the world trade organization (WTO) and in 2011 had a total of 178 member countries. The world organization for animal health maintains permanent relations with 45 other international and regional organizations and has regional and Sub-regional offices in every continent.

Its missions are the following:

- To guarantee transparency in the global animal disease situation.
- To collect, analyze and disseminate veterinary scientific information.
- To provide its expertise and stimulate international solidarity in the control of animal diseases.
- To guarantee the safety of international trade by drafting sanitary standards for international trade in animals and their products within the framework of a mandate given to the OIE by the WTO SPS agreement (the agreement on the application of Sanitary and Phytosanitary measures).
- To promote the legal framework and the resources of veterinary services.
- To enhance the guarantee of food safety and promote animal welfare.

### **Standards:**

The OIE develop standards for use by its member countries to protect themselves from disease incursion while avoiding unjustified sanitary barriers.

These standards are the Aquatic Animal Health Code and the Manual of Diagnostic tests for Aquatic Animals.

The standards deal with the following subjects:

- Aquatic animal disease diagnosis, surveillance and notification
- Risk analysis
- Quality of aquatic animal health services
- Disease prevention and control
- Trade measures, importation/exportation procedures and health certification
- Veterinary public health
- Welfare of farmed fish
- Diseases of crustaceans
- Diseases of fish
- Diseases of molluscs

## ***Certification I: International Federation of Organic Agriculture Movements (IFOAM):***

### **Background:**

IFOAM is the worldwide umbrella organization for the organic agriculture movements, which appeared in Versailles France on the 5<sup>th</sup> 1972, during an international congress on organic agriculture organized by the French farmer organization “Nature et Progrès” and have its headquarters in Bonn, Germany.

IFOAM unites more than 750 organizations in 180 countries. Its mission is “Leading, uniting and assisting the organic movement in its full diversity. Its goal is the worldwide adoption of ecology, socially and economically sound systems that are based on the principles of organic agriculture”

Among IFOAM activities we can list the set up of organic farming standards and the proposal of an organic accreditation service.

Accreditation by IFOAM assures organic integrity in the international level. It certifies that the accredited certification bodies (CB) have the capacity to carry out certification programs and is an international proof of reliability concerning certification of organic seafood from its farming to its consumption.

### **Standards**

1. Intensive monitoring of environmental impacts
2. Integration of natural plant communities in farm management
3. Processing according to organic principles
4. Use of natural breeding procedures without the use of synthetic hormones, irradiation and antibiotics.
5. Absence of GMOs in stocks and feed
6. Stocking at appropriate density
7. Feed and fertilizer from certified organic aquaculture
8. No use of synthetic inputs
9. Preference for natural medicines
10. Restrictions energy consumption

## ***Certification J: Naturland***

### ***Background:***

Naturland is an independent organization which describes itself as an organic farmers association. Naturland has set standards for a range of sectors such as agriculture activities, textiles, cosmetic, sustainable capture fisheries and sustainable aquaculture.

Since the mid 90's, Naturland has carried out pioneering work and developed standards for different species (carp, salmonids, mussels, shrimp, tilapia, catfish, croaker, drums, seabream, seabass, perch,... ) and different production systems in aquaculture. Naturland standards are applied in more than 18 countries in Europe, Latin America and South East Asia.

Naturland requires certified organic feed and species-appropriate low stock densities, forbids the use of chemicals and sets guidelines for the protection of nature and animals, in addition, the operations must respect social standards.

### **Standards:**

#### **Part A. General Regulations**

##### **I. Contracts and certification procedure**

- Prerequisites for granting the producer contract
- Producer contract
- Standards
- Conversion
- Changes in the farming system
- Documentation and inspection
- Certification
- Approval
- Labelling and marketing

##### **II. General (management) regulations resp. other predominant provisions**

- Storage
- The sale of purchased merchandise
- Purchase of means of production and equipment
- Exchange of farming equipment between different agricultural operating systems (certified organic/conventional)
- Use of foil and fleeces, nets and technical mulching materials
- Non-employment of GMO and GMO derivatives
- Non-use of nanomaterials
- Biogas plants
- Quality assurance

### III. Social responsibility

- Human rights
- Forced labour
- Freedom of association, access to trade unions
- Equal treatment and opportunities
- Child labour
- Health and safety
- Employment conditions

### Part B. Regulations governing organic aquaculture

#### I. Principles of Management

- Selection of site, interaction with surrounding ecosystems
- Species and origin of stock
- Breeding, hatchery management
- Design of holding systems, water quality, stocking density
- Health and Hygiene
- Oxygen Supply
- Organic Fertilising
- Feeding
- Transport, slaughtering and processing
- Smoking

#### II. Supplementary regulations for the pond culture of carp (*Cyprinus carpio*) and its accompanying species (e.g. tench *Tinca*, pike *Esox*, the Cyprinidae species) in ponds

- Close-to-nature design of the ponds
- Construction of ponds, quality of water
- Stocking density and feed
- Health and Hygiene
- Organic Fertilising
- Transport, slaughtering

#### III. Supplementary regulations for the culture of Salmonidae (e.g. trout *Trutta*, *Oncorhynchus*, salmon *Salmo* and charr *Salvelinus* sp.) and Coregonidae (whitefish *Coregonus*) in ponds and net cages

- Site selection
- Prevention of water pollution, natural design of the ponds
- Stocking density
- Health and hygiene
- Feeding
- Transport, slaughtering

#### IV. Supplementary regulations for the marine culture of mussels (e.g. *Mytilus edulis*) and macroalgae on ropes and frames



- Site selection, interactions with the surrounding ecosystems
- Type and origin of stock
- Culture systems
- Processing

V. Supplementary regulations for the pond culture of shrimps (e.g. *Litopenaeus vannamei*, *Penaeus monodon*, *Macrobrachium rosenbergii*)

- Site selection, protection of mangroves
- Protection of ecosystems – farm area and surrounding
- Species and origin of stock
- Hatchery management
- Pond design, water quality, stocking density
- Health and hygiene
- Fertilising of ponds
- Feeding
- Harvesting and processing

VI. Supplementary regulations for the culture of tropical freshwater fishes (e.g. milkfish *Chanos chanos*, tilapia *Oreochromis sp.*, Siamese catfish *Pangasius sp.*) in ponds and net cages

- Site selection
- Water pollution control, natural design of ponds
- Special provisions for the design of tilapia-pond farms
- Stocking density
- Health and hygiene
- Feed

VII. Supplementary regulations for the culture of species of the families codfishes (*Gadidae*), sea breams (*Sparidae*), sea bass (*Dicentrarchidae*) and croakers/drums (*Sciaenidae*) in marine net cages

- Site selection
- Prevention of water pollution
- Stocking density
- Health and hygiene
- Transport, slaughtering



## **Costs and benefits for stakeholders:**

### ***Benefits for producers:***

- The ecolabel helps retailers to tap new markets and target a niche category of customers or consolidate position in existing markets.
- Improved production efficiency of personnel (cost and/or risk reduction)
- Improved quality of products.
- Labels can improve customer's confidence in high quality products and build a brand loyalty.
- Reputation enhancement since the producer is seen as a green producer more eco-friendly.
- While there is no evidence of a price premium generally, more stable supply relationships are likely to mean less price volatility. Premium-quality products might attract a price premium.
- Enhance export market opportunities.
- Provides insurance against boycotts and bad press from environmental groups and in the media.
- Be in compliance with public regulations

### ***Costs for producers:***

- Costs are dependent on the size and the type of business being certified.
- The costs to producers of compliance with private standards are likely to vary depending on the pre-existing state of the operations. The costs of certification escalate if a variety of certifications required.

### ***Benefits for consumers:***

- Ecolabelling is an effective way of informing customers about the environmental impacts of selected products, and the choices they can make. It empowers people to discriminate between products that are more compatible with environmental objectives and those which are not.

- Consumers benefit from guarantees concerning the traceability of the products they are consuming.
- Thanks to ecolabels or certification schemes consumers can make the difference between high quality and low quality products.

***Costs for consumers:***

- Paying against a certified or labelled product a price premium.

## Case study: Visit at Kefalonia Fisheries



Kefalonia fisheries SA is an aquaculture farm located in the largest of the Ionian Islands, between Italy and Greece, Kefalonia Island.

This farm was created by Marinos Yeroulanos in 1981, it is considered as a world-wide pioneer in the production of seabass and seabream since Kefalonia fisheries is the first Mediterranean farm to produce those two species in Europe.

Kefalonia fisheries employs over than 100 employee today and produces over than 3000 tons of first quality seabass and seabream of which 250 tons are organic and earns a turnover of over 20 million Euros per year.

The farm is however specialized in the production of seabass; seabass production represents over 80% of the total production. Kefalonia fisheries' production manager Mr. Troianos Dimitris said "our company decided to be specialized in seabass production in order to go against the flow and avoid competition against other Greek farms in international markets since the most of Greek farms are specialized in seabream production". According to him, the production of seabass is more complex and difficult, because it request more time and expertise, specifically in the disease treatment process, also because mortality risk is higher than in seabream production.

### Organic Kefalonia:

Kefalonia fisheries started producing organic seabass and seabream on 1996 and got first certified in 2006 according to Naturland standards.

The highest standard -the Kefalonia Fisheries organic range- is certified organic to the Naturland e.V. standards (as being in full accordance with the EC Council Regulation No. 834/2007) - one of the most respected, independent third party certification organization – and was recently certified to the EC Regulation 710/2009 by BIO Hellas institute. The BIO Hellas institute has been assessed and approved by the Hellenic ministry of Rural Development and Food as an inspection and Certification body for organic products, with

the E.U. Code GR-BIO-03. The certification is a guarantee that organic standards are implemented at all stages of production with full traceability and quality control.



Organic aquaculture production in Kefalonia fisheries is defined by 3 guiding principles:

- Respect for the environment
- Respect for the well-being of the fish
- Respect for the consumer



Operation of sea bass juvenile vaccination

The special issues that are dealt with in Kefalonia fisheries concerning organic production are:

- **Sustainability:** according to Kefalonia fisheries one of the ways to relieve pressure on wild fish stocks is to develop environmentally responsible, sustainable fish farming, and to do it the natural way.
- **Clean waters:** Kefalonia Fisheries site is free of all industrial, agricultural and urban activity and virtually unexposed to pollutants, and is protected from storms. The farm ensures a constant renewal of the waters by strong undercurrents.
- **No chemicals in the production:** In Kefalonia fisheries no pesticides, antibiotics, hormones or any other chemicals are allowed under their organic standards.
- **Stocking density:** At Kefalonia Fisheries, the fish is stocked at an average of 10kg per cubic meter of water, according to the farm production manager, the fish take up 1% of the volume in their pen. The fish grow slowly, as nature intended.
- **Environmental impact:** Kefalonia fisheries adopt for organic production the practice of rotating the production sites, this practice allows for the continuous renewal and recovery of the seabed.
- **Special feed:** Kefalonia fisheries use feed made up of only the most natural ingredients, which is certified organic and accompanied by all the necessary certificates.

Kefalonia Fisheries owns two sites -in the Gulf of Argostoli in Kefalonia Island, Greece- to perform the on-growing of seabass and seabream: one situated in the Livadi area and the other one in Kokkinos Vrahos area. Three units operate in total in Livadi area two conventional (ZOE and KATERINA) and one organic unit (VIRGINIA). All units are 100m apart from each other as the EU regulation defines.



## The three ongrowing units: ZOE KATERINA and VIRGINIA



VIRGINIA ongrowing unit

Organic production is different and has everything separate from the conventional production. It has its separate personnel unit which is trained on the “organic farming practices” by the ongrowing unit manager and the quality manager and which deals only with managing and handling of the organic farming cages.

### **Production and handling operations for organic farming:**

- The organic farming cages are numbered separately and have a different marking system.
- The feed used in organic farming is certified organic and distributed to the cages by an automatic feeding system and monitoring through computer system.





### Automatic feeding system: AkvaMarina CCS

- The feed is stored in a separate storage than the one for conventional feed.
- Special nets not treated with antifouling are used and appropriately marked.
- During harvesting, separate tanks and nets are used, appropriately marked. Transport of organic fish is done on a separate route.
- Packaging of organic fish is done in a separate day than the conventional one, if there is a need to proceed to the packaging of both organic and non-organic fish the same day, the packaging of the organic fish takes place at the beginning of the day.



Transport boxes for conventional and organic fish

- When packaging organic fish, lights with the sign of “organic” are lit at the packaging area, so that the personnel working are aware of that.



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