November 2008

GENERAL FISHERIES COMMISSION
FOR THE MEDITERRANEAN

COMMISSION GÉNÉRALE DES PÊCHES
POUR LA MÉDITERRANÉE

GENERAL FISHERIES COMMISSION FOR THE MEDITERRANEAN

COMMITTEE ON AQUACULTURE

Sixth Session

Tirana, Albania, 17-19 December 2008

REPORT OF THE MEETING OF THE WORKING GROUP ON SITING AND CARRYING CAPACITY

Heraklion, Crete, 21-23 October 2008

1. Opening of the meeting and arrangements

1. The Meeting of the Working Group on Siting and Carrying Capacity (WGSCC) of the GFCM Committee on Aquaculture (CAQ) was held at the University of Biology of Crete, Greece, from 21 to 23 October 2008.

2. Mr Ioannis Karakassis, Coordinator of the WGSCC opened the meeting and welcomed the participants. The WGSCC expressed its great appreciation for the kind hospitality and good organisation. The Agenda and the list of participants are attached respectively as Appendix 1 and Appendix 2 to this report.[1]

[1] The presentations made by the experts during the meeting will be available on the GFCM web site www.faogfcm.org

2. CAQ – Working Groups Activities and SHOCMED

3. Mr Fabio Massa reminded the participants of the context of the meeting in relation to the new framework, structure and functions of the Committee. He insisted on the role of the different subsidiary bodies which support the CAQ in identifying priorities issues and in providing advice on aquaculture management. The participants were also informed on the outcome of the second Coordination Meeting of the CAQ Working Groups held in Rome on 3rd September 2008.

4. It was recalled that at its fifth session (June, 2006) the CAQ requested the formulation of specific projects in support of the *ad hoc* Working Groups (siting and carrying capacity; sustainability and marketing), and highlighted the need for financial support for their implementation, both from the GFCM autonomous budget and from extra-budgetary sources. In particular, within the framework of the *ad hoc* Working Group on Site Selection and Carrying Capacity a project proposal was drafted (SHOCMED) with the aim of "Developing siting and carrying capacity guidelines for Mediterranean aquaculture within aquaculture appropriate areas".

5. SHOCMED has a total duration of 40 months and should endeavor to support the CAQ in its effort to address some of the priority issues identified and endorsed by the GFCM at its 31st session (January 2007). During the 32nd session of the GFCM (Rome, February 2008) the workplan presented by the CAQ was approved by the Commission. On this occasion the delegate from the European Community (EC) confirmed interest in supporting the WGSCC through the financing of "SHOCMED". The project proposal was revised to match budget availability and sent to the EC. The final version of SHOCMED and the relative agreement between the GFCM WGSCC Secretatiat and EC, for the first year of activities, was signed and sent to the EC for finalisation. The Meeting was further reminded that the EC contribution is limited to 30% (about 40.000 euro) of the budget scheduled. Although the objectives of SHOCMED remain unchanged, the planned activities were scaled back. The final version of the Project proposal was distributed among the participants.

6. The participants commented this initiative, in particular the aspects on environmental regulation in support of the development of sustainable aquaculture. However, the delay in the implementation of the activities (the first project document was drafted in 2006) was underlined, as well as the limited budget available. This will not allow for a very deep analysis of some expected outputs. It was neverthless considered appropriate to keep all the activities indicated in the programme and to maximise the available scientific knowledge and data collected during recent years. Moreover, suggested the SHOCMED partnership take advantage of recent initiatives, such as the project ECASA (ecosystem approach for sustainable aquaculture) and the IUCN guide on *"site selection and site management"*. Details on the organisation/implementation of SHOCMED are discussed in point 8 of the Agenda.

7. The meeting also recalled that many of the aspects to be discussed also follow-up on the previous meetings and particularly those of the last joint IUCN/FEAP/ and GFCM/CAQ workshop on "Guidelines for the Sustainable Development of Mediterranean Site Selection (Istanbul, Turkey, October 2007). The previous GFCM publications "*Consultation of the Appliction of Article 9 of the FAO Code of Conduct for Responsible Fisheries in the*

Mediterranean Region"[2], report of meeting "*Interactions between aquaculture and capture fisheries: a methodological perspective*[3], and the report of the "*Expert meeting for the re-estblishment of the GFCM CAQ Network on Environment and Aquaculture in the Mediterranean*" were also considered as well as inputs for the WGSCC.

3. Guidelines on site selection and site management

8. Mr Francois Simard presented and summarised the main achievements of the IUCN/FEAP guidelines exercice. A copy of the latest draft of the "*Guide on Site Selection and Site Management*" was distributed to the participants. He reminded the meeting that the idea of the preparation of the guidelines was a follow-up to the IUCN meeting held in Barcelona in 2004 on Mediterranean Marine Aquaculture and Environment, and during the Workshop organised by FAO, NACA and IUCN within the IUCN Congress (Bangkok, 2004). The Barcelona meeting discussed: the relationship between the environment and aquaculture; the issues and positive examples in Mediterranean aquaculture related to the environment; aspects related to the sustainability of aquaculture; the problems concerning the development of aquaculture in the southern Mediterranean countries. During the workshop in Barcelona particular attention was paid to the impact of aquaculture on natural resources and the necessity to identify reliable indicators on the environmental, economic and social aspects of aquaculture.

9. The preparation of the guidelines is also the result of cooperation established between FEAP and IUCN since 2005 which aims to identify the environmental issues related to the development and management of fish farming in the Mediterranean region, thanks to the collaboration of many experts from different scientific background, institutions and countries. The guidelines "Aquaculture and the Environment" and "Site Selection and Siting Capacity" include information from the different disciplines and aspects (legal, environmental, technological and socio-economic) of the aquaculture sector.

10. The Working Group appreciated and thanked the IUCN for the efforts made and work carried out. There was in particular unanimous consideration that such guidelines represent good additional technical grounds in support of many aspects of the work of the WGSCC.

4. Site Selection and Zoning using an Ecosystem Approach to Management

11. The progress made by the Technical Cooperation Project (TCP/TUR-3101) "Developing a Roadmap for Turkish Marine Aquaculture Site Selection and Zoning Using an Ecosystem Approach to Management" was presented by Mr Ibrahim Okumus as follows.

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[2] FAO Fishereis report No 606

[3] GFCM Studies and Review No 78

12. Marine aquaculture has exhibited rapid development during recent years in Turkey. Production reached 80,840 mt or 10.5% of fishery production from 340 farms in 2007. However rapid development and an increasing number of cage farms near shores have attracted media-oriented public reaction. The major issues were recently-built summer houses, and the visual impact of cages and conflicts for use of the coast.

13. The Turkish Ministry of Environment and Forestry (MEF) proposed an amendment to the Environmental Law on 26 April 2006 to exclude marine cages from environmentally sensitive areas, enclosed bays and near-shore areas, to set up new criteria for cage farms and to request that farmers either prove compatibility with new criteria or close down the farms .

14. This TCP/TUR-3101 project responds to Turkey's (Ministry of Agriculture and Rural Affairs - MARA) request for technical assistance to make urgent recommendations as a short-term solution and develop a workplan for identifying new offshore/open sea sites and zones for future development. The main objective of the project is to assist in the developing of a road map for sound marine aquaculture site selection and a zoning plan for marine aquaculture.

15. The project was started with an inital meeting in Ankara where related General Directorates in MARA and MEF were visited. A first Stakeholder Workshop was held in İzmir on 16 -17 July 2008 with 37 participants from 22 ministries, institutions, farmers' groups, companies and NGOs. Six presentations were made by the project team and the MARA. A facilitation approach was used and participants were divided into groups and were asked to write out 2-3 major issues/problems affecting marine aquaculture in Turkey. Various issues were raised and gathered under group headings (including environmental impacts, R&D, education and training, investment and credit, farm management, mariculture management and coastal zone management). The final part of the exercise consisted in prioritizing the solutions and actions and placing them in a time frame to start the road map.

16. A second workshop was organized in Muğla, and attended by 62 participants belonging to 5 institutions, 16 fish farming companies, 6 aquaculture support industries, 3 farmer's associations. Thirteen presentations focusing on offshore/open sea aquaculture were given by the coordinator, international and national consultants. The participants were asked to identify fundamental problems and potential solutions. Following the discussions the problems were classified under 3 main categories as Management and Administration (35% of total), site selection and logistic support (26%) and others including image of aquaculture, credit and financing, insurance, inadequate R&D and trained technical taff (39.5%).

17. The draft road map thus prepared included: strengthening institutional organization; planning and managing mariculture development; supporting mariculture development;preparing an aquaculture zoning plan for one selected location (Gerence bay and Izmir); and issuing an advocacy brochure to facilitate improvement of the image of aquaculture. Finally a project proposal has been formulated with the following expected outputs: coastal zone planning for mariculture development, reviewing of carrying capacity in selected areas, reviewing of the regulatory framework of aquaculture (including EIA and monitoring) and support for mariculture development through capacity building on R&D and technical, on-site practical training.

18. The Working Group welcomed the work done during the TCP and highlighted that the situation reached in Turkey is a consequence of the interaction between aquaculture and other

activities within the coastal area which can generate conflicts with other users such as local tourism. Moreover, it was noted that: a) the media can exacerbate the conflict and b) it is essential to consult with and involve the public. The recommendations indicated by the TCP include a plan in which the new process for site selection should be followed with the joint participation also of the farmers, authorities and other relevant stakeholder, as well as following an Ecosystem Approach for Aquaculture development.

19. For a sector in rapid expansion such as marine aquaculture in the Mediterranean, the problem encountered in Turkey could also be faced in other areas or countries of the Mediterranean with negative consequences in terms of employment, income and economic growth, and the negative effects on the image of aquaculture. In such cases, when proposing strategies, the identification of mitigation interventions and a risk analysis is strongly suggested. Risks should be encountered if only application of moving strategy is applied and the conflicts should transfer to other areas if compensatory actions are not considered.

20. As an additional contribution to the application of Ecosystem Approach to Aquaculture management, Mr Francois Simard, presented the IUCN initiative in Algeria and Egypt. The aim of this initiative is to identify a local development plan for aquaculture that shifts to a consensual approach between all the activites in the areas identified. This should be based on the identification of interventions by delimiting the same areas and through the involvement of the skateholders in the development plan, to avoid any possible conflicts among them.

21. Participants stressed the necessity, at Mediterranean level, for this kind of intitiative in particular in those areas like the coastal areas in which finfish aquaculture could increase exponentially and potential conflict among users could raise. For the sustainable development of aquaculture in specific Mediterranean areas, a communicative and consensual approach between the different users is essential and should be considered in a ecosystem perspective, through coastal zone management planning/zoning and allocation of natural resources in the context of Integrated Coastal Zone Management.

22. It was also recalled that in the recent protocol on Integrated Coastal Zone Management prepared by the Barcelona Convention Contracting Parties and in particular in the Article on the economic activites in the Mediterranean coastal areas, for Aquaculture is indicated, among other issues, to take into account the need to protect aquaculture and shellfish areas in the development project.

23. During the discussion on the necessity for the development of aquaculture zoning and participatory and integrated approaches in the Mediterranean coastal areas, the meeting underlined that in the Mediterranean countries, there are many areas in which these principles are applied at different levels, and that much experience exists in identifying zones for aquaculture. The examples of some Mediterranean countries were brougth to the attention of the meeting. The participants considered appropriate to bring together these differents experiences on aquaculture zoning and integrated approach in Mediterranean: this will serve as a moment of mutual exchange of knowledge and experience in particular to the aspects related to the institutional integration aspects, involvement of stakeholders and aquaculture allocation zone in an ecosystem perspective.

5. Monitoring aquaculture activities

24. Mr Dror Angel made a short presentation of the different environmental variables adopted in monitoring finfish marine aquaculture. This presentation and that of the following point were made on the basis of a paper entitled "*Aquaculture and environment in the Mediterranean: available information and proposed step forward*" (Ioannis Karakassis and Dror Angel)[4].

25. A number of indicators that can be used to monitor the effects of aquaculture on environmental were listed and reviewed. Reference was made to the GESAMP Expert Working Group on Environmental Impacts of Coastal Aquaculture (GESAMP, 1996) which in reviewing monitoring for coastal aquaculture recommended that "monitoring effort" should be proportional to the "scale of intensity". Indicators for monitoring the ecological effect of aquaculture sediment and on water quality were also described. In particular the change in sediment quality was described including physical, chemical and biological aspects.

26. An initial list of variables that could be used to monitor the environmental pressures or impacts from marine finfish Mediterranean aquaculture were presented and discussed (sediment sampling, redox potential, organic and inorganic nutrients, sediment organic matter, total phosphorus in sediment, sediment grain size, benthic community, water quality). This list of variables and other observations regarding aquaculture-environment interactions were derived and selected from numerous research and other initiatives related to aquaculture site selection and carrying/holding capacity in the Mediterranean areas.

27. Participants agreed on the list of parameters identified. In relation to the effects of aquaculture on the environment it was noted that the problem was not the water column but the sediment. It was highlighted that the impact of external environmental factors on aquaculture activities, and for marine finfish aquaculture to be sustainable, first of all good quality water is required. The development of aquaculture mainly depends on the preservation of healthy environmental conditions. It was also recalled that throughout the Mediterranean countries there are no agreed standards to ensure equal terms for monitoring the quality of the environment. There is therefore an urgent need to introduce a minimum environmental monitoring programme on the effects of aquaculture. In order to minimize environmental damage caused by aquaculture, it is necessary to monitor fish farms in a standardized and regulated manner, but to date monitoring is not compulsory in many areas and if done, it is highly variable in frequency and quality.

28. The Meeting was also reminded that the Code of Conduct for Responsible Fisheries, in its Article 9 on Aquaculture Development, also recognizes as essential the establishment of specific procedures for monitoring the environment. The necessity for the definition of precise standards to apply to aquaculture activities and improve the national expertise to monitor external environmental conditions as well as to maintain them safe for production

[4] The document "Aquaculture and environment in the Mediterranean: available information and proposed step forward" (Ioannis Karakassis and Dror Angel) will be available on the GFCM web site www.faogfcm.org

activities were also highlighted during the GFCM Consultation on the Application of Article 9 of the FAO Code of Conduct for Responsible Fisheries in the Mediterranean Region.

29. The Working Group stressed the necessity to monitor the physical environment (water column and sediments, benthic ecosystem in particular for the "Posidonia beds") around fish farms in order to ensure that environmental quality standards that have been established for the relevant water body are not exceeded. A limited list of variables to be measured at Mediterranean fish farms levels has been established to serve as a basis for pan-Mediterranean environmental impact assessment (EIA) and monitoring protocols. The establishment of robust monitoring programs at aquaculture facilities will enable the WGSCC to progress toward a better approximation of environmental carrying and holding capacities for relevant Mediterranean sites.

6. Environmental impact of aquaculture activities

30. Mr Ioannis Karakassis made a short presentation reviewing several aspects related to the interactions of intensive finfish marine aquaculture with the surrounding environment, in the Mediterranean. He described a series of environmental impacts of aquaculture activities including negative and positive aspects. The main impacts of aquaculture on the environment were listed: the source of pressure, the potential effects on biota, the level of scientific documentation and estimated recovery of the community.

31. He described examples of physical damage to marine habitats and species, with special emphasis on the consequences of organic enrichment of the seabed and benthic biodiversity. The effect on the seabed varies considerably as a result of site selection and the physical characteristics of the site (depth, current velocity, sediment type, etc.) and tends to be rather localized, whereas the effect on water quality (e.g. dissolved nutrients, turbidity, algal biomass, etc.) is generally slight to immeasurable. The exception to the rule, with respect to localized benthic effects, is the special case of "Posidonia beds" (*Posidonia oceanica)* which are apparently much more sensitive to and impacted by fish farms, underlining the importance of exclusion zones when considering candidate sites for aquaculture. The effects are related to site-specific environmental attributes, such as depth, hydrographical considerations, quality of ambient water, sediment type, presence of other pressures in the area.

32. Discussion was raised on Posidonia meadows. Posidonia seagrass beds are protected habitats[5] which have a fundamental role for the health and productivity of Mediterranean marine ecosystems, due to their roles in mantaining sediment stability and water quality and in providing safety and food for a large number of species of fish and crustaceas. It also

[5] Posidonia seagrass meaodws are protected by a number of international conventions, EU and national conventions such as: Bern Convention, EU habitat Directive, Barcelona Convention and EU fishing regulation and by a number of national legislations

represent an essential habitat for a variety of juvenile stages of fishery resources. With reference to the impact of aquaculture activities on the Posidonia meadows, experts recalled that this is limited if compared to other impacts of other human activities (harbour realed activities, introduction of methane/gas pipelines, fishery trawlers, tourist boat anchoring, seawage discharge or industrial effluents).

33. However in consideration of the role played by *Posidonia oceanica* in the Mediterranean marine ecosystem and of the impact of releasing nutrients from intensive fish farms, the Working group suggested that, in the Mediterranean, the installation of new aquaculture on Posidonia beds should be avoided. A plan for monitoring the impact of nutrient release on the seagrass beds should be introduced. In case of existing or potential impact a compensatory or mitigation plan should be introduced (minimun depth, security distance, current, transplantation plan, moving/rotation plans).

34. Fish farms tend to be "fish-attracting-devices" (FADs) and the effect of aquaculture on wild fish, both near and far (regional effects) were described and discussed. The positive effect of the interaction of aquaculture with fisheries were reported, highlighting the results in which the time series analysis of local fisheries landing showed increased biomass in a case study on some Greek fishing areas that was monitored.

35. The participants agreed that the FAD effect depends on the location of the cages, in particular if the cages are either on the migratory routes of fishes or in areas of passage for certain species. If so, this could enhance the FAD effect. As the increase in fish biomass in the aquaculture zones is not limited to the farms areas, this phenomenon could also be caused by various other reasons, including additional food availability in the area detemined by additional nutrients that can have effect on some parts of the marine food chain. In consideration that fisheries are not allowed in the aquaculture areas and the spill over of juveniles of fishery resources can be favoured, farms areas could be considered as *ad hoc* marine protected areas.

36. Environmental Impact Assessment procedures are used in many Mediterranean countries prior to licensing of fish farming activities. However, there is some evidence that this procedure has often failed to adequately predict impacts particularly on Posidonia meadows and/or to adopt good practice in the preparation of the respective environmental impact statements. In this context it was considered important to take into account the study prepared by FAO regarding the efficiency of the EIA procedure in relation to aquaculture development and to identify weaknesses of this procedure in the Mediterranean[6].

[6] reference was also made to the recent FAO Technical Workshop on Environmental Impact Assessment and Monitoring in Aquaculture 15-17 September 2008, Rome, FAO Headquarters

7. Legal framework for site selection for aquaculture activities in the Mediterranean

37 Ms Rosa Chapela made a short presentation on the legal framework in Mediterranean countries for site selection. The presentation was made partly based on data collected within the framework of the preparation of the work carried out in cooperation with IUCN. Legal information was available for Spain, France, Algeria and Malta, while from Greece, Turkey, Egypt and Morocco the source of information was through a survey and a questionnaire on certain specific issues. Some general information was also gathered through the FAO NALO data bases. Altogether, the information on the Mediterranean legal framework for siting on marine aquaculture remained still limited and somewhat fragmented. Some specific issues emerged such as the complex and time-consuming permit process, long and confusing procedures for granting licences. The numerous laws, regulations, directives, rules and procedures that aquaculture promoter must comply with are extensive. The involvement of so many different authorities at several levels appeared cumbersome, although the differences among countries are great. Similar problems are encountered on Environmental Impact Assessment procedures, differences exist between countries in terms of studies and documents required.

38. The meeting expressed its appreciation of the work carried out and considered it relevant for the identification of a significant number of gaps in the criteria applied at different level in monitoring aquaculture activities within an established area. The participants also considered that deeper analysis covering all the Mediterranean countries was necessary to achieve a clear understanding of the legal framework on aquaculture and site selection with particular attention to the analysis of the criteria and regulatory systems applied the relevance of the national enforcement in application EIA and in monitoring and protecting benthic habitats.

39. Discussion followed on the definition of a programme for the implementation of desk and comparative studies based firstly on a detailed questionnaire on national regulations to be sent to the countries. The questionnaire collected will be followed by a regional meeting to discuss and review a first gap-analysis on the Mediterranean legal framework regulating the activities of finfish marine aquaculture, regarding the environment and its monitoring including EIA procedures.

8. Workplan and time frame

40. On the basis of the presentations made and discussion of the workplan of the Working Group on Siting and Carrying Capacity, timing of the SHOCMED programme was discussed and re-oriented. A preliminary re-identification of some activities for the WGSC and within SHOCMED for the period 2009 – 2010 were also indicated.

Programme 2008 – 2009

a) Identify the main issues that need to be addressed related to aquaculture (e.g. sensitive habitats, uses of the coastal zone, environmental peculiarities of Mediterranean marine ecosystems, etc).

b) Conduct a review of relevant sources of information and scientific evidence for thresholds related to major environmental changes determined by finfish marine aquaculture.

c) Conduct a review on major gaps in regulations, reporting and communication of monitoring programmes for finfish marine aquaculture activities.

d) Conduct a review on existing procedures for site selection used across the Mediterranean and evaluation of the effectiveness of regulatory schemes and EIA procedures.

e) Organise a regional meeting on Mediterranean marine finfish aquaculture regulation, site selection, EIA regulation and monitoring. (May 2009)

f) Conduct a review on the following general issues: (a) aquaculture – environment interactions and exclusion criteria for site selection taking into account recent research findings; (b) safety and risk analysis, (c) infrastructural needs (d) interactions with other uses of the coastal zone.

g) Identify environmental attributes affected by and affecting aquaculture with particular reference to Mediterranean marine ecosystems (e.g. as a function of depth, distance from shore, current regime, etc).

h) Organize a multi-stakeholder workshop on Siting and Carrying Capacity (October 2009) and discuss and finalize priorities issues for the SHOCMED programme. Preparation of a detailed programme for SHOCMED 2009 – 2010.

i) Organize a meeting focused on Mediterranean experiences on the allocation of zones for Aquaculture activities planned through an integrated and participatory approach and within an ecosystem perspective.

Activities from a) to h) will be partially covered by the SHOCMED programme.

Programme of 2009 – 2010

The following activities should be part of the SHOCMED programme for the second year:

j) Environmental Quality Standards. Review and define a list of environmental variables essential for monitoring of marine finfish aquaculture (O2, phyto, turbidity, nutrient concentration, sediment organic matter, macrofauna, redox potential, sediment). Environmental Quality Standards will be defined in order to have a common standard including methodology. This work could be based on the expert approach (Delphi) at Mediterranean level with the possibility of implementing some case studies (to be considered depending on budget availability).

k) Environmental Impact Assessment. Discussion and definition of the minimum and common requirements and good practice at Mediterranean level (preparation of the document on how Environmental Impact Assessment should be implemented at Mediterranean level);

l) Monitoring list for Marine Aquaculture. Definition of agreed protocol and procedures for the implementation of monitoring activities for marine finfish aquaculture in consideration of the list of parameters and EQS identified.

9. Any other matters

41. The Working Group discussed on the necessity to have a common Mediterranean system in which available (or published) environmental data are stored as well as data referred to the environment monitoring of the marine fish farms surroundings. This system (which will aggregate the existing databanks/archives/databases available) would permit many scientists to have access to data collected at different level of aggregation and at different spatial and time scale toward the definition of common environmental quality standard and analysis. The meeting suggested that SIPAM (Information System for the Promotion of Aquaculture in the Mediterranean) should support the activities of the CAQ WG on Siting and Carrying Capacity with the implementation of a data entry-tool defined and established within the SHOCMED project.

42. Participants also agreed that the reference of key papers of selected publications on the aquaculture-environment interaction in the Mediterranean marine ecosystems should be also made available on the online SIPAM database. This base-line may also be used as additional support for establishing good practice principles and adopting common standard for environmental sustainability.

10. Conclusion and specific Recommendations

Conclusions

43 The Working Group confirmed the need for proper site selection protocols for marine finfish aquaculture in the Mediterranean and insisted that these should be considered a priority. This should be implemented following the coordination of the numerous initiatives present at Mediterranean level, taking advantage of the scientific achievements in the different dimensions of the aquaculture sector (social, economic, environment, governance) and in an interdisciplinary manner.

44. The recent EC contribution to the WGSC through the support to SHOCMED was received with thanks and appreciation. However, due to financial limitations in implementing the activities of the WGSC in particular for the wide involvement of experts from the Mediterranean, the Meeting considered it advisable to investigate the possibility to increase rate of contribution for the next work plan period; the CAQ should investigate the possibility to involve also other potential donors.

45. The development of aquaculture in the coastal zone should be considered within the context of Integrated Coastal Zone Management and in an ecosystem perspective using as much possible as the development of aquaculture zoning and participatory and integrated approaches.

46. Monitoring of marine finfish aquaculture is essential to evaluate the effects and impact of aquaculture on the environment and on aquaculture itself. A minimum list of variables to be monitored, that may have an impact on the water column and on the bottom should include: sediment sampling, redox potential, organic & inorganic nutrients, sediment organic matter, total phosphorus in sediment, sediment grain size, benthic community, water quality.

47. The monitoring of the activities of capture fisheries (i.e., fisheries landing and surveys of fisheries resources) in the aquaculture areas could contribute to a better identification, evaluation, and assessment of a positive interaction between aquaculture activities and local fishing communities;

48. For the purposes of the Working Group it is necessary to take more advantage of the outputs and achievement of different experiences, pilot projects, studies and research programmes carried out in the Mediterranean areas concerning site selection with particular attention to aspects concerning marine aquaculture in relation to the environment and carrying capacity;

Specific recommendations

49. A monitoring programme for the environment of finfish marine aquaculture should be established at local and national levels. It is necessary to monitor the physical environment, including both water column and sediments (in particular near maerl and Posidonia beds) around fish farms in order to ensure that environmental quality standards that have been established for the relevant water body are not exceeded. A limited list of variables to be measured at Mediterranean fish farms has been established to serve as a basis for pan-Mediterranean environmental impact assessment (EIA) and monitoring protocols. The establishment of robust monitoring programs at aquaculture facilities will enable the Working group to progress toward a better approximation of environmental carrying and holding capacities for relevant Mediterranean sites

50. In Mediterranean countries the establishment of new aquaculture installations should be avoided over Posidonia beds and severely limited around Posidonia beds. In any case a restricted plan monitoring the impact of fish farms on the seagrass beds should be introduced. In addition a compensatory or mitigation plan should be introduced (minimum depth, secure distance, current, transplantation plan, moving/rotation plans).

51. For site selection and site management of Mediterranean aquaculture, procedures of Environmental Impact Assessment (EIA) as well as Environmental Monitoring Programs should be mandatory, harmonized and implemented in all Mediterranean countries.

Appendix I

Agenda

1. Opening of the meeting and arrangements
2. CAQ – Working Groups Activities and SHOCMED
3. Guidelines on site selection and site management
4. Site Selection and Zoning using an Ecosystem Approach to Management
5. Monitoring aquaculture activities
6. Environmental impact of aquaculture activities
7. Legal framework for site selection for aquaculture activities in the Mediterranean
8. Workplan and time frame
9. Any other matters
10. Conclusions and specific recommendations

Appendix II

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