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**GENERAL FISHERIES COMMISSION FOR  
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POUR LA MÉDITERRANÉE**



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**Report on intersessional activities for 2012-2013, recommendations  
and workplan for 2013-2014 related to aquaculture**

## INTRODUCTION

1. This document provides a summary of the work undertaken by the Committee on Aquaculture (CAQ) and its subsidiary bodies during the intersessional period. It also gathers the main conclusions and management advice as well as its programme of work for 2013-2014 as identified and included in the report of its eighth session (document GFCM:XXXVII/2013/Inf.7).

## ACTIVITIES OF THE COMMITTEE ON AQUACULTURE (CAQ)

2. The eighth session of the CAQ, including a special session of the Information System for the Promotion of Aquaculture in the Mediterranean (SIPAM), was held in Paris, France, from 13 to 15 March 2013. The Committee reviewed the activities and outcomes of the CAQ subsidiary bodies and projects. The intersessional activities were carried out in accordance with the programme of work agreed upon by the thirty-sixth session of GFCM (May 2012) and results are reported in the appropriate sections. The main activities of the Committee are summarized as follows:

### Working Group on Sustainability in Aquaculture (WGSA)

3. The activities of the WGSA were implemented within the European Union (EU) co-funded project on “Indicators for Sustainable Development of Aquaculture and Guidelines for their use in the Mediterranean (InDAM)”. InDAM Year 2 ended in December 2011 and its third year of implementation started in January 2013. It addressed the following issues: (i) finalization of the Guide on indicators for sustainable aquaculture in the Mediterranean and Black Sea countries, (ii) implementation of the pilot studies in Montenegro (step 1), in Spain and Morocco (step 2) and in Tunisia (step 3) to be carried out in 2013.

### Working Group on Site Selection and Carrying Capacity (WGSC)

4. The activities of the WGSC were implemented within the project on “Developing site selection and carrying capacity for Mediterranean aquaculture within aquaculture appropriate areas” (SHoCMed). SHoCMed Year 2 ended in December 2011 and the third year started in January 2013. During the intersessional period the following SHoCMed activities were carried out:

- Preparation of a draft document on: “Establishment of allocated zones for aquaculture (AZA): Guide for establishing coastal zones dedicated to aquaculture in Mediterranean countries”;
- Organization of two training workshops (T/W) on site selection, allocated zones for aquaculture and site management for coastal marine aquaculture. The first T/W was organized in Morocco, (February 2013) and the second in Turkey (February 2013) in collaboration with the Working Group on the Black Sea (WGBS). The events were organized in cooperation with local institutes and organizations and with FAO Fisheries and Aquaculture Department, and aimed at supporting GFCM Members to be more familiar with basic concepts related to AZA and on the steps to be undertaken for their establishment;
- Organization of a meeting on environmental monitoring scheme for Mediterranean and Black Sea marine aquaculture (Morocco, February 2013), which addressed key aspects related to the setting-up of an environmental monitoring scheme for aquaculture activities including priority variables to be measured.

### **Information System for the Promotion of Aquaculture in the Mediterranean (SIPAM)**

5. The activities carried out by SIPAM are hereafter summarized:

- IT components were improved by addressing the requirements of Recommendation GFCM/35/2011/6 pertaining to production statistics and data submission mechanisms, namely: statistical area and data meta-analysis; national summaries and tailor-made reports; PDF receipt submission system and capture-based aquaculture
- The Quick Start Guide for National Coordinators was updated to include two ad hoc sections on production statistics and on production centres data submission process;
- A prototype system for data consultation of SIPAM production statistics, to be accessed by registered users, was realized with the Crystal-Xcelsius dashboard designer;
- A preliminary version of the GFCM Aquaculture Statistical Yearbook (reference year 2010) was drafted in cooperation with the SIPAM national focal points.

6. Following the adoption of Recommendations GFCM/33/2009/4 and GFCM/35/2011/6, GFCM Members submitted aquaculture data through the SIPAM information system for the reference years from 2008 to 2011 (2011 submission is still ongoing). Production statistics prior to 2008 hosted by SIPAM were reviewed to ensure completeness and consistency.

### **Mediterranean coastal lagoons management: interactions between aquaculture and capture fisheries (LaMed-2)**

7. The project “Mediterranean coastal lagoons management: interactions between aquaculture and capture fisheries” (LaMed-2) started in September 2010. It is one of the two components of the larger project LaMed “Strengthening cooperation on fisheries and aquaculture management in the Mediterranean and the Black sea” and funded by the Directorate General for Fisheries and Aquaculture of the Italian Ministry for Agriculture and Forestry Policies.

8. The knowledge, data and experience gathered and reviewed through the project was included into the document “*Mediterranean coastal lagoons: sustainable management and interactions among aquaculture, capture fisheries and environment*” to be published within the GFCM Studies and Reviews series in 2013.

9. The main key elements were identified for the preparation of specific “*Guidelines for the sustainable management of coastal lagoons in the Mediterranean and the Black Sea*” to address the conservation of traditional aquaculture and artisanal capture fisheries, the prevention of any further degradation of coastal lagoons and restoration of the environment.

### **Working Group on Marketing of Aquaculture products (WGMA)**

10. A preliminary survey on aquaculture farmers' organizations is ongoing. The regional survey is implemented in cooperation with the International Organisation for the Development of Fisheries in Eastern and Central Europe (EUROFISH) and with the support of the SIPAM national focal points, producers' organizations and other relevant experts and national contact points already cooperating with the GFCM. The initiative represents a preliminary assessment of aquaculture farmers' organizations.

### **Working Group on the Black Sea (WGBS) related to aquaculture**

11. During the training workshop on site selection, allocated zones for aquaculture and site management for coastal marine aquaculture (Turkey, February 2013) participants were introduced to the main aspects related to establishing AZA and to the aquaculture zoning at local and national level.

12. At the same time, a back-to-back meeting on Black Sea aquaculture species diversification was held. Participants were introduced to the concepts of species diversification in aquaculture within the Black Sea region and discussions also addressed the role of aquaculture for marine restocking for stock enhancement purposes.

### **The glossary on aquaculture**

13. A draft glossary on aquaculture to harmonize the main aquaculture terms used by the CAQ was prepared. The draft glossary includes terms, among others, drawn from InDAM and SHoCMed projects' outputs, other activities of the subsidiary bodies, and from the SAC and the FAO glossaries as appropriate.

### **Standard format for national reports on aquaculture research and development activities**

14. A draft standard format for national reports on aquaculture research and development activities was developed. It comprises eight sections covering the main research topics in aquaculture and future research programmes and projects to be undertaken at national and international level.

## **THE FIRST GFCM STRATEGIC FRAMEWORK PROGRAMME**

15. The First GFCM strategic Framework Programme (FWP), adopted by the Commission during its last session in Morocco (May 2012), has been envisaged as a platform to promote sustainable development and cooperation in the GFCM area. It will also strengthen intra-institutional cooperation and coordination in matters relating to marine capture fisheries and aquaculture at regional level through the implementation of five work programmes (WP), including WP III on "Promoting the role of aquaculture for food security and economic growth".

16. The following activities were implemented by the CAQ and also within the context of the FWP:

- The two training workshops on AZA within the FWP work programme III output A) *Supporting the establishment of allocated zones for aquaculture (AZAs)*;
- The ongoing preliminary survey on aquaculture farmers' organizations within the output B): *Assessment of the current status and trend of farms and of marketing capability of aquaculture products*;
- The preparation of guidelines on lagoons management within the output E): *Enhancing traditional extensive aquaculture management in coastal lagoons*.

## **ELECTION OF THE BUREAU OF THE COMMITTEE ON AQUACULTURE**

17. The Committee decided to extend the mandate of Mr Francois René (France) as Chairperson for the second two-year term. It elected Mr Pablo Avila (Spain) and Mr Houssam Hamza (Tunisia) as first Vice-Chairperson and second Vice-Chairperson respectively.

## **SUGGESTIONS AND ADVICE OF THE CAQ**

18. On the basis of the main conclusions and suggestions of the CAQ subsidiary bodies and projects, the CAQ discussed and agreed on the following:

### **Lagoon management and interaction between aquaculture and capture fisheries**

19. Develop a set of ‘Guidelines for the sustainable management of coastal lagoons in the Mediterranean and the Black Sea’ considering the below elements:

- Traditional uses and knowledge of coastal lagoons, namely aquaculture and capture fisheries, and their interactions with other uses of coastal lagoons and activities having an impact on them and on coastal fisheries communities;
- Prevention of degradation, ecosystems restoration and conservation of biodiversity and natural habitats associated to coastal lagoons;
- Interaction of ichthyophagous seabirds and other non-marine species in coastal lagoons management;
- Hydraulic and channels management.

### **Working Group on Site Selection and Carrying Capacity (WGSC)**

20. Optimize the use of AZA as a suitable spatial planning tool for the integration of aquaculture in the coastal zones. The future work and research should, *inter alia*, focus on the following:

- Provide support to countries in the implementation of AZA;
- Foster cooperation between research institutions and other stakeholders to increase awareness on monitoring the environment surrounding farms at sea.

### **Working Group on Marketing of Aquaculture Products (WGMA)**

21. Support aquaculture farmer’s organizations through:

- Fostering recognition of the role played by farmers’ organizations in the development process of sustainable aquaculture in order to formulate supportive policies and legal arrangements to empower farmers’ organizations;
- Promoting managerial capabilities of farmers’ organizations on market governance issues in order to meet the challenges and opportunities of modern supply chains for seafood;
- Further promoting cooperation between CAQ and farmers’ organizations (farmers/producers) in order to provide first-hand information on the dynamics of the sector and for the formulation of proactive policies for sustainable development of aquaculture within the GFCM area.

### **Working Group on Sustainability in Aquaculture (WGSA)**

22. Continue pilot studies on indicators also taking into consideration land-based aquaculture and molluscs culture.

23. Continue the work on the development of the guidelines for the use of indicators which, among others, should be based on the following:

- Use of indicators to strengthen the public perception of aquaculture, market competitiveness, environmental sustainability and social acceptability;

- Establishment of a system of indicators together with procedures for its application according to national legislation;
- Support to multi-stakeholder and consensus-based approach for the consultative process to select indicators and use of the ecosystem approach to aquaculture (EAA);
- Development of a methodology and a technical protocol on how to apply indicators, data display (e.g. traffic-light, radar charts), regular revisions of the indicators and associated reference values/baselines/standards.

## **OTHER SALIENT SUGGESTIONS AND RELEVANT ADVICE**

24. During its eighth session, the CAQ also decided on additional issues to be addressed:
- Establish a regional reference framework for the sustainable development of aquaculture, taking into account the heterogeneity and specificities of the sector;
  - Undertake a “Regional review on the current status and peculiarities of aquaculture in the GFCM area” also via a thematic survey to take stock of the aquaculture status in the region;
  - Implement strategic actions and concerted initiatives to address national and sub-regional thematic priorities, challenges and expectations.

## **PROPOSED WORK PROGRAMME 2013-2014**

### **Working Group on Sustainability in Aquaculture (WGSA)**

25. WGSA will focus on implementing InDAM project’s activities:
- Identify reference points and standards for selected indicators;
  - Test the selected indicators at the local level and disseminate results;
  - Identify a strategy for the involvement of interested parties in the use of indicators;
  - Implement new pilot studies on indicators for sustainability including for other aquaculture systems and group of species.

### **Working Group on Site Selection and Carrying Capacity (WGSC)**

26. WGSC will focus on implementing SHoCMed project’s activities:
- Identify reference points of EQS for monitoring aquaculture;
  - Implement a programme for the dissemination of the technical results and outcomes of SHoCMed activities on AZA and allowable zones of effect (AZE);
  - Establish an IT platform on site selection and carrying capacity for data sharing ;
  - Carry out an EQS calibration exercise and set up a database;
  - Prepare a guide on harmonised environmental monitoring for the Mediterranean and Black Sea aquaculture.

### **Information System for the Promotion of Aquaculture in the Mediterranean (SIPAM)**

27. The SIPAM activities will focus on the following identified priorities:
- Follow the progress on data collection on: production centres, production statistics and market;
  - Finalize the integration of SIPAM activities and databases within the WGBS and follow-up assistance provided to the countries in terms of aquaculture data submission;

- Reactivate the “Research and Development Programmes” database and cooperate with other relevant institutions working on regional databases on aquaculture for data sharing such as AquaMed.

#### **Lagoon management and interaction between aquaculture and capture fisheries**

- Identify indicators for the sustainable development of aquaculture and capture fisheries activities within coastal lagoons;
- Continue the updating of the database on the coastal lagoons based on country reports and data sheets prepared within the LaMed-2 project and made available on the web.

#### **Working Group on Marketing of Aquaculture Products (WGMA)**

- Work with WGSA on the indicators and reference points for sustainable aquaculture on economic and marketing issues;
- Finalize, in cooperation with partners, the regional survey on farmers’ organizations and prepare a review of the legislation and present status of producers’ organizations and farmers’ organizations in the GFCM member countries;
- Cooperate in the organization of a scientific and technical conference on Mediterranean aquaculture (Bizerte, Tunisia 11–14 June 2013) on a “Market oriented approach to sustain the development of Mediterranean aquaculture”.

#### **Working Group on the Black Sea (WGBS)**

28. The WGBS activities will be implemented in close cooperation with the WGSA and WGSC. WGBS activities on aquaculture will be based on the outcomes of the second WGBS meeting (still to be held at the time of writing).

#### **OTHER PROPOSED ACTIVITIES**

- Carry out a regional survey on aquatic animal health and biosecurity on aquaculture (to be included in the FWP);
- Carry out a regional survey on the main aspects related to certification and traceability in aquaculture (to be included in the FWP);
- Prepare a project for the elaboration of the Regional review on the current status of aquaculture in the GFCM competence area and organization of a final workshop for the dissemination of results (to be included in the FWP);
- Draft a report on the “State of the aquaculture sector in the GFCM member countries” to be released on a biennial basis;
- Finalize and adopt the draft glossary on aquaculture;
- Finalize the draft standard format for national reports on aquaculture research and development activities to be adopted.

**Meetings and trainings scheduled for 2013-2014**

Title	Date/Place
WGSA – InDAM –Pilot study in Tunisia Step 3 on implementation of a system of indicators for sustainable aquaculture	June 2013 / Monastir, Tunisia
WGSA – InDAM – AdriaMed Pilot study Step 1 in Montenegro on identification of indicators for sustainable aquaculture	July 2013 / TBD
InDAM - SHoCMed - Workshops on the identification of reference points for environmental, social and economic indicators on aquaculture	November 2013 / TBD
WGSA – InDAM –Pilot study in Morocco Step 2 on indicators assessment and definition of a quantitative reference framework	December 2013 / M'diq, Morocco
WGSA – InDAM – Pilot study in Spain on the identification of indicators for sustainable aquaculture (molluscs)	TBD
Sixth Coordination Meeting of the Working Groups of CAQ	TBD
Fifteenth session of SIPAM	1 <sup>st</sup> quarter of 2014 / TBD

29. All proposed activities will be implemented subject to the availability of funds.

**SUGGESTED ACTION BY THE COMMISSION**

30. The Commission is invited to review the activities carried out by CAQ subsidiary bodies during the intersessional period and to provide guidance on any follow-up that may be required as well as on the working strategies to be adopted. It is also invited to examine and, as appropriate, endorse the conclusions and advice of Committee on Aquaculture.

31. The Commission is also invited to review the activities proposed by its Committee on Aquaculture as detailed in this report. The Commission may wish to highlight its priorities and to consider budgetary implications in finalising the programme of work.

## Appendix A

**DRAFT TERMS OF REFERENCE FOR SELECTED ACTIONS AND MEETINGS**

- A.** (WGSA) Terms of Reference of the **Pilot study in Tunisia Step 3 on implementation of a system of indicators for sustainable aquaculture** organized within InDAM project (June 2013, Monastir, Tunisia):
- Introduce participants to use of traffic-light to display the value of indicators;
  - Discuss about a strategy for adoption and future use of indicators by national target users;
  - Review the list of indicators and methodological sheets agreed during pilot studies step 2 in Tunisia;
  - Perform a field visit to fish farms and use the selected indicators to assess aquaculture operations;
  - Review the system of indicators and their methodological sheets based on the field activity.
- B.** (WGSA) Terms of Reference of the **Pilot study Step 1 in Montenegro on identification of indicators for sustainable aquaculture** organized within InDAM and AdriaMed projects (July 2013, place TBD):
- Introduce participants to concepts of sustainable development in aquaculture, indicators of sustainability and InDAM project;
  - Discuss the initial set of 156 preselected indicators identified by InDAM;
  - Discuss the relation between the use of indicators and the implementation of AZA
  - Prioritize attributes of indicators through a process of scoring and ranking and possible use of Delphi approach;
  - Select indicators to be used at farm, local and national level based on priority attributes and final validation.
- C.** (WGSA-WGMA) Terms of Reference of the **Workshops on the identification of reference points for social and economic indicators on aquaculture** organized within InDAM project (November 2013, place TBD):
- Present and discuss the status of the application of social and economic indicators for sustainable aquaculture at different level (regional, national, local, farm) and share the available information;
  - Review the methodological sheets (which include methodology to measure indicator and reference values/baselines/ standards) of the social and economic indicators prepared during pilot studies step 2 in Turkey and Tunisia;
  - Review the regional indicators for the social and economic dimensions and identify reference values and standards;
  - Discuss, synthesize and identify reference points and standards for the selected indicators to be included within the methodological sheets.



**D.** (WGSA-WGSC) Terms of Reference of the **Workshops on the identification of reference points for environmental indicators on aquaculture** organized within InDAM and SHoCMed projects (November 2013, place TBD):

- Present and discuss the status of the application of environmental indicators for sustainable aquaculture at different level (regional, national, local, farm) and share the available information;
- Review the methodological sheets (which include methodology to measure indicator and reference values/baselines/ standards) of the environmental indicators prepared during pilot studies step 2 in Turkey and Tunisia;
- Review the regional indicators for the environmental dimension and identify reference values and standards;
- Discuss, synthesize and identify reference points and standards for the selected indicators to be included within the methodological sheets.

**E.** (WGSA) Terms of Reference of the **Pilot study in Morocco Step 2 on indicators assessment and definition of a quantitative reference framework** organized within InDAM project (December 2013, M'diq, Morocco):

- Prepare methodology sheets for the pre-selected indicators during step 1 (e.g. based on prioritized indicators attributes);
- Discuss with key stakeholders to further test and validate the applicability of pre-selected indicators;
- Reassess and finalize indicators including methodological aspects and reference values/baselines/standards;

**F.** (WGSA) Terms of Reference of the **Pilot study in Spain on the identification of indicators for sustainable aquaculture of molluscs** organized within InDAM project (date and place TBD):

- Introduce participants to concepts of sustainable development in aquaculture, indicators of sustainability and InDAM project, use of traffic-light to display the value of indicators;
- Select specific indicators for sustainable aquaculture of molluscs to be used at farm, local and national level based on priority attributes and final validation;
- Prepare methodology sheets for the selected indicators for sustainable aquaculture of molluscs;
- Identify reference points and standards for the selected indicators to be included within the methodological sheets.
- Test applicability of indicators and prepare a strategy for adoption and future use by national target users.

### **G. Regional review on the current status of aquaculture in the GFCM Competence Area**

The social and economic relevance of sustainable development in aquaculture within the GFCM area has been stressed on many occasions and in several fora. At present, aquaculture industry consists of various segments depending, *inter alia*, on the rearing system, the farming environment and the cultured species. In addition, it is important to recall that GFCM Members are at different stages of industry maturity, depending on multidimensional factors and local specificities.

This heterogeneous regional industry calls for strategic actions to address fundamental differences among countries and between sub-regions in order to guarantee equal opportunities and social, economic and environmental sustainability. The preparation of these actions requires timely information and updated knowledge of the aquaculture sector in the GFCM area including with regards to main issues such as market competition, use of coastal zones, legislation, and research.

To concretely address this challenge the GFCM will undertake a *Regional review on the current status of aquaculture in the GFCM competence area* via a thematic regional survey in order to take stock of the aquaculture status in the GFCM area.

The Regional review would help setting-up a suitable regional platform to exchange experiences, improve the knowledge and strengthening the cooperation on the aquaculture sector among GFCM Members. The Regional review will also be instrumental to identify priorities in light of the regional, sub-regional and country specificities, and hence provide useful elements in support to aquaculture action plans in the GFCM area.

Within the GFCM remit of promoting sustainable development of aquaculture, the overall objective of the regional review is to gather key information for a thematic evaluation of aquaculture in the GFCM Area through a regional survey which will comprise the following main activities:

1. Carry out an inventory of regional initiatives, projects and programmes dealing with Mediterranean and Black Sea aquaculture in order to build on their outcomes and achievements;
2. Perform an analysis at regional, sub-regional and national level of the status of aquaculture in terms of:
  - Farming technologies
  - National expertise
  - Market (traceability, certification, national and international markets)
  - Species diversification including on-going experimentation
  - Aquatic animal health including biosecurity, veterinary and quality control
  - Aquaculture nutrition, feed technology and use of fish meal (nature, origin)
  - Availability of infrastructure and integrated activities
  - Existing national development plan for aquaculture
  - Organization of the private sector
  - System of data collection systems and reporting of aquaculture
  - Aquaculture-related legislation
  - Research and education facilities
  - Government and private sector investments
  - Environment monitoring programmes
  - Climate change
  - Organic aquaculture
  - Public perception of the aquaculture sector and aquaculture products
3. Identification of priorities, challenges and technical assistance needs at national, sub-regional and regional levels;
4. Organization of a workshop to present and disseminate the results of the regional review and define a strategic reference framework for aquaculture.

**Appendix B****Guidelines for the sustainable management of coastal lagoons  
in the Mediterranean and the Black Sea****BACKGROUND**

1. During the 6<sup>th</sup> and 7<sup>th</sup> Sessions of CAQ, environmental degradation was recognized to have negatively affected several coastal lagoons in the Mediterranean and the Black Sea due to inadequate management. CAQ thus stressed the importance to address the issues of interactions between aquaculture and capture fisheries and the relevance of these two sectors in consideration of the fragile ecosystems and motioned for their sustainable management consistent with an integrated coastal zone management.
2. Subsequent to a request by the Commission at its 32<sup>nd</sup> Session, the GFCM Secretariat developed the project LaMed “Mediterranean coastal lagoons management: interactions between aquaculture and capture fisheries”, funded by the Italian Ministry of Agriculture and Forestry Policies. The main issues related to the role of traditional extensive aquaculture and capture fisheries and the lagoons management were addressed during a meeting held in Cagliari, Italy, June 2011.
3. Furthermore, at its 36<sup>th</sup> Session, the Commission, acting on the advice made on aquaculture management, gave mandate to the Secretariat and to the CAQ to proceed with the preparation of specific guidelines regarding the management plan of coastal lagoons aiming at addressing the conservation of traditional aquaculture and artisanal capture fisheries, the prevention of any further degradation of coastal lagoons and the preservation of these environments.
4. Finally, at its 8<sup>th</sup> Session, the CAQ identified the main key elements for the preparation of specific “*Guidelines for the sustainable management of coastal lagoons in the Mediterranean and the Black Sea*”.

**FOLLOW-UP**

The Commission is invited to review this draft and may wish to revise it as appropriate. The Commission may also provide further advice in this regard.

## Definitions

**“Coastal lagoons”:** *coastal lagoons are shallow water bodies separated from the ocean by a barrier, connected at least intermittently to the ocean by one or more restricted inlets, and usually oriented shore-parallel<sup>1</sup>.*

## Objective

The overall objective of the “Guidelines for the sustainable management of coastal lagoons in the Mediterranean and the Black Sea” is to provide general guidance in the development and implementation of actions for the sustainable management of coastal lagoons, which includes the prevention of further environmental degradation, restoration of ecological conditions, and the conservation of traditional aquaculture and artisanal fisheries which represent a strategic components of common traditional knowledge of local communities. Ultimately the Guidelines aim also at providing key elements to inform the elaboration of plans of actions for the sustainable management of coastal lagoons in the GFCM Area.

## Principles

For the management of coastal lagoons the following principles and instruments are relevant:

**FAO Code of Conduct for Responsible Fisheries:** the approach to coastal lagoons management in the Mediterranean and Black Sea should be in line with the main principles enshrined in the 1995 FAO Code of Conduct for Responsible Fisheries and in particular with Article 6 paragraph 8 which calls upon States, inter alia, to protect and rehabilitate as far as possible and where necessary critical fisheries habitats in marine and fresh water ecosystems such as wetlands, lagoons, nursery and spawning areas from destruction, degradation, pollution and other significant impacts resulting from human activities that threaten the health and viability of the fishery resources.

**National and international legal instruments:** coastal lagoons management should also be consistent with the principles enclosed in international legal instruments such as the Johannesburg Declaration on Sustainable Development of 2002, the 1971 Ramsar Convention on wetlands, the 1979 Bonn Convention on the conservation of migratory species of wild animals, the Barcelona Convention and its Protocols (“Barcelona System”), and the 1992 Convention on biodiversity, which all highlight the role of the management of natural resources, biodiversity conservation as well as of the traditional activities of communities in coastal lagoons.

**Role of aquaculture and artisanal fisheries:** actions should pursue the preservation of traditional extensive aquaculture and artisanal fisheries in coastal lagoons in consideration of the ecological and economic services provided by these traditional activities and as a cultural heritage.

**Participatory approach and traditional knowledge:** actions should ensure a wide participation of stakeholders, and in particular local communities, in any decision-making consultative process in relation to the management of coastal lagoons to foster ownership and use of traditional knowledge and practices. Most coastal lagoons as can be seen today are the

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<sup>1</sup> Kjerfve, B. (1994). Coastal Lagoons, chapter 1. In: Kjerfve, B. (ed.) Coastal lagoon processes. pp 1-8. Elsevier Oceanography Series, Amsterdam.

results of the interaction of natural dynamics and management by man for centuries, and they would not have survived without the continuous management by local communities for economic purposes thus enabling the conservation of these environments through centuries.

**Prevention of degradation and restoration:** actions should ensure the prevention of any further degradation of coastal lagoons and the restoration of the ecosystems associated to these environments and biodiversity.

**Conservation:** actions should put in place measures for the conservation of coastal lagoons also linked to a correct hydraulic management of these environments, which contributes to the control of the ecological characteristics of the system and to production enhancement.

**Ecological and productive ecosystems:** coastal lagoons are highly ecological resilient and productive ecosystems with impressive environmental heterogeneity among different lagoons and among various portions of the same lagoon. Actions should endeavour to maintain their resiliency and productivity within the context of sustainable development.

**Impacts of climate change:** the risks posed by a changing climate including, *inter alia*, sea temperature increase, sea level rise and salinity intrusion, sea water acidification, and intensification and unpredictability of extreme weather events, should be taken into consideration for coastal lagoons management and conservation.

**Sustainability dimensions:** the main issues dealing with interactions between aquaculture and capture fisheries in coastal lagoons in its sustainability dimensions (environmental, economic, social and overarching governance) and as reaffirmed at the 2012 United Nations Conference on Sustainable Development (Rio+20) should be taken into account.

**Indicators for the sustainable management of coastal lagoons:** actions should support the use of a system of indicators to measure progress towards the sustainable management of coastal lagoons.

**Complementarity, Coherence and Consistency:** actions should be complementary, coherent and consistent with current activities, actions and international commitments, including the ecosystem approach to fisheries and aquaculture (EAF/EAA).

**Flexibility, Adaptability, Transparency and Accountability:** the principles of flexibility, adaptability, transparency and accountability are fundamental elements for the sustainable management of coastal lagoons.

### **Proposed Actions**

The GFCM Members should consider the following actions, including taking into consideration CAQ advice, related to relevant issues in the sustainable management of coastal lagoons, (they shall be without prejudice to additional or stricter measures taken or to be taken for the sustainable management of coastal lagoons):

1. Undertake appropriate measures in order to prevent any further environmental degradation, pollution, and contraction of the overall coastal lagoons surface by land reclamation.

2. Avoid the intensification of activities in coastal lagoons and surroundings and consider undertaking mitigation measures as appropriate to reduce the impacts on lagoon ecological dynamics.
3. Consider undertaking restoration and conservation measures for coastal lagoons and surroundings based on a multifunctional approach so as to re-establish and preserve unaltered the level of productivity, biodiversity, diversified habitats and ecotones, ecological complexity, ecological resilience and stability, and ecosystem services provided by these environments.
4. Consider the effects and impacts caused by climate change on coastal lagoons and consider adaptation and mitigation measures to cope with the emerging challenges.
5. Avoid the introduction of alien species in coastal lagoons and consider the use of a system to monitor the stocking and/or restocking enhancing initiatives.
6. Undertake appropriate interventions to ensure a correct hydraulic management of coastal lagoons and related communication channels to the sea. These would result, *inter alia*, in reduced sedimentation, improved water circulation between the lagoons and the sea and inside the lagoons, better distribution of trophic resources in the lagoons, and fostered seasonal migration of euryhaline species inwards and outwards the lagoons.
7. Adequate and effective measures shall be put in place to address the impact on fish communities by ichthyophagous seabirds and other non-marine species which cause social, economic and environmental disturbances.
8. Evaluate the interactions between traditional aquaculture and artisanal capture fisheries in coastal lagoons and their key role in enabling the physical conservation of these environments while supporting social well-being and sustainable livelihoods.
9. Consider an integrated management approach and planning of traditional aquaculture and artisanal capture fisheries within an EAF/EAA and ICZM perspective taking into consideration the other different uses which may occur in coastal lagoons and surrounding territory including, *inter alia*, agriculture, urbanization, industrialization and ecotourism.
10. Ensure a wide participation of stakeholders, and in particular local communities, in decision-making consultative processes inherent to aquaculture, artisanal capture fisheries and to general management of coastal lagoons to take advantage of traditional local knowledge, innovations and practices.
11. Contemplate the adoption of a system of indicators to measure progress towards the sustainable management of coastal lagoons in its economic, social, environmental dimensions and governance.

### **Human resources development for coastal lagoon management**

Communication and awareness programmes related to the sustainable management of coastal lagoons should be established amongst stakeholders and the general public to provide an adequate knowledge base on these sensitive ecosystems.

Effective participation of stakeholders, in particular local communities, should be supported by access to information and education.

Member countries are encouraged to seek assistance in the monitoring the progress towards the sustainable management of coastal lagoons and in the development and implementation of national plans of action for the management of coastal lagoons.