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## Preface

Coastal wetlands around the Mediterranean basin are very diverse as a result of the climatic variability of the region. Ranging from large river deltas and lagoons in Northern shores to sebkhas and seasonal marshes in the South, these unique ecosystems have traditionally played a major role in the development of local communities, through the provision of essential services like water, food, materials and transport. Other primary benefits are flood protection and prevention of soil erosion, maintenance of water quality, climate change mitigation, recreation and tourism. Mediterranean people have used wetlands and lived in them for centuries, developing strong ecological and cultural bonds with them. Coastal wetlands have also high levels of biodiversity and are the primary habitat for many species, providing protection for the whole biological integrity of coastal environment.

Besides both mentioned characteristics (diversity and strong ties with people), Mediterranean coastal wetlands are currently defined by a third specific feature: a degraded environmental condition as a consequence of a very diverse and complex set of threats. These ecosystems are under a great deal of pressure from the dual forces of rising sea level derived from climate change, and the intervention of an ever-growing human population. Direct impacts include the destruction or degradation of wetlands from land reclamation and infrastructures. Indirect impacts derive from the discharge of pollutants, changes in river flows and sediment supplies, land clearing, and dam operations. The last century has seen the loss of more than half the wetlands in the Mediterranean region, which has resulted in a severe loss of their functions and original values. Even though many attempts have been made to counteract this trend, the degradation and loss have not yet been stopped or reversed.

However, well-managed wetlands can be very productive and, at the same time, continue to be high-quality habitats for numerous threatened species of fish, amphibious, reptiles and birds that are all part of our Mediterranean natural heritage. Thus, the age-old maintenance of traditional aquaculture/capture fishery practices in certain Mediterranean coastal wetlands has decisively contributed to preserve these ecosystems. In Italy, traditional extensive *Valliculture* represents a unique ecological, landscape, and cultural heritage and contributes to the conservation of the sensitive Upper Adriatic coastal wetlands. In Southern Spain, extensive and semi-intensive aquaculture practises have become an integral part of a vast protected coastal marshland system, promoting both environmental conservation and the development of local economy. In France, ancient salt marshes and wetlands on its Southwest coast have traditionally been devoted to the extensive culture of eel, gaining an enormous environmental and patrimonial value. In all cases, economic activity based on eco-friendly aquaculture and fishery systems have led to the protection and rehabilitation of coastal wetlands and lagoons, increasing biodiversity and supporting a number of environmental services for their hydrology and ecology. Many of these exploited wetlands are listed as sites of biological and ecological interest, some of them being protected areas and/or hosting populations of species covered by the SPA/BD Protocol Annexes of the Barcelona Convention.

Therefore, it seems clear that to achieve a sustainable management of Mediterranean coastal wetlands and lagoons, it is fundamental to put together the indicated aspects of natural functionality conservation and productive processes. Unfortunately, the relationship between sustainable uses such as aquaculture/capture fishery and wildlife conservation is not equally explored in all Mediterranean countries and not enough information is available on positive interactions between these practices and coastal wetlands environment.

This project responds to the need to fulfil SAP BIO regional priorities regarding wetlands and to the Parties request for elaboration of projects addressing climate change response issues. It also addresses to the necessity, discussed by the Experts in June 2011 at the GFCM LaMed-2 Meeting in Cagliari, on *Mediterranean coastal lagoons management: interactions between aquaculture and capture fisheries* to develop a holistic approach to the management of Mediterranean coastal wetlands and lagoons, and to implement regional actions considering all dimensions of sustainable development, as well as to design a common strategy for the sustainable management of aquaculture and capture fishery in the Mediterranean countries.

The project may also provide Mediterranean countries with an integrated strategy to conserve and manage their unique coastal biodiversity, promoting the use of aquaculture and capture fishery as a base for habitat rehabilitation, climate change mitigation, and the improvement of local communities' welfare. Additionally, the project foments the sharing of development experiences on coastal areas, supplying high opportunities for countries partnerships in order to exchange information, maintain a common database on the status of their coastal wetlands and lagoons, and facilitate decision making processes.

A Meeting to guide the further elaboration of this regional action was held in Málaga, Spain, from 18 to 19 October 2011, organized by the Regional Activity Centre for Specially Protected Areas (RAC/SPA) of the UNEP Mediterranean Action Plan, in collaboration with the Mediterranean Marine Programme of the International Union for the Conservation of Nature (IUCN). The Meeting was hosted by the IUCN-Med office in Málaga and attended by Delegates and Technical Experts from the Regional Activity Centre for Specially Protected Areas (RAC/SPA) of the UNEP Mediterranean Action Plan; Mediterranean Marine Programme of the International Union for the Conservation of Nature (IUCN); General Fisheries Commission for the Mediterranean (GFCM) / Committee on Aquaculture (CAQ); MedWet; COPEMED /ARTFIMED projects of the Food and Agriculture Organization of the United Nations (FAO); Conservation du Littoral (CdL); and the Agencia de Gestion Agraria y Pesquera de Andalucía (AGAPA).

The project is currently in its elaboration phase and present document brings together a number of guidelines and advise emanated from the mentioned meeting, after common work by Delegates on the different project items, as compiled by RAC/SPA during discussion sessions.

## 1. Relevance of the action

### 1.1 Justification and reasoning

The project presented aims to address already identified priorities of the Strategic Action Programme for the Conservation of Biological Diversity (SAP BIO) in the Mediterranean Region, responding to the challenge of reconciling the socio-economic development of the Mediterranean coastal areas and the long-term conservation of the area's biological diversity. It seems clear that the wide range of threats currently hanging over Mediterranean wetland and coastal lagoons require adequate responses coming from multiple stakeholders, through the implementation of regional activities. Thus, the project is born as one of these possible regional activities, in order to help fulfilling SAP BIO priorities.

The Regional Activity Centre for Specially Protected Areas (RAC/SPA) of the UNEP Mediterranean Action Plan, through its Strategic Action Programme for the Conservation of Biological Diversity (SAP BIO) in the Mediterranean Region, has the appropriate international legal and policy framework to assist and support Mediterranean countries in order to accomplish project overall objective, under the principles accounted by the Barcelona Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (and its protocols), and other international frames such as the Ramsar Convention, the 1992 Convention on Biological Diversity, the 2002 Johannesburg Declaration on Sustainable Development, or the 2003 Food and Agriculture Organization (FAO) Code of Conduct of Responsible Fisheries in the Mediterranean.

Present regional action addresses high priority issues identified within the framework of the Mediterranean Action Plan. During their 15<sup>th</sup> Ordinary Meeting, the Contracting Parties to the Barcelona Convention adopted a roadmap to progressively apply the ecosystem approach to the management of human activities that may affect the Mediterranean coastal environment. The project falls also within the mission of the CBD Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets, specifically focusing on the achievement for the Mediterranean area, of *Target 4* in relation to stakeholders involvement in the implementation of plans for sustainable production and consumption; *Target 5* regarding the reduction on habitat loss rate; *Target 6 and 7* that make reference to the sustainable use of fish stocks, including restoration plans; *Target 14* concerning the recovery of essential ecosystem services, particularly those related to water; and *Target 15* with regard to the enhancement of ecosystem resilience and the contribution of biodiversity to carbon stocks.

Under this work structure, the project is lined up with similar objectives, as well as linked up with the activities and the outputs of ongoing GFCM LaMed-2 project, the current assessment of Mediterranean wetlands by the Mediterranean Wetlands Observatory (MWO), the IUCN guidelines for a sustainable aquaculture, and the FAO guidelines and development tools. As well as the 2012 *Agadir Guidelines: practical proposals to value and ensure sustainable use of water-related ecosystems in the Mediterranean*; set at the Medwet International Symposium on Water and Wetlands in the Mediterranean (Agadir, Morocco, 6-8 February 2012).

The action could also be an appropriate basis for the implementation of restocking actions finally directed towards the improvement of natural (marine) fish stock status and the restoration of critical fish habitat.

Finally, the project pays attention to the necessity of integrating wetland conservation tasks with agriculture, water quality and other issues related to the comprehensive sustainable management of coastal areas.

## 1.2. Project scope and geographical boundary conditions

Present project embraces RAMSAR definitions of wetlands/lagoons and their protection/restoration, with the improvement of participated dialogue for planning and management.

In this sense, the project tries to integrate the multiple uses of coastal areas such as artisanal fishery, traditional aquaculture / fishery, recreational activities and other cultural heritage aspects, with ecological services, management, ecological restoration labours and biodiversity protection, in order to achieve a more integrated management of coastal wetlands and lagoons, as well as to develop innovative approaches and tools (for example, indicators) and to increase general awareness through the dissemination of successful experiences on sustainable uses of coastal wetlands and lagoons, creating a considerable networking on this matter.

The natural area for the implementation of the project includes all Mediterranean riparian countries, and all the Governmental and Non-Governmental entities and stakeholders concerned with the sustainable use and the conservation of coastal wetlands and lagoons in the Mediterranean will benefit from the results and outputs of the project. These include authorities, organisations and individuals in the region. The project results and outputs will also facilitate the work of many international organisations (IGOs and NGOs) active in the Mediterranean.

## 2. Pilot activities

To attain the overall objectives of the project, it is necessary to:

1. Assess the ecological status and pressures of inventoried Mediterranean coastal wetlands and lagoons.
2. Analyze the benefits that sustainable practices such as extensive aquaculture / traditional capture fishery provide to these ecosystems.
3. Identify and assess ecosystem goods and services.
4. Develop a set of ecological and operational objectives with indicators and target levels.

These actions require carrying out a detailed study of existing successful experiences on the integration of aquaculture/capture fishery and other sustainable activities, and wildlife conservation.

Furthermore, field surveys, analysis of country reports and consultation with international experts, regional organizations and country delegates, will be required to propose coastal

sites in the Mediterranean region for the pilot implementation of sustainable experiences on aquaculture/capture fishery and other related eco-friendly practices.

## 2.1. Key requirements to drive pilot cases

Representative criteria for addressing the work with pilot cases include case size, replication capacity, value for biodiversity and geographical balance.

In order to choose the most appropriate experiences, a minimum number of five cases (perhaps one case per country), is proposed including some firmly established experiences (e.g. aquaculture in Doniana area, SW Spain) or new innovative management practices.

## 2.2. Candidate areas

A number of candidate areas, according to the above mentioned criteria, are proposed:

- Lake Maryout in Egypt.
- Cabras lagoon in Sardinia, Italy.
- Oued Moulouya in Morocco.
- The lagoons of Hergla in Tunisia.
- Veta la Palma farm in SW Spain.
- Gediz delta in the Aegean region of Turkey.
- Neretva delta in Croatia.
- One or two places (not yet determined) in Greece.
- Les Salins de Camargue in France.

# 3. Tentative project architecture

## 3.1. Consultation needs with interested and affected parties

The RAC/SPA, through a preliminary consultation process with international experts, regional organizations and country delegates, is currently analyzing the available information on successful experiences of integration between aquaculture/capture fishery and wildlife conservation.

National Focal Points, as well as different authorities and institutions at National and

Subnational levels, would also be contacted to participate to the project and to contribute by:

- Advising (particularly during the initial phase of the project) on the definition of important wetland locations, mapping, software and training requirements.
- Facilitating access to existing data (e.g. wetland inventory, in-situ data on the selected sites, field surveys, etc.).

It should also be enhanced the value of other existing networks with information on the integration of aquaculture environmental issues through the region, considering particularly the GFCM contact points for the LaMed-2 Project.

Finally, organizations such as the IUCN Environmental Law Centre and BirdLife International, will be taken into account for advising purposes and to build a closer relationship with subnational stakeholder institutions for fishery, agriculture and related activities.

### 3.2. Project architecture

Three levels of modules can be distinguished for the architectural design of the project under construction:

1. Local modules: that would include the case-studies and local component of participatory dialogue. The case studies would provide the basic tools and information for the following modules.
2. National modules: defined essentially by a participatory process aimed to identify target areas and issues, through the combined effort of all international project partners and the integration of results into national policy and planning.
3. Regional modules: ranging from the simple (and essential) increase of public awareness to the dissemination of project outputs and their integration with ongoing regional databases as GlobeWetland II, for the management-oriented assessment and monitoring of Mediterranean coastal wetlands and lagoons, and with other regional efforts for the conservation and management of Mediterranean coastal areas (e.g. Med-INA in Greece).

It should also be emphasized project capacity building to guide its internal ability to achieve measurable and sustainable results, in a scaled-on development from local to regional scale, providing at the same time teaching resources and educational ideas (teaching toolbox) to equip all Mediterranean wetland stakeholders with skills, knowledge and inspiration.

### 3.3 Project opportunities

Many different opportunities that may derive from this project, such as:

- Creation of local employment.
- Enhancement of the positive link between development and conservation, and between sustainable fishing activities and the ecosystem.

- Objective demonstration of ecosystem values.

One of the most important benefits from the project is the possibility of addressing the CBD-Aichi biodiversity targets, particularly those referring to stop the loss of biodiversity in Mediterranean coastal wetlands and lagoons, restore lost functionality and ensure that they continue to provide essential services to local communities.

Present regional projects may also constitute an important basis for stakeholders' involvement in the implementation of plans for the sustainable production and use of Mediterranean coastal fish stocks, including restoration plans.

Finally, as was mentioned above in this document, the project as a holistic approach to the management of Mediterranean coastal wetlands and lagoons, since its implementation would take into consideration all environmental, economic, social and governance dimensions of sustainable development.

### 3.4 Preliminary schedule and estimates on cost levels

To implement the project, three possible phases are tentatively proposed:

1. Two-year phase: to develop criteria to identify representative areas (according to wetland type: estuaries, marshes, coastal lagoons, artificial wetlands, etc.) and actions to perform; to choose target areas for pilot experiences and long-term implementation of project goals; to prepare guidelines and tools; and to involve stakeholders.

Project capacity building, teaching resources, on-the-job training (including workshops and training seminars) should be taken into account during this stage of the project.

2. Five-year phase: to put into practice mainly strategic activities on pilot sites, involving administrations, private and public actors, donors, local communities, etc. Along this phase, first assessment of ecological state should be carried out, also monitoring foreseen social-economic benefits at local and regional levels.
3. Seven-year-phase: for final assessment of strategic activities and interventions. During this third phase, a coordination strategy and synergy schedule should be defined between all project actors.

Finally in the seven-year-phase, the state of project development should, according to Meeting Delegates and Expert, allow to finish with the monitoring of project outputs and assess both ecological improvement and economic revenue in terms of jobs and profit.

Dissemination of all results would be the last project mission to be performed along this phase.

### 3.5. Potential donor sources and eventual contributions of participant organizations

The following institutions and actors can be mentioned, among others, as potential donor sources to be approached for this regional project and/or its national components:

- The United Nations Development Programme (UNDP).
- The Directorate-General for the Environment, European Commission.
- The World Bank.
- The Global Environment Facility (GEF).
- The African Development Bank (AfDB).
- National donor agencies present in the region: the French Global Environment Fund (FGEF), German Society for International Cooperation (GIZ), Spanish Agency for International Cooperation to Development (AECID), etc.



## **Annex I: Draft project description**



## Summary

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Title (provisional)	Enhancing Mediterranean wetlands and livelihood through rehabilitation, ecosystem-based management and participatory approach.
Total duration of the action	Fourteen years (168 months), distributed in three phases: <ol style="list-style-type: none"> <li>1. Two-year phase.</li> <li>2. Five-year phase.</li> <li>3. Seven-year-phase.</li> </ol>
Objectives (overall) of the action	To provide Mediterranean countries with an integrated strategy to restore, conserve and manage their unique coastal biodiversity, promoting the use of aquaculture and capture fishery as a base for habitat rehabilitation, climate change mitigation, and the improvement of local communities' welfare.
Partner(s)	Relevant regional organizations such as FAO, GFCM, MedWet, IUCN and Tour du Valat.
Target group(s)	All Governmental and Non-Governmental bodies and stakeholders concerned with the sustainable use and the conservation of coastal wetlands and lagoons in the Mediterranean.
Final beneficiaries	The users of the Mediterranean coastal wetlands and lagoons, including the local communities, as well as biodiversity itself will benefit from the results and outputs of the project.
Estimated (overall) results	<ol style="list-style-type: none"> <li>1. Recovery of essential ecosystem services in degraded Mediterranean coastal wetlands and lagoons, particularly those services related to water, and objective demonstration on ecosystem values.</li> <li>2. Integration of ecosystem approach in the implementation of plans for sustainable fish production and consumption, through eco-friendly aquaculture and capture fishery.</li> <li>3. Enhancement of ecosystem resilience, with special focus on the role of coastal wetlands and lagoons in global carbon balance.</li> <li>4. Methodologies available to the stakeholders and decision-makers at regional, national and local levels. Creation of local employment is expected to derive from this project.</li> <li>5. Enhancement of the positive link between sustainable fishing activities and ecosystem conservation.</li> <li>6. Fulfilment of several CBD-Aichi biodiversity targets for the Mediterranean area.</li> </ol>

Main activities	<ol style="list-style-type: none"><li>1. Assess the ecological status and pressures of inventoried Mediterranean coastal wetlands and lagoons.</li><li>2. Analyze the benefits that sustainable practices on extensive aquaculture and traditional capture fishery provide to these ecosystems.</li><li>3. Develop a set of ecological and operational objectives with indicators and target levels.</li><li>4. Establish the basis for the processing of a common strategy for the sustainable management of aquaculture and capture fishery in Mediterranean coastal wetlands.</li></ol>
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## **1. Objectives**

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The overall objective of this project is to provide Mediterranean countries with an integrated strategy to conserve and manage their unique coastal biodiversity, promoting the use of aquaculture and capture fishery as a base for habitat rehabilitation, climate change mitigation, and the improvement of local communities' welfare. The project constitutes a holistic approach to the management of Mediterranean coastal wetlands and lagoons, since its implementation would take into consideration all environmental, economic, social and governance dimensions of sustainable development. The project also responds to the necessity to have a common strategy for the sustainable management of aquaculture and capture fishery in the Mediterranean countries, which are requested to prepare an integrated action plan to achieve the sustainable development of these activities.

The Regional Activity Centre for Specially Protected Areas (RAC/SPA) of the UNEP Mediterranean Action Plan<sup>1</sup>, through its Strategic Action Programme for the Conservation of Biological Diversity (SAP BIO) in the Mediterranean Region, has the appropriate international legal and policy framework to assist and support Mediterranean countries in order to accomplish project overall objective, under the principles accounted by the Ramsar<sup>2</sup> Convention and other international declarations such as the 1978 (revised in 1995) Barcelona Convention (and its protocols) for the Protection of the Marine Environment and the Coastal Region of the Mediterranean, the 1992 Convention on Biological Diversity Rio Summit, the 2002 Johannesburg Declaration on Sustainable Development, or the 2003 Food and Agriculture Organization (FAO) Code of Conduct of Responsible Fisheries in the Mediterranean<sup>3</sup>.

To attain the overall objective, five specific goals will have to be reached:

1. Promoting and enhancing the implementation of the ecosystem approach to the management of Mediterranean coastal wetlands and lagoons.
2. Assessing and upgrading positive interactions between aquaculture/capture fishery and species/habitats conservation in the Mediterranean region.
3. Providing Mediterranean countries with a common strategy for the sustainable management of aquaculture and capture fishery in their coastal areas.
4. Providing opportunities for countries partnerships in order to exchange information, maintain a common database on the status of their coastal wetlands and lagoons, and facilitate decision-making processes.
5. Proposing coastal sites for the pilot implementation of sustainable aquaculture/capture fishery experiences.

Both overall and specific objectives will be accomplished in the context of the UNEP/MAP Strategic Action Programme for the Conservation of Biological Diversity (SAP BIO) in the Mediterranean Region, under the above-mentioned guiding principles.

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<sup>1</sup> <http://www.unepmap.org/index.php?module=content2&catid=001001002>

<sup>2</sup> [http://www.ramsar.org/cda/es/ramsar-home/main/ramsar/1\\_4000\\_2](http://www.ramsar.org/cda/es/ramsar-home/main/ramsar/1_4000_2)

<sup>3</sup> <http://www.fao.org/docrep/013/i1900e/i1900e00.htm>

## 2. Relevance of the action

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### General presentation and analysis of the problems and their interrelation at all levels.

Coastal wetlands around the Mediterranean basin are very diverse as a result of the climatic variability of the region. Ranging from large river deltas and lagoons in Northern shores to *sebkas* and seasonal marshes in the South, these unique ecosystems have traditionally played a major role in the development of local communities, through the provision of essential services like water, food, materials and transport. Other primary benefits are flood protection and prevention of soil erosion, maintenance of water quality, climate change mitigation, recreation and tourism. Mediterranean people have used wetlands and lived in them for centuries, developing strong ecological and cultural bonds with them. Coastal wetlands have also high levels of biodiversity and are the primary habitat for many species, providing protection for the whole biological integrity of coastal environment.

Besides both mentioned characteristics (diversity and strong ties with people), Mediterranean coastal wetlands are currently defined by a third specific feature: a degraded environmental condition as a consequence of a very diverse and complex set of threats. These ecosystems are under a great deal of pressure from the dual forces of rising sea level derived from climate change, and the intervention of an ever-growing human population. Direct impacts include the destruction or degradation of wetlands from land reclamation and infrastructures. Indirect impacts derive from the discharge of pollutants, changes in river flows and sediment supplies, land clearing, and dam operations. The last century has seen the loss of more than half the wetlands in the Mediterranean region, which has resulted in a severe loss of their functions and original values. Even though many attempts have been made to counteract this trend, the degradation and loss have not yet been stopped or reversed.

However, well-managed wetlands can be very productive and, at the same time, continue to be high-quality habitats for numerous threatened species of fish, amphibious, reptiles and birds that are all part of our Mediterranean natural heritage. Thus, the age-old maintenance of traditional aquaculture/capture fishery practices in certain Mediterranean coastal wetlands has decisively contributed to preserve these ecosystems. In Italy, traditional extensive *Valliculture* represents a unique ecological, landscape, and cultural heritage and contributes to the conservation of the sensitive Upper Adriatic coastal wetlands. In Southern Spain, extensive and semi-intensive aquaculture practises have become an integral part of a vast protected coastal marshland system, promoting both environmental conservation and the development of local economy. In France, ancient salt marshes and wetlands on its Southwest coast have traditionally been devoted to the extensive culture of eel, gaining an enormous environmental and patrimonial value. In all cases, economic activity based on eco-friendly aquaculture and fishery systems have led to the protection and rehabilitation of coastal wetlands and lagoons, increasing biodiversity and supporting a number of environmental services for their hydrology and ecology. Many of these exploited wetlands are listed as sites of biological and ecological interest, some of them being protected areas and/or hosting populations of species covered by the SPA/BD Protocol Annexes of the Barcelona Convention.

Therefore, it seems clear that to achieve a sustainable management of Mediterranean coastal wetlands and lagoons, it is fundamental to put together the indicated aspects of natural functionality conservation and productive processes. Unfortunately, the relationship between aquaculture/capture fishery and wildlife conservation is not equally explored in all Mediterranean countries and not enough information is available on positive interactions between these practices and coastal wetlands environment.

The project presented is part of the already identified priorities of the Strategic Action Programme for the Conservation of Biological Diversity (SAP BIO) in the Mediterranean Region, responding to the challenge of reconciling the socio-economic development of the Mediterranean coastal areas and the long-term conservation of the area's biological diversity. It seems clear that the wide range of threats currently hanging over Mediterranean wetland and coastal lagoons require adequate responses coming from multiple stakeholders, through the implementation of regional activities. Thus, the project is born as one of these possible regional activities, in order to be developed during the future SAP BIO implementation.

Present regional action addresses high priority issues identified within the framework of the Mediterranean Action Plan. During their 15<sup>th</sup> Ordinary Meeting, the Contracting Parties to the Barcelona Convention adopted a roadmap to progressively apply it to the management of human activities that may affect the Mediterranean coastal environment. The project falls within the mission of the Strategic Plan for Biodiversity 2011-2020<sup>4</sup> and the Aichi Biodiversity Targets<sup>5</sup>, specifically focusing on the achievement for the Mediterranean area, of *Target 4* in relation to stakeholders involvement in the implementation of plans for sustainable production and consumption; *Target 5* regarding the reduction on habitat loss rate; *Target 6 and 7* that make reference to the sustainable use of fish stocks, including restoration plans; *Target 14* concerning the recovery of essential ecosystem services, particularly those related to water; and *Target 15* with regard to the enhancement of ecosystem resilience and the contribution of biodiversity to carbon stocks.

Under this work structure, the project is lined up with similar objectives, as well as linked up with the activities and the outputs of ongoing GFCM LaMed-2 project<sup>6</sup>, the current assessment of Mediterranean wetlands by the Mediterranean Wetlands Observatory (MWO)<sup>7</sup>, the IUCN guidelines for a sustainable aquaculture, and the FAO guidelines and development tools.

The action could also be an appropriate basis for the implementation of restocking actions finally directed towards the improvement of natural (marine) fish stock status and the restoration of critical fish habitat.

Finally, the project pays attention to the necessity of integrating wetland conservation tasks with agriculture, water quality and other issues related to the comprehensive sustainable management of coastal areas.

### Description of the target groups and final beneficiaries.

Project target groups include authorities, organisations and individuals in all National Correspondents of SAP BIO and the Contracting Parties to the Barcelona Convention. The project results and outputs will also facilitate the work of many international organisations (IGOs and NGOs) active in the Mediterranean. The ultimate beneficiaries will be the users of the Mediterranean coastal wetlands and lagoons, including many sectors of human activities such as Fisheries, Tourism etc., as well as the biodiversity itself of these unique and extremely sensitive ecosystems.

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<sup>4</sup> <http://www.cbd.int/sp/>

<sup>5</sup> <http://www.cbd.int/sp/targets/>

<sup>6</sup> [http://www.faosipam.org/?pag=content/\\_ShowPortal&Portal=LAGOONS](http://www.faosipam.org/?pag=content/_ShowPortal&Portal=LAGOONS)

<sup>7</sup> <http://www.medwetlands-obs.org/>

Specific problems to be addressed by the action.

1. There is a need to update the inventory of Mediterranean coastal wetlands and lagoons.

Ramsar/MedWet National Focal Points, as well as different authorities and institutions at National and Subnational levels, will be contacted to advise on the definition and mapping of wetland locations, and to facilitate access to existing data (e.g. wetland inventory, in-situ data on the selected sites, field surveys, etc.).

2. The benefits that sustainable practices on extensive aquaculture and traditional fishery provide to wetlands, and the role of these activities on ecosystem restoration, are only known at a local scale and are not conveniently widespread all over the Mediterranean area.

This project will allow to quantitatively and qualitatively analyse such (social, economic and environmental) benefits through the study of successful experiences on the integration of aquaculture/capture fishery and wildlife conservation. In addition, a number of degraded coastal wetlands in the Mediterranean region will be proposed for pilot implementation of similar experiences.

Relevance of the proposal to the needs and constraints to target groups and beneficiaries and how it will provide the desired solutions.

The main constraint of project target groups, including Governmental and Non-Governmental entities and stakeholders concerned with the sustainable use and the conservation of Mediterranean coastal wetlands, are perhaps the deficit that chronically affects the environmental decisions taken at regional level and the need to exchange more information in order to update the inventory (and current status) of these ecosystems along the Mediterranean shores.

The implementation of this project may become a stepping-stone to enhance countries partnership, increasing information exchange and creating a common database on the status of Mediterranean coastal wetlands and lagoons. Likewise, this will facilitate decision-making processes, as those concerning a common strategy for the sustainable management of aquaculture/capture fishery, and the work of all international organisations active in the region.

Regarding the industrial sectors of human activities that take advantages of the Mediterranean coastal wetlands resources (e.g. small-to-medium enterprises involved in Fisheries, Tourism etc.), this project is designed to deliver innovative solutions for the sustainable management of economic activity:

- Promoting diversification of the aquaculture industry by providing a greater range of species and alternative production systems, including offshore systems.
- Protecting sensitive coastal environments through the development of novel integrated farming systems in sensitive wetland habitats and minimizing the impacts of aquaculture discharges through the use of wetlands as natural biofilters.
- Assessing dangers associated with introduced aquaculture species.

Finally, the biodiversity itself of these unique and extremely sensitive ecosystems will benefit from this project, since its implementation will strengthen links between researchers and policy makers, through consultation with international experts, scientific analysis of ecosystem goods and services, and the development of ecological and operational tools (e.g. indicators) to be used at different target levels.

### **3. Description of the action and its effectiveness**

#### **Action 1: Assessment of the ecological status and pressures of inventoried Mediterranean coastal wetland and lagoons.**

The main aim of this action is to contribute to the assessment of the state of wetlands in the Mediterranean region, providing an updated baseline to assess progress towards developing an ecologically representative and coherent network of Mediterranean coastal wetlands and lagoons.

This action requires out consultation with international experts, regional organizations, and country delegates experts working on this subject, in order to:

1. Update the analysis of the status of wetland inventories carried out in all the Mediterranean countries at national and subnational scale.

At present, although most of Mediterranean countries hold important datasets on many wetlands (e.g. Algeria, Egypt, France, Israel, Jordan, Lebanon, Libya, Morocco, Serbia and Montenegro, etc.), not all of them have carried out a comprehensive wetland inventory and many existing databases are old (e.g. Tunisia, Italy or Turkey).

2. Continue the compilation of existing digital wetland datasets from regional, national and international sources. It is necessary to remark that, in many countries that have carried out a complete or partial inventory, data are still not available in digital format.

#### **Outputs:**

The main expected outputs of this action are:

1. Promotion of partnerships and mobilization of Mediterranean countries and international organizations holding Mediterranean datasets concerning wetlands (Wetlands International, IUCN, WWF, BirdLife International, Blue Plan, WCMC, etc.) towards the creation of a common and updated PanMediterranean Wetland Database in terms of:
  - General characteristics (contacts, map, size, geographical coordinates, zonation, IUCN management category, legal references).
  - Management (plan of management, enforcement and surveillance, equipment, staff, monitoring programme, illegal activities).

- Habitats and species currently under protection and health status of key ones.
  - Main affecting threats.
2. Contribution to spread the use of technical tools (e.g. GIS technology) that allow those countries and organizations to carry out wetland inventories under a common standard methodology (e.g. MedWet<sup>8</sup>).
  3. Development of methodologies, approaches and other resources available to Mediterranean protected wetland managers, institutions, scientists, decision-makers at regional, national and local levels, and general public, to know better the work done in the region on wetland rehabilitation and protection, and to increase their awareness towards these ecosystems.

**Action 2: Analysis of the benefits that sustainable practices on extensive aquaculture and traditional capture fishery provide to these ecosystems.**

This action refers to the quantitative and qualitative analysis of the benefits that sustainable aquaculture/capture fishery provide to Mediterranean coastal wetlands and lagoons, as well as to socio-economic analysis of ecosystem goods and services.

The action requires:

1. Study-in-detail of existing successful experiences on the integration of aquaculture/capture fishery and wildlife conservation.
2. Field surveys, analysis of country reports and consultation with international experts, regional organizations and country delegates, to propose coastal sites in the Mediterranean region for the pilot implementation of sustainable aquaculture/capture fishery experiences.

**Outputs:**

The main expected outputs of this action are:

1. Objective demonstration of wetland ecosystem values.
2. Enhancement of the positive links between sustainable fishing activities and the conservation of coastal wetlands and lagoons in the Mediterranean region.

It is expected to demonstrate that sustainable aquaculture effectively restore the flow of water into and out of the degraded wetlands, reestablishing the transport of nutrients, nutrient cycling, water quality, flood storage, and many other abiotic conditions largely disturbed. Typical fish ponds are earthen enclosures usually surrounded by reed belts and natural vegetation, in which the fish live in a natural-like environment, feeding on the natural food growing in the pond itself from sunlight and nutrients available in the pond water.

Project development will upgrade the positive interactions between extensive marine farming and wetland conservation, proving that extensive fishponds provide

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<sup>8</sup> <http://www.medwet.org/medwet-inventory/>

important habitats for flora and fauna, and act as huge water treatment plants where the excess of nutrients (nitrogen, phosphorus, etc.) and organic matter are removed from the water and transformed into living biomass by means of natural processes.

With the combination of extensive stabilisation ponds, fishponds and macrophyte pond, the original nutrient removal efficiency of a disturbed wetland can be restored and enhanced. Furthermore, by the integration of valuable fish and plant species, these nutrients can be converted into marketable by-products.

3. Upgrading and promotion of extensive aquaculture and traditional capture fishery as cost-effective and ecologically friendly activities for coastal wetland rehabilitation, sustainable management and the economic improvement of neighboring communities (creation of local employment).
4. Recovery of essential ecosystem services of some degraded Mediterranean coastal wetlands (previously selected), particularly those services related to water.

Provided that some intervention has to be undertaken upon already degraded wetlands, extensive marine aquaculture may become a valuable tool for ecological restoration and future wetland management, since fish ponds are true multifunctional fish farms where various services are provided for maintenance of biodiversity, generation of market goods, recreation and rural tourism.

### **Action 3: Development of a set of ecological and operational objectives with indicators and target levels.**

Most of the main reference frameworks (e.g. codes of conduct, guides of good practice, standards, labels etc.) and initiatives for the construction of sustainable development indicators in aquaculture, are based on very unbalanced approaches to the dimensions of sustainable development and have little reliance on participatory processes. The holistic (ecosystem) approach covers all dimensions of sustainability, including the economic, social and environmental, as well as the institutional one (governance).

The multidisciplinary and participatory ecosystem approach that this action requires, will compare the outputs of the experiences on sustainable aquaculture undertaken in the degraded Mediterranean wetland sites selected for Action 2, resulting in a diagnosis and global recommendations to be used for the implementation of Action 4 (Elaboration of a common strategy for the sustainable management of aquaculture and capture fishery in Mediterranean coastal wetlands).

#### **Outputs:**

The main expected outputs of this action are:

1. Integration of ecosystem approach in the implementation of plans for sustainable fish production and consumption, through eco-friendly aquaculture and capture fishery.
2. Development of work methodologies based on operational objectives with indicators, for the sustainable development of aquaculture. Indicators will be co-constructed with broad-based groups of stakeholders, facilitating participatory approach and a collective learning process. This process will also promote the institutionalisation of the monitoring and the future implementation of the indicator system

**Action 4: Establishment of the basis for the processing of a common strategy for a sustainable management of aquaculture and capture fishery in Mediterranean coastal wetlands and lagoons.**

The expected outputs of the above described project Actions 1, 2 and 3, will constitute a strong technical provision for the development of guidelines, common principles and targets for the elaboration of a common strategy regarding the sustainable production and use of Mediterranean coastal fish stocks (in compliance and linked to the common fisheries policy – CFP<sup>9</sup> – prevailing between EU countries), including restoration plans.

This action requires:

1. Stress project capacity building to guide its internal ability to achieve measurable and sustainable results, in a scaled-on development from local to regional scale, providing at the same time teaching resources and educational ideas (teaching toolbox) to equip all Mediterranean wetland stakeholders with skills, knowledge and inspiration.
2. Enhance participatory dialogue between decision makers in the Mediterranean region, to extend current framework for a common fishery policy, by the implementation of an ecosystem-based management approach to aquaculture development.

**Outputs:**

The main expected outputs of this action are:

1. Technical contribution for the eventual elaboration of common guidelines for a Mediterranean strategic plans regarding the development of sustainable aquaculture, recognizing and holistically managing the positive relationship between this kind of aquaculture, wild capture fisheries and the maintenance of ecological functionality of wetlands.
2. Promotion of awareness and improvement of responsibility about the importance of responsible aquaculture, encouraging cooperation between individual fish farmers with the aquaculture production sector, public institutions, non-governmental organisations and the general public.
3. Strengthening of the linkages between national aquaculture advisory committees with regional committees and international organizations, concerning responsible aquaculture.

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<sup>9</sup> [http://ec.europa.eu/fisheries/cfp/index\\_en.htm](http://ec.europa.eu/fisheries/cfp/index_en.htm)

## **4. Methodology**

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The proposed methodology for the implementation of this project and its partial actions is based on a scale-on modular design. Three levels of modules are distinguished:

4. Local modules: that will include the case studies (successful experiences on the integration of aquaculture/capture fishery and wildlife conservation) and local component of participatory dialogue. The case studies will provide the basic tools and information for the following modules.
5. National modules: defined essentially by a participatory process aimed to identify target areas (degraded wetland sites selected for pilot works) and issues, through the combined effort of all international project partners and the integration of results into national policy and planning.
6. Regional modules: ranging from the simple (and essential) increase of public awareness to the dissemination of project outputs and their integration with ongoing regional databases, for the management-oriented assessment and monitoring of Mediterranean coastal wetlands and lagoons, and with other regional efforts for the conservation and management of Mediterranean coastal areas, including the eventual development of common strategic for a sustainable management based on ecologically friendly aquaculture/capture fishery.

### **Methods for action 1.**

Consultation meetings with international experts, regional organizations as FAO, RAC/SPA, GFCM, Tour du Valat, MedWet and IUCN, and country delegates will be organized for common analysis of existing wetland inventories. In addition, current digital wetland datasets will continue to be compiled.

GIS technology and related methodologies will be used for this compilation. Presentation reports will be drafted, reviewed and finalized along with the implementation of this project action.

### **Methods for action 2 (a case-study based methodology).**

Procedure for analyzing the benefits that sustainable aquaculture/capture fishery provide to Mediterranean coastal wetlands and lagoons, will be based on the study in depth of successful experiences currently existing in the region. The RAC/SPA, through a preliminary consultation process, is already evaluating the available information on such works in the Mediterranean area.

In particular, the case study of Doniana in SW Spain, elaborated by RAC/SPA, constitutes an excellent example of the guiding principles that could be applied to other coastal wetlands in the GFCM area, where aquaculture could effectively support a number of environmental services for the hydrology and ecology of many disturbed coastal areas, restoring the damage produced in the original landscape by land misuses, minimizing its own ecological footprint and combining the economic benefits of aquaculture with objectives in conservation.

This kind of management has become an integral part of mentioned Doniana area, a vast protected coastal marshland notable for its wide variety of landforms, fauna and vegetation types representative of the Mediterranean bioma. A total of 3200 ha are currently devoted to sustainable aquaculture in an area that has been designated a Wetland of International Importance under the Ramsar Convention and a Biosphere Reserve under the UNESCO Man & Biosphere Programme. Aquaculture activity is developed in large artificial earthen ponds connected to each other and to the Guadalquivir River by means of a complex channel network. To maintain oxygenation and water quality in the ponds,  $10^6$  m<sup>3</sup> of tidal water is pumped daily from the river estuary through the whole system. These extensive aquaculture ponds maintain rather stable flooded conditions regarding water depth (40-50 cm on average), water flow rate (up to 1 hm<sup>3</sup>/day in summer) and water salinity that ensures a large buffering capacity for changes in salinity, water flow and nutrient concentration which can be very drastic in the Guadalquivir estuary.

Doniana area is taking an innovative approach to sustainable aquaculture, an approach that works closely with the natural ecosystem to avoid the pitfalls of conventional, intensive fish farming. This fish-farm could be a useful model for future plans to regenerate the disrupted marshland areas and coastal wetlands of Mediterranean shores, where the careful use of natural resources such as water and land can generate substantial economic profits while enhancing a wide range of environmental values.

In addition, the project will enhance the role other existing networks with information on the integration of aquaculture environmental issues through the region, considering particularly the GFCM contact points for the LaMed-2 Project. Actually, the General Fisheries Commission for the Mediterranean (GFCM) and its subsidiary Committee on Aquaculture (CAQ) have agreed on the importance of identifying such interactions, in order to improve wetland / lagoon management and eventually revert their environmental degradation.

#### Key requirements to drive pilot experiences in selected sites

Consultation with international experts, regional organizations and country delegates, along with field work and the analysis of already elaborated country reports, will be used to choose coastal sites in the Mediterranean region for the pilot implementation of sustainable aquaculture/capture fishery experiences.

Representative criteria for addressing the work with pilot cases will consider case size, replication capacity, value for biodiversity and geographical balance.

In order to design the most appropriate experiences, a minimum number of five sites (perhaps one case per country) will be proposed. The following areas are initially considered as adequate candidate sites for the project purposes, but have to be first fully discussed with Contracting Parties representatives:

- **Lake Maryout in Egypt.** Extends for 80 km along the NW coast of Alexandria and 30 km south. Ecological conditions adversely affected by increased discharge of domestic sewage, industrial and agricultural wastewater. The lake used to be a major source of food production (some areas of the lake were used as fish farms), fish and birds. Current environmental conditions are generally unsuitable for fish production and farming. In addition, the importance of the lake for birds has diminished greatly

over the past two to three decades, due to habitat loss, ecological changes and increased disturbance and hunting pressure<sup>10</sup>.

- **Cabras lagoon in Sardinia, Italy.** Area of 22,28 km<sup>2</sup>. Unique and delicate ecosystem that strongly meets with local traditions, such as the use of fish traps and the fishing of Grey mullet for its roe. Included in the Ramsar Convention for the presence of rare water birds, almost disappeared in other European regions<sup>11</sup>.
- **Oued Moulouya in Morocco.** The Oued Moulouya is the largest river to the east of the Middle Atlas. The estuary lies 20 km north of the town of Berkane and has three components, together comprising 2,700 ha. Main economic activities are fishing, hunting, agriculture and coastal tourism. The area is threatened by unsustainable fishery, uncontrolled tourist development along the beach, and hunting and poaching by the local population (particularly of ducks and other waterfowl)<sup>12</sup>.
- **The lagoons of Hergla in Tunisia.** A brackish 1,000-ha lagoon located in the open Bay of Hergla where in 2010 was established the first fish farm in Tunisia operated following ecological procedures<sup>13</sup>.
- **Gediz delta in the Aegean region of Turkey.** Extensive coastal wetland with bays, salt and freshwater marshes, large salt pans, and four highly saline lagoons located at the mouth of the Gediz River in Turkey. The site is an important area for breeding, feeding, wintering, and sheltering internationally important numbers of numerous species of waterbirds. Human activities include fishing, agriculture, and cattle grazing<sup>14</sup>.
- **Neretva delta in Croatia.** Listed under the [Ramsar Convention](#), the Neretva delta covers approximately 12,000 ha. The delta in Croatia has been reduced by extensive land reclamation projects. The marshes, lagoons and lakes that once dotted this plain have almost completely disappeared; although five protected localities with a total surface of 1,620 ha already exist. These are the ornithological, ichthyologic reserves and the protected landscapes<sup>15</sup>.
- **Les Salins de Camargue in France.** Hypersaline flooded habitat located in the lower Camargue, which is part of the Camargue region, a large and complex site designated a Wetland of International Importance (Ramsar site) and home to more than 400 species of birds<sup>16</sup>.
- **One or two places (not yet determined) in Greece.**

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<sup>10</sup> *Country report: Egypt.* LaMed-2 Meeting on the Interaction between aquaculture and capture fisheries (IACF) in the Mediterranean coastal lagoons. Cagliari, Italy, 28-30 June 2011.

<sup>11</sup> *Country report: Italy.* LaMed-2 Meeting on the Interaction between aquaculture and capture fisheries (IACF) in the Mediterranean coastal lagoons. Cagliari, Italy, 28-30 June 2011.

<sup>12</sup> <http://www.abhm.ma/spip.php?rubrique2>

<sup>13</sup> *Possibilities for aquaculture development in Tunisia. FAO/UNDP Fishery Survey and Development Project. Tunisia.* In <http://www.fao.org/docrep/005/AC672B/AC672B09.htm>

<sup>14</sup> *Country report: Turkey.* LaMed-2 Meeting on the Interaction between aquaculture and capture fisheries (IACF) in the Mediterranean coastal lagoons. Cagliari, Italy, 28-30 June 2011.

<sup>15</sup> <http://archive.rec.org/REC/Programs/REREP/Biodiversity/neretva/neretva.html>

<sup>16</sup> *Country report: France.* LaMed-2 Meeting on the Interaction between aquaculture and capture fisheries (IACF) in the Mediterranean coastal lagoons. Cagliari, Italy, 28-30 June 2011.

### **Methods for action 3.**

In the methodology for achieving expected outputs of action 3, the monitoring of pilot experiences and the application of ecosystem approach to establish operational objectives and define indicators for the sustainable development of aquaculture, will be consider firstly.

As mentioned above, indicators will be defined along meetings and consultation sessions with broad-based groups of stakeholders, from local (people involved in the works on pilot sites) to national (country delegates) and regional (international organizations) scale, facilitating participatory dialogue and a collective learning process.

### **Methods for action 4.**

Proposed methodology for this action is based on project capacity building in a scaled-on development from local to regional scale, in order to provide enough technical support for an eventual outline of a common procedure to implement eco-friendly aquaculture systems in the Mediterranean region.

## **5. Duration and indicative action plan for implementing the actions**

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To implement the project, three phases are tentatively proposed as a preliminary schedule:

1. Two-year phase: to develop criteria to identify representative areas (according to wetland type: estuaries, marshes, coastal lagoons, artificial wetlands, etc.) and actions to perform; to choose target areas for pilot experiences and long-term implementation of project goals; to prepare guidelines and tools; and to involve stakeholders.

Project capacity building, teaching resources, on-the-job training (including workshops and training seminars) should be taken into account during this stage of the project.

2. Five-year phase: to put into practice mainly strategic activities on pilot sites, involving administrations, private and public actors, donors, local communities, etc. Along this phase, first assessment of ecological state should be carried out, also monitoring foreseen social-economic benefits at local and regional levels.
3. Seven-year-phase: for final assessment of strategic activities and interventions. During this third phase, a coordination strategy and synergy schedule should be defined between all project actors.

Finally in the seven-year-phase, the state of project development should, according to Meeting Delegates and Expert, allow finishing with the monitoring of project outputs and assess both ecological improvement and economic revenue in terms of jobs and profit.

Dissemination of all results would be the last project mission to be performed along this phase.

### Workplan for Action 1 and 2

Action 1 and the first requirement of action 2 (study-in-detail of existing successful experiences on the integration of aquaculture/capture fishery and wildlife conservation) are expected to develop along the 1<sup>st</sup> (Two-year) phase.

### Workplan for Action 2

Pilot experiences involving implementation of sustainable aquaculture/capture fishery experiences on proposed coastal sites in the Mediterranean region, should start at the third year of project's development and continue to be implemented along the 2<sup>nd</sup> (Five-year) and 3<sup>rd</sup> (Seven-year) phases.

### Workplan for Action 3

As indicated before, the multidisciplinary and participatory methodology that this action requires will compare the outputs of the experiences on sustainable aquaculture undertaken for Action 2, resulting in a diagnosis and global recommendations to be used for the implementation of Action 4.

The work plan for this action will start at the very beginning of the project, extending along 2<sup>nd</sup> (Two-year) and 3<sup>rd</sup> (Five-year) phases.

### Workplan for Action 4

Finally, during the 3<sup>rd</sup> (Seven-year) phase and based on the outputs obtained during the implementation of actions 1, 2 and 3, it is expected to be in the position to elaborate and disseminate common principles and targets for the elaboration of a PanMediterranean strategy regarding restoration and sustainable use (particularly of fish stock by ecologically friendly aquaculture and its relationships with wild capture fishery and biodiversity protection) of Mediterranean coastal wetlands.

## **6. Sustainability**

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Sustainability of present project, expressed in terms of ability to maintain its operations, services and benefits during project's lifetime, will primarily uphold in its own capacity building. As pointed above in this document, project capacity building will be stressed from the beginning of its implementation through a continuous process of participatory dialogue with all actors involved in Mediterranean wetland conservation and management. More specifically, project sustainability through this participatory process will be of prime importance to extend current conservation/management of Mediterranean wetland frameworks for the elaboration of a common ecosystem-based management policy (at the 3<sup>rd</sup> and final project phase).

However, since sustainability should be seen within time and changing social, economic and political contexts, a project designed to be implemented along fourteen years (three phases of two, five and seven years, respectively) needs to focus on the profitability of its specific actions. Although initial investments will have to be supported by those institutions (or by other forms of subsidy), sustainability along time will rely on its economic viability.

In this sense, as aquaculture methods advance, it is likely that environmentally friendly aquaculture will grow in importance as a source of high quality marketable seafood products. Consumer's demand for seafood keeps growing and the world's capture fisheries are reaching their maximum harvest potential. With declining catches in coastal fisheries in the Mediterranean and other shores, the choice is to develop aquaculture as a local supply of seafood. Moreover, the aquaculture industry in Europe is becoming large enough to not only support its own domestic seafood markets, but to supply valuable export markets as well.

On the other hand, this kind of aquaculture production methodologies are included in what the Directorate-General for Fisheries and Maritime Affairs, European Commission, has named *aqua-environmental measures*. As defined in the European Fisheries Fund (EFF), *aqua-environmental measures* aim to promote fish farming techniques that help to protect and improve the environment and to conserve nature<sup>17</sup>.

Backing again to the well known case study of sustainable aquaculture in Doniana (a successful experience to be replicated in pilot cases under project's action 2), short after aquaculture started (in 1990), the ecological damages produced by a long history of land misuse were reversed by a process of controlled reflooding. By 1995, the 10,300 ha of extensive ponds managed for sustainable fish farming transformed in a bird sanctuary of international importance, to the great delight of visiting ornithologists and other ecotourists. A total of 250 bird species can currently be recorded there, of which no fewer than 50 have special conservation interest. At times 80% of the birds of Doniana concentrates in the extensive ponds, and this managed wetland which is now flooded for much greater periods than if they was left to nature alone, is also of great importance to migratory birds.

It should be considered that market demand pays good prices for the products generated by this kind of near-natural, unforced model of integrated management for aquaculture and conservation, which commercial success is based on the highest standards and guidelines of quality in production operations (e.g. International Standards such as IQNet Association's UNE-EN ISO 9001, 140001 and 22000; UE Regulation N° 761:2001; GLOBALG.A.P. Certification, etc.). Strong concern on nature and quality provides a global recognition and facilitates worldwide access to specialized market (*gourmet* restaurants, high-end department stores, *gourmet* supermarkets, etc., throughout Mediterranean area and to overseas countries, including US, by authorized retailers).

Economic (and consequently, social and environmental) profitability of these eco-friendly experiences on aquaculture-based management of wetland, are gaining a wide international recognition for their creative and leading approach to sustainability, based on the combination of economic activity with conservation goals. For example, Doniana aquaculture model has the recognition and support of a number of international institutions such as WWF, the Royal Society for the Protection of Birds and Wildlife Trust, Euroduck International, the European Landowners Organization, or the Spanish MAB (Man and Biosphere) Committee (UNESCO), which finally results in a further increase of activity profitability and sustainability.

Defining general project sustainability as the percentage of project initiated goods and services that are still being delivered and maintained after five years of termination of project implementation, and applying such definition to the case study of Doniana (a truly inspirational model that is expected to influence plans for the regeneration and management of other coastal wetlands in the Mediterranean region and beyond) five years after starting the operations, environmental outputs (e.g. increase of local biodiversity), local actions (e.g.

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<sup>17</sup> [http://ec.europa.eu/fisheries/cfp/eff/index\\_en.htm](http://ec.europa.eu/fisheries/cfp/eff/index_en.htm)

ecotourist initiatives) and services (e.g. local employment) continued to be (and still are) stimulated by the project built initiatives.

Summarizing, local and regional Administrations, and mentioned (or other) donors are requested to provide support to this regional project, which is economically, socially and environmentally sustainable, and politically justifiable from local to regional scale.



## Sustainability analysis

The traditional multi-dimensional attributes of sustainability (logistics, economic, community, equity, institutional and environmental) have been rigorously analyzed for this project at the time of its design, through the evaluation of a number of aspects:

1. *Relevancy.* Project overall and specific objectives are consistent with identified regional, national, local and sectoral priorities of the Strategic Action Programme for the Conservation of Biological Diversity (SAP BIO) in the Mediterranean Region, address high priority issues identified within the framework of the Mediterranean Action Plan, and fall within the mission of the CBD Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets.
2. *Acceptability.* According to the results of the Meeting held by RAC/SPA in Málaga (Spain), in October 2011 (hosted by the Málaga´s IUCN-Med office), to present a first draft of the project to main Mediterranean institutions (the Meeting was attended by Delegates and Technical Experts from the Mediterranean Marine Programme of the International Union for the Conservation of Nature - IUCN; General Fisheries Commission for the Mediterranean - GFCM / Committee on Aquaculture - CAQ; MedWet; and COPEMED/ARTFIMED projects of the Food and Agriculture Organization of the United Nations -FAO), there is a strong acceptability of project´s objectives, actions, methods and assumptions by these bodies, which assures project´s commitment with long term sustainability.

3. *Economic/Financial viability.* As it was discussed in other chapters of this document, this project will induce products (e.g. fish farming top-quality products) and services (e.g. ecological capital created by the sustainable production initiatives, regional networking, local employment, other local economic initiatives such as ecotourism, etc.) that will directly benefit target groups and final beneficiaries. Project actions are designed to be profitable and not to produce economic losses.
  
4. *Environmental Sustainability.* Induced environmental impacts - both positive and negative, will be contemplated in the implementation of project actions, particularly the pilot experiences on sustainable aquaculture driven under action 2. If negative impacts are foreseen, mitigational measures will be planned and implemented, in order to minimize environmental cost and maximize both ecological and economic net profit.
  
5. *Implementation and Monitoring Strategy.* Regarding project management arrangements (e.g. implementation period), a realistic implementation plan in terms of project architecture and logistics has been designed. Thus, the proposed methodology is based on a scale-on modular design, from local to regional level, that will facilitate the definition of functions and responsibilities, including the adequate monitoring provisions in each of the three proposed phases (two-year, five-year and seven-year, successively).
  
6. *Post implementation operation and maintenance.* As refers to management support required after implementation of eco-friendly fish production pilot experiences, existing successful examples (e.g. Doniana in Spain) reveal that activity revenues (e.g. high product market value, local employment) guarantee the yields and allow to assume necessary post implementation operations by the executing agency (private or public), and the affected communities, but with the commitment of sub-national and national Administrations (e.g. in the form of regular subsidies to implement management improvements).