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GENERAL FISHERIES COMMISSION FOR THE MEDITERRANEAN

COMMISSION GÉNÉRALE DES PÊCHES POUR LA MÉDITERRANÉE

GENERAL FISHERIES COMMISSION FOR THE MEDITERRANEAN

COMMITTEE ON AQUACULTURE (CAQ)

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REPORT OF THE WGSA-InDAM[1] EXPERT MEETING ON DEFINITION OF REGIONAL MINIMUM SET OF INDICATORS FOR SUSTAINABLE AQUACULTURE
St. George's Bay, Malta, 25-26 November 2010

(draft)

OPENING OF THE MEETING AND ADOPTION OF THE AGENDA

The WGSA – InDAM experts meeting on the definition of a regional minimum set of indicators for sustainable aquaculture was held from 25th to 26th November 2010 in St. George's Bay, Malta. It was organised by the Working Group on Sustainability in Aquaculture (WGSA) and was hosted by the Regional Ministry for Resources and Rural Affairs, the Malta Aquaculture Research Centre and Maltese authorities. The meeting was attended by experts from Albania, Greece, Croatia, Spain, Turkey, Israel, Italy, Malta, Tunisia, France and Montenegro (Annexe 1).

Mr Fabio Massa from the GFCM Secretariat opened the meeting and welcomed the participants. He summarized the activities carried out during the first year of the InDAM project, and presented the work plan for the second year of the project, recalling the importance given by the Commission in support to the development of sustainable aquaculture within Mediterranean countries (outcomes for the second year of InDAM are attached as Annex 3) He recalled that the work plan of the WGSA was discussed during the workshop on *Guidelines and application of indicators for sustainable development of aquaculture* held in Salambo (Tunisia) on 19- 20 November 2009 and finalized during the Coordination Meeting of the Working Group of CAQ. It was presented to and endorsed by the 34th Session of the GFCM (14-17 April 2010 in Athens, Greece).

[1] InDAM *" Indicators for Sustainable Development of Aquaculture and Guidelines for their use in the Mediterranean (InDAM) GFCM/CAQ"* is a project in support to the activities of the GFCM Committee on Aquaculture (CAQ) which is co-funded by European Commission DG-MARE. InDAM project aims to establish a regional reference system for the development of sustainable marine aquaculture in the Mediterranean using indicators (governors, social-economy and environment) and its integration into coastal zone management. http://www.faosipam.org/?pag=content/_ShowPortal&Portal=InDAM

Mr. Pablo Avila, coordinator of the WGSA and chairman of the meeting introduced the agenda and the main objectives of the experts meeting. Furthermore he recalled the specific tasks that were expected to be discussed during the present experts meeting. In particular: a) to review and analyze the criteria for the indicators identified by InDAM; b) to select a minimum set of indicators to be considered for the whole Mediterranean region which will be proposed to the CAQ and consequently to the GFCM; c) to discuss on the follow up of the Pilot Actions. He also highlighted the relevance in working and cooperating at regional level on the identification of indicators for sustainable aquaculture. He stressed also that the experts when are called to identify indicators to be considered for the regional scale, particular effort should be made in thinking at "global" scale and always bearing in mind the question "Does a specific indicator contribute to an evaluation of sustainability of aquaculture in the Mediterranean region?". The meeting experts were called to give and answer to this concept.

The agenda was adopted with some minor changes (Annexe 2).

ACTIVITIES OF THE WORKING GROUP ON SUSTAINABLE AQUACULTURE

The chairman recalled on the main activities of the WGSA and in particular to the main goals achieved by the InDAM project. The previous meetings in Montpellier, the Pilot actions carried out in Tunisia and in Turkey and the meeting held in Salammbô, Tunisia.

The chairman recalled also that within the Mediterranean the identification of indicators, including a common reference system, is a necessity for continuing in the development of aquaculture. It is considered an essential condition for the responsible development of marine aquaculture in the GFCM regions. He recalled on the contribution made by the IUCN and FEAP on the definition of Indicators and Guidelines for the Sustainable development of Mediterranean Aquaculture, as well as the EVAD and AquaMed projects, and stressed that cooperation and exchange of knowledge and experience are key elements in the initiative carried out by InDAM.

Mrs. Cristina Garcia Diez, from the Foundation, "Spanish Aquaculture Observatory" (FOESA), presented the Mediterrane-On Project, that during 2010 defined indicators for sustainable aquaculture and established a ranking of punctuations from 1 to 5, being 1 unsustainable and 5 sustainable. The methodology chosen for this project followed the same line as the InDAM project based on the consensus and the experiences of the relevant aquaculture stakeholders among the different Mediterranean countries and on the meetings and workshops held in 2010. With the collaboration of APROMAR and IUCN, Mediterrane-On defined and developed 3 indicators for each dimension: economic, socio-territorial and environmental, and for the 3 levels: farm/company, national and regional (Mediterranean), all indicators being within the governance dimension. For 2011, Mediterrane-On relies on the collaboration of GFCM for the development of a new pilot case study in Spain and for the organisation of the next workshops.

Participants emphasised on the relevance of such initiatives and projects and stressed that the definition of indicators should continue in a cooperative manner in which the different relevant stakeholders are involved and in particular the involvement of farmers is fundamental to identify the best strategies for the management and further development of sustainable aquaculture. The meeting also stressed that the WGSA-InDAM should continue in strengthening the involvement also of the farmers and on the cooperation of other initiatives such which of FOESA

The meeting also strongly requested that every effort should be made to disseminate the InDAM results, outputs and documentation in order to increase the share of knowledge about indicators for sustainable development of aquaculture. Any kind of effort should be made including the production of publications, leaflets, documentation and increase the networking among the Mediterranean experts on this subject.

REVIEWS OF THE INDICATORS FOR MEDITERRANEAN SUSTAINABLE AQUACULTURE IDENTIFIED DURING THE FIRST YEAR OF INDAM

The Chairman of the meeting introduced this point of the agenda and recalled that during the first year of activities of InDAM, a first list of 155[2] Indicators were identified and associated to the selected Principles for one of each of the pillars of sustainability (Governance, Economic, Social and Environmental). He recalled also that this first list of indicators were discussed and selected at local level during two pilot studies carried out in Tunisia and Turkey. The coordinators and experts who run both case studies were asked to inform the participants about the experience and on the main outputs and achievements of the pilot study.

Mr. Ferit Rad presented the methodology used in the Turkish Pilot Study-Technical Meeting on "Indicators for the Development of Sustainable Aquaculture in the Mediterranean Sea" which was held in Mugla, Turkey, on 28-29 September 2009 within the activities of GFCM-CAQ InDAM project. He stressed that the pilot study was hosted by the Ministry of Agriculture and Rural Affairs (MARA) of Turkey in Muğla and 36 persons with different background including farmer's organisations, civil society organisations, producers, research scientists and administrators were presented. He further mentioned that a 3 steps methodology, namely: a) identification and prioritization of attributes to be used in the selection of indicators, b) rapid appraisal method for selection of indicators based only in one attribute (acceptability) and finally c) selection process for indicators based upon attributes prioritized (relevance to criteria and principle, reliability, data availability and understandability by stakeholders, was adopted. He pointed out the importance of defining and prioritizing the attributes for selecting indicators and underlined that different stakeholders had different preferences for attributes.

The emerging issues, which need to be addressed within the concept of sustainable aquaculture at local level, are: site selection and site allocation, environment, the image of aquaculture and of aquaculture products, marketing, transparency and institutional capabilities of public organisations. He also presented the results of the indicator selection exercise implemented during the pilot action for economic indicators, which had initially been structured by the InDAM project. Existence of quality certification schemes, feed cost/kg, fish produced (and % of total cost/kg), fry cost/kg (and % of total cost/kg), supply and sales by contract and existence of farm health management system were the 5 top ranked indicators for the economic dimension.

Mrs. Guzel Yucel Gier presented the methodology and the main outcomes of the Turkish pilot study in the environmental dimension. The stakeholders discussed, analyzed and prioritized the 53 indicators.

She also underlined that the process of identifying and prioritizing attributes for the selection of indicators during the meeting created interaction between stakeholders, and that this contributed to building awareness on the concept of sustainable aquaculture.

Mr Hayri Deniz, Director of the Mariculture Section of the Ministry of Agriculture and Rural Affairs and Coordinator of the InDAM Turkish Pilot Study, gave brief information on the current situation of Turkish aquaculture and outlined the main outputs of the InDAM Turkish Pilot Study related to the social and governance dimensions of sustainable aquaculture. He presented results of rapid appraisal, results of selection of indicators using prioritized attributes, ranking of indicators based on their weighed average score in terms of prioritized attributes and outcome of discussions for governance and social dimensions.

He stressed the importance of the governance dimension and so the compatibility among responsible institutions for sustainable aquaculture and impossibility of sustainability without coherent laws and regulations even if environmentally, economic and social dimensions are well-organized. The lack of consensus or unsatisfactory coordination among authorities has adverse effect on sustainable aquaculture development. For instance, in 2006 the change in the Turkish Environmental Law, carried out without an agreement between institutions, created very huge problems for the Turkish aquaculture sector. He highlighted that Integrated Coastal Management plan for coastal areas, including

[2] http://151.1.154.86/faosipam/htm/content/Draft_Report_Montpellier_2.pdf

aquaculture under head state authority, is one of the key components to take into account in the future evolution of the marine aquaculture sector. He also highlighted the difficulties of sustainable development without social agreement among related parties.

Participants stressed the relevance on the use of indicators for the further development of aquaculture and also recalled that this practice should and could enhance communication between farmers and society. It was remarked that for the applicability and practicability of the indicators, the consensus on the definition of indicators is the first step. Consequently the Principels/Criteria/Indicators (PCI) approach[3] within the concept of sustainable aquaculture will remain a challenge that should be improved by the definition of reliable reference points at local level for monitoring purposes.

The meeting also underlined that the whole list of indicators should be considered as a tool at disposal of the GFCM countries to be used at different levels (or scales) and linked to the local community in which some specific indicators could be changed added or removed according to the requirement of the development and of the condition for the sustainable development of aquaculture in a specific area. Importance was given to the methodology used for the selection of the indicators, and how it should be linked through agreed principles and selected according to an agreed level of priorities and attributes.

SELECTION OF MINIMUM SET OF INDICATORS TO BE CONSIDERED FOR THE WHOLE SUSTAINABLE DEVELOPMENT OF AQUACULTURE IN THE MEDITERRANEAN REGION

The chairman recalled that this point of the agenda is the follow up of a specific request made by the WGSA and CMWG in which it was considered that, on the basis of the activities carried out by InDAM and for regional consideration, a reduced number of indicators should be selected for each one of the dimension of sustainability and such indicators should be considered applicable at Mediterranean level and focused on management issues. The indicators that will be selected by the meeting should be considered within the 155 indicators[4] indicated by the WGSA and that additional indicators of regional relevance could also be considered. During the selection process, the experts should always have in mind the regional relevance of indicators and therefore not to be so detailed, but it will be necessary to assess and monitor the level of sustainable development activities of aquaculture in the Mediterranean as well as the establishment of a sustainable development reference system.

Following the proposal of the methodology to be implemented during the expert meeting, for the selection of a minimum set of indicators at regional level, a first approach was made to agree upon the attributes taken from the experience of previous InDAM activities. Consensus was achieved upon the attributes in order to take into consideration when selecting indicators.

During the meeting the methodology for the selection of indicators was based on a participatory approach dealing on separate groups of experts selected by dimension of sustainability (economics, environment, governance and social). A minimum set of indicators was selected by each group of experts, taking into consideration the principles and criteria from InDAM previous work. A first list of indicators was presented and discussed (Table I - Annexe 4 shows the list of indicators and some comments).

General presentation and discussion on the minimum set of indicators was held among participants in order to achieve a consensus. At the same time some other indicators were identified for each

[3] The WGSA adopted and adapted the PCI (Principels/Criteria/Indicators) approach proposed by EVA. The PCI approach a participatory processus for the identification of Indicators for sustainable aquaculture. *The Principles are associated to the different dimensions (or pillars) of sustainable aquaculture (Economic, Social, Environmental and Governance). The Principles could correspond to one or more postulates or priories concepts determining or promoting the sustainable development of aquaculture. Criteria, break down the principle into specific themes or characteristics and specify the issue to be addressed through the relevant variables. Indicators allow the criteria to be measured, (qualitative or quantitative), and are essential to monitor or assess the behaviours of the criteria over the time.*

[4] http://151.1.154.86/faosipam/htm/content/Draft_Report_Montpellier_2.pdf

dimension at a regional level. A clear definition of each indicator was demanded, as well as some aspects to take into consideration the relation of indicators with the dimension in which they should be included.

Concerning the economic dimension, a list of four main indicators was identified. Some aspects about the causes of big crisis on the aquaculture sector dated on different countries were mentioned as well as the necessity of identification of indicators for specific causes of economic breakdowns. The companies' structure of the sector was raised up as a possible indicator, as well as the capital concentration and origin. The evaluation or response of economic indicators should be based on the medium or long-term basis.

As far as the environment dimension is concerned, a list of seven indicators, related to the three principles already identified, was presented. Aspects on autonomy of fish nutrition as well as demand of fish meal were pointed out. Discussion on the definition of inshore, offshore and coastal zones was held in relation to site selection and movement of sites offshore. The identification of trends on movements was considered as a possible indicator, if these replacements of aquaculture installations had environmental justifications.

Concerning the governance and the social dimensions, six and five indicators were selected respectively. An important issue was raised up related to the aspect of "transversality" that the governance dimension has on itself and the relation at "regional level". Some of the indicators in this dimension were related to the environmental or to the economic dimension. A debate on the possibility of dealing with governance as a dimension that contains the three other dimensions as: Governance Environmental oriented, Governance Economic oriented and Governance Social oriented, was carried out and pointed to be considered further ahead.

A first consensus was achieved on the list of indicators, although more detailed aspects are required for fine-tuning, as well as a linked definition of principles.

PILOT STUDIES ON SUSTAINABLE INDICATORS IN THE MEDITERRANEAN COUNTRIES

The chairman introduced this point of the agenda and recalled to the participants that for the second year of activities of InDAM, a follow up of the Pilot studies carried out during the first phase and implemented at local level and precisely in Mugla (Turkey) and Monastir (Tunisia) should be considered. He recalled also that pilot studies at local level should have two phases: first one with the aim to receive feedback from local stakeholders (on the whole list of indicators identified by the WGSA); and second one more focused on the test of the indicators selected.

The follow up of the Turkish and Tunisian pilot studies and the start up of the new pilot studies in the region were discussed among participants to the meeting. It was stressed that these pilot studies are meant to assess the indicators (for sustainable development of a certain type of aquaculture in a particular area). Their results will be used to improve the methodology but, by no means, it will be considered as an index of sustainability of aquaculture in the study area.

A discussion has been carried out on whether these follow up should still be theoretical exercises to be performed during the next meetings with the different stakeholders, or if the indicators, selected in the pilot study, should be discussed further. Eventually narrowing list of indicators based on the selected attributes could be also considered.

Some participants suggested on the introduction of the "human dimension" in the list of indicators, and the concept of market competition of Mediterranean aquaculture products with products from other regions of the world. Other participants stressed the importance of including indicators related to the spread fish pathologies and monitoring of pathologies.

For the second year of the project, as also requested by the WGSA, this experience will be extended to other countries in order to move the action towards a general consensus on the definition of

sustainability of aquaculture in the Mediterranean region. The new case studies should take advantage from the Tunisian and the Turkish experience and will be supported by a multidisciplinary cooperation framework in which experts from different disciplines (economist, biologist, etc.) will be involved in the discussion. The new pilot case studies will be carried out in two or more countries. The contents and aims of the new pilot studies (Spain and Morocco) will follow in part the approach implemented by the previous carried out in Turkey and in Tunisia, however the specificity in term of implementation and application will be discussed during focused meeting that will be organised with the local experts and that are still to be defined.

WGSA PROGRAMME OF WORK FOR 2011 AND BEYOND

The work plan and programme of the activities for InDAM second year was mentioned and the summary is presented in Annexe 3.

OTHER MATTERS

In relation to the divulgation and dissemination of InDAM results, outputs and documentation, (publications, leaflets, documentation, etc), a proposal was made for the development of a Professional Social Network in which the participants of the working groups will be able to have an active feedback and constant collaboration. This issue has to be further detailed, explained and developed, especially concerning compatibility with the already existing sites on web.

Another aspect was the development of synergies with other relevant projects and initiatives related to sustainable development of aquaculture (IUCN, FOESA, AquaMed, etc.). As for the IUCN, the participation on the Guides for the Sustainable Development of Aquaculture in the Mediterranean is a fact. The synergy with FOESA was made clear and joint actions will take place for the new year of work of InDAM and Mediterrane-on.

CONCLUSIONS AND RECOMMENDATIONS

- A brainstorming discussion among the experts followed and can be summarized as below: Participants stressed that aquaculture is an important economic activity in coastal and rural areas.Iit offers opportunities to create employment, helps community development, reduces over exploitation of natural aquatic resources, and contributes to enhance food security. Social acceptability and responsibility are two key components for sustainable aquaculture. The WGSA also concurred that the identification of indicators is essential for having a common understanding of the sustainability and reaffirmed that indicators should also serve as tools for the communication among the farms and the society.
- A minimum set of indicators has been identified in order to be considered for the whole sustainable development of aquaculture in the Mediterranean region, taking into account the total list of selected indicators within the first year of InDAM. In particular, 22 indicators in total distributed as follows: 4 for the economic dimension, 7 for the environmental dimension, 5 for social dimension and 6 for governance.
- Although a consensus on the acceptance of the whole set of indicators was achieved, some discussion arose concerning the allocation of some indicators in the different sustainability dimensions.

- Results and methodology form the pilot studies carried out during the InDAM first year were presented. Discussion was held upon the objectives and methodology to apply for the follow up of the pilot studies and the definition of the new ones to be possibly held in Spain and Morocco.
- For the implementation of the new pilot studies and in consideration of the specificity in terms of implementation and application, details will be discussed during focused meeting that will be organised with the local experts and that are still to be defined
- For the second step of the pilot studies and in order to assess the indicators at local scale, the use of traffic light approach was considered as possible tool to display indicators values. This methodology provides a way to evaluate and integrate information on aquaculture development and management coming from different disciplines (socio-economic; governance, environment) on a clear and easy way.
- Pilot studies should be defined on a common approach and more detailed revision on the methodology to be applied for the assessment of indicators (by attributes), especially concerning the expected differences to be found among locations.
- The implementation of a reference system for indicators of sustainable aquaculture development should be considered and applied in support to the development of sustainable aquaculture within the Mediterranean countries.
- All indicators should be considered within the framework of the Code of Conduct for Responsible Fisheries, as adopted by the countries and should also considered as follow up of Consultation on Art. 9 of the CCRF the Mediterranean countries in which, among the actions proposed, a series of activities was identified in support of a better understanding of the criteria and techniques for sustainable aquaculture, such as the design of indicators of sustainability for production systems.
- Synergies with relevant projects related to sustainable development of aquaculture were found, thanks to the participation of experts from other working groups and projects such as the project Mediterrane-On carried out by the Spanish Aquaculture Observatory Foundation (FOESA). The definition of the work-package for the dissemination of results and outputs from InDAM cooperation and synergies should be found with such entities.
- The WGSA considered that the list of the regional indicators identified are essential for the definition of the regional sustainable reference framework for the development of aquaculture and that these indicators should be considered in assisting and monitoring the GFCM member countries in the process of the whole development of sustainable aquaculture The indicators, as were summarised in the Annexe 4, to be put forward for the consideration of the 7th Session of the Committee on Aquaculture.

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Annexe 1

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Annexe 2

AGENDA

1. **Opening of the meeting and adoption of the agenda**
2. **Activities of the Working Group on Sustainable Aquaculture**
3. **Reviews of the indicators for Mediterranean sustainable aquaculture identified during the first year of InDAM**
4. **Selection of minimum set of indicators to be considered for the whole sustainable development of aquaculture in the Mediterranean region**
5. **Pilot studies on Sustainable Indicators in the Mediterranean countries**
6. **WGSA Programme of work for 2011 and beyond.**
7. **Other matters.**
8. **Conclusions and Recommendations**

Annexe 3

Work plan for the following period of InDAM, including outputs and related activities

OUTPUT 1

Consensus on the definition of "sustainability" of aquaculture development in the Mediterranean within the framework of an ecosystem approach to aquaculture is established.

Activity 1.1 ***Implementation of Pilot case studies for the selection of indicators on aquaculture at local level***

During the first year of activities of InDAM two pilot case studies on the identification of indicators on aquaculture were implemented at local level and precisely in Mugla (Turkey) and Monastir (Tunisia). The aim of these studies was receiving feedback from local stakeholders on the whole list of indicators identified by the WGSA. For the second year, as also requested by the WGSA, this experience should be further extended to other countries in order to divulgate the action toward a general consensus on the definition of sustainability of aquaculture in the Mediterranean area. The new case studies should take advantage from the Tunisian and the Turkish experiences and will be supported by a multidisciplinary cooperation framework in which experts from different disciplines (economist, biologist, etc.) will be involved in the discussion. The new pilot case studies will be carried out in two countries or more countries.

The performed pilot studies consisted mainly of one or two local multi-stakeholder technical meetings followed by a bottom-up approach for the identification of indicators and were attended by representatives of different interested parties in order to discuss and receive feedback on the work carried out at regional level. Among the stakeholders selected attributes for the identification of indicators were chosen and agreed upon (such as: data availability, statistical robustness; local acceptability) for the selection of indicators at local level.

Activity 1.2 ***Definition of Regional minimum set of the indicators for sustainable aquaculture***.

An experts' meeting will be organised with the aim to address the issue of the minimum set of regional indicators and the implementation of sustainable indicators at global and local scale within the context of coastal zone management. In particular, the meeting will aim: a) to review and analyze the indicators identified by InDAM; b) to select a minimum set of indicators to be considered for the whole Mediterranean region which will be proposed to the CAQ and consequently to the GFCM; c) to discuss on the follow up of the Pilot Actions in the Mediterranean countries ; d) to discuss and review the relationship of the Indicators identified at Regional Scale with those identified and applied by WGSC, WGMA and SIPAM and other relevant institutions working on Mediterranean Aquaculture Indicators.

Activity 1.3 ***Organization of a regional meeting of the WGSA on the pilot case studies***.

At the end of the second year of InDAM a regional meeting will be organized and held to discuss the results achieved in the year, to synthesize the outcomes of the pilot case studies implemented in the Mediterranean and to discuss on the application of the indicators to finalize the outputs discuss on the status of finalization of the guidelines for the application of the indicators for the sustainable development of marine aquaculture.

OUTPUT 2

Relevant documentation on aquaculture sustainability is gathered and regularly updated and proper synergies between other projects related to sustainable development of aquaculture and the GFCM - Working Group on Aquaculture Sustainability are identified and developed.

Activity 2.1 ***Implementation of a programme for the dissemination of InDAM results, outputs and documentation.***

A programme for the dissemination of achievement of InDAM will be implemented. This will include the production of a summary of the main the technical documents on indicators for sustainable aquaculture and indicators produced by the experts and a translation in local languages (Arabic and Turkish foreseen for the first translations) of the summaries. The SIPAM web section dedicated to the WGSA-InDAM will be updated and improved and the database, InDAM-db, storing the most significant scientific documents on indicators of sustainable aquaculture related to the Mediterranean Region, will be updated and related information disseminated within the Mediterranean countries.

Activity 2.*2 Finalisation and publication of the document "Indicators for Sustainable Development of Mediterranean Aquaculture (WGSA - InDAM first year)".*

The technical document which includes the main technical contributions carried out during the first year, the results of the two pilot studies, and the main achievements of InDAM year 1 will be further edited, finalised and printed. The document will be published as GFCM Studies and Reviews for a wider diffusion among the GFCM members and a broad circulation among the Mediterranean countries will be ensured as well.

Activity 2.3 ***Development of synergies with relevant projects related to sustainable development of Aquaculture.***

In order to maximize the work efforts made and to identify synergy on sustainable aquaculture and indicators, cooperation will be further strengthened with the other institutions involved on the application of sustainable indicators in the GFCM areas (i.e. IUCN, FOESA, AquaMed).

OUTPUT 3

The most suitable and workable sets of indicators and reference points guiding the sustainable development of Mediterranean aquaculture are established (as a result of regional multidisciplinary cooperation and feedback from stakeholders).

Activity 3.1 ***Prepare guidelines on the application of indicators for sustainable aquaculture, according to the methodologies applied and to the agreed schemes.***

Guidelines for the application of the Sustainable indicators and reference points and standards will be prepared during the second year of InDAM. These will serve as practical tool for the application of the indicators at local level and within the GFCM countries. The guidelines would provide a series of main governance, economic, environmental and social indicators identified in the various country pilot projects supported through the InDAM project. The guidelines would hence provide information on how such indicators are selected and prioritized. Among other, the essential information of each indicator and its application would be provided in the form of a fiche including the following information: definition; relevance to sustainability; rationale; methodological aspect (i.e. measurement of the indicator); reference value; measurement frequency; information and data required (i.e. data source, availability), references. The Guidelines will also include a Glossary of the terms used for the different

indicators. For the preparation of these guidelines the CMWG suggested the creation of a team of experts on each dimension of sustainability.

Activity 3.2 ***Test the indicators reference system at local level: follow up of the pilot case studies carried out***

In Tunisia and Turkey and in particular in the areas (respectively Monastir and Mugla) where the first pilot case studies were carried out during the first year of InDAM, the reference system of indicators will be tested with the participation of the different stakeholders already involved. The local experts in cooperation with the farmers and local authorities will monitor the activities of aquaculture, this will serve also to make a first practical evaluation of the selected indicators based on the available data and collected at local level and for the evaluation of the drafted guidelines.

Annexe 4

Table I - Minimum list of Indicators for aquaculture sustainability for the Mediterranean

GOVERNANCE DIMENSION				
PRINCIPLE	**CRITERIA**	**N°**	**INDICATORS**	**Comments**
Strengthen integration of aquaculture in local development	Importance of development initiatives	1	Existence of Allocated Zones for aquaculture development (AZA)	Definition and successful implementation.
	Capacity of aquaculture to improve environmental monitoring capacity	2	Existence of support mechanism for aquaculture ecological services	
Promote participatory in decision making process	Level of participation	3	Existence of mechanism for all stakeholders participation in decision making and conflict solving at all levels	
Strengthen research, information systems and extension services	Importance of research and training in aquaculture	4	Existence of continuous research programme on aquaculture development with sustainable funding for generating scientific and technological information openly accessible to all stakeholders, particularly farmers through proper means of dissemination, including extension services.	
Strengthen institutional capacities in relation with sustainable development	Level of national recognition of sustainable development	5	Existence of legislation governing aquaculture development in line with the principles of the CCRF	
Aquaculture monitoring and reporting mechanism	Capacity for quantitative monitoring and reporting of aquaculture development	6	Existence of monitoring mechanism for aquaculture development, particularly statistic information and data collection and dissemination	

SOCIAL DIMENSION				
PRINCIPLE	**CRITERIA**	**N°**	**INDICATORS**	**Comments**
Contribute to food security and food safety	Importance of fish availability and supply. Contribution to food security.	1	Relevance of fish produced for domestic markets Existence of strategies or national plans on the importance of aquaculture regarding food security...	(self-consumption) (kg per capita, trends)
	Employment opportunity and development in unprivileged communities.	2	Employment opportunity and development in unprivileged communities.	Potential number of workers (trends)
	Transparency of production process.	3	Existence of mechanisms for information with regard to the aquaculture production process and its compliance to regulations available and accessible to the public. Existence of legislation or mechanisms to enforce transparency...	Information has to be delivered and available to all. Labelling
Strengthen the role of the Producer Organizations and NGO's to improve image of aquaculture, social awareness and responsibilities	Importance of fish farmer organizations	4	Existence of strategies or initiatives for the training and functioning of producers organizations	
Strengthen corporate social responsibility		5	Existence of national legislation on employees' welfare fully applied by the aquaculture sector Existence of preventing policies regarding employees´ welfare...	Insurances? Access to the system of social protection?..

ECONOMIC DIMENSION				
PRINCIPLE	**CRITERIA**	**N°**	**INDICATORS**	**Comments**
*		1	Value of production (Euro/year)	See trend in value, ±
*		2	Existence of quality/environmental certification schemes	(Yes/no)
*		3	Relevance of Product diversification/differentiation	See trend in number of species, size categories and other value added products
*		4	Existence of funding for market promotion activities by Producers Organization	See trend in budget allocation for market promotion activities (communication, information, image building and marketing) ±

* These Indicators were selected and added on apart from those already existing.

ENVIRONMENTAL DIMENSION				
PRINCIPLE	**CRITERIA**	**N°**	**INDICATORS**	**Comments**
Minimize global impact of aquaculture.	Needs of natural resource (pelagic fish and vegetables)	1	Food conversion ratio (kg food/kg fish)	
		2	Demand of pelagic fish (t/year) for fish meals.	
Respect the ecological service of ecosystem.	Oceanographic conditions	3	Existence of criteria for the depth (m) of cage applied to site selection.	
		4	Percentage of the surface used by cages to total surface in a determined coastal area	Relation to ICZM
Minimize local impact on environmental conditions and biodiversity	Use of chemical products and drugs	5	Kg of antibiotics per tonne fish (kg)	
	Impact on benthos, habitat and communities	6	Existence of monitoring system for the evaluation of the level of degradation of sensitive habitats (monitoring)	
	Genetic impact	7	Monitoring of escapees (numbers)/restocking	