February 2010

GENERAL FISHERIES COMMISSION FOR THE MEDITERRANEAN

COMMISSION GÉNÉRALE DES PÊCHES POUR LA MÉDITERRANÉE

GENERAL FISHERIES COMMISSION FOR THE MEDITERRANEAN
COMMITTEE ON AQUACULTURE
THIRD COORDINATING MEETING OF THE WORKING GROUPS (CMWG)
FAO HQ ROME, Italy, 24-26 February 2010
WORKING GROUP ON SUSTAINABILITY ON AQUACULTURE REPORT OF THE WORKSHOP ON GUIDELINES AND APPLICATION OF INDICATORS FOR SUSTAINABLE DEVELOPMENT OF AQUACULTURE- InDAM Salammbo, Tunisia, 19-20 November 2009

OPENING , ARRANGEMENTS OF THE MEETING AND ADOPTION OF THE AGENDA

1. The *Workshop on Guidelines and application of indicators for sustainable development of aquaculture* was held from 19 to 20 November 2009 and was hosted by the Institut National des Sciences et Technologies de la Mer (INSTM). The Workshop was organised within the activities of INDAM [1], a project in support to the Working Group on Sustainability on Aquaculture (WGSA) of the GFCM Committee on Aquaculture (CAQ).

2. Mr Ridha M'Rabet, the Director of INSTM opened the workshop and, after welcoming the participants, expressed his pleasure for hosting the CAQ meeting. He then informed the participants on the main research activities of aquaculture in Tunisia. He recalled the relevance of the INSTM research activities for the aquaculture development in Tunisia, in which the research on species diversification and on the interaction between the environment and aquaculture represent one of the main aspects.

[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 Union 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.

February 2010

3. Mr Mohamed HadjALi, Coordinator of the InDAM Pilot Action in Tunisia, was nominated chairperson of the meeting; the Agenda was adopted with no change. He briefly recalled that the aim of the workshop is to present and discuss on the main issues related to the Indicators for Sustainable development of Aquaculture within the GFCM region; to present the main achievements and results of the first year of InDAM; to present and discuss on the results of the two case studies held in Tunisia and Turkey; to synthesize and identify priorities on the main issues related to the Indicators for Sustainable development of Aquaculture. The list of participants, the adopted Agenda and the prospectus are included in this report respectively as Appendixes 2 and 1.

WORKING GROUP ON SUSTAINABILITY AND INDAM PROJECT

4. Mr Fabio Massa, Technical Secretary of the CAQ thanked the INSTM for the hospitality and provided a general introduction of the activities of the Working Group on Sustainability, of the main topics related with the InDAM Project as well as of the PCI (Principles, Criteria, Indicators) approach. He recalled the main outcomes and conclusions of the "Workshop on the selection of indicators for sustainable development of aquaculture" (November 2008, Montpellier, France) where, among others, the methodological approach was discussed and agreed by the WGSA. The outcomes of the "Expert Meeting for the Sustainable Development of Aquaculture in the Mediterranean" (February 2009, Montpellier, France), in particular the identification of the list of indicators as well as the terms of reference for the pilot actions of InDAM, were also recalled. He recalled that this *Workshop on Guidelines and application for sustainable development of aquaculture represent* is the final meeting of the first year of the InDAM Project. Issues related to the organisation of the CAQ Working Group on Siting and Carrying Capacity, the Working Group of Marketing on Aquaculture and of SIPAM were also presented.

INDICATORS FOR THE DEVELOPMENT OF SUSTAINABLE AQUACULTURE IN THE MEDITERRANEAN

5. The Chairperson introduced this point of the agenda and recalled the relevance of the aquaculture in the Mediterranean Sea and how this sector continues to grow, thus representing an important contribution to the fisheries production and economic development in many coastal areas. He stressed the urgency to provide the countries and the GFCM with a shared and comprehensive decision support tool to support them in taking decisions in a short time. He brought the example of the new development of aquaculture in Tunisia in which about new ten marine fish farms are close to be implemented and for which some clear answers about the prospective of their sustainability are to be requested as well as certainty to the investors are to be provided. Common and "shared-at-Mediterranean-level" indicators for sustainable aquaculture could represent the best solution.

6. The main aspects and achievement of InDAM were recalled and it was also mentioned that the development of Mediterranean aquaculture is facing a series of environmental and socio-economic increasing constraints. Therefore if the sustainability of aquaculture will be not considered in the appropriate way within the context of the coastal areas management and in an ecosystem perspective there is not a future for its further development.

7. The meeting also recalled that the application and use of indicators for sustainable aquaculture are the most appropriate tools to ensuring and for creating conditions for sustainable growth of aquaculture and that these are necessary to assess and monitor the aquaculture activities. During the discussion the participants highlighted that the indictors have different functions and that the principle of the co-construction of the indicators means the collective involvement of the civil society and the main stakeholders, and is a way toward a common vision of sustainability that should be contextualised at the appropriate level and geographic scale.

8. During the discussion the experts underlined that the aquaculture activities may often have difficulties to be accepted by the society, being this generated also by the lack of knowledge on aquaculture and/or by an incorrect information. The image of aquaculture should be then improved and the indicators, in this context, could be considered essential tools for the communication between farmers and society. In this respect the meeting stressed the urgency for the application of indicators to be shared in the international community in support of the aquaculture development.

9. The meeting recalled also that indicators should always take into consideration the fours dimension of sustainability (social, economic, governance and environment) and that for a practical use standards and when possible reference points should be associated to one of each indicators. The latter will serve for those countries in which aquaculture is well developed and in which conflicts exist for increasing competition for space (such as in Turkey) but also for those countries in which aquaculture is further developing (Tunisia and Morocco). For these reasons the necessity to develop guidelines for the application of the use of indicators on sustainable aquaculture remains a priority at Mediterranean level.

PRINCIPLES OF THE INDICATORS FOR SUSTAINABLE AQUACULTURE

10. Ms Sinthya Mathe' contributed to the point of this agenda and presented the working paper "*The implementation of the Mediterranean aquaculture sustainable development: Governance conditions***.** The presentation dealt with the conditions of governance to co-construct indicators of sustainable development of aquaculture in the InDAM project. The first part of the presentation focused on the comparison between the individual selection of Principles and Criteria (PC) during the InDAM kick-off meeting and the collective selection (focus groups) during the second meeting. The comparison confirmed some results of the EVAD project and showed the interest of the collective selection. The participants chose the PC taking account their own interests and their function during the individual selection. This discussion generated learning processes which created a transversal vision of sustainable development of aquaculture (equilibrium between the governance economic, social and environmental dimensions) and underlined the importance of a large representativeness of the stakeholders' point of view. The second part of the presentation highlighted the interests and the difficulties of the evaluation of the governance dimension, due to the complexity of this dimension. The process could be facilitated through the establishment or institutionalisation of a permanent group of representatives of the different institutions and stakeholders which would permit to build and assess the governance indicators.

11. The participants to the workshop highlighted that the approach is essential also for the aspects related to the governance dimension of the aquaculture that represent the key to sustainability. They also stressed that sometimes the definition and quantification of the indicators are not so evident. It was also recalled that some governance' aspects are different from country to country or from south to north in the Mediterranean and in addition the same concept can has different sensibility, such as animal welfare for example. Participants taking also in consideration the impact that the new general rules for aquaculture can have at local level stressed that these can affect, in some case, the global sustainability. Difference should be made between small and big farms, in particular the role played on the sustainability by the small farms. The concept of artisanal fish farms should be thoroughly discussed and taken into consideration for the conservation of the local tradition and for supporting the local community, such as in the case of artisanal fisheries. The issue of the certification of traditional, organic and environmental production should be considered within the governance dimension.

February 2010

INDICATORS FOR DEVELOPMENT OF SUSTAINABLE AQUACULTURE - METHODOLOGICAL FRAMEWORK AND INDAM CASE STUDIES.

12. With reference to this point of the Agenda, the chairperson recalled that within the InDAM first year activities, it was decided to implement pilot studies to test the appraisal of the different stakeholders, in terms of compatibility, validity and acceptability of the sustainable aquaculture indicators identified at regional level in the meetings held in Montpellier (November 2008 and February 2009), and to provide guidance at local level in the participation progress. The pilot studies were planned in two selected coastal areas, at different level of aquaculture development, one in Turkey and one in Tunisia, and results were discussed in two technical meetings, held respectively in Mugla, Turkey, 28-29 September 2009, and in Monastir, Tunisia, 13-14 October 2009. It was also recalled that the two pilot actions were organized to: share the outcomes of the InDAM meetings on Principle, Criteria and Indicator approach (PCI); initiate a selection process based on the identification and prioritization of attributes for selection of indicators; and have a common understanding between the different local stakeholders on the concept of sustainable aquaculture indicators and following a bottom-up approach.

THE PILOT STUDY IN TURKEY - TECHNICAL MEETING

13. Ms Guzel Yucel and Mr Hairy Deniz presented the main outcomes and methodology applied of the InDAM Turkish pilot study (the draft document was made available for participants). They informed the meeting that the pilot study was concluded during a technical meeting held in Mugla, Turkey, 28-29 September 2009, where the stakeholders discussed, analysed and prioritized the 155 indicators identified and selected during the previous InDAM meetings held in Montpellier, France. The technical meeting was organised by the Ministry of Agriculture and Rural Affairs (MARA) of Turkey and was attended by 36 participants, namely experts from different national institutions, fish farmers, academicians, representatives from civil society organizations and from aquaculture's professional organizations.

14. The methodology and process for selection of indicators was discussed with the stakeholders that before prioritizing the indicators its identified the attributes that an indicator should possess. The technical meeting in Turkey followed these steps: a) identification and prioritization of attributes to be used in the selection of indicators; b) a rapid appraisal method for the selection of indicators; c) a selection process based upon attributes endorsed and prioritized by stakeholders. This last process was based on three different questionnaires distributed and discussed among the participants As a result mean scores and rank were finally obtained for indicators selection attributes. *Relevance to Criteria and Principle* obtained the highest score, followed by *Reliability* and *Data Availability*. Based on these attributes the selected indicators were prioritized for each sustainability dimension (social, governance, economic, ecological).

THE PILOT STUDY IN TUNISIA - TECHNICAL MEETING

15. Mr Ben Salem and Mr Hadj Ali presented the main outcomes and methodology applied of the InDAM Tunisian pilot study (the draft document was made available for participants). The Tunisian pilot study followed the same organization pattern as the Turkish pilot study and was concluded during the technical meeting held in Monastir, Tunisia, 13-14 October, 2009. As for the pilot study in Mugla, the stakeholders were called to discuss, analyse and prioritize the indicators identified during the previous InDAM meetings held in Montpellier.

16. The technical meeting was organised by the Fishery Directorate of the Ministry of Agriculture and Marine Resources and was attended by 39 participants, namely representatives of the Fisheries and Aquaculture Department of the Ministry for agriculture and marine resources, of the Ministry of

environment and sustainable development, of interprofessional groups, of environmental organisations, aquaculture research scientists.

17. Participants considered *Data availability* the attribute with the highest relevance, followed by *Reliability*. Indicators were discussed and suggestions were made to improve their application. Indicators were prioritized though the use of questionnaires.

18. In both pilot studies, the technical meeting participants highlighted the difficulty in understanding the terms used and suggested the preparation of a glossary and/or directives for the explanation of indicators with algorithms and the data required for the estimation of qualitative indicators. They recalled the importance of the definition of reference points for quantitative indicators and of a methodology for the use of indicators in the process of sustainable development, such as trend analysis, and traffic light methods.

19. The meeting agreed about the conclusions of the pilot studies highlighting that there was a common understanding and perception of the importance of an agreement on indicators being the prioritization process a necessity for the selection of indicators for sustainable development of aquaculture. Constructive discussions on different aspects of the indicator selection process were made during the meeting, also in the determination of the InDAM follow up. It was also underlined that the technical meetings created interactions between the different stakeholders and contributed to building awareness on the concept of sustainable aquaculture. The participants reiterated that the use of indicators should and could enhance the communication between farmers and society, and agreed that the next step should be to enhance this communication process by testing the use of indicators at local level.

GUIDELINES ON THE USE OF INDICATORS FOR DEVELOPMENT OF SUSTAINABLE AQUACULTURE IN THE MEDITERRANEAN

20. Ms Guzel and Mr Hayri presented some draft templates and examples for guidelines for the application of sustainable indicators for aquaculture for the governance economic, social and environmental dimensions of the sustainable aquaculture. The presentations were made on the basis of the Turkish case study implemented in Mugla.

21. The workshop participants agreed on the importance of developing practical guidelines on the use of indicators for the development of sustainable aquaculture. The guidelines should be considered for the use of indicators and reference points and standards; furthermore and, when applicable, some aspect related to the feasibility, practicability, expertise requirement, costs should be indicated. The participants recalled that one of the main objectives of the InDAM is to make available to the countries further to the list of indicators to be used as practical tool for the application of them at local level and some guidelines which could help in this direction

22. The participants stressed also that the development of sustainable aquaculture activities in the Mediterranean as well as the application of indicators for sustainable aquaculture should be continuously monitored and exchange of knowledge on application of such indicators should be done among countries. In this respect participants evocated the realisation of an Observatory for the Sustainable Aquaculture in the Mediterranean that could help in this direction. This observatory should, in addition to monitoring, gathering and analyse information on sustainable aquaculture in the countries; allow and support the

countries in the applcation of sustainble aquaculture; and make available to the countries useful tools for fostering and disseminating the applicaltion of the indicators for sustainable aquaculture in the Mediterranean coastal countries. It was then suggested that this Observatory should be implemented in support of the activities of the CAQ and its subsidiray body

OTHER MATTERS

23. The GFCM Aquaculture officer presented the released InDAM webpage available on the SIPAM portal (www.faosipam.org) which is composed by four main sections (News, Events, Documents and Presentations) in which information are also provided on the pilot case studies on Turkey and on Tunisia. Furthermore the outcome of the InDAM bibliographical data-bank were illustrated: it provides a web-based search-system tool, very user friendly, to retrieve the reports and publication on indicators of sustainable on aquaculture which matches with the selected criteria (and which are also based on the different dimension of the sustainable aquaculture).

CONCLUSION AND RECOMMENDATIONS

24. On the basis of the methodology implemented by the WGSA and the sustainable reference systems established within the InDAM Project (Monpellier (France) meetings held in November 2008 and February 2009) and on the technical contribution made in Turkey and in Tunisia, the participants discussed on the made achievements made by the pilot studies, identified priorities for the second year of InDAM including some aspects related to the content of the guidelines for the application and use of the indicators for the development of sustainable aquaculture in the Mediterranean countries.

The main topics mentioned during the discussion, as well as the main conclusions of the workshop are hereunder summarized:

a) Case studies

- Participants agreed that the *pilot case studies* are essential to establish a local reference system for the development of aquaculture sustainability and its integration into coastal zone management. The *pilot case studies* are also essential for having a common understanding of the concept of sustainable aquaculture between the different local stakeholders. Participants considered also that additional pilot case studies should be implemented in other Mediterranean countries for giving contribution to the co-construction of the indicators and their application;

- the results of the *pilot case studies* is relevant for the purposes of InDAM; in particular for generating discussion and to test the methodologies applied on the identification of sustainable indicators at local level;

- the use of indicators for aquaculture should be considered within the sustainable reference system identified (PCI - Principles, Criteria, Indicators), as well as being specified in a multidisciplinary context of aquaculture development;

- in the *pilot case studies* the multistakeholder participation should remain a priority as well as the bottom-up approach. The involvement of the different local actors (administration, farmers and farmers associations, NGOs, scientists) was considered essential for having a common understanding of the concept of sustainable aquaculture, and this could be considered also as one

of the major added value toward the identification and application of indicators for sustainable aquaculture at local scale;

- the information given to the participants on the *pilot case studies* on the PCI, as well as the identification of the attributes for the indicators was essential during the process for the selection of indicators; in this process the selection of indicators was considered more transparent;

- during *pilot case studies,* the work done with the different actors gave different perspectives of aquaculture development. The aquaculture activities have been considered both from the farm, from the administration and from the civil society point of view ;

- in the implementation of *pilot case studies*, the identification and prioritization of attributes of indicators is a crucial issue. It should be considered as the first logical and methodological step in the selection process of the indicators for the development of sustainable aquaculture in the Mediterranean.

- common understanding and perception of attributes of the indicators for sustainable aquaculture at local level are required in order to achieve consensus on the identification and prioritization of the same indicators. The preparation of a "*Glossary on Attributes for Selection of Indicators"* would facilitate this process**.**

- functionality and practicability of the PCI approach within the concept of sustainable aquaculture will remain a challenge point (reliable reference points at local level for monitoring purposes) for the next *pilot case studies*.

- a weighting and scoring table system for the evaluation and contribution of the indicators identified will also help in the management of sustainable aquaculture, and tools such the traffic light approach can be useful in the process of application of monitoring of aquaculture activities. This will facilitate the evaluation of sustainability of aquaculture activities at different local scale.

b) The following main activities should be considered for the Workplan of the second year of InDAM:

- *Guidelines on the application of indicator for sustainable aquaculture developed*

  Guidelines on the application of the indicators for sustainable marine aquaculture in the Mediterranean will be drafted according to the methodologies applied and to the agreed schemes; a Glossary of the terms used for the different indicators will be also included in the Guidelines. The number of the indicators should be also revised for a better and more comprehensive application.

- *The indicators reference system for sustainable development of aquaculture is disseminated in the Mediterranean also as a result of regional cooperation.*

  Based also on the created interest in some Mediterranean areas, additional new *pilot case studies* will be implemented. A preliminary interest was indicated for further case studies, being conducted, at local level, in Morocco, Italy, Spain and Greece. The new case studies should take advantage from the Tunisian and Turkish experience, and supported by a multidisciplinary cooperation framework that should be established.

- *The indicators reference system tested at local level.*

  As follow up of the *pilot case studies carried out* in Tunisia and Turkey, the reference system of indicators will be tested with the participation and involvement of the different stakeholders, already involved in the selection process. The foreseen activities will also serve for a first practical evaluation of the selected indicators based on the data available and collected at local level and for the evaluation of the drafted guidelines.

- *Preparation of a programme for the implementation and /or establishment of a Mediterranean Observatory on Sustainable Aquaculture.*

A preliminary content for a document "*Guidelines for the use of Indicators for Sustainable Developmet of Aquaculture and related Standard and Reference points*" was adopted . The workshop agreed that the Guidelines document would need to be simple and concise and the use of graphics and drawings would be appropriate to illustrate certain concepts and their easy grasping.

The document should include the following points:

- Background

  In this chapter information should explain the context in which the Guidelines have been developed. Detailed information will be given on how the document was conceived and the process leading to its preparation;

- Target users

  The target users of the guidelines would need to be well defined indicating, for each user group, the purpose and advantages derived from the use of such indicators as well as on the different level of the utilisation of the indicators (regional, national, local);

- Selection of indicators

  The guidelines would provide a series of main governance economic, social and environmental indicators identified in the various country pilot projects supported through the InDAM project. However, the guidelines would clearly state that other indicators, not included in the list provided, may be of more relevance to certain countries, regions or areas. The guidelines would hence provide information on how such indicators are selected and prioritized. The PCI and co-construction methodology developed and recommended for the identification of the indicators would be included as an appendix to the guideline document;

- Value of a single indicator

  The importance of determining the degree of value of a single indicator (standards and, when possible, reference points) should be indicated in order to ensure its proper use and interpretation in determining the level of sustainability of any given aquaculture activity; including feasibility, practicability, expertise-requirement and cost effectiveness.

- Pilot case studies

  For the purpose of clarity and usability of the guidelines it was proposed that one or more case action should be annexed (or i.e. box tools) in order to provide practical examples on how indicators are identified and prioritized;

A series of additional Appendices will be also annexed to the Guideline, such as:

- *List of indicators*

  A list of top indicators identified through the project and the various pilot actions would be included in the guidelines. Each indicator would be provided in the form of a fiche where the following information, where appropriate, would be given: definition, relevance to sustainability, rationale, methodological aspect (i.e. measurement of the indicator), reference value, limitations, level of implementation, measurement frequency, information and data required (i.e. data source, availability), references.

- *Full methodology*

  This annex should describe in details, but concisely, the methodology developed in order to allow replicability

APPENDIX I

Agenda

1. Opening and arrangements of the meeting and adoption of the Agenda.
2. Working Group on Sustainability and InDAM Project .
3. Indicators for the development of sustainable aquaculture in the Mediterranean
4. Principles of the indicators for sustainable aquaculture
5. Indicators for development of sustainable aquaculture - Methodological framework and InDAM Pilot Studies.
6. Guidelines on the use of Indicators for Development of Sustainable Aquaculture in the Mediterranean
7. Other matters
8. Conclusion and Recommendations

List of participants

Pablo AVILA ZARAGOZA
Area de Estructuras Pesqueras y Acuícolas.
SubDir. Recuros Pesqueros y Acuícolas
Empresa Pública Desarrollo Agrario y Pesquero
C/Severo Ochoa 38 Pta Campanillas
29590 Malaga, Spain
Tel +3467094450 - +34951042150
Fax +34951042151
E-mail **pavila@dap.es**

Scander BEN SALEM
Institut National des Sciences et Technologies de la Mer
28 Rue 2 mars 1934,
2025 Salammbô, Tunisia
Tel. + 212.71.735848.
E-mail: scander.bensalem@instm.rnrt.tn

Mustapha BENDAG
Direction General Peche Aquaculture
Ministère de l'agriculture
30 rue Alain Savary
1002 Tunis, Tunisia
Tel + 212.97.909.153
E-mail: Mustapha.bendag@topnet.tn

Maria COZZOLINO (Ms)
IREPA onlus
Via San Leonardo 84131
Salerno , Italy
Tel: + 39 089 338978
Fax + 39 089 3389 35
E-mail: cozzolino@irepa.org

Hayri DENIZ
Director of Marine Aquaculture Ministry of Agriculture and Rural Affairs, Aquaculture Department
Eskisehir Yolu 9 Km 06275 Lodumlu
Çankaya,
Ankara, Turkey
Tel: + 90 312 286 49 01
Fax: + 90 312 286 75 92
E-Mail: hayri.deniz@tarim.gov.tr , hayrideniz@hotmail.com

Ali EL OUAER
Institut National des Sciences et Technologies de la Mer
Route de Khniss
5000, Monastir, Tunisia
Tel +216 73 531 867 - +21621803370
E-mail ali-elouaer@inst.rnrt.tn

Mohamed HadjAli SALEM
Directeur
Centre régional du SIPAM
Ministère de l'agriculture
30 rue Alain Savary
1002 Tunis, Tunisia
Tel.: + 216 71784979
Fax: + 216 71 793962
E-mail: Hajali.salem@fao.org

Alessandro LOVATELLI
Fishery Resources Officer (Aquaculture)
Aquaculture Management and Conservation Service (FIMA)
Fishery and Aquaculture Management Division
Fisheries and Aquaculture Department
Viale delle Terme di Caracalla
00153 Roma, Italy
Tel: + 39 06 57056448
Fax: + 39 06 57053020
E-mail:alessandro.lovatelli@fao.org

Fabio MASSA
GFCM Aquaculture Officer
CAQ Technical Secretary
International Institutions and Liaison Service
Fisheries and Aquaculture Economics and Policy Division (FIEL)
Fisheries and Aquaculture DepartmentViale delle Terme di Caracalla
00153 Roma, Italy
Tel.: +39 06 57053885
Fax: +39 06 57053020
Email: fabio.massa@fao.org

Syndhia MATHE (Ms)
Université of Montpellier
Faculté de Sciences Economiques
Avenue de la Mer - Site de Richter
CS 79606
34960 Montpellier cedex 2, France
Tel. : +33 (0)4 6715839
E-mail: syndhia.mathe@univ-montp1.fr

Zouari MOURAD
Direction Generale des peches et de l'Aquaculture
Monastir, Tunisia
Tel. +216.71.782.635 - +216 73.466.188
Email: iwashi@jicapeche.com

Abdellah MOUSTATIR
Ministere de Pêches Maritimes - DPNA
Rabat, Morocco
Tel: +212.53.688.217
E-mail: moustatir@mpm.gov.ma

Ridha M'RABET
Director
Institut National des Sciences et Technologies de la Mer
28 Rue 2 mars 1934,
2025 Salammbô, Tunisia
Tel: + 216 71 730548
Fax: + 216 71 732622
Email: ridha.mrabet@instm.rnrt.tn

Abdellatif ORBI
Institut National de Recherche Halieutique
INRH
2, Rue De Tiznit
Casablanca, Morocco
Tel + 212.5 222.98.534
E-mail: orbi@inrh.org.ma

François RENÉ
Station expérimentale de l'IFREMER
Chemin de Maguelone
34110 Palavas les Flots
France
Tel: + 33 4 67504100
Fax: + 33 4 67682885
E-mail: francois.rene@ifremer.fr

Güzel YÜCEL GIER (Ms)
Dokuz Eylul University, Institute of Marine Science and Technology
Baku Bulvarı No: 100 35340
İnciralti-İzmir, Turkey
Tel:0232 278 65 15 -278 65 25/140
Fax: 0232 278 50 82
E-mail: yucel.gier@deu.edu.tr