



INTEGRATED MANAGEMENT OF LAGOON ACTIVITIES IMOLA PROJECT II

ABSTRACTS

IMOLA SEVENTH TECHNICAL WORKSHOP

THE IMOLA PROJECT PHASE I AND II: HIGHLIGHTS AND CONSTRAINTS ENVIRONMENTAL CONTROL, SUSTAINABLE TOURISM AND PRIVATE-PUBLIC PARTNERSHIPS

Hue, 19 November 2011



PEOPLE'S COMMITTEE OF THUA THIEN HUE PROVINCE



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IMOLA PROJECT

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**Dự Án Quản Lý Tổng Hợp Các Hoạt Động Đầm Phá Thừa Thiên Huế -
IMOLA GCP/VIE/029/ITA**

Integrated Management of Lagoon Activities of Thua Thien Hue Province -
IMOLA Project

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**“The IMOLA Project Phases I and II -
Highlights and constraints.
Environmental control, sustainable tourism and private-public
partnerships”**

*One day technical session of the IMOLA Project
(Integrated Management of Lagoon Activities)
Hue, Vietnam, November 19th 2011*

Date: Saturday, November 19th, 2011

Venue: People Committee Grand Central Meeting Room, 16, Le Loi Street, Hue City, Vietnam

Services provided: Travel arrangements and hotel reservation, residence permits and visa issuing for foreign guests.

Workshop Secretariat: Mrs Pham Thi Lien Hoa, Project Assistant and Administrator, IMOLA Office at the Department of Agriculture and Rural Development (Thua Thien Hue Province), 53 Nguyen Hue Street, Hue. Telephone: +84 54 3831387 (ext. 114 or 117), Fax: +84 54 3831587, E-mail: imola.project@gmail.com

Workshop objectives: The IMOLA 7th Technical Workshop is aimed to draw conclusions on six years of uninterrupted project activities, bringing attention to project highlights in the matter of planning and management (GIS database, hydrological modeling, empowering communities and resources co-management) and discussing constraints that promote/prevent socio-economic development of the lagoon.

The integrated lagoon management plan hinges on four objectives: mitigate the negative effects of aquaculture, reduce the impact of capture fishery, empower communities and ameliorate the environment. Additional elements of importance are how to maintain control over a changing environment, climatic variability, how to promote economic activities through private-public partnership, which sector should be explored for potential economic development and search for livelihood alternatives.

To discuss these issues, the IMOLA Project, in close coordination with the FAO Country Office and the Embassy of Italy in representation of the Donor, has organized this 7th IMOLA Technical Workshop bringing together a diversity of National stakeholders and potential international partners for a generalized confrontation of ideas and perspectives stemming from the overall positive set of project outcomes.

A set of formal presentation will be followed by a roundtable discussion, chaired by the Provincial Authorities, the Ambassador of Italy and the Representative of the FAO. A press-conference will disseminate the workshop outcomes to the public.

Institutional attendance: A number of Provincial agencies and international project representatives are invited to attend, among which:

1. Representative of the National Government Office
2. Representative of the Ministry of Foreign Affairs
3. Representative of the Ministry of Planning and Investment
4. Representative of the Ministry of Natural Resources and Environment
5. Representative of the Ministry of Finance
6. Representative of the Ministry of Agriculture and Rural Development
7. Representative of the IPSARD
8. Representative of the DECAFIREP
9. Representative of the Institute of Marine Resources and Environment, Hai Phong
10. Representative of the Standing Office of the Provincial Communist Party
11. Representative of the Standing Office of the Provincial People's Council
12. Officials from the Provincial People's Committee
13. The Office of the Provincial People's Committee
14. IMOLA Project Steering Committee members
15. The representatives for the Government of Italy
16. The Ambassador of Italy to Vietnam
17. The representative of the Italian Development Cooperation Office, Hanoi
18. The Representative of the UNESCO in Vietnam
19. The President of the Italian Touring Club
20. The President of the Chamber of Commerce of Rovigo
21. Delegates entrepreneurs from the Veneto Region
22. The President of the Ca' Vendramin Foundation
23. The Chairman of the Delta Po Consortium
24. The Representative from TCAP, FAO Headquarter Office, Rome, Italy
25. The Representative Regional FAO Office, Bangkok, Thailand
26. The Representatives for FAO in Vietnam
27. The Department of Agriculture and Rural Development of Thua Thien Hue Province, Hue
28. The Department of Planning and Investment of Thua Thien Hue Province, Hue (DPI)
29. The Department of Science and Technology of Thua Thien Hue Province, Hue (DOST)
30. The Department of Labor Invalid and Social Affairs
31. The Department of Culture, Sport and Tourism
32. The Department of Natural Resources and Environment of Thua Thien Hue Province, Hue
33. The Sub-Department of Marine, Island and Lagoon
34. The Department of Traffic and Transportation
35. The Department of Foreign Affairs of Thua Thien Hue Province, Hue (DOFA)
36. The Police PA35, PA17
37. The Women's Union of Thua Thien Hue Province
38. The Farmer's Union of Thua Thien Hue Province
39. The Hue Meteorology and Hydrology Center
40. The Sub-department of Capture Fisheries and Aquatic Resources Protection
41. The Sub-department of Aquaculture
42. The Center for Agriculture, Forestry and Fisheries Extension
43. Sub-Department of Irrigation and Natural Disaster Control
44. Sub-Department of Animal Health
45. Sub-Department of Forest Protection
46. The Provincial Fisheries Association
47. Institute of Marine Geology, National research Council, Bologna
48. SVB Engineering Studio, Faenza
49. The Association of Forestry Science and Technology
50. The Hue University
51. The Hue College of Sciences and its Departments
52. The Hue College of Agriculture and Forestry and its Departments
53. The District Representatives of Phu Loc, Phu Vang, Quang Dien, Phong Dien, Huong Tra

54. Representatives of interested communes
55. The Regional Fisheries Livelihood Program
56. The Quang Dien Rural Development Project
57. The DANIDA FSPS II Project
58. The NAV Project
59. IMOLA Project Management Board
60. IMOLA CTA, Operations Coordinator, IMOLA Staff
61. HVTV, TRT televisions, National and local newspapers



**Dự Án Quản Lý Tổng Hợp Các Hoạt Động Đầm Phá Thừa Thiên Huế -
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**“The IMOLA Project Phases I and II -
Highlights and constraints.
Environmental control, sustainable tourism and private-public
partnerships”**

Hue, Vietnam, November 19th 2011

Thua Thien Hue Provincial People’s Committee Grand Meeting Hall, 16, Le Loi, Hue

Workshop program

07.30-08.00	Delegate registration	Workshop secretariat
08.00-08.05	Opening speech	H.E. the Vice Chairman of the Provincial People’s Committee, Mr Le Trung Luu
08.05-08.10	Welcome address	H.E. The Ambassador of Italy, Mr Lorenzo Angeloni
08.10-08.20	Welcome speech to delegates and introductory remarks	H.E. The Representative of the FAO, Mrs Yuriko Shoji

Session 1	The Integrated Lagoon Management Plan: overview and general provisions	
08.20-08.35	Overview of the IMOLA Project	The National Project Director, Mr Hoang Ngoc Viet
08.35-08.50	The Tam Giang Cau Hai lagoon integrated management plan – Overview and general provisions	Mr Massimo Sarti , Project Coordinator of the IMOLA Project
Session 2	IMOLA Project highlights: Decision-support tools	
08.50-09.05	The IMOLA GIS database and plans	Ms Le Thi Hanh (GIS system manager)
09.05-09.20	The Tam Giang-Cau Hai hydrological modeling	Mr Gianfranco Castelli (Te. Ma. in representation of the Ca Vendramin Foundation)
09.20-09.35	Rearrangement of fishing gears, zoning maps and planning options: examples from Cau Hai, Huong Tra and Phu Vang	Mr Bui Duc Be (IMOLA Project Socio-Economic Technical Staff)
09.35-09.50	Vulnerability assessment in Huong Tra District: field test and practical use in planning	Mr. Phong Tran (IMOLA Project Consultant)

09.50-10.10	Tea break
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Session 3		Alternative livelihoods: Sustainable tourism
10.10-10.25	Sustainable agri-tourism: a viable option for Tam Giang-Cau Hai lagoon	Mr. Fabio Cappiello , Evivatour Vietnam
10.25-10.40	The Italian model for rural tourism	Mrs Maria Chiara Minciaroni , (Centro Studi Italian Touring Club)
10.40-10.55	Regeneration of mangrove forest & ecological pond	Mr. Pham Ngoc Dung , Association of Forestry Science and Technology

10.55-11.25	Plenary discussion	Moderators: Mr Massimo Sarti , Project Coordinator of the IMOLA Project and Mr Hoang Ngoc Viet , National Project Director
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Session 4		Alternative livelihood: Fishery sector
11.25-11.40	Investing in developing countries (opportunities for private-public partnership)	Mr Ornello Boscolo (in representation of the Chairman of the Chamber of Commerce of Rovigo (Veneto Region))
11.40-11.55	Raising clams in Vietnam for exporting	Dr Francesco Paesanti , biologist, clam-farming specialist

11.55-13.30	Lunch break	
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Session 5		IMOLA II future prospects and the Decentralized Cooperation Project
13.30-13.45	Management of wetlands and lagoons. The DeltaMed experience.	Mr Lino Tosini (Ca' Vendramin Foundation)
13.45-14.00	Man and the Biosphere Programme/Biosphere Reserves in Vietnam: an option to promote rural tourism	Mr. Nguyen Hoang Tri , Secretary General, Vietnam MAB National Committee

14.00-15.30	Roundtable discussion: highlights and stakeholder's recommendations	Moderators: H.E. The Ambassador of Italy, Mr Lorenzo Angeloni and Mrs Yuriko Shoji , Representative of FAO
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Session 6		Summary and conclusions
15:30-15.40	Closing remarks	H.E. Le Truong Luu (Vice chairman of the Provincial People's Committee)

15:40-16.00	Tea break	
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Session 7		Press Conference
16:00-17.00	Press conference	H.E. Mr Lorenzo Angeloni (Ambassador of Italy to Vietnam), Chairman

1. OVERVIEW OF THE IMOLA PROJECT

Mr **Hoang Ngoc Viet** (National Project Director)

FINAL REPORT OF IMOLA PROJECT PHASE II Integrated Management of Lagoon Activities in Thua Thien Hue Province

I. Overview of the project:

Integrated Management of Lagoon Activities in Thua Thien Hue phase II is funded by the Government of Italy via FAO approved by the Prime Minister in the project funded by FAO at the letter no 656/TTg-QHQT dated 04 May 2009 and approved by Thua Thien Hue PPC at the decision no 1289/QD-UBND dated 01 July 2009.

1. Overall objective:

The development objective as stated in the Project Document, is "The natural resources of the Tam Giang Cau Hai lagoon of Thua Thien Hue Province are managed sustainably and continue to provide sustainable livelihoods for the people who depend on them as their main source of income, employment and food security.

2. Project duration

From April 2009-April 2011

3. Budget:

* Total budget for Phase II:	1,100,000 USD
- Counterpart budget:	100,000 USD (excluding in-kind contribution in office facilities formulated in the first phase)
- Total donated fund:	1,000,000 USD

4. Project locations:

Districts of Phu Loc, Quang Dien, Huong Tra, Thua Thien Hue

II. Results of project implementation:

The IMOLA Project goal states that the natural resources of the Tam Giang Cau Hai lagoon of Thua Thien Hue Province are to be managed sustainably and continue to provide livelihoods for the people who depend on them, as their main source of income, employment and food security. The achievement of this goal implies that during the time span of IMOLA II Phase, the Integrated Lagoon Management Plan is piloted by means of delegation of power in managing the natural resources to the emerging Fishery Associations. This immediate objective will be achieved through the implementation of three main components (outputs and sub-outputs), supported by a number of activities, all concurrent towards the implementation and consolidation of the plan, which the Provincial People's Committee of the Thua Thien Hue Province should consider to endorse and enact.

The project has completed contents in the signed project document as follows:

1. Objectives

An Integrated Lagoon Management Plan (ILMP) developed through a process of dialogue and participation of relevant stakeholders, and coordination promoted for its experimental implementation with balance of sustainable use of natural resources and livelihood need of the resources users

- The ILMP is produced and endorsed via a series of consultation and a set of feasible recommendations is produced to support for the sustainable use of natural resources
- A geodatabase to support for decision making and policy development as well as lagoon supervision of lagoon management is available for Hanover to relevant departments
- The feasibility and environmental, socio-economic impacts of at least 10 actions toward ILMP are piloted and assess the matter of capture fisheries, aquaculture, environmental, aquatic resources, zoning plans, functional zonings, rearrangement of stake trap, bottom net, lift let.
- Lesson learnt on lagoon co-management with participation of the FAs and local authority is drawn and shared within Thua Thien Hue and other provinces.
- Four main objectives of the project has basically achieved, for the final output of ILPM is completed 90%

2. Results of activities implementations:

Output 5 concerns the development of an Integrated Lagoon Management Plan, developed through a process of dialogue and participation with lagoon users and stakeholders with close coordination for plan implementation. There are 9 activities with 7 completed activities including 5.1, 5.2, 5.4, 5.5, 5.6, 5.7, 5.9.

In output 5, activity 5.3 concerns development and endorsement the zoning plan for lagoon have been available at district and communal level, the lagoon scale zoning plan have been completed by 90%.

Activity 5.8 ILPM have been developed and agreed via consultation sessions with all stakeholders will be completed at the end of second phase and will be submitted to PPC for approval, the four recommendations to support for the plan has been prepared. The activity has been achieved 70%.

Output 6 concerns the implementation of the ILMP promoted through experimentation of pilot schemes: it is subdivided in sub-outputs, based on specific areas of intervention. There are three sub-outputs.

Sub-output 6.1 concerns fishery co-management to be operationalized in at least six communes through organizational support to fishery associations (FAs), there are 9 activities, with 6 completed activities including 6.1.1, 6.1.4, 6.1.5, 6.1.6, 6.1.8, 6.1.9, 6.1. The activity 6.1.2 has been implemented with the following progress: 16/22 FAs with representation of over 80%, 6.1.3: 20 out of 22 FAs have aquatic resources management regulation, and 20/20 FAs has completed zoning plan, achieving 95%. The Activity 6.1.7 regarding gear rearrangement has been completed in Phu Loc, and 95% completed in Huong Tra. At present the rearrangement is ongoing in Phu Vang and the project will support re-planning of Sam Chuon lagoon.

Sub-output 6.2 concerns the development of alternative/sustainable aquaculture ventures, promoted and experimented though models. There are 4 activities: Activity 6.2.1 – experimental polyculture model has been completed. Bivalve culture models planned in Loc Binh and Vinh Hien are only completed 40% with feasibility study.

Sub-output 6.3 concerns the lagoon environmental monitoring, including experimentation of environmental protection measures and rehabilitation interventions in selected lagoon areas. The conservation have been identified and developed with boundaries, the FAs has designed the management plan and protect the spawning grounds, nurseries areas, intertidal beach pockets in Loc Binh, seaweed areas in Vinh Hien, mangrove forest in Ru Cha. The conservation measures in these areas have been produced.

The activity concerning the development a Provincial instrumental environmental monitoring scheme has been assessed for feasibility and proposed for suspension due to budgetary constraints.

Sub-output 6.4 concerns the building and management of the geo-database and building technical capacity in utilizing spatial tools for integrated lagoon management and planning. It is completed. The fishery and aquaculture geo-database and thematic maps are produced and available to support for DARD and PC in aquaculture master plan and capture fisheries geo database for at least 7 communes for DARD and PPC in support of capture fisheries planning. However the handover of the GIS technology for district and commune only reached 33%.

Output 7 concerning dissemination of information and experience sharing is on-going.

3. Evaluation of project operation in Phase II

Achievements

The project has supported 22 FAs in 8 target communes to operationalize co-management with cooperation of the CPCs and other stakeholders. In 8 target communes, a co-management body have been formulated to assist the communal authority in lagoon management. All these FAs have charter, EB members, membership list and approved by the Provincial Fisheries Association with the fishermen representation rate of over 75%.

In order to help the FAs in zone-based management of the lagoon, in the phase II< the project has identified and demarcated of the FAs and zoning plan is onging, this is the base for fishing right allocation to the local FAs and future co-management operation. 17 FAs have received Fishing Rights in Phu Loc and HUong Tra.

Capture fisheries replanning and management: The project has been undertaking comprehensive zoning and planning of the water surface of two important lagoon areas: the Cau Hai sub-basin (Phu Loc District) and the Huong river delta, including the communes of the Huong Tra District and Quang Cong (Quang Dien District). The zoning has included among the diverse options of reduction in number of the fixed fishing gears, The zoning plans and their implementation details, including scheme of progressive reduction of fixed fishing gears are consulted at all level of governance and feedback has been provided to Districts in September 2010. The reorganization plan of all fixed fishing gears in the Cau Hai basin implied removal between 40 and 50% in number and reduction in size, resulting in decreased efficiency of capture and positive consequences in terms of productivity in the long run.

Removal and reorganization into functional zones was made possible thanks to the operationalization of Fishery Associations that took the burden of consultation and negotiations at grass-root level. The operation was conducted with an average high degree of consensus in such a way that a complete new scheme for capture has been

enacted in limited time. The process had been thoroughly documented through participatory mapping, in multiple steps and phases of the reorganization is recorded in the fishery geo-database, for future update and monitoring. The rearrangement of fixed fishing gears implemented by IMOLA has been inline with the rearrangement plan of the Thua Thien Hue province

The project has been provided technical assistance for rearrangement of the stake trap in Phu Loc and Huong Tra, which has gained positive results in reduction of the fishing capacity on the ecosystems, aquatic resources to be restored in the lagoon. The project have nearly completed functional zoning plan the water surface of two important lagoon areas: the Cau Hai sub-basin (Phu Loc District) and the Huong river delta, including the communes of the Huong Tra District and Quang Cong (Quang Dien District).

Aquaculture planning and management. The project has completed a comprehensive aquaculture survey in the Tam Giang-Cau Hai lagoon, covering the remaining 32 communes. A survey on aquaculture ponds developed on coastal (sandy) land was completed in November 2010. Spatial data and related questionnaires are acquired and information is processed. Outputs include comprehensive cartographic atlas and aquaculture statistics. Thematic maps include: i) distribution of ponds by type and by age, ii) culture methods, iii) distribution of ponds in operation, iv) number of crops, v) pond conditioning techniques, vi) characteristics of intake and discharge water systems, vii) stocking density and disease occurrences, viii) pond productivity, average and total and ix) property status.

The surveyed and aquaculture geo-database and thematic maps have made great contribution to the planning and management of aquaculture in the lagoon.

Support for environmental monitoring and zoning of conservation area: Planning options for the implementation of environment protection and conservation are developed. Implementation details include identification of conservation areas, their topographic demarcation, designation of management bodies in charge (Fishery Associations), designing of management regulations and implementation of protection measures for spawning ground.

The project has conducted comprehensive surveyed of the aquatic resources including stocking, aquatic fingerling, botanical bed and different sea weeds in the Thua Thien Hue lagoon. Identified locations are the intertidal and shallow-subtidal pocket beaches of Loc Binh, expandable to the shores of west Cau Hai; sea-grass fields of Vinh Hien, the relic mangrove swamps of Ru Cha (Huong Phong) and some of the seaweed fields in the lagoon of the Huong Tra district. This is a pre-condition for implementation of the plan for conservation and protection of gene sources in the entire Thua Thien Hue lagoon.

A general assessment of all potential conservation sites in Tam Giang-Cau Hai has been completed and based on that, an integrated conservation plan for the whole lagoon is conceived.

The project has worked in collaboration with Te.Ma to study the hydro-dynamic modeling of the lagoon and water current as well as study the matter of Tu Hien inlet stabilization, this is one of the significant for evaluation of impact of water exchange between the lagoon and the see, a base for recommendations of Tu Hien stabilization intervention in the future

3. Constraints during project's operation

- Some activities have been completed, as reported by the CTA, yet independent evaluation has not been organized; it is therefore difficult to determine the benefit of project activities to beneficiaries.
- Products/reports of consultants have not been evaluated against indicators; some activities are overlapping with other projects and programmes of the fisheries sector (i.e. activities on aquaculture).
- Budgeting and budget management have not been strictly in line with the logframe and the project document addendum, therefore, some activities in the ProDoc II do not receive enough funding to be conducted.
- Fund allocated for salary and contract of consultants were large: 61,8 % of the total project budget (as stated in the financial report of the project), therefore, funding for technical operations (e.g. zone demarcation, pilot models) and technical and financial support to FAs were limited.
- The Integrated Management of Lagoon is only completed in zoning plans, GIS database, development of FAs for community base management, experimentation of fishing right allocation to the FAs but the lagoon comprehensive Integrated Management Plan have not been produced sufficiently which is a basic shortcoming of the project at the moment, because this is very difficult issues, involving many sectors of socio-economic. At the angle of the project, it is difficult to produce a overall integrated management plan.

4. Budget disbursement:

Funding: Total funding of the project during phase II (USD 1,313,165)

From Donor contribution: USD 1,213,165 (Balance IMOLA I: 13,165. Budget revision F date October 8th 2010, increase to USD 1,213,165)

And from GoV contribution, VND 980.000.000

5. Recommendations

1. For the project to continue with efficiency, we recommend the Government of Italy and United Nations agencies to resort to de-centralized sources. These sources should be directed to the support of FAs, and Fishing Rights Work, Zoning Work and establishment and zoning plan of conservation sites throughout the lagoon.

2. Project has gained encouraging results. In future activities, however, we recommend that GoV, GoI and organizations to provide equipment and facilities to FAs so that the FAs can realize their management role.

3. At present, the Ministry of Finance has issued the Decree no 225/TT-BTC dated 31 December 2011 regarding regulation on the governmentally financial management of the non-refundable ODA. Therefore, for the funding of 495.793USD for decentralized project in the next phase, it is suggested to FAO and Donor to consider to change the fund management mechanism to make sure it is in line with the existing regulation of the Government of Vietnam. It is recommended the Donor and FAO should delegate the funding sources to PMP in the decentralized phase as other projects ongoing in the province.

NATIONAL PROJECT DIRECTOR

REPORT OF IMPLEMENTATION INDICATOR OR OUTPUTS

EVALUATION BY INDICATOR UP TO 15 FEB 2011

TT	Content	Indicators of implementation	Unit	Objective by the project period	Implemented up to 30 April 2011	Rate of implementation (%) up 30 April 2011
(1)	(2)	(3)	(4)	(5)	(6)	(7)=(6)/(5)
Goal	The natural resources of the Tam Giang Cau Hai lagoon of Thua Thien Hue Province are managed sustainably and continue to provide sustainable livelihoods for the people who depend on them as their main source of income, employment and food security.	<p>1) Ratio of poverty households is generally decreased in the lagoon communes as compared to that of 2005</p> <p>2) Organic water pollution level is generally decreased in the lagoon as compared to that of 2006</p> <p>3) Pressure from capture fishery is generally decreased in the lagoon in terms of inputs and outputs as compared to that of 2007</p> <p>4) Application of polyculture techniques in prawn culture in the lagoon increased at least 30% as compared to that of 2006</p> <p>5) More than 100 ha of conservation or protected areas are demarcated in the lagoon as compared to that of 2005</p> <p>6) At least 10% increase in fingerling production capacity for aquaculture in the Province as compared to that of 2005</p>			<p>Ratio of poverty household and water-pollution level has to be appraised by specific surveys.</p> <p>Ratio of poverty household and water-pollution level has to be appraised by specific surveys.</p> <p>Pressure from capture fishery decreases as a result of the 2010 rearrangement.</p> <p>Application of polyculture techniques piloted and prospected to be increased as a result of the implementation of the aquaculture master plan.</p> <p>More than 150 ha identified/demarcated for conservation.</p>	<p>NA</p> <p>NA</p> <p>NA</p> <p>NA</p> <p>150%</p>
Project purpose	The Integrated Lagoon Management Plan is piloted in its implementation and consolidated, by means of delegation of power in managing the natural resources to the emerging Fishery Associations.	<p>1) A final ILMP is produced and adopted through a series of consultation and provides a set of feasible recommendations for sustainable use of lagoon resources</p> <p>2) A geodatabase to support policy and decision making as well as monitoring in lagoon resource management is prepared and transferred to the relevant government department</p> <p>3) Feasibility and environmental and social-economic impacts of at least 10 actions towards ILMP are tested and evaluated in the areas of capture fishery, aquaculture, and conservation</p> <p>4) Lessons for lagoon co-management involving local FAs and authorities drawn and shared within the Thua Thien Hue Province and with other provinces</p>			<p>Fingerling production has slightly increased as a result of experimentation, which had primarily the scope to appraise feasibility</p> <p>An ILMP is in its rough draft form.</p> <p>A geodatabase is finalized and ready to be handed over the recipient agency/ies.</p>	<p>100%</p> <p>90%</p> <p>100%</p> <p>100%</p>

TT	Content	Indicators of implementation	Unit	Objective by the project period	Implemented up to 30 April 2011	Rate of implementation (%) up 30 April 2011
Output 5	An Integrated Lagoon Management Plan (ILMP) developed through a process of dialogue and participation of relevant stakeholders, and coordination promoted for its implementation	<ol style="list-style-type: none"> 1) A draft ILMP (including a strategy framework and a range of practical actions to be implemented over a period of five years in relation to institutional arrangements and policies, fishery management, sustainable aquaculture development, conservation and key support functions such as monitoring, research, enforcement etc.) is produced and available 2) Draft ILMP companion documents including thematic maps are produced and available 3) Lagoon zoning plans are produced and available both at entire lagoon scale as well as select district and commune levels 4) A provincial institutional coordination mechanism for integrated lagoon planning and management established and operated 5) A provincial scientific/technical advisory mechanism established and operated for horizontal coordination 6) Lagoon stakeholder consultation mechanism established and operated at commune and/or district levels for vertical coordination 7) A final ILMP is produced through a series of consultation 8) A final ILMP is officially adopted by the PPC 9) At least 5 proposals are prepared in support of the ILMP implementation 			<p>The ILMP is produced in draft form.</p> <p>A companion document is produced in draft form. A thematic map atlas is produced and available.</p> <p>Lagoon zoning plans are produced and available at District and Commune level. Zoning plan at the scale of the entire lagoon is being prepared.</p> <p>Institutional coordination mechanism and scientific/technical advisory mechanism is in place and operating. Lagoon co-management bodies available at all target communes</p>	<p>100%</p> <p>100%</p> <p>90%</p> <p>100%</p> <p>100%</p> <p>100%</p> <p>100%</p> <p>100%</p> <p>70%</p> <p>100%</p>

TT	Content	Indicators of implementation	Unit	Objective by the project period	Implemented up to 30 April 2011	Rate of implementation (%) up 30 April 2011
Output 6	The implementation of ILMP promoted through development of pilot schemes under key focus areas.					
Sub-output 6.1	Fishery co-management operationalized in at least six communes through organizational support to Fishery Associations, institutional arrangements and implementation of relevant assessments.	<p>1) All project supported FAs in target communes have charter, Executive Board, member list, official approval for establishment from PFA</p> <p>2) All project supported FAs in target communes have representation rate of more than 80%</p> <p>3) All project supported FAs in target communes have lagoon resource management regulation and plan coupled with FA zoning plan to ensure efficient co-management and sustainable use of the resources</p> <p>4) 70% of project-supported Fishery Associations are granted with fishing rights by DPC</p> <p>5) Co-management bodies/mechanisms are established involving CPCs and FAs</p> <p>6) 70% of project-supported Fishery Associations adopt and implement significant activities to reduce fishing pressure on the lagoon</p> <p>7) Fishing pressure reduced through fixed fishing gear rearrangement in Phu Loc and Huong Tra</p> <p>8) Provincial Fishery Association is operative to provide support to member Fishery Associations</p> <p>9) Potential for alternative livelihoods for local fisherfolk are identified and reported to the Provincial Government</p> <p>10) Appropriate mesh size for each fishing gear is identified based on the scientific and experimental studies and suggested to the Provincial Government for the revision of fishery related decision and regulations</p>			<p>22/22 (100%) FAs have charter, EB, member list, and PFA approval</p> <p>16/22 (73%) FAs have representation rate higher than 80% (Note: 22/22 FAs have >75%)</p> <p>20/22 (91%) FAs have resource management regulation</p> <p>20/20 (100%) FAs have completed zoning plans</p> <p>6/20 (30%) FAs have been granted with fishing rights. 11/20 (55%) FAs submitted dossiers to DPC for approval. 3 FAs are completing the documents</p> <p>8/8 (100%) target communes have Co-Mgmt Bodies</p> <p>18/18 (89%) capture or general FAs have implemented some activities to reduce fishing pressure</p> <p>Fixed fishing gear rearrangement planned and under implementation in Phu Loc in 2010; and planned and to be implemented in Huong Tra in 2011, with IMOLA technical assistance, upon PPC approval</p> <p>PFA is operative, providing support to local FAs</p> <p>Some potential for alternative livelihoods (e.g., nursery, feed production, bivalve culture, etc.) identified and compiled as reports</p> <p>2nd selectivity study and socio-economic study on larger mesh size conducted in mid-late 2010 with one provincial workshop planned in early 2011</p>	<p>100%</p> <p>86%</p> <p>95%</p> <p>90%</p> <p>100%</p> <p>100%</p> <p>95%</p> <p>100%</p> <p>100%</p>

TT	Content	Indicators of implementation	Unit	Objective by the project period	Implemented up to 30 April 2011	Rate of implementation (%) up 30 April 2011
Sub-output 6.2	Alternative/sustainable aquaculture development promoted and experimented.	<p>1) At least 10 polyculture models are piloted with local FAs and completed with publication of final evaluation report on environmental impacts and economic efficiencies</p> <p>2) At least 300 FA members are provided with the knowledge and experience of the Project's polyculture pilot models through experience sharing workshops</p> <p>3) One provincial workshop is organized to share and disseminate the polyculture pilot experience of the Project</p> <p>4) At least one bivalve culture model each in Loc Binh and Vinh Hien is under operation, providing net profit to the FAs</p> <p>5) At least one FA is producing fish fingerlings in a financially sustainable way for its members</p>			4 aquaculture pilot models implemented	40%
Sub-output 6.3	Lagoon environmental monitoring assisted and environment protection and improvement in particular lagoon areas promoted and piloted.	<p>1) Areas for re-naturalization identified and re-naturalization interventions endorsed by the recipient communes</p> <p>2) Hydrology of the lagoon understood and feasibility study for improved circulation and enhanced water exchange employed</p> <p>3) Provincial environmental monitoring scheme developed and endorsed by the Province, set up and routinely operating.</p>			<p>No bivalve culture models have been implemented due to seasonality and budget limitation</p> <p>2 FAs producing freshwater fish fingerlings while 1 FA is producing eel fingerlings with the former two financially sustainable while the eel Areas for re-naturalization identified through surveys, endorsed by Huong Phong commune</p>	<p>0%</p> <p>40%</p> <p>300%</p> <p>100%</p> <p>100%</p>
Sub-output 6.4	Geo-database and technical capacity in utilizing spatial tools for integrated lagoon management and planning developed.	<p>1) At least 10 officials each at the provincial and district level are capable of handling GIS</p> <p>2) At least 30 officials are capable of handling GPS for field survey</p> <p>3) Comprehensive aquaculture geo-database for an entire lagoon available to DARD and PPC and used for aquaculture planning</p> <p>4) Capture fishery geo-database at least for 7 communes available to DARD and PPC and used for capture fishery planning</p> <p>5) Flood vulnerability maps for the lagoon communes available with set of recommendations for disaster mitigation</p>			<p>No training on GIS has been provided to provincial and district officials in IMOLA II but IMOLA I</p> <p>More than 10 officials are capable of handling GPS through OJT from IMOLA</p> <p>Preliminary net enclosure geo-database developed for Sam Chuon Lagoon</p> <p>Comprehensive sandy aquaculture geo-database being prepared for 12 communes</p> <p>Comprehensive aquaculture geo-database for 31 lagoon pond aquaculture communes</p> <p>Capture fisheries (fixed gears) geo-database for more than 11 communes available to DARD and PPC and used for rearrangement plan preparation and implementation as well as FA zoning plan making</p>	<p>0%</p> <p>33%</p> <p>100%</p> <p>157%</p> <p>50%</p>

TT	Content	Indicators of implementation	Unit	Objective by the project period	Implemented up to 30 April 2011	Rate of implementation (%) up 30 April 2011
Output 7	Information disseminated and project experience shared nationally and internationally on the ILMP and its implementation.	<p>1) Project website maintained, providing access to project profiles, activity summaries, project reports, maps, photos, relevant public regulations, links and contact information</p> <p>2) IMOLA outputs and outcomes widely disseminated through distribution of at least 10 different kinds of paper-based or electric materials</p> <p>3) Mutual action or collaboration undertaken with at least 10 other organizations or projects based on MOUs</p> <p>4) National level agencies including MARD and MPI recognize the contribution and outputs of IMOLA through at least two national workshops on ILMP and its implementation organized with more than 50 participants each</p> <p>5) IMOLA disseminate its experiences in at least 10 national and international conferences and meetings</p> <p>6) IMOLA models (co-management, environmental monitoring, alternative/innovative culture methods, etc.) shared with other provinces through guidance documents</p> <p>General evaluation of project completion</p>			<p>Project website constantly updated with all expected contents with average 290 hits/mo.</p> <p>More than 10 reports published and disseminated (see 6-month reports for detailed lists)</p> <p>Guidelines for lagoon fisheries co-management have been under preparation (80% progress) to be published towards the end of the 2nd phase</p> <ul style="list-style-type: none"> • More than 10 MOUs signed with other agencies for collaboration • IMOLA outputs recognized and studied by RUDEC/MARD in relation to the Tam Nong concept with organization of a workshop in mid Nov 2010 • Three technical workshops were organized in 2009, 2010 and 2011 respectively with more than 50 participants each with representation of national agencies; one international conference on fishing capacity management was held in May 2010 • IMOLA disseminated its experiences at 11 conferences and meetings at national and international levels • Guidelines for lagoon fisheries co-management have been available for printing 	<p>100%</p> <p>90%</p> <p>100%</p> <p>100%</p> <p>110%</p> <p>100%</p> <p>95%</p>

Date:
National Project Director

2. THE TAM GIANG CAU HAI LAGOON INTEGRATED MANAGEMENT PLAN – OVERVIEW AND GENERAL PROVISIONS

Mr **Massimo Sarti** (IMOLA Project Coordinator)

AN OVERVIEW

The Integrated Lagoon Management Plan developed by IMOLA hinges on three sets of provisions aimed to obtain the following:

- Mitigate the effects of aquaculture
- Reduce the impact of capture fishery
- Ameliorate the aquatic environment

A shift from open access to area-based regime will be promoted, to encapsulate each activity into functional zones, regulated and administered by Fishery Associations.

“Group user rights” will be supported, under a co-management mechanism, in compliance to decision 4260/2005/QD-UBND by which the Provincial People’s Committee has delegated power to the District to allocate fishing rights to Fisheries Associations (FAs), at the grassroots level.

Ecosystem management principles will be applied, which integrate ecological, socio-economic and institutional factors into comprehensive analysis and action in order to sustain and enhance the quality of the habitats.

Ecosystem zoning is defined based on ecological qualifiers, such as water seasonality and quality, life and landforms and cover, soil and climate.

The concept of ecosystem risk level will be introduced based on risk analysis, which includes hazard and asset analysis, likelihood of a hazard to turn into an emergency and mitigation measures.

In support of mitigating the effects of aquaculture, a plan of reorganization is recommended, by a stepwise (immediate, mid-term, long-term) reduction of low-tide earthen shrimp ponds; prioritizing for removal the abandoned, unproductive ones and those located in sensitive areas or hindering circulation. Mechanism for removal will be lease renegotiation.

Institutionally, the Sub-Department of Aquaculture will be delegated to enact this mechanism making use of aquaculture census and database and a system of compensation (monetary and in kind) should be envisioned for those losing their livelihood.

In specific locales, low-tide ponds may be preserved by enclosing them into an impermeable earth-fill dike, so to ensure control on hydrologic system and discharge of wastewaters. High-tide and enclosed low-tide ponds should be comply with the requirement of a treatment system and routine monitoring for released wastewaters. Clustering of pond owners and treatment pond establishment should be implemented in the mid-term (five years) or long-term (10 years) depending upon the situations.

Fish polyculture should be promoted as a progressive replacement of shrimp monoculture in all low-productive low-tide pond, with a timeline foreseeing three steps: short-term (5 years), mid-term (10 years) and long-term (15 years). Within the same time frame, shift from natural to hatchery-based fingerling provision and feeding strategy using home-made formulated of industrial feed should be required by law.

Adoption of basic or simplified BMPs and GAPs protocols should be encouraged and granted incentives for applying farmers, as a requirement to produce certifiable and traceable aquatic commodities for the national market or export.

In support of adjustment of capture fishery activities, all lagoon communes should be under the co-management mechanism of fishery activities by 2020, with Fishery Associations established representing over 80% of the population.

Establishment of Fishery Association should be delegated to the Sub-Department of Capture Fishery and Resource Protection, coordinated with the Provincial Fishery Association.

Capture fishery and aquaculture activities should be regulated per functional zones, under the legal provisions established by the fishing rights. Fishing right have limited duration.

Mechanism of financial support should be through registration of fishery activities and payment of fees, part of which flow back to the communes as co-managements costs.

All fishery activities should be framed into a Fishery Association zoning plan organized into functional zones; each functional zone being regulated by a specific set of norms. Functional zones include navigation and coastline buffers, areas for aquaculture, capture and conservation.

Fishery Associations and co-management body may revise their rules and regulations by requests of the majority of members, to be ratified at annual congresses. Similarly, Executive Board and co-management bodies are elective charges.

Monitoring surveillance and control, as well detection of violations, confiscation of gears and fines is a prerogative of the Fishery Association. Co-management body has jurisdiction on all violations. Fishery Association and Co-management body prerogative should be ratified by relating legal provisions and financial support.

In support of environment conservation and rehabilitation, a minimal acreage and a list of selected conservational sites, supported by scientific studies and evaluated for feasibility, should be ratified.

Selected zones such as seaweed prairies, coastal subtidal platforms (0-70 cm), pocket beaches, tidal deltas (Tu Hien, Ba Con) should be prioritized for conservation, for their ecological value.

Conservation should be enacted by demarcation of core and buffer zones. Management regulations and responsibilities, as well as resource-use limitations should be under the jurisdiction of competent Fishery Association and co-management body.

Integrated terrestrial and aquatic park should be established in the commune of Huong Phong, for recreational use and touristic service, under the management of a park authority (including representation of the community).

Development of ecological corridors and island should be established as a principle in all conservation areas, to allow free migration of life forms, enhance continuity of natural zones and increase the critical acreage for ecosystem rehabilitation.

Biotope should be established in the Ru Cha relic mangrove forest, under management of the competent community, under specific set of regulations developed by stakeholders and under jurisdiction of the park authority.

Concerning lagoon water circulation, critical conditions of large sector, isolated embayments and cut-off lagoon ponds do not envision rapid recovery of the aquatic environment in the short term, unless drastic measures are undertaken.

Depending upon the results of the hydrological modeling, measures range from i) removal of obstacles at inlet, lagoon and river conduits by dredging; ii) canal and lagoon-bottom dredging to increase average depth, iii) opening of artificial inlet, iv) forced circulation driven by tidal forces, assisted by unidirectional hydro-mechanical gates.

Institutional recommendations relate to the establishment of a Tam Giang-Cau Hai Development Authority, for better coordination, stakeholder representation and sector integration.

The TGCHDA should include a broad representation of National and Provincial Government, Technical Departments, experts and stakeholders.

The Authority, based on the achievements of the IMOLA Project, should promote an integrated management process to address the equally complex ecological and socio-economic issues of the Tam Giang-Cau Hai lagoon. The assessment of the principle causes of degradation has been addressed by the project and is an asset of the Authority; implementation of appropriate and effective methods to restore the lagoon to its former healthy state should be responsibility of the Authority. The proposed strategy is based on the integration of drainage basin and coastal processes with the goal of an ecologically beneficial hydrologic regime that improves water quality, recovers lost habitats and enhances agro-ecological productivity in the wetland and watershed. A comprehensive monitoring program should allow the planning team to assess restoration postulations and progress towards targets. The plan should be susceptible of adaptation and adjustment to reflect the newly gained knowledge. The effectiveness of this strategy is only one of the factors contributing to the restoration of the lagoon; equal weight must be given to the community participation and stakeholder base.

THE TAM GIANG CAU HAI LAGOON INTEGRATED MANAGEMENT PLAN – PRELIMINARY RECOMMENDATIONS

The Integrated Lagoon Management Plan developed by IMOLA hinges on three sets of provisions aimed to obtain the following:

- Mitigate the effects of aquaculture, through implementation of a reduction and rearrangement scheme, including a re-naturalization of reclaimed land
- Reduce the impact of capture fishery, through area-based management delegated to Fishery associations
- Ameliorate the aquatic environment, through conservation and rehabilitation measures
- Improvement of lagoon circulation through dredging and promoting tidal forcing.

The following recommendation are formulated to promote a marked shift in lagoon management and hydrological/ecological conditions:

- A shift from open access to area-based regime will be promoted, to encapsulate each activity into functional zones, regulated and administered by Fishery Associations.
- "Group user rights" will be supported, under a co-management mechanism, in compliance to decision 4260/2005/QĐ-UBND by which the Provincial People's Committee has delegated power to the District to allocate fishing rights to Fisheries Associations (FAs), at the grassroots level.
- Ecosystem management principles will be applied, which integrate ecological, socio-economic and institutional factors into comprehensive analysis and action in order to sustain and enhance the quality of the habitats.
- Ecosystem zoning is defined based on ecological qualifiers, such as water seasonality and quality, life and landforms and cover, soil and climate. Provisions are designed and tailored upon characteristics of ecosystems.
- The concept of ecosystem risk level will be introduced based on risk analysis, which includes hazard and asset analysis, likelihood of a hazard to turn into an emergency and mitigation measures.

In support of mitigating the effects of aquaculture, the following is recommended:

- A plan of reorganization is formulated and implemented, by a stepwise (immediate, mid-term, long-term) reduction of low-tide earthen shrimp ponds; prioritizing for removal the abandoned, unproductive ones and those located in sensitive areas or hindering circulation. Mechanism for removal will be lease renegotiation.
- Institutionally, the Sub-Department of Aquaculture, in coordination with District Departments of Agriculture and Rural Developments (DARDs) will be delegated to enact this mechanism, making use of aquaculture census and database and a system of compensation (monetary and in kind) should be envisioned for those losing their livelihood.
- In specific locales, low-tide ponds may be maintained by enclosing them into an earth-fill embankment, so to ensure control on hydrologic system and discharge of wastewaters. High-tide and enclosed low-tide ponds should be mandated to comply with the requirement of a treatment system and routine monitoring for released wastewaters.
- Clustering of pond owners and treatment pond establishment should be implemented in the mid-term (five years) or long-term (10 years) depending upon the situations.

- Fish polyculture should be promoted as a progressive replacement of shrimp monoculture in all low-productive low-tide pond, with a timeline foreseeing three steps: short-term (5 years), mid-term (10 years) and long-term (15 years). Within the same time frame, shift from natural to hatchery-based fingerling provision and feeding strategy using home-made formulated or industrial feed should be required by law.
- Adoption of basic or simplified BMPs and GAPs protocols should be encouraged and granted incentives for applying farmers, as a requirement to produce certifiable and traceable aquatic commodities for the national market or export.

In support of adjustment and amendment of capture fishery, the following is recommended:

- All lagoon communes should be under the co-management mechanism of fishery activities by 2020, with Fishery Associations established representing over 80% of the population.
- Establishment of Fishery Association should be delegated to the Sub-Department of Capture Fishery and Resource Protection, coordinated with the Provincial Fishery Association.
- Capture fishery and aquaculture activities should be regulated per functional zones, under the legal provisions established by the fishing rights. Fishing right have limited duration.
- Mechanism of financial support should be through registration of fishery activities and payment of fees, part of which flow back to the communes as co-managements costs.
- All fishery activities should be framed into a Fishery Association zoning plan organized into functional zones; each functional zone being regulated by a specific set of norms. Functional zones include navigation and coastline buffers, areas for aquaculture, capture and conservation.
- Fishery Associations and co-management body may revise their rules and regulations by requests of the majority of members, to be ratified at annual congresses. Similarly, Executive Board and co-management bodies are elective charges.
- Monitoring surveillance and control, as well detection of violations, confiscation of gears and fines is a prerogative of the Fishery Association. Co-management body has jurisdiction on all violations. Fishery Association and co-management body prerogative should be ratified by relating legal provisions and financial support.

In support of environment conservation and rehabilitation, the following is recommended:

- A minimal acreage and a list of selected conservational sites, supported by scientific studies and evaluated for feasibility, should be ratified.
- Selected zones such as seaweed prairies, coastal subtidal platforms (0-70 cm), pocket beaches, tidal deltas (Tu Hien, Ba Con) should be prioritized for conservation, for their ecological value.
- Conservation should be enacted by demarcation of core and buffer zones. Management regulations and responsibilities, as well as resource-use limitations should be under the jurisdiction of competent Fishery Association and co-management body.
- Integrated terrestrial and aquatic park should be established in the commune of Huong Phong, for recreational use and touristic service, under the management of a park authority (including representation of the community).

- Development of ecological corridors and island should be established as a principle in all conservation areas, to allow free migration of life forms, enhance continuity of natural zones and increase the critical acreage for ecosystem rehabilitation.
- A biotope should be established in the Ru Cha relic mangrove forest, under management of the competent community, under specific set of regulations developed by stakeholders and under jurisdiction of the park authority.

Concerning lagoon water circulation, critical conditions of large sector do not envision rapid recovery of the aquatic environment in the short term, unless drastic measures are undertaken.

- Depending upon the results of the hydrological modeling, measures range from i) removal of obstacles at inlet, lagoon and river conduits by dredging; ii) canal and lagoon-bottom dredging to increase average depth, iii) opening of artificial inlet, iv) forced circulation driven by tidal forces, assisted by unidirectional hydro-mechanical gates.

Institutional recommendations.

- These relate to the establishment of a Tam Giang-Cau Hai Development Authority, for better coordination, stakeholder representation and sector integration.
- The TGCHDA should include a broad representation of National and Provincial Government, Technical Departments, experts and stakeholders.
- The Authority, based on the achievements of the IMOLA Project, should promote an integrated management process to address the equally complex ecological and socio-economic issues of the Tam Giang-Cau Hai lagoon. The assessment of the principle causes of degradation has been addressed by the project and is an asset of the Authority; implementation of appropriate and effective methods to restore the lagoon to its former healthy state should be responsibility of the Authority. The proposed strategy is based on the integration of drainage basin and coastal processes with the goal of an ecologically beneficial hydrologic regime that improves water quality, recovers lost habitats and enhances agro-ecological productivity in the wetland and watershed. A comprehensive monitoring program should allow the planning team to assess restoration postulations and progress towards targets. The plan should be susceptible of adaptation and adjustment to reflect the newly gained knowledge. The effectiveness of this strategy is only one of the factors contributing to the restoration of the lagoon; equal weight must be given to the community participation and stakeholder base.

IMOLA PROJECT OUTPUTS OF THE THIRD PHASE AND DECENTRALIZED COMPONENT

Massimo Sarti, Project Coordinator of the GCP/VIE/029/ITA IMOLA Project

The IMOLA Project has operated for five years and half in the Province recording remarkable achievements. From Phase I, devoted to assessments and experimentation in 21 communes, transition was made to Phase II, that of pilot implementation of the plan: tangible results were achieved in the way of fishery co-management, aquaculture planning, establishment of protection zones, hydrological studies and alternative livelihoods in and outside the fishery sector.

Phase III extension, including the Decentralized Cooperation Project in partnership with the Veneto Region of Italy, includes the following actions.

Application of surveying technologies and automated methods of detection of environmental parameters, for implementing environmental monitoring and hydrological lagoon modeling.

An environmental monitoring program for the lagoon is lacking; therefore there is no firm basis for environmental control and planning, neither prospect for mitigating the effects of a degrading situation. As observed in most coastal lagoons of the world, combined negative effects of natural coastal processes and economic activities, along with adverse climatic hazards may create conditions of hindered circulation and excess siltation, leading to basin anoxia, decreased productivity, mass mortality and loss of accessible water surface. Interventions and hydraulic infrastructure are in most cases necessary to restore optimal conditions.

An environmental monitoring programme (including current-meter and morphological surveying of the lagoon) and related hydrological modeling of lagoon basins and inlets is proposed for designing interventions of inlets stabilization, siltation prevention, re-naturalization of degraded *habitats* (abandoned ponds, mangrove swamps, coastal spawning grounds, etc.), vivification of enclosed embayments.

Bivalve and shrimp farming in compliance with quality standards, environment protection and safety. Market-oriented mechanisms to improve the sustainability of TT Hue fisheries products.

Fish farming is household based in Thua Thien Hue and largely practiced in the absence of any elementary production protocol that ensures compliance with quality standards, environmental protection and food safety. Under these circumstances, product marketability is limited and profit unstable.

This set of activities will contribute to promote a market-oriented lagoon fishery (including aquaculture) through the introduction of better management practices (BMPs), aquatic animal health monitoring and prevention, processing and marketing, possibly integrating positive experience of the Veneto in this field. Particular emphasis will be posed on alternative farming methods, with reference to bivalve farming. This aquaculture method might offer viable livelihood opportunities to the inlet communities of Vinh Hien and Loc Binh. Thanks to the introduction of farming methodologies implemented in the lagoons of the Veneto Region and to their contribution in kind of expertise and lessons learned, bivalve farming can be piloted in the forthcoming year with reasonable chances of success.

Piloting Tam Nong in Thua Thien Hue. Development and promotion of income-generating activities outside agriculture and fishery sectors (product manufacturing and rural tourism).

As Viet Nam progresses towards middle-income status and beyond, the process of industrialization and urbanization will have a profound influence on rural areas and

local people's livelihoods. To address these issues in the country's modernization process, the Vietnamese Communist Party has issued Resolution No. 26 of the Tenth Central Committee in November 2008 on Agriculture, Farmers and Rural Areas known as Tam Nông.

Based on the experiences of the IMOLA project, all stakeholders have agreed to develop a new project in Hue in which the Tam Nông principle will be introduced.

One of the leading concepts of Tam Nong is the development and promotion of income-generating activities outside the agriculture and fishery sectors. In fact, excessive utilization of biological natural resources lead to depletion, income instability, food insecurity and diffused poverty for fishers.

Sources of income should be sought in areas such as product manufacturing, taking advantage of opportunities offered by the Provincial nascent industry, processing of rural commodities, eco- and agri-tourism. Ecological or rural tourism is an option for Tam Giang of still unexpressed potential, to be developed in coordination with environmental conservation policies, rehabilitation and restoration interventions. The application of Tam Nong principles in Tam Giang-Cau Hai will contribute to diversify the rural economy of Tam Giang from mere commodity production to provision of service (touristic services, environment custody and maintenance, etc.), and from subsistence to market-oriented.

Planning of the Sam Chuon lagoon in the Phu Vang District and continued support to co-management.

The IMOLA project piloted the implementation of fishery management through Fishery Associations and operationalization of co-management in three Districts (Phu Loc, Quang Dien coastal and Huong Tra). Lately, a request was formulated from Provincial authorities to IMOLA to broaden their area of intervention to the District of Phu Vang, thus bringing, once implemented, the project contribution to over 80% of the lagoon water surface.

The Thuy Tu channel and the Sam Chuon basin of Phu Vang are critical for a number of reasons: population density, extent of fishery and aquaculture activity, adverse circulation conditions and poor basin ventilation, excessive pollution, touristic vocation. Importantly, the District of Phu Vang has particular relevance as being a suburb of Hue city and undergoing rapid urbanization.

The application of the IMOLA methodology has been recognized innovative and efficient in organizing fishery communities, re-organize the fishery sector applying technological tool (GIS and remote sensing), develop zoning and demarcation and prepare regulatory instruments for operationalizing co-management through fishing rights. The methodologies piloted elsewhere in the lagoon might prove to be instrumental for resolving the problems of, and reorganizing this important sector of the Huong river delta. Reorganization of the fishery sector during 2011 will be a pre-requisite to experiment a new model of rural tourism in the Phu Vang District.

Supporting co-management: from Fishery Associations to Fishery Cooperatives and S&M rural enterprises.

Concerning FAs and co-management, the project will maintain assistance to the IMOLA supported communes and in addition, will apply methodologies to operationalized co-management in the Phu Vang communes surrounding Sam Chuon.

While significant strides has been made in lagoon co-management in the past five years, its full operationalization requires more time and continuous support and facilitation to its process. In 2011, the project needs to extend its support to lagoon co-management implementation under fishing-rights regime and the consolidation of sustainable structure/system of lagoon co-management has to be achieved. FAs granted fishing rights must be capable to operate financially and technically. Necessary

public support system should be considered including the fiscal decentralization in lagoon management. The Project support in this process is therefore an indispensable condition to ensure better sustainability.

IMOLA PROJECT UPDATE ON THE ACHIEVEMENTS OF THE THIRD PHASE AND DECENTRALIZED COMPONENT

Massimo Sarti, Project Coordinator of the GCP/VIE/029/ITA IMOLA Project

During 7 month of operation after termination of the IMOLA Project Phases I and II, the following achievement have been recorded:

Environment improvements and sanitation

Hydrological surveyed in April, the hydrological model is being run, additional data to be acquired. The additional survey has been undertaken in rainy season to collect more data to support the modeling. The model will be presented in the 7th Technical Workshop

Completed Vulnerability assessment in Huong Phong Commune has been completed. Final report has been delivered, including vulnerability map of the commune. Its database has been updated into IMOLA database. The survey of 600 households in Huong Phong villages to develop vulnerability mapping and assessment has been carried out and data processed.

Mangrove trees in Ru Cha, in ecological ponds and intensive site next to Ru Cha, covering 3000 square meters (3500 units of nursery trees, and nearly 2500 units were planted and developing well. (1000 units in intensive sites and 1620 units in 04 aquaculture ponds) The trees are growing well. The project is checking its survival in this rainy season. This model should be duplicated. The project will survey potential sites for mangrove plantation in the near future based on the testing result of the project and scientific results.

Capture fisheries.

Fixed fishing gear plan for Huong Tra district, evaluated by DARD, and approved PPC. At present, the IMOLA Project is providing technical support for Huong Tra DPC in detailed plan for implementation and developing the action plan. Rearrangement of fixed fishing gears in Phu Vang: mapping of fixed fishing gears status completed. The fishing gears status map has been available. The zoning plan of stake trap has been available and agreed in communes of Phu Dien, Phu Xuan, Vinh Ha, Phu Thuan, and Vinh Xuan. The demarcation and household rearrangement has been made in these communes. The consultations sessions are going in other minor communes of Thuan An, Phu Hai, Phu Da and Vinh Phu. Only in Thuan An, the stake traps re-planning interferes with other related plans and is therefore more laborious to complete

Aquaculture.

Net enclosure in Sam Chuon, status map completed. The questionnaire survey has been conducted and completed. 1628 hectares of net enclosure were surveyed and the status map is delivered. 1369 net enclosure households/owner were interviewed, all data were inputted and are being included into IMOLA database. The thematic maps are being developed. After thematic maps are produced, the zoning plan will be developed for Sam Chuon areas.

Ongoing ecological ponds

The ecological ponds are operating well in Huong Phong. Its initial results seem very positive because mangrove trees and aquatic species have grown well. This model could be duplicated to regenerate the forest in the area, as well as to create good condition for culture species development. The species has been harvested

Fish feed production

The artisanal fish feed production is being prepared for implementation, to limit the use of live product (trash fish) in aquaculture, with the aim to reduce pressure on lagoon wild stock. The Huong Giang Fishery Association is willing to join this project providing facilities and human resources. It is planned to start in the next crop.

Fish cages in Hai Tien

Four houses have been supported for upgrading, achieving stable shelter conditions for inhabitants. The fish cages of these households operate well. The fishes are developed enough to marketable size and ready for harvest. The farmers are waiting for good prices to harvest. After harvest, the farmers will make saving with support of project partners (e.g. Blue Dragon).

Bivalve culture

The project will conduct survey for bivalve culture. The project has contacted the bivalve specialist in Italy for technology exchange in nursing the bivalve. They planned to visit the project in November. Preparations are being made in November for the survey in the rainy seasons and set up collaborative relationships with related Fishery Associations.

Co-management

Support for fishing right allocation to Fishery Associations, including development of functional zones and fisheries regulation for Fishery Associations management. Fishing right delivery has been approved in communes Loc Binh, Vinh Hien, Phu Loc Town, Loc Tri, Loc Dien and Hai Duong. The Huong Phong has adjusted the regulation and submitted to Huong Tra for approval. The evaluation of Huong Phong Fishery Association, fishing right documents was done by Huong Tra DARD. Fishing right document is being developed in Quang Cong commune.

Co-management in Phu Vang

The project is surveying the Fishery Association' status for establishment and strengthening in Phu Vang, to make sure that Phu Vang Fishery Associations will be granted the fishing rights and functionality of the associations are ensured. It is planned to support to establish six new Fishery Associations and strengthen seven existing Fishery Associations in Phu Vang district.

IMOLA databases

At present, the IMOLA Project database is being continuousl updated. The database is being operated by two DONRE staff, in preparation for handing over this project output to the beneficiary Province, in the future. The database is updated with recent data acquired in Phu Vang, Phu Loc, Huong Tra and partly Quang Dien and Phong Dien (sandy aquaculture), with different sub-sector of capture fisheries, aquaculture, water ways, official boundaries, conservation sites. This database is a decision-support tool for local authorities.

Rural tourism

Preparations are made to develop lagoon tourism, with the participation of Vietnamese and Italian partners (e.g. Italian Touring Club). Study is in preparation to assess the needs, potential and feasibility for improvement of lagoon tourism.

3. THE IMOLA GIS DATABASE AND PLANS

Ms. **Le Thi Hanh** (IMOLA GIS system manager)

In six years of uninterrupted project activities, once of the project highlight is set up GIS database system. It is very important tools support for other project activities can be implemented successful.

This presentation is a general description of the major component of and plans in next steps of the project.

IMOLA GIS database

The database contains geographically oriented data and information obtained from a multitude of source, under various formats and by a variety of means. It is maintained in the Geographic Coordinate System GCS_WGS_1984 and projected with Universal Transverse Mercator (UTM) projection: UTM zone 48N, WGS84 ellipsoid, and datum WGS 1984.

IMOLA GIS databases are organized of thematic geodatabases that are stored under its folder. It is available in two formats, raster and vector; articles describing the database are organized two sections for the two data types.

1.1 Raster sector

First, the remote sensing images are a source of raster sector data that IMOLA Project. It is including: Aerial photographs, ASTER images, DigitalGlobe images, Landsat images, SPOT5 images. Without making use of these images, digitalization of tens of thousands of pond units would have been impossible, or otherwise, very costly in terms of human resources and time.

The second type of raster data are topographical maps are published in 2005 by The Map and Geodesy Company of The Ministry of National Security. It is used as base-maps in the cartographic products designed by the project staff. These topographical maps also provide such basic information as lagoon water body or border line.

The third type of raster data are 364 maps scan obtained from the 364 dossiers of relevant IMOLA communes/districts. The 364 dossiers on commune/district border, which were created under Directive No. 364/CT of November 6, 1991 of the Prime Minister and managed by the CPCs and Provincial/District Department of Internal Affairs, are recognized as having supreme legal value. Therefore, where requested by local authorities, it is compulsory to adopt the commune administrative border under definition of the 364 dossiers for the functional zoning in the FAs fishing right profiles to be recognized legally.

The maps were originally produced in the older national geographic coordinate system (i.e. HN72*), and, with coordinates and description text from the 364 dossiers, were projected onto the WGS_1984_UTM_Zone_48N by using GeoTools of MONRE.

1.2 Vector sector

The vector data are created in the platform of ESRI ArcGIS 9.3 applications. These are the IMOLA-made database, are organized in topical geodatabases as following:

- Administrative Profile,
- Lagoon Navigation Route & Coastal Buffer,
- Fishing Gear,
- Aquaculture Survey,
- Fishing Rights Profile,
- Environmental Survey, and
- Land Use.

Activities

- Set up Aquaculture and fishing GIS databases for Thua Thien Hue province.
- Support Local Government built up and implement a Aquaculture Master Plan of Thua Thien Hue province.
- Support DPCs implement the Decision on the approval of stake trap removal and rearrangement in the lagoon of Tam Giang - Cau Hai lagoon.
- Zoning planning and allocation of fishing rights
- Sharing GIS databases and provided maps to relevant organizations

Next steps

- Continue to update Aquaculture and fishing GIS databases system
- Map of aquaculture replanning in Thua Thien Hue province: Phu Vang district, Sam Chuon lagoon, Quang Cong commune (Quang Dien district).
- The coordinate conversion projected from WGS_1984_UTM_Zone_48N into the Vietnamese national 2000 (VN2000) 48N projection will be done in order to make the compatible with the GIS Hue project which is available in Thua Thien Hue province.

4. ENVIRONMENTAL MONITORING AND HYDROLOGICAL LAGOON MODELLING, MODELLING OF TIDAL CIRCULATION IN TAM GIANG CAU HAI LAGOON

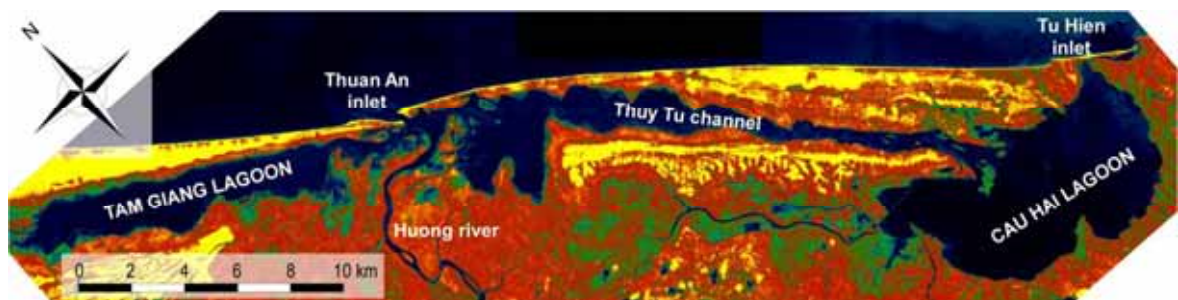
L. Stefanon, G. F. Castelli, B. Matticchio, L. Tosini, Ca'sVendramin Foundation

Background

Within the II phase of the FAO IMOLA project, a new set of activities are being carried out to continue the experimental implementation of the plan. Four main outputs have been scheduled, among which the Output 1 is to implement an environmental monitoring program focusing on tidal circulation and flushing of Tam Giang Cau Hai lagoon.

Tidal circulation has high water quality relevance and affects several aspects of lagoon management. For example it influences the choice of optimal location for shellfish and aquaculture activities, which require water quality control and active tidal exchange to provide clean water and nourishment. In general, it is of great concern for development plans of the coastal community and of lagoon-dependent activities, for must have the capability to preserve a balance between the ecological functionality of the system and the economic requirements.

Presently, there is no systematic information on tidal circulation of Tam Giang Cau Hai lagoon. A hydro-morphological field surveys program and the set up of an hydrodynamic model of the lagoon basins and inlets is thus proposed with the purpose of understanding the main hydrological and morphological processes of the lagoon system and activating feasibility studies to improve the tidally driven circulation.



The Tam Giang – Cau Hai lagoon

Description of activities

The monitoring and modelling programme focuses on the southern lagoon from Thuy Tu to Cau Hai, including Tu Hien inlet. In the light of the experience gained in lagoons of Venice and Po River Delta, Italy, the study aims at i) achieving a deeper

understanding of the mechanisms which promotes tidal circulation, ii) mapping the lagoon areas most suffering for water stagnation and reduced exchanges with the sea, with the final goal of identifying possible interventions to improve water quality.

The development of the model requires a wide and detailed cartographic and topographic data set. The main source is the GIS database which is already available within IMOLA Project. It includes base cartography, satellite imagery and thematic maps which can describe in detail several elements relevant to modelling purposes, like ponds boundaries, fishing gears location, etc..

Bathymetric surveys are part of the ongoing activities, aiming at achieving a detailed data set on the present state morphology of the lagoon inlet and of other parts of the basin of major interest for the hydrodynamics.

Hydrologic surveys are also undertaken to obtain a specific data set useful to impose suitable boundary conditions for the hydrodynamic model (tidal levels and flows along the boundary). More general data are collected to complete the necessary information for the model set up and to provide the full set of boundary conditions. They include bathymetric maps that describe the general topography of the whole Tam Giang – Cau Hai lagoon, flow discharges of the main rivers entering the lagoon, tidal levels in the nearshore sea.

In these respects, a partnerships has developed with Hanoi Water Resources University, given their deep knowledge of the Thua Thien Hue lagoon system, and they very long and high level experience in field surveys and in lagoon modelling.

Contacts are made with relevant local agencies to acquire available data and necessary input. A hydro-meteorological database, including historical secondary data collected from local agencies will be set up. This will include meteorological recordings (rain and wind) at the existing stations in the lagoon vicinity, and river water levels (and possibly discharges) for a few year period in order to characterize the seasonal hydrologic regime of the system.

Field surveys

The field surveys mainly aim at collecting a suitable data set for the model set up. They also represent the first step for the implementation of a monitoring programme, which will enlarge the present knowledge of hydrologic and hydrodynamics aspects of the lagoon system. The surveys focuses on Cau Hai lagoon, Tu Hien inlet and Thuy Tu channel. They include depth sounding, tidal levels recordings, flow and currents measurements at the inlets and in the main channels using ADCP. A Number of CTD surveys are also carried out to map the salinity distribution within the system.

At present a field survey has been carried out by Te.Ma. S.n.c. Company of Faenza, Italy, charged by Fondazione Ca' Vendramin. It took place in the period from 15 to 22 April 2011, and represents an extension and a deepening of a previous survey which was undertaken by the same company in Dec 2009 within the IMOLA Phase II Project.

Te.Ma. provided all equipment and personnel for the survey and technical assistance for logistic and operational matter, thanks to the experience acquired during previous mission. Mr. Bruno Matticchio and Ms. Luana Stefanon of Consorzio Delta Po, Italy, provided general assistance on survey planning and data processing. IMOLA team,

under the coordination of the CTA Mr. Massimo Sarti, provided general logistic assistance on site. Boats were provided by local operators. Local operators were also involved on direct measurements (tide, salinity) after adequate training

The following activities were executed in the field:

- **Geodetic reference survey**, with the purpose to achieve a sharp geo-referencing of the acquired data. The geodetic network was designed and conducted applying the GPS static differential methodology. The results of this process have been combined with available National Reference System coordinate, necessary for real-time navigation in DGPS RTK mode which were adopted during the bathymetric and ADCP surveys.
- **Bathymetric survey**, using a suitable local boat as a survey vessel, mounting a single-beam echo-sounder transducer and DGPS RTK antenna. The surveyed areas are the Tu Hien inlet and the Thuy Tu channel, which were covered by a number of cross-sections in order to obtain a suitable data set to produce DEM models.
- **Tide level survey**, inside the lagoon during spring and neap tides. This has been used as primary data set for hydrodynamic model calibration. A number of tidal stations (8) were installed in different parts of the lagoon to measure tidal lags and amplitude differences between the sea and the internal water bodies. Two of them were equipped with self recording probes while others were direct reading (manually) stations.
- **Current metering**. Two self recording current meters were installed, close to the Tu Hien inlet and in the Thuy Tu channel, respectively. They collected local flow velocity and direction for a number of tidal cycles. To assess discharge-velocity relationship, one vessel mounted ADCP was used for measuring tidal flows (discharges) at the inlet and close to the current meters.
- **Lagoon salinity survey**. A boat equipped with salinity probes and handheld GPS was used. This allowed to detect salinity distribution in Cau Hai and Thuy Tu at different depths to get a picture of horizontal and vertical stratification in this season.

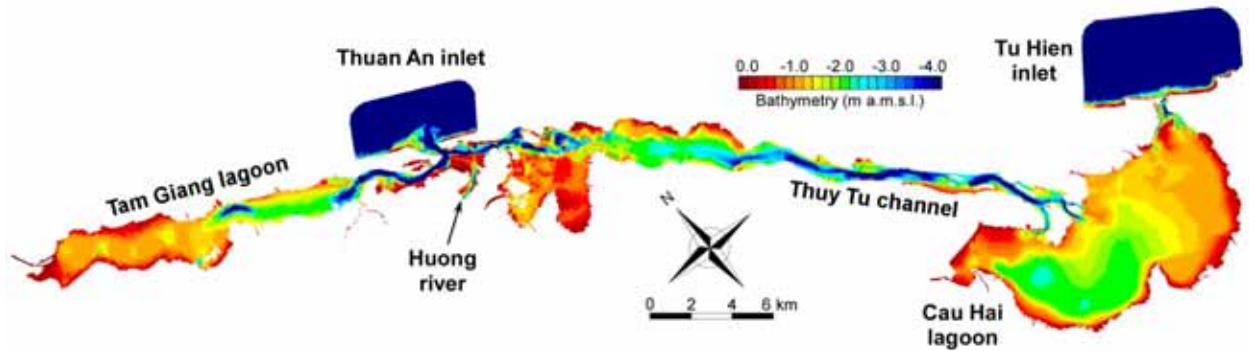
All data have been processed and validated according to the required standards of the Project, and they will be made available through a GIS-based database and rendered as thematic maps.

Model set up

The task is to develop and calibrate a mathematical model, to simulate tidal currents within the lagoon and to determine the efficiency of the lagoon water circulation and exchanges with the sea. For this purpose, numerical tools developed by the University of Padova, Italy, are used. These are a set of modules, based on a finite element formulation, able to solve various aspects of shallow waters hydrodynamics in 2D domains, including water levels and currents velocities, tracers dispersion and particle tracking, sediment transport, wind waves. A 3D baroclinic module is also employed, able to simulate density driven currents, for analyzing salinity transport and diffusion in stratified water bodies. The models have been widely applied for analyses in many coastal lagoons of Italy, including the Venice lagoon and the Po river Delta Lagoons.

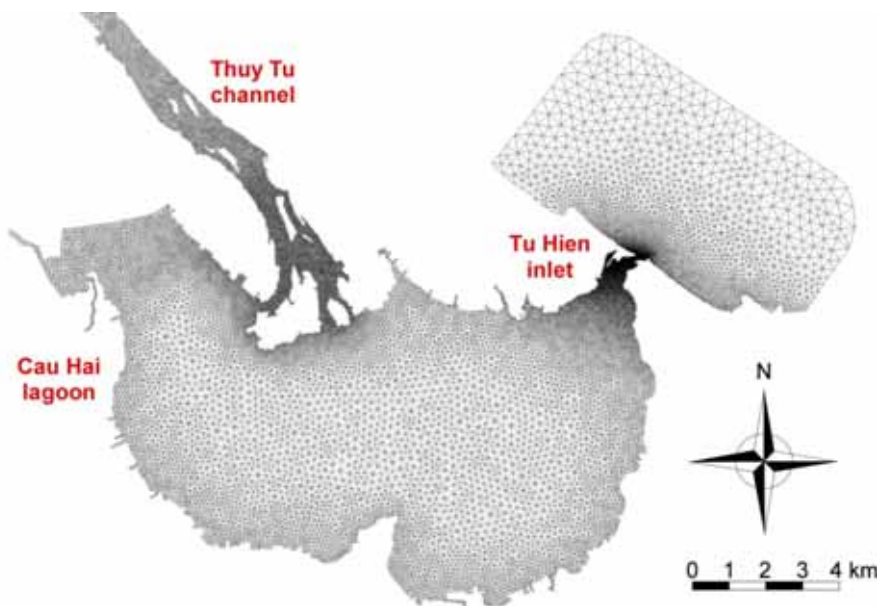
The domain of the model includes the whole Tam Giang - Cau Hai lagoon, and portions of sea close to Thuan An and Thuy Tu inlets. The computational grid is variably sized in order to describe in higher details the lagoon morphology of Cau Hai lagoon and Tu

Hien inlet where the study is mainly focusing. High flexibility is allowed for this by the unstructured finite element mesh of the model, which permits to follow in detail bathymetry and morphology of the lagoon, describing the areas of special interest with higher resolution.



Domain of the Tam Giang - Cau Hai hydrodynamical model

The boundary conditions for the simulations are primarily represented by the tidal elevation at the inlets. Other prescribed boundary conditions will consider the wind blowing over the lagoon surface and water inflows from the tributary rivers. However, since simulations are primarily devoted to investigate tidal circulation, the main scenarios will refer to dry season, when inflows from the rivers are almost negligible.



Model grid of Cau Hai Lagoon

The basic data for model calibration come from the two field campaigns held in December 2009 and in April 2011. They provide a suitable data set for the verification of the response of the model through the comparison between observed and measured parameters. Measured tidal levels in different parts of the lagoon are particularly significant both with respect to the correct evaluation of the tidal wave

propagation within the basin, and for the identification of the sub-basins pertaining to each of the two lagoon inlets.

Flow measurements at the Tu Hien inlet will allow for the calibration of the model with respect to current velocity and volume exchanges between the sea and the lagoon,

thus reproducing the efficiency of the inlet related to the present state morphological configuration. Similar evaluations will be provided for the Thuy Tu channel, which links the two main sub-basin of the lagoon, and where the water renewal problems are more evident.

The model is expected also to be applied to verify the response of the system to floods from the river. This will be done, if necessary data will be available, by prescribing flood hydrographs at the upstream nodes of the rivers entering the lagoon, and comparing model results with available water level data and with results of other modelling studies.

Expected results from the modelling activities will primary be the identification of the tidal currents regime in order to map a hydraulic regime-based zonation scheme of the lagoon. Due to the high seasonal variability of the hydrology, the results obtained with reference to the field surveys can not be considered representative of the general behaviour of the lagoon. In this sense further field investigations are advisable mainly related to tide and salinity measurements, in order to evaluate seasonal differences depending on river regime, and obtain a more comprehensive validation of the model.

Model results and scenarios simulation

The model is used to study the effects induced by the main tidal forcing and meteorological conditions on lagoon hydrodynamics. In a first scenario, only tidal action is considered, prescribing the tidal conditions that can take place at the two sea inlets. A further scenario consider the superimposition of wind effect, which is expected to affect considerably the circulation pattern in the whole lagoon, especially in Cau Hai basin, and the extension of the area of influence of each inlet. Finally, effects of heavy discharges from the rivers are to be simulated, to assess the radical changes in the flow field induced by the flood events during the rainy season.

Different morphological scenarios are also considered, mainly referring to the configuration of the Tu Hien inlet. In fact there is evidence that physical processes governing inlet evolution are the main responsible of the variations in water volume exchange between the sea and the lagoon, which in turn affect the environmental conditions within the lagoon itself.

For each scenario the model can provide the flow field, i.e. the current intensity and paths in the different lagoon areas. To separate the oscillatory tidal motion from the secondary and non linear effects due to topography and to other non-periodical forcings (wind, river inflows), the residual currents pattern can also be achieved. This provide information about the net effect of water movement which is related to the diffusion and spreading of dissolved substances in the lagoon.

The model simulations will be also used to investigate the effects of a number of possible interventions aiming at improving tidal flushing in the lagoon system.

The most suffering water bodies are in the central and southern lagoon, where the human influence is stronger and where there is higher density of natural and artificial obstacles. Dredging interventions and maintenance in the Tu Hien inlet are the options that can be investigated in order to verify the effects of an increased inlet capacity to exchange water with the sea. Dredging intervention and maintenance of the southern part of the Thuy Tu channel will also be considered. In fact the entrance of Thuy Tu

into Cau Hai, is consistently obstructed partly by the remains of an ancient ebb-delta morphology, partly by human structures that create obstacles to the flow.

According to the Project guidelines, all model results, both in calibration and in scenarios simulation, will be made available through a GIS-based database and rendered as thematic maps.

5. FUNCTIONAL ZONING PLAN AND MANAGEMENT OF ACTIVITIES IN THE TAM GIANG – CAU HAI LAGOON

Mr **Bui Duc Be** (IMOLA Project Socio-Economic Technical Staff)

During survey on the status of activities in the Tam Giang – Cau Hai lagoon (mainly capture fisheries and aquaculture), the project realizes that the capture fisheries and aquaculture in the lagoon are out of control and over-exploitation. This has made negative impacts on the lagoon, i.e exhausted aquatic resources, polluted environment, degraded ecological system and apparently the community livelihood facing difficulties.

In the past years, the Project have worked in collaboration with local authorities and community to propose solution to make sure lagoon fishing activities and aquaculture ventures under control with the aim to improve the above mentioned problem. One of the solutions proposed and implemented by the project is **development of functional zoning plans and fishing right allocation to the FAs respectively**.

1/ Functional zoning plan

a. Functional zones: The water surface of the FAs/communes/district are zoned into small areas with different functions, with specific regulations for each zones including what activities are allowed, no of allowed fishing gears, gears size, mesh size, operation time, who can access the zones ...

1. Methodology:

- Develop the status map of each communes by 364 boundaries (using GPS, GIS)
- Develop the zoning plan based on the idea of the community
- Collect relevant scientific research on the lagoon (hydrological, morphological, aquatic resources)
- Consultation at communal level
- Consultation at district, provincial level to reach consensus on the zoning plan

2. Achieved results

a. Phu Loc district

- Completed zoning plan for 5 communes
- Completed stake trap rearrangement

b. Huong Tra district: completed the zoning plan for entire lagoon (including two communes of Huong Phong and Hai Duong)

c. Phu Vang district: Completed zoning plan for stake traps in key communes of Phu Dien, Phu Xuan, Vinh Ha, Vinh Xuan, Phu Thuan and Phu Hai

3. Zoning plan with fishing right allocation in the lagoon to the Fisheries Association

a. Fishing right allocation: zoning plan is a base for FAs in development of the fishing right allocation document to submit to the DPC for evaluation and approval. In the Fishing Right Documents, the FAs should regulate specifically all possible activities in each sub-zones. At present, there are 15 out of 22 IMOLA-supported projects receiving lagoon fishing right allocation by DPC of Phu Loc and Huong Tra

b. Management:

- The FAs should regularly supervise the implementation of the approved fishing right project by the relevant districts.
- Functional agencies should monitor at random (possibly at the request of the FA)

4. Comments

- There needs a demarcation for management by the community (firstly, Phu Loc should demarcate the zones for stake traps)
- Stipulate the maximum quantity of Chinese trap for each FA (based on the quantity regulated by Province for each district) as a base for solution by the FAs in control this kind of fishing gears
- Provide financial support for the FAs
- Support boat for patrolling team of the FAs
- Institutional improvements, specify the practical rights of the Fisheries Associations
- Support for alternative livelihoods

6. APPLICATION OF GIS AND LOCAL KNOWLEDGE FOR FLOOD RISK ASSESSMENT: CASE STUDY OF HUONG PHONG COMMUNE, HUONG TRA DISTRICT

Tran Van Giai Phong, Ph.D, Bui Duc Tinh, Ph.D, Nguyen Quang Tuan,
National Consultants

Many case studies and research projects have shown that there are no general technical solutions for reducing specific local disaster risks. New insights also reveal that disaster risk programs have failed to induce people to participate because these interventions have lacked both the will and the instruments to allow people to use their own knowledge. It is our conviction that greater efforts should be made to strengthen the capacity of local people for developing their own knowledge base, and to develop methodologies that promote activities for reducing risks in a sustainable way.

Linking community knowledge with modern techniques to record and analyze risk related data is one way of engaging and mobilizing community capacity. Realizing the important roles of local community in vulnerability identification and assessment, the Decentralized Cooperation Project (GDCP/VIE/002/ITA) part of the Integrated Management Of Lagoon Activities (IMOLA) Project carried out a participatory Geographic Information System (GIS) vulnerability-mapping assessment in Huong Phong commune from May to August 2011. The purpose was to prepare detailed vulnerability maps for commune planners, villagers and other stakeholders, to identify the magnitude and extent of past disasters, and to make recommendations for local authorities and decision makers regarding disaster risk reduction activities based on local knowledge and needs.

This report presents findings from flood risk assessment and mapping activities undertaken as part of the Decentralized Cooperation Project. It summarizes activities conducted and presents the findings of vulnerability assessment in Huong Phong. The report was prepared to fulfill obligations as per consultant contract with the IMOLA project led by Dr. Tran Van Giai Phong and two national consultants Dr. Bui Duc Tinh and Mr Nguyen Quang Tuan from Hue University.

7. SUSTAINABLE AGRI-TOURISM: A VIABLE OPTION FOR TAM GIANG – CAU HAI LAGOON.

Mr **Fabio Cappiello**, (Evivatour Vietnam)

Pro- Poor Tourism

Tourism plays a more and more important role in emerging economies, particularly the poorer ones, according to official data of the World Tourism Organization, and appears as one of the largest export earners in 80% of developing countries, in one third of those it is the first resource of richness, representing an indispensable instrument to enhance the participation of these countries to the global economy, reduce poverty and achieve socio-economic progress.

The impact of Mass Tourism

Two billion dollars per day. This is the turnover of tourism industry that moves one billion persons each year. But at which cost? Who are the earners? And above all who are the losers? 80% (source of World Tourism Organization) of tourists come from two dozens of countries in the so called North of the world. People born in a poor country do not travel. And very often they do not even enjoy the place where they were born.

The principle of sustainability in tourism management: sustainable tourism.

On the track of negative effect produced by mass tourism, there should be an alternative: the need for a more responsible tourism which favors local economy and social development, respecting not only the nature and the environment but also the culture of each locality, proposing an authentic relationship with the visited places and people, so that traveling turns out an occasion for the visited and the visitors to meet and exchange, bringing greater satisfaction and longer lasting results.

Interaction between the Authorities and private operators, a concrete example.

Under the patronage of the Embassy of Italy in Hanoi in collaboration with Development Cooperation Office of Italy.

SUSTAINABLE TOURISM AND DEVELOPMENT COOPERATION

Follow in the footsteps of the Italian Development Cooperation in Vietnam

A pilot initiative of responsible tourism promoted by Eviva Tour Vietnam with the aim to encourage sustainable development and responsible tourism in Vietnam.

The Italian leading model of fishing-tourism and related tourism as an instrument for the exploitation of the tourism heritage of Tam Giang-Cau Hai Lagoon.

The success of the fishing-tourism and related tourism model represents a formula which is capable to combine responsible tourism, supporting local small business, environment education – all elements that would be able to facilitate the development and rationalization of the tourism and environmental heritage of Tam Giang-Cau Hai Lagoon.

8. THE ITALIAN MODEL FOR RURAL TOURISM

Mrs **Maria Chiara Minciaroni**, (Centro Studi Italian Touring Club)

Touring Club of Italy (T.C.I.) is the major independent no profit tourism association in Italy. It was founded in 1894 with the aim of spreading and developing the social and cultural virtues of tourism, to maximize the legacy of our environment and landscape, to promote the defense and conservation of the country's national heritage, and to produce publications on travel.

The T.C.I.'s Research Department, established in the 1990s, operates on the Italian and European market as a tourist consultancy and for the planning of development and promotion programs, financed by local authorities, governmental departments, or the European Union.

One of leading projects of TCI is the **Orange Flag program**, born in 1998.

The Orange Flag is a quality label for sustainable tourism and environment run by The Orange Flag program is turned to:

- Italian villages of the inland (with no coastal portions)
- with less than 15.000 inhabitants

It is aimed to encourage economic and social growth through the development of sustainable tourism. The initiative provides territory valuable tools to:

- offer an element of excellence from the point of view of supply;
- stimulate local traditions, hand-crafted and agricultural activities;
- elevate local identity and awareness about landscape, environment and cultural heritage;
- promote a feeling of welcome towards visitors;
- support environmental sustainable initiatives involving inhabitants, schools and tourists.

The Orange Flag label is a guarantee of quality for travellers and a chance for the territory to enhance self analysis processes according to ecotourism aspects. Villages may be awarded with the Orange Flag if TCI criteria are achieved and maintained. The whole evaluation process embodies ecotourism values and is made up of the analysis of more than 250 indicators. An Improvement Plan is written for providing local administrations indications to develop their tourist offer in a sustainable way and to identify problems to face.

In order to guarantee high quality levels, certified villages are audited every two years. Villages certified with the Orange Flag label are introduced in T.C.I. promotion network. This mean they can use all instruments of communication Touring Club of Italy puts at their disposal to promote their territory and to undertake a non-stop improvement path.

9. DEVELOPMENT OF RU CHA MANGROVE FOREST IN ECOLOGICAL AQUACULTURE PONDS

Mr **Pham Ngoc Dung**, Thua Thien Hue Association of Forestry Science and Technology

Ru Cha is the largest mangrove forest in Thua Thien Hue province. The main forest makes up 5.24 ha, having high cultural and historical value as well as playing an important part in protecting the environment for the whole area. Moreover, salt marsh botanical bed in Ru Cha is also a place for raising aquatic larvae and for birds of Huong river estuary - Thuan An.

Ru Cha is surrounded with a rather large aquaculture area, covering about 175 ha. However, like other farming areas, the effect of aquaculture here is not so high, due to the problems of environment and culture techniques. Therefore, to enhance the farming efficiency sustainably, it is necessary to develop an environmentally friendly farming method which has high economic efficiency as cultured species diversification and intercropping farming. Especially, it is important to focus on ecological farming by planting a certain amount of mangrove trees in the aquaculture ponds.

Since September 2011, Thua Thien Hue Association of Forestry Science and Technology and IMOLA Project has agreed to plant mangrove trees to enhance biodiversity and to build models of ecological aquaculture ponds in Ru Cha area.

Over one year of implementing this program (9/2010-11/2011), more than 3,500 mangrove seedlings (mangrove, aegiceras, Vet) have been qualified to be planted. Besides, almost 3,000 mangrove trees have been planted in four spots, one in Ru Cha including 1,000 trees and three in aquaculture ponds with nearly 2,000 mangroves to build the ecological model pond.

According to the results of monitoring and evaluating the plants' growth and development until the end of September 2011, plants are capable of adapting to the environmental conditions in the different growing regions, including areas inside the salinity dyke which is tideless and has low salinity, as well as areas outside the dyke, directly adjacent to Tam Giang - Cau Hai lagoon, having a clear tidal mechanism and high salinity. However, the level of growth and development of crops in the regions differ. Mangrove trees have grown well in the ponds outside the salinity dyke, where the salinity is high (>20 ‰). Meanwhile, the aegiceras have grown better inside the dyke, where has low salinity (<15‰). Vet trees have had the ability to adapt well to both plantation areas.

This result has shown that planting mangrove trees in the aquaculture ponds in Ru Cha is a potential approach. It has built ecological ponds to develop the environmentally friendly farming method with high and sustainable economic efficiency, as well as enlarged the area of Ru Cha to further develop the environmental, ecological and landscape values of the forest. At the same time, it has opened a new direction, which is of great potential for mangrove planting activities in Thua Thien Hue province.

10. INVESTING IN DEVELOPING COUNTRIES (OPPORTUNITIES FOR PRIVATE-PUBLIC PARTNERSHIP)

Mr **Ornello Boscolo** (in representation of the Chairman of the Chamber of Commerce of Rovigo (Veneto Region))

The Chamber of Commerce of the province of Rovigo in Veneto region, represents the reference establishment among companies which I join to. The province of Rovigo, in the northern Adriatic coast has many environmental similarities compared to the lagoon of Hue. In the '80, the economy of the coastal population, who now lives, as well as in the past, of fishing, began the first major experience of production of bivalve mollusks. This activity, with the rationalization of cultivation method, has produced an exponential growth by the year 1985. Before that year the local production of mollusk was irrelevant, but since 1985, provinces of Veneto are placed among the top producers at a European level. This phenomenon had a significant economic impact on local populations. Through resource management regulation, collectors have organized themselves into cooperatives and consortia, so that they were able to agree a protocol with quality experts, with the result of guarantee of the products placed on the market.

11. RAISING CLAMS IN VIETNAM FOR EXPORT

Dr. **Francesco Paesanti**, Biologist, clam farming specialist

Dr. Francesco Paesanti is a marine biologist, who deals with shellfish farming in Italy since 1980. He attended the opening of economic initiatives related to bivalve mollusks in different countries of the world. In particular, the specialist worked on breeding, rearing, harvesting, purification, transformation. The presentation pertains to the rearing of live bivalve mollusks in North Italy, in the Po Delta. The specie bred is verace clam *Tapes philippinarum*. The presentation will also explain socio - economic transformation of the area thanks to this activity, starting from a laboratory reproduced seed to the management of areas on concession .

12. WORLD BIOSPHERE RESERVE IN VIETNAM – CONSERVATION FOR DEVELOPMENT, DEVELOPING TO CONSERVE.

Professor Nguyen Hoang Tri, PhD., General Secretary, Vietnam MAB National Committee

Vietnam has been internationally recognized with 8 biosphere reserves. The country's experience in the participatory management involving different departments, unions, businesses and individuals under the coordination of the Province and City People's Committees has been highly acknowledged in the world. However, up to now, there remain many limitations in accessing a model to implement the idea "conservation for development, developing to conserve" in sustainable development. One of the causes is practicing interbranch coordination whilst managing according to branch and territory. Another reason is that Vietnam's recent integration into the world brings many difficulties in the implementation process. In addition to a detailed presentation on the structure and functions of biosphere reserves, this article does an in-depth analysis of the general principles behind "conservation for development, developing to conserve" as well as practical experiences in implementing the biosphere reserve model into the sustainable development of the country.

The Biosphere Reserves in Vietnam

Within 9 years (2000-2009), Vietnam has participated in international activities in the "Man and Biosphere" Program, contributing 8 world biosphere reserves.

Vietnam has 8 world biosphere reserves

- Can Gio mangrove forest biosphere reserve, Ho Chi Minh City (Can Gio Biosphere Reserve) was internationally recognized on 21/01/2000 with a total area of 71,370 hectares; Population: 57,403 people;
- Cat Tien biosphere reserve (Cat Tien Biosphere Reserve), covering the provinces of Dong Nai, Binh Phuoc, Lam Dong and Dac Lac was internationally recognized on 10/11/2001 with a total area of 728,756 hectares; population: approximately 170,500 people;
- Cat Ba Island biosphere reserve (Cat Ba Biosphere Reserve), Hai Phong was internationally recognized on 02/12/2004 with a total area of 26,241 hectares; Population: 10,673 people;
- The biosphere reserve of coastal wetlands of inter-provincial Red River Delta (Red River Delta Biosphere Reserve), covering 5 districts of Thai Thuy, Tien Hai (Thai Binh Province); Giao Thuy, Nghia Hung (Nam Dinh Province) and Kim Son (Ninh Binh Province) was internationally recognized on 02/12/2004 with a total area of 105,557 hectares; population: 128,075 people;
- Kien Giang biosphere reserve, Kien Giang Province, was internationally recognized on 27/10/2006 with a total area of 1,188,105 hectares; Population: 352,893 people;
- Western Nghe An biosphere reserve, Nghe An Province, was internationally recognized on 18/09/2007 with a total area of 1,303,285 hectares; Population: 473,822 people;
- Cu Lao Cham biosphere reserve - Hoi An, Quang Nam Province, was internationally recognized on 26/05/2009 with a total area of 33,146 hectares; Population: 83,792 people;

- Ca Mau biosphere reserve, Ca Mau Province, was internationally recognized on 26/05/2009 with a total area of 371,506 hectares; Population: 170,321 people.

Biosphere reserve is a model of sustainable development in developed countries such as Germany, France or Spain. Although Vietnam has only been integrating into the world biosphere reserve network for a few years, it will 'take short cuts' to apply the innovative ideas and effective approaches to help build Vietnamese biosphere reserves as the model of sustainable development in the future. The specific implementation contents include:

Environment: Protect natural resources (water, energy, agriculture and biodiversity), control the adverse effects of climate change; implement sustainable rural development; implement sustainable urbanization; Prevent and reduce the effects of natural disasters.

Economy: Reduce poverty; raise the collective responsibility in economic activities, trade; economic development goes hand in hand with environmental protection and ensuring social justice.

Socio-Culture: respect for human rights, building and maintaining peace and security; promote gender equality; protect cultural diversity, increasing health; preventing HIV/AIDS; building clear and transparent institutions.