

Aquaculture Sustainability Index Development to Support Decision making in water management in the Mekong delta – Vietnam - BL/00/V15

Project partners:

- SPACEBEL – Da Vinci, Hoeilaart, Belgium (Belgian promoter)

Sub-contractors:

- Free University of Brussels (VUB), Dept. of Hydrology (Belgian co-promoter)
- Gent University, Laboratory of Hydrology and Water Management (Belgian co-promoter)
- Aquapôle, Campus de l'Université de Liège (Belgian co-promoter)

- Vietnamese Association of Seafood Exporters & Producers (Vietnamese promoter)
- Vietnamese Institute for Fisheries Economics and Planning, Ministry of Fishery
- Southern Sub Institute of fishery Planning
- Ben Tre Department of Fisheries (Southern Vietnam)

(Geographic) study area : The area of interest covers the Cho Lach district belonging to Ben Tre province, Ben Tre province is 1 in 13 provinces of Mekong delta (or Cuu long Delta)

Science policy testsite : pilot project in study area (Cho lach – Ben Tre Province)

Project period: 01-06-2007 / 31-05-2009

Funding framework: Bilateral cooperation Belgium – Vietnam, BSPO

Data used:

- Available literature and field measurement records (water quality)
- Conducted questionnaires
- VH (LANDSAT & ERS) satellite archives from 2000 and new VHR satellite images (KOMPSAT-2) of the study area taken during early 2008

Context and objectives

While aquaculture play's an important role in Vietnam's economical development, its unplanned and unregulated growth has had negative social and environmental impacts. The Objective of the project is to contribute towards a more sustainable aquaculture system in Vietnam. Therefore, researches have been conducted to develop sustainability assessment tools in order to manage fish farming and measure progress towards sustainable development. One of them is the Aquaculture Sustainability Index (ASI). The sustainability index can help the farms' owners deciding which part in the farming process goes wrong and thus measures can be taken accordingly. Management bodies, policy-makers, environmentalists, etc. can also base on the ASI to adjust socio-economic development and environmental protection strategies and to develop long-term plans to achieve sustainable development. Then two essential questions were raised up in the framework of AQUASID:

- What is the impact of aquaculture activities on the water resources quantity / quality?
- How to develop a sustainable and responsible aquaculture regarding the environment?

To provide some elements of response to these questions the project focused on the specific objectives:

- 1 – The development of indicators involved in ASI computation with a focus on water resources inventory and loading capacity of the rivers in Mekong Delta.
- 2 – The integration of all kind of environmental information related to aquaculture into a dedicated web-GIS in order to provide support to remote decision makers in fish farms implantation management (South Vietnam).

Methodology

Because the productivity and value of freshwater fisheries is highly dependent upon the quantity and quality of the water supply with regards to temporal variability, (which causes large problems in water resources management), practical tools that can generate information on flow regime in a timely and useful manner have been developed. An integrated catchments model was needed, which models both quality and quantity and uses all available information, including GIS. The hydrological HEC RAS model was chosen for that purpose. Then a complete environmental database using remote sensing imagery and field campaigns was created as an essential source of environmental information needed as input for ASI calculation. The consortium has developed and deployed ASI map through a web-GIS portal to be use as a "prototype" system to help remote decision makers in fish farming planning. Actually the use of web mapping tools such as those proposed by Mapguide Open Source software were particularly suitable in term of dissemination of the information from the centralized VASEP premises in Hanoi to VIFEP in Ho Chi Minh City and finally to the very end users located in Ben Tre and Cho lach.

Results

- Land use maps (up-to-date cartography) for the area of interest (Cho Lach district) 2008
- Field data records on water quantity and water quality
- a complete hydrological model (HEC-RAS) to simulate water availability and pollutant dispersion
- A New Aquaculture Sustainability Index to be use in fish farming planning (based on socio-economic indicator coupled with Environmental indicator)
- A **dedicated Web GIS** designing, implementing, generating and delivering ASI maps on the World Wide Web using MAPGUIDE.

Products and services

- Aquaculture sustainable index map (ASI) of Cho lach in South Vietnam
- Access to dedicated web portal displaying ASI maps using a set of web mapping tools (Mapguide Open source)
- Pilot application deployed in VASEP & VIFEP premises in Hanoi (or Ho Chi Minh City)
- Applicable to other districts/ provinces in Vietnam

Website (with project results): currently at : <http://172.17.5.31:8008/mapguide/Aquasid/Aquasid.html>

In the future : www.vasep.to-be-completed.vn

Pictures illustrating the project:

The screenshot displays the AQUASID Project web mapping application. The main map area shows a satellite view of a coastal region with a large blue water body and several red polygons representing fish farm ponds. The application interface includes a green header with the text "AQUASID Project The Web Mapping Application". On the left, there is a "Layers" panel with various map layers like "Cho Lach Station", "Fish farm ponds", "Mekong delta", etc. On the right, there is a "Query Features" panel with a "Select a Layer" dropdown, a "Property Filter" section with "Area" selected and a value of 7500, and a "Results" list showing various numerical values. The bottom status bar shows coordinates, scale, and "Powered by MapGuide".

The future dedicated AQUASID WEB-GIS deployed in Hanoi –

Discipline

Aquaculture
Environment/nature conservation
Food security
Hydrology & freshwater resources
Forest & natural vegetation
Agriculture Environment
Land planning & infrastructures
General Earth observation
Policy & legislation
Economic issues

Publications

Pauwels, V.R.N., A multistart weight-adaptive recursive parameter estimation method, Water Resources Research, 44(4), W04416, doi:10.1029/2007WR005866, 2008.

Thesis submitted in fulfilment of the requirements for the award of the degree of Master in by Nguyen Thi Hai Ha, Sept. 2008 – Promotor Prof. O. Batelaan – Vrije Universiteit Brussel, Faculty of Engineering, Dept. of Hydrology and Hydraulic Engineering.