

Study of the Salt Penetration in the Mekong River Delta by means of Satellite Images



Financed by: SSTC/DWTC

Client: SSTC/DWTC (Services of Prime Minister of Belgium)

Date: 1997 – 1998

Budget: € 175 000

Location: Lower Mekong River delta, Vietnam

Partners: University of Ghent (Regional Geography)

Assignment:

Evaluation of the impact of deepening the Dinh An on salt penetration and rice production in the lower Mekong delta and impact on agriculture with special focus on the agricultural flooding risk and socio-economic impact.

Scope of Services:

- Satellite imagery of the Mekong delta
- Description of landuse and rice culture
- Description of seasonal variations of salt penetration
- Correlation field survey data and satellite images
- Correlation seasonal variations of rice production and salt intrusion
- Numerical modelling
- Environmental, agricultural and socio-economic impact

Technical Description:

The study investigates the impact of deepening the Bassac estuary (Dinh An) on salt intrusions and rice production. This impact will be deduced from a detailed analysis of proper satellite pictures of the study area.

The coastal plain of the lower Mekong delta is subjected to a severe degree of salt penetration through the major rivers and creeks. Due to this penetration, salt infiltrates the local soil. These salty intrusions form a limiting factor for the rice culture. Indeed, with the salt content of both water and soil, the rice harvest varies between 1 time a year to 2-3 times a year.



Rice harvest in the low Mekong delta



Rice culture in the Mekong delta

As the development of the Mekong delta is an urgent matter for the Vietnamese authorities, large-scale public works such as the deepening and embankment are foreseen with the aim to:

- promote navigation (increase ships tonnage)
- increase the production of rice
- protect against flooding.

An impact study of these significant infrastructure works and the intensification of the agricultural production on the different ecosystems occurring in the Mekong delta is therefore very important in order to ensure a sustainable development of the Mekong area.

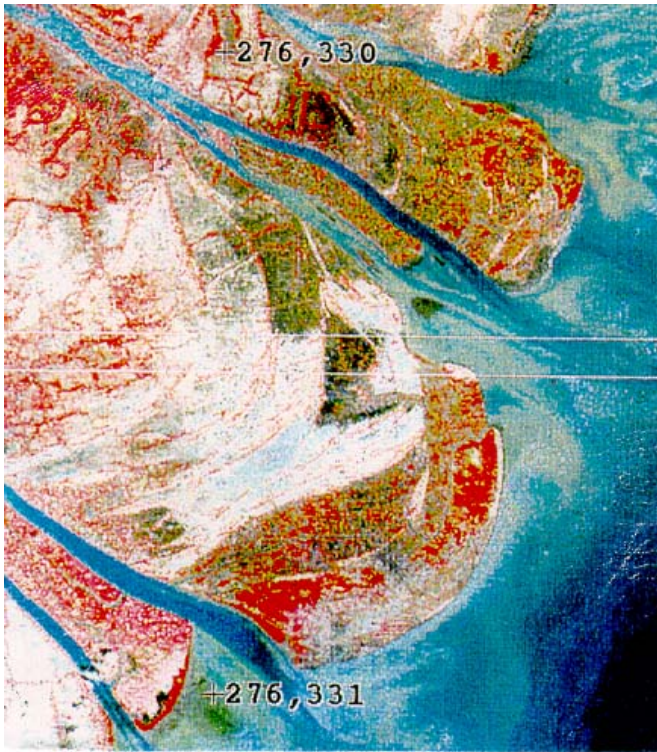


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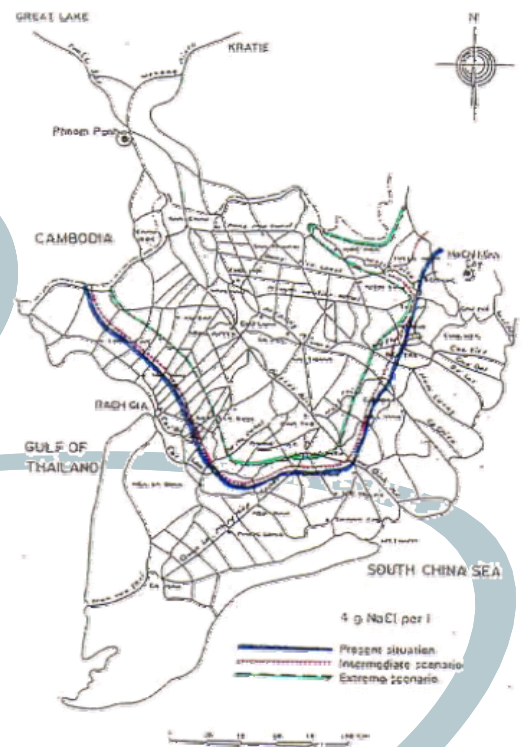


Spot image of lower Mekong delta with mangrove (red), rice fields (white), coastal waters (blue)

Appropriate satellite images of the study area are selected (LANDSAT, SPOT, ...). In accordance with an intensive field investigation programme where survey teams and survey ships are deployed, a profound calibration and validation of the satellite pictures is performed (ground and sea truthing). Out of the spatial view from these "truthed" remote images, the following features can clearly be detected:

- saline intrusion may be critical and reach up to 100 km inshore; particularly in the dry season
- clear seasonal fluctuations of paddy growth are revealed as a direct response of agricultural efficiency to salinity intrusion.

Based on the spatial distribution and the temporal variations in the salinity penetration in the Mekong delta, some general sustainable management measures are suggested.



Scenario of related salinity intrusion in lower Mekong basin (dry season)