Current and Erosion Modelling Survey in the Coastal Zone of Soc Trang, Vietnam

Design of erosion control methods based on field measurements and numerical modelling

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Summary

Management of Natural Resources in the Coastal Zone of Soc Trang Province

The Vietnamese-German technical cooperation project, "Management of Natural Resources in the Coastal Zone of Soc Trang Province", which started in March 2007, aims at providing pilot solutions to solve the conflict between economic development and sustainable management of natural resources. This includes climate change adaptation activities focussing on livelihood diversification and mangrove management.

The Mekong Delta, although relatively small in size compared with the entire country, plays an important role as "rice bowl" for the whole of Vietnam. But the lack of an integrated approach to sustainable management, utilisation and protection of the coastal zone, unclear responsibilities of local authorities and rapid expansion and economic interests in shrimp farming have led to rising concerns over environmental and social impacts and resulted in the unsustainable use of natural resources in the coastal zone of Soc Trang Province. This is threatening the protection function of the mangrove forest belt and reducing income for local communities.

The coastal zone is not only at risk from the negative ecological consequences of shrimp farming and the unsustainable use of natural resources, it will also be affected by the impacts of climate change which will cause increased intensity and frequency of storms and floods and rising sea levels.

The overall project goal is to protect and sustainably use the coastal wetlands of Soc Trang for the benefit of the local population. The objective for the first phase (2007-2010) is to promote co-management of the coastal zone between resource users and local, district and provincial authorities.

The project leader GTZ assigned the Institute of River and Coastal Engineering in cooperation with the Southern Institute of Water Resources Research in Ho Chi Minh City to design erosion control methods based on field measurements and numerical modelling.

Current and erosion modelling survey

The coastal region of the province Soc Trang is located in the sphere of influence of the Mekong Delta and characterised by its discharge regime as well as by the tidal regime of the South China Sea (fig. 1). The regular northeast monsoon winds cause an increased coastal longshore drift. Along the coast a dynamic process of accretion and erosion occurs. Especially in Vinh Tan Commune severe erosion endangers the dyke and for this reason the hinterland (fig. 2). In the frame of this project the operational background of the coastal processes in the investigation area is analysed. For a focus area coastal protection measures are determined.

The reasons of erosion in the focus area Vinh Tan have not been analysed completely.

An interaction of the following causes affects the shoreline:

- Relative low sediment supply
- Exposed coastline with a dominating long-shore component especially during northeast monsoon
- Erosion by tidal currents and waves
- Anthropogenic influences, such as the deforestation of mangroves

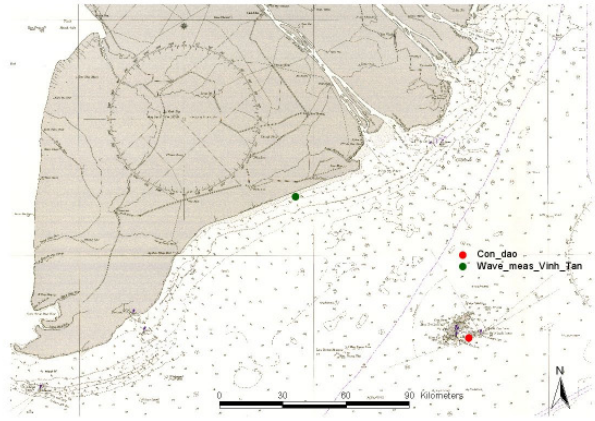

Fig. 1: Sea chart of south east Vietnam


Fig. 2: Erosion zone in the investigation area

In October 2009, during times of the largest discharge of the Mekong River, in a first campaign current measurements were done with a vessel mounted Acoustic Doppler Current Profiler (ADCP). Figure 3 shows chosen cross-shore profiles during flood and ebb tide. Further current measurements of the same profiles are planned during the northeast monsoon period. Parallel to the current survey water samples are taken to analyze the suspended sediment concentrations.

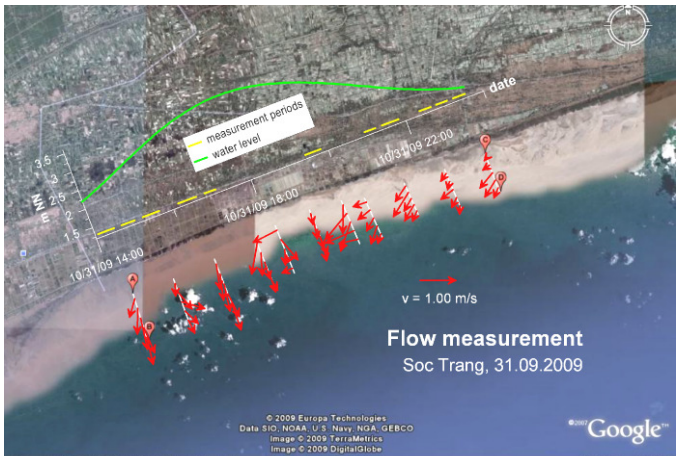

Fig. 3: Results of the current survey in October 2009

To analyse the processes of sediment transport near the coast optical backscatter sensor (OBS) devices and pressure transducers are installed in 100 m and 300 m distance to the shore at the erosion area. Additionally a Nortek AWAC profiler records currents and waves 2 km offshore.

All data are used to setup a numerical model to simulate waves, currents and sediment transport. Figure 4 shows a results of the wave simulation with SWAN.

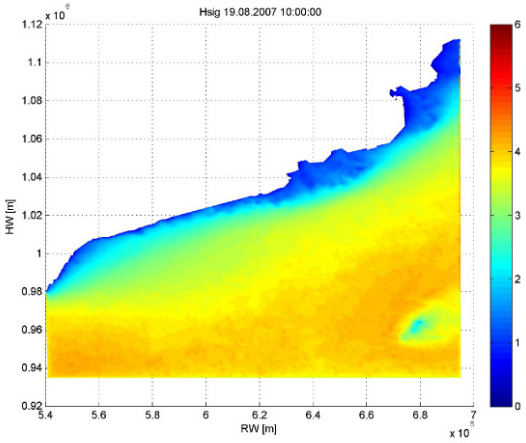

Fig. 4: Results of the wave simulation with SWAN

Duration
15 Months

Start
01.08.2009

Initiator
Gesellschaft für Technische Zusammenarbeit (GTZ)

Project Management
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