Design of bamboo breakwaters and bamboo groins in Soc Trang Province, Vietnam

Coastal areas in the Mekong Delta, Vietnam are characterized by strong morphodynamic processes such as the discharge regime of the Mekong River, the tidal regime of the South China Sea and the monsoon weather patterns of Southeast Asia. These parameters influence processes of accretion and erosion. Naturally, the coastline of the Mekong Delta is protected from erosion and storms by a narrow belt of mangroves. But in some areas, such as the Soc Trang Province, this natural coastal protection has been destroyed due to unsustainable use of the mangroves.

Thus, the von Lieberman GmbH was asked to design according coastal erosion protection. In previous studies available data of the coast of Soc Trang were researched and analyzed. Additional field measurements were carried out to understand the hydrodynamic and morphodynamic processes. This data base was used to set-up, calibrate and verify different numerical models simulating hydro- and morphodynamics and the effects of breakwaters.

In addition to the application of conventional breakwaters adapted approaches using the local material bamboo were investigated. This material has many advantages based on its strength, availability and costs. Using bamboo structures the required wave transmission can be achieved.

All static and geotechnical proofs of the bamboo breakwaters were done, drawings have been accomplished and recommendations for the constructions have been given.

Client:
Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ)
Soc Trang Project

Achievements:
- Design of bamboo breakwater and bamboo fences
- Preparation of construction drawings
- Detailed planning of the construction

Project completion period:
05/2011-09/2011

Contract value:
ca. 15.000 €
Installation of bamboo breakwaters and bamboo groins in the Mekong Delta, Vietnam

Coastal areas in the Mekong Delta, Vietnam are characterised by the discharge regime of the Mekong River as well as by the tidal regime of the Vietnamese East Sea. Most of the dynamic coastline of the Mekong Delta is protected from erosion, storms and flooding by a narrow belt of mangroves. However, the unsustainable use of natural resources in the coastal zone is threatening the protection function of this forest belt. It is most likely that climate change, particularly the increased intensity and frequency of storms and floods and rising sea levels will intensify erosion and increase the demand for a sustainable erosion protection management.

Based on former studies and a detailed design bamboo breakwaters and bamboo fences were installed in Soc Trang and Bac Lieu Province. The goal is to rehabilitate the mangrove belt in areas protected by the breakwater and the fences. This pilot project for erosion protection and mangrove rehabilitation in erosion sites will also be used to gain knowledge for future application and optimization through detailed documentation and monitoring.

In May 2012 500 m bamboo fences have been built at the coast of Bac Lieu and at the coast of Soc Trang Province a 100 m breakwater and 600 m bamboo fences have been constructed. All steps of the installation and construction were documented. A monitoring programme to assess the stability and the effects of the structures was established and started.

Client:
Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ)
Soc Trang Project

Achievements:
• Technical preparation and supervision of the construction of the bamboo fences in Bac Lieu and Soc Trang Province
• Support of the tender
• Construction supervision on-site
• Continuation of the monitoring programme for the effectiveness of bamboo fences
• Continuation of the established monitoring programme

Project completion period:
11/2011 - 06/2012

Contract value:
ca. 30 000 €