CAN THO, HOW TO GROW?

Flood proof expansion in rapidly urbanising delta cities in the Mekong delta - the case of Can Tho

Master thesis poster
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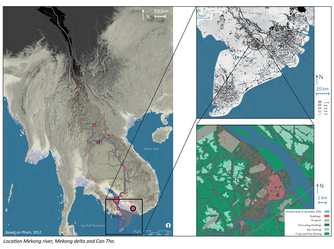


Location Mekong river, Mekong delta and Can Tho.

"The Mekong delta is at the crossroads. Today, the delta has to adapt once again to the new conditions of change, this time a rapid urbanisation and quick economic changes. Climate change in the future causes huge drastic changes in the water regime of the Mekong delta in the future. This asks for a new way of thinking in water engineering, management and design to let grow the Mekong delta cities safely and sustainable." (Hasnain, 2008)

Since 2008, for the first time in history, more than 50% of the world's population lives in cities. This development can be seen in the Mekong delta in Southern Vietnam, one of the world's most threatened delta areas related to climate change. This area is experiencing a quick process of urbanisation and economic growth. Meanwhile, large areas in the delta are affected by flooding during the rainy season and suffering from a lack of fresh water shortage in the dry season. This shows that the (Mekong) delta cities are facing a double complexity. Their location in a delta in context to flooding and climate change and secondly, the rapid growth of cities while they face a rapid transformation from a traditional to a modern and globalising society bringing huge social, cultural and economic changes. One characteristic city facing this process is Can Tho situated in the heart of the Mekong delta which will double its population to one million in the coming 20 years. In this graduation project is researched how to find a strategy for the expension of this Mekong delta city as a sustainable example for other Mekong delta cities.

To understand the social, spatial and hydraulic problematics of the delta - and more specific for the city Can Tho - several methods are used: the method of the layer approach demonstrates how human intervention transformed the delta landscape to an more urbanised area and how this resulted in problems for the Mekong delta. A spatial-, typological- and hydraulic analysis for Can Tho adresses other location specific issues of Can Tho in order to find the most suitable way of expanding.

The layer approach shows how the delta transformed from a water based network to a road based society. Furthermore we see urban sprawl around the large cities, mostly between Ho Chi Minh City and Can Tho, the two largest cities of the delta. This area is also the most fertile agricultural area. While the Mekong delta is one of world's largest rice producing areas, this urban spread could threaten the world food supply in the future. The second layer approach of the urban area of Can Tho shows the current city densification and how nowadays growth leads to the loss of creeks and green space, which results in more flooding by extreme rainfall because rain water can not run off anymore.

A spatial analysis of Can Tho makes clear that there is a lack of public space and public green in the city. This results in the fact that streets are the place for all daily activities as markets and terraces and that there is no place left for the pedestrian. The green spaces in the city, like a large university complex, are fenced private domains which are blocking the continuity of the city, showing the first signs of spatial segregation. A lot of riverfronts are blocked by poor housing, industries or resorts, loosing the strong Vietnamese traditional relation between the city and water.

The building typology research shows the former rice field allotment structure has a strong impact on the growing urbanisation around Can Tho; the dikes between rice fields are transforming towards roads, keeping the structure of the landscape intact. Furthermore, suburbs are not connected with piping for sanitation or fresh water supply, making rain water and pumped ground water their source of fresh water. The poorest people even use the Mekong water for their 'fresh' water supply. Meanwhile, rivers and creeks are used as sewage system and garbage bins in the poorer areas.

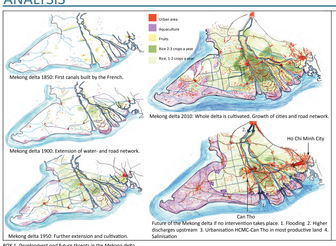
Hydraulic analysis learned that in the rainy season annual flooding of 50 cm is normal for Can Tho. This flooding occurs by rainfall and a high sea tide and a high discharge upstream from China. In the dry season saline sea water intrudes more and more in the delta. The absence of rain in the dry season increases ground water pumping causing soil subsidence resulting in more flooding. Climate change and urbanisation will result in more extreme hydraulic problems in the future.

The proposal to expand Can Tho on a sustainable and climate proof way is based on a new city structure that relates to the existing landscape and the water network. Green public spaces along rebuilt and existing creeks become a new network covering and connecting the whole city. Waterfront development along the Mekong river provides safety for flooding with a 'delta dike'. With its gentle slope this type of dike will not disturb the relation between water and city. The creeks inside the dikes are locked off from the natural water flow of the Mekong river, these creeks have an enormous potential. Firstly, they improve the drainage capacity to store rain water. Also public spaces along the creeks are designed to be temporally flooded in case of extreme rainfall. Secondly, this creeks are not connected with the polluted Mekong. Water treatment systems make this water suitable for grey water supply in housing making Can Tho, independent from ground water pumping. Thirdly, maintaining a natural water balance will avoid soil subsidence.

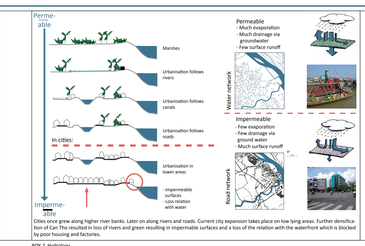
The already existing landscape rice field structures and a strong local policy will be used to guide the transformation from an agricultural to an urban area. Strategic road building and a proper division of ground lease contracts creates potential to urbanise the rice fields. This model of growth as a cooperation between landscape, urbanism and engineering could be used in more Mekong delta cities answering climate change, avoiding lurking segregation and the maintainance of the local food production.

This transformation from water as a threat towards water as an opportunity gives the basis to sustainably expand the Mekong delta cities!

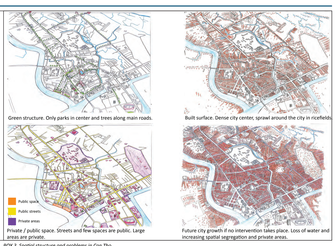
ANALYSIS



BOX 1. Development and future threats in the Mekong delta.

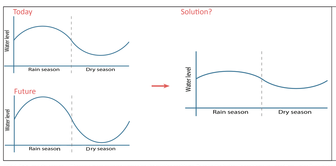


BOX 2. Hydrology



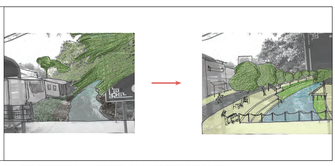
BOX 3. Spatial structure and problems in Can Tho

VISION FOR CAN THO

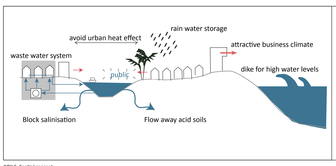


BOX 4. Rain- and dry season will become more extreme worsening the existing problems. To solve the hydraulic problems you need less water fluctuations.

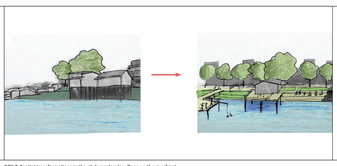
BOX 6. Spatial transformations in the city's masterplan. Bring back the former rivers.



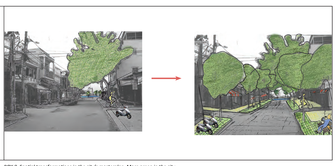
BOX 8. Spatial transformations in the city's masterplan. Make the river a frontside instead of a backside.



BOX 5. Spatial concept

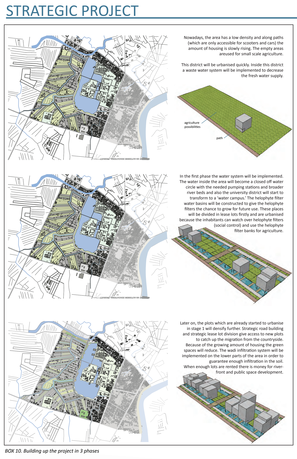


BOX 7. Spatial transformations in the city's masterplan. Open up the riverfront.

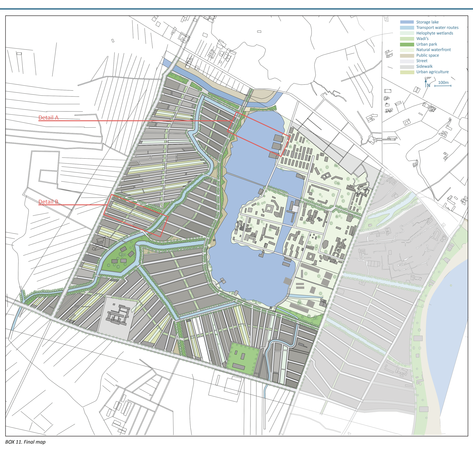


BOX 9. Spatial transformations in the city's masterplan. More green in the city.

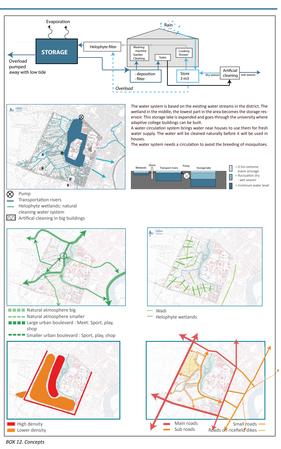
STRATEGIC PROJECT



BOX 10. Building up the project in 3 phases

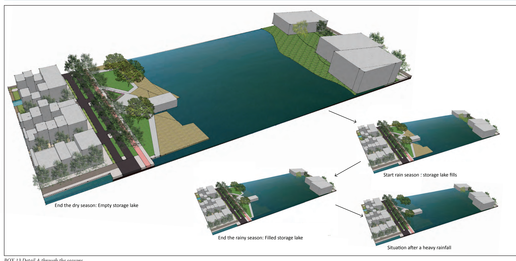


BOX 11. Final map



BOX 12. Concepts

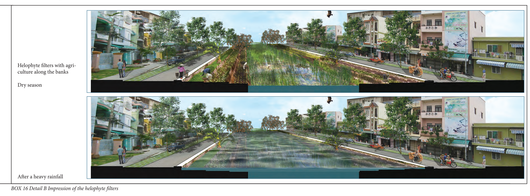
DETAILS



BOX. 13 Detail A through the seasons

BOX. 14 Detail B through the seasons

BOX. 15 Detail A Impression



BOX. 16 Detail B Impression of the helophyte filters