

# Adaptive delta management

As a follow up to the development of the Delta Plan for the Netherlands to help protect the country against the potential effects of climate change, a group of researchers from Wageningen UR has been building on that work, under the research programme Global Food Security, to develop appropriate methods to assist countries to manage their deltas in the face of climate change. But why are deltas so important? How can the methods developed help towards promoting food security and human livelihoods? These issues are being addressed in Bangladesh, Benin, Cambodia, Egypt, Myanmar and Vietnam.

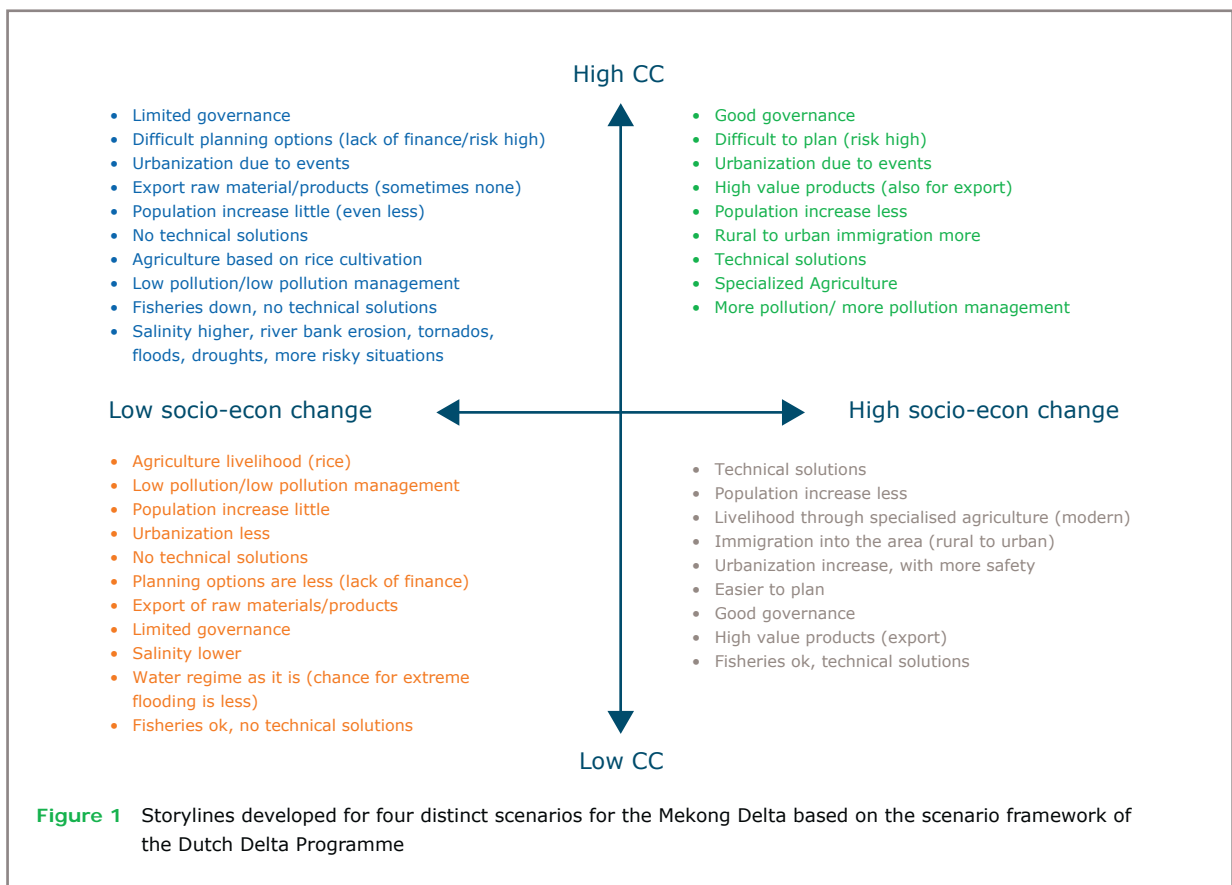


Deltas are dynamic, productive systems where people have lived for millennia. They account for roughly 5% of the land area and are the most densely populated places on Earth. Some of the most fertile soils can be found there, making them extremely important regions for the growing of crops. Across the world they also support industry and livelihoods.

Deltas vary in size, structure and composition. On the whole, however, they are relatively young landforms shaped by the interplay of coastal and riverine processes and are of great ecological significance, comprising wetlands rich in biodiversity. Deltas are low-lying areas characterised by a mosaic of gradients between land and sea, fresh and saline waters, as well as exposed and sheltered environments. These patterns and dynamic processes form the basis of ecosystem services such as land formation, coastal protection and food for fisheries.

So, most deltas are 'hotspots' of human activity, making them vulnerable to changes induced by a range of driving forces, both natural and

anthropogenic. A vulnerability and resilience assessment of ten deltas worldwide by the Delta Alliance (2010), found that the most important driver of change in deltas is climate change. According to the study, climate change is expected to have significant impacts, in the medium to long term, on seven out of the ten deltas investigated. Possible impacts include rising sea levels, resulting in higher flood risk, salt water intrusion and coastal erosion, increasing temperatures, and changes in composition, distribution and extent of ecosystems. Although climate change is an important driver, there are, other, more immediate concerns – increasing population and economic growth, rapid urban and industrial development and subsidence – all combine to stress delta systems. Many of these changes are more likely to be felt in low-lying, densely populated areas of developing countries where the measures to adapt to these effects are limited. Inclusive, integrated approaches towards delta development, management and governance are critical, but how can these countries adequately address current problems and prepare for the potential effects of climate change in the future?



The Framework for Delta Assessments has proven to be a useful starting point in gaining an insight into the strengths and weaknesses of existing delta management in the case study countries. Essentially, the framework is a scenario tool that considers the interactions between climate change and socio-economic conditions and their effects on, for example, local populations, food production and industry. It makes it possible to 'visualise' a number of developments in the medium to long term, serving as the basis for the formulation of appropriate strategies for the sustainable development of deltas.

### The importance of inter-delta exchange of knowledge and expertise

Exchange of knowledge and expertise among deltas is considered to be crucial. As a consequence, there have been regional training workshops on the challenges and approaches in river delta planning in Ho Chi Minh City, Vietnam in 2012 and in Thanlyin, Myanmar in 2013. Some of the main objectives of these workshops were to:

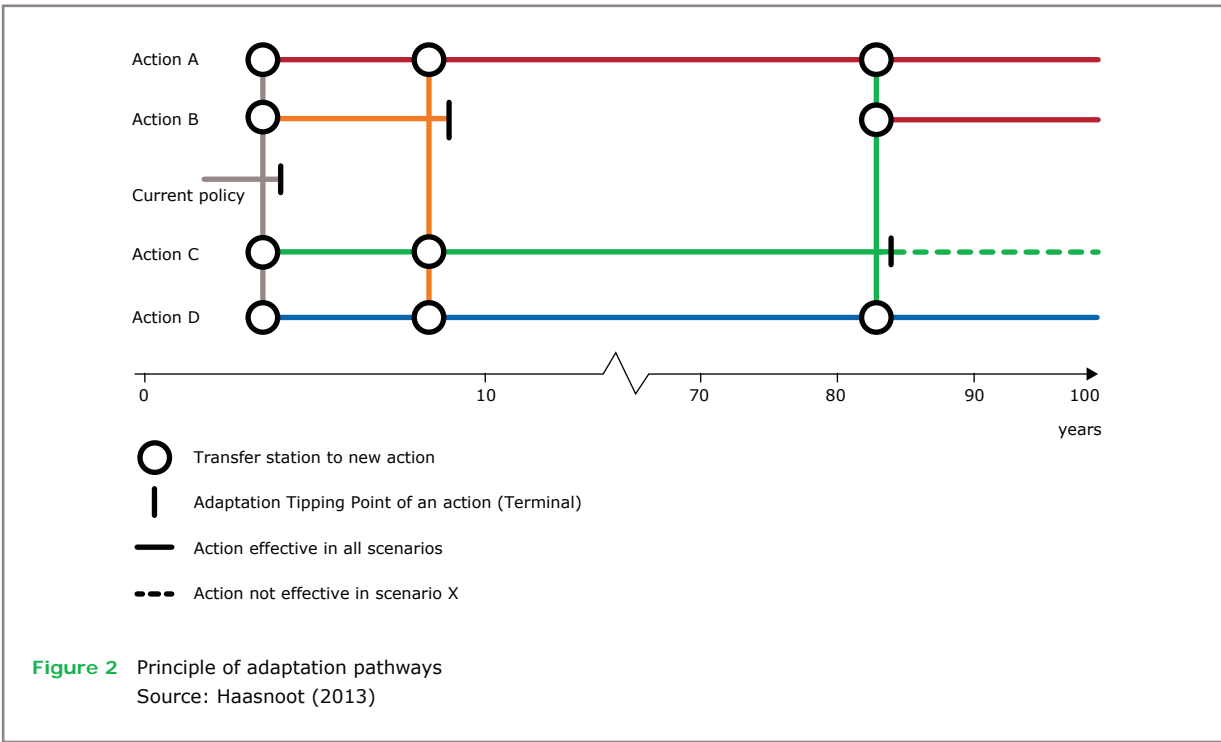
- expose participants to the latest thinking of delta planning with specific focus on environmental and social aspects within the development context
- familiarise participants with the multi-level and multi-sectoral dimension of the topic – also by sharing the experiences of the participants from

different backgrounds, with specific focus on rural/coastal and urban case studies

- familiarise participants with approaches on how to address these multiple dimensions – also considering uncertainty – and (institutional) conditions for implementing such approaches
- discuss examples of approaches and methods of delta planning drawing on European and Asian case studies.

During the workshops different scenarios were developed for the four combinations of high and low socio-economic growth and of high and low climate change (Figure 2). This was done for the Ayeyarwady, Ciliwung, Ganges-Brahmaputra-Meghna, and Mekong deltas separately as well as for the upland, rural and coastal areas of the combined deltas. Also, different adaptation pathways were developed in order to achieve a given set of objectives (Figure 3). The participants were highly appreciative of the workshops, expressing the wish that they be repeated in the future in different host countries with different delta issues.

Currently, Wageningen UR researchers in collaboration with other international groups have been joining forces to adapt the framework to study deltas in Africa and Asia. They are driven by the belief that it is only through inter-delta exchange of knowledge and expertise that sustainable and innovative solutions for delta issues worldwide can



be found. It is within this context that the Global Water Partnership (GWP) and the Delta Alliance, with support from the Netherlands International Development Programme and the Dutch Ministry of Economic Affairs are developing a Global Programme of Action, the so-called *Enabling Delta Life Initiative*, to enhance climate resilience and strengthen the governance of deltas worldwide. To develop this initiative a number of workshops have been held with country representatives closely involved in delta management within their respective countries.

The story does not end here. The Framework for Delta Assessment is being used as a platform for global action in other areas, such as the Ganges-Brahmaputra-Meghna Delta in Bangladesh, L’Ouémé

Delta in Benin and the Nile Delta in Egypt. Interaction with the different groups has shown that the Framework for Delta Assessments can effectively contribute to an increased insight into the strengths and weaknesses of existing delta management. However, additional work is needed to include institutional structures and governance issues.

Plans are currently underway to develop a comprehensive framework and toolbox for adaptive delta management as well as set up a community of practice. It is further envisaged that there will be more collaborative efforts to link up the biophysical framework with a socio-economic component to enable more robust decision-making on food security issues in the future.



Participants discussing different scenarios during the workshop

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**Contributors**  
 Henk Wösten [henk.wosten@wur.nl](mailto:henk.wosten@wur.nl)  
 Wim van Driel  
 Catharien Terwisscha  
 Wouter Wolters

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