

Vulnerable deltas, difficult choices

Deltas are economic and environmental hot spots. They are very fertile, strategic sites with rich ecosystems. But deltas are vulnerable to flooding and drought, especially in the face of climate change. Challenges and opportunities aplenty.

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There are dozens of large deltas in the world and most of them are densely populated. Throughout the centuries, people have made use of the riches available in these wetland areas, with their unique combination of salt and fresh water. They have adapted to nature and fought against it, which is how rice paddies came into being, as did fisheries, dams and dikes, floating dwellings and villages on artificial mounds. It has become clear that we need to know a great deal more about these areas, as climate change is starting to have a major impact on them. In fact, governments are sometimes faced with impossible choices: do we raise the height of the dikes to cope with higher sea levels in future, or would we be better off retreating to higher land? What measures can be taken when planning an area to accommodate climate change, and where is the infrastructure vulnerable?

Exchanging knowledge

Every choice has consequences. In the view of Marcel Marchand of the Dutch research institute Deltares, governments are better placed to make conscious choices when deltas are studied thoroughly and the knowledge gained is exchanged throughout the world. "Deltas are similar in a lot of ways, but it's the differences that are most interesting. That's where there's the most to be learned."

As an example he cites the two major deltas in Vietnam, the Mekong in the south and Red River Delta in the north. "They're both big, flat areas, very fertile with lots of rice planting and other agriculture, and a major city nearby. But the way they tackle flood-

ing is very different: the Red River Delta has a lot of dikes and many polders; there are far fewer dikes in the Mekong Delta and the land is more adapted to flooding. It's interesting to look at why one country has opted for two such different solutions. Is it due to cultural differences? Or the river's drainage rate? If we can answer questions like these we can learn far more about deltas and how to respond to climate change."

Breaching the dikes

Marchand stresses that solutions in one delta can't simply be transferred to another. "Take the Flood Action Plan in Bangladesh. In the 1990s this was supposed to cope with the recurrent flooding in the area. The solutions looked at were mainly technical, like building dikes. In retrospect, you have to acknowledge that the choices made weren't the right ones. The fishing industry got into difficulties due to a lack of water, and as a result some of the dikes were breached once again."

Building dikes means you have to maintain them and increase their height regularly, Marchand explains: "Because the land level drops behind the dikes, there's no sedimentation any more." Purely technological solutions weren't the last word in Singapore, either, where a large part of Marina Bay was closed off to create a fresh

water lake. Problems were expected with the water quality in the lake, and extra measures were needed to resolve them. Marchand goes on: "When planning radical public works it's important to look at the long-term effects." He's in favour of integrated water and coastal management. "It's difficult to do this in many countries, though, because the appropriate departments are too set in their ways." According to the coastal zone management specialist, England is an example of a country that has made the right bets in its integrated climate adaptation programmes. An extensive programme has been set out for the Thames Barrier, East London's major flood defence, with a range of options intended to ensure that the United Kingdom's capital city remains dry, even under extreme conditions.

Scorecard

Deltares, in association with the Delta Alliance and the World Estuary Alliance, is developing a scorecard to assist deltas round the world to make the right choices in the face of climate change. The scorecard is an extension of an earlier Deltares study, which described eight deltas. It is intended to provide a framework that allows deltas to be compared with each other to identify the differences and estimate the consequences of any choices made. Wim van Driel, Delta Alliance Programme Manager: "The scorecard facilitates integrated delta management. It's a comparative study of deltas' ecological, social and economic resilience. The scorecard indicates the degree to which an area can absorb extreme pressures, which may take many forms: explosive population growth, but climate change, too." Deltares's Marchand says: "We want to describe those three layers and also to indicate what the developments are. Then you can run them past the different climate scenarios and make a pretty good estimate of the consequences and the options available." A preliminary version of the scorecard will be available at the end of 2010. ■

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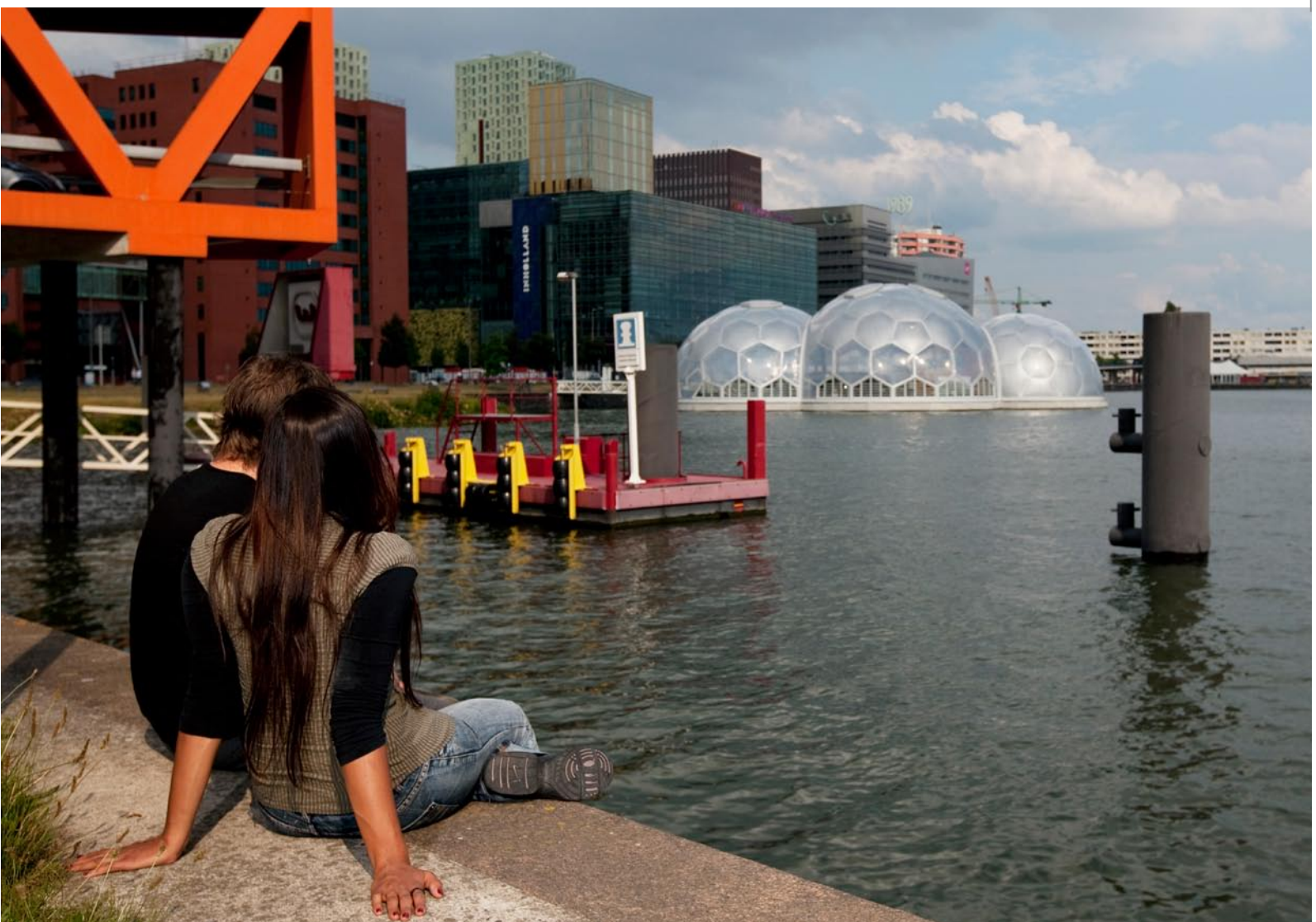
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Dutch centre of water expertise

The Dutch water sector opened a centre of expertise for water, climate and energy in June 2010. It is a remarkable building, consisting of three inter-linked domes, floating in the Rijnhaven in Rotterdam. It is climate-proof, sustainable, innovative and flexible - an example of climate-resilient building in the areas outside the dikes. The floating pavilion will become the centre of expertise and a showcase for the National Water Centre. It is currently being developed into a cluster where different parties will come together: innovative and international knowledge institutions with expertise in water management, companies and government bodies.

The National Water Centre will facilitate research projects and the design and application of innovations in water management. New developments in the water sector will also be presented to the public here.

The idea for a National Water Centre was conceived from the Dutch Delta Design (DDD) project of the Netherlands Water Partnership (NWP). The founding fathers of the National Water Centre are Arcadis, DHV, Dura Vermeer, Evides Water Company, Ahoy, the Rotterdam University of Applied Science, Delft University of Technology and the City of Rotterdam.



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