



## Conclusions - China

In order to facilitate its enormous growth in the vulnerable coastal area under increasing pressures of climate change, China is very rapidly developing and applying principles of Integrated Coastal Zone Management (ICZM). Over the last decade, such ICZM developments have become clearly visible in a number of ways:

### 1) Development and application of ICZM knowledge and capacity

China has developed its ICZM capacity through international cooperation and nationwide initiation of ICZM programs, together with the development of institutions, regulations and laws from the nineties onwards. An early example of cooperative projects between China and the Netherlands is the Yellow River Delta project (1995-1997) focused on providing an integrated planning framework and GIS knowledge base for the development of the Delta. This project included environmental quality, social conditions and protection from flooding and formed the base for further coastal cooperation. Specific attention was furthermore paid to the application of geosciences related to sediment supply, subsoil stability and land-sea interactions in the Chinese coastal development areas. Examples of these applications include:

- The deep-sea port and industrial development of Caofeidian island in Bohai Bay, involving a large land reclamation project and related infrastructure development;
- Shanghai and Yangtze delta including large projects and infrastructure developments such as the Donghai cross-sea bridge, water reservoirs in the coastal area, harbour development (Shanghai and Yangshan harbour) and Pudong Airport;
- The coastal protection of Pearl River Delta.

Recently a formal cooperation between China – the Netherlands has been created by establishing a Dutch-Sino Centre for coastal Geology, linking the China Geological Survey and the Dutch institution Deltares.

### 2) Large scale rehabilitation of degraded areas

Rapid urban development in densely populated coastal areas in the second half of the 20<sup>th</sup> century has created severe problems related to the management of land and water resources, in particular water quality. In the last decade, China has taken action to rehabilitate the most degraded areas. An example is the restoration of Suzhou Creek and Lake Tai, the major water supply sources in the greater Shanghai coastal area. An extensive rehabilitation program was developed, using a phased approach, including: hydraulic measures and clean up actions; wastewater flow interception and treatment; removal of polluted sites and embankment reconstruction. An integrated water quality model and a Decision Support System facilitated the identification and selection of measures to be taken. A major restructuring of the institutional arrangements of the water sector contributed considerably to the successful implementation of this rehabilitation project.

### 3) Large scale coastal developments in anticipation of climate change

In China, in the last twenty years some 100 million people moved from inland areas to the coast. This process of massive coastal urbanisation will continue and accelerate in the next decades, involving another estimated 200 million people. In preparing for the enormous coastal pressures, China is developing and applying the concept of eco-cities, as a holistic approach to sustainable urban living. New land is developed according to the principle of '*Building with Nature*' (see also CCC III-3-3-1), while ensuring control and protection of land and water resources. Supply of water, energy and transport and waste (water) management based on the use of renewable sources and clean technology principles are fully integrated in the urban design concept. Examples of present developments include the cities of Caofeidian and Tianjin Binhai in Bohai Bay and Dongtan near Shanghai. These planned developments are regarded as large scale 'pilot projects'. The results of these projects will help determine whether new eco-cities will be built along the entire Chinese coast. There is considerable enthusiasm in Chinese society for eco-cities. The ambition may set a standard for the rest of the world.