



Building with Nature

Hydraulic engineering that
makes use of natural processes

Building with Nature is a concept that provides answers to the issues we face in deltas due to overpopulation and climate change. It involves incorporating local natural processes – such as wind, water flows, and the development of flora and fauna – into the design of hydraulic engineering schemes. This results in sustainable solutions with advantages for nature, recreation, the economy, and the local community.





Nature development in the city of Rotterdam enhances the ecological quality of the river.



Indonesian people building dams of natural materials to help mangroves get re-established

What's the issue?

Around the world, deltas and coastal areas are under increasing pressure. By 2050, about 50 per cent of the global population is expected to live in such areas. Coastal and delta ecosystems are very important for nature, the economy, and human well-being. Climate change is adding to the pressure on such areas. How should we respond to land subsidence, rising sea levels, increased river flows, and the exhaustion of groundwater reserves? And what can be done about heat stress, drought, and salination?

Building with Nature is a concept that provides answers to such questions. It involves incorporating local natural processes – such as wind, water flows, and the development of flora and fauna – into the design of hydraulic engineering schemes. The result is flexible and sustainable solutions with advantages for nature, recreation, the economy, and the local community.

The River as a Tidal Park

The city of Rotterdam is putting the concept of Building with Nature into practice with its project “The River as a Tidal Park”. In and around the Meuse river that discharges into the sea at Rotterdam, nature is being re established in order to boost the ecological quality of the waterway. Fish such as salmon and sturgeon will soon find suitable habitats there, as quiet spots are created and the river water becomes cleaner. The tidal park also contributes to flood prevention. As the gradually sloping river banks that reach the height of a dyke are able to act as wave breakers when the water levels are high. Furthermore, the return of natural features is opening up recreational opportunities across the region.

The Sand Motor

One well-known example of Building with Nature is the Sand Motor, a sustainable coastal maintenance technique. Sand is deposited on a manmade sandbank just off the shore, from where the wind and sea currents carry and deposit it along the coast. The result is a coastline reinforced by natural processes to create an attractive nature reserve and recreational area.

Sustainable mangrove restoration in Indonesia

Erosion is a serious problem along the coast of North Java (Demak). Mangroves perform a variety of functions: they promote coastal suppletion, they reduce flood risk, and they serve as a habitat and nursery for many different species. They are also a source of food and income for the local population. Demak’s mangroves are being restored by building a series of permeable wooden dams with the help of local people. The dams break the ocean waves, so that a calm, shallow zone is created behind them. There, sediment accumulates and a new coastal landscape develops, where mangroves can naturally re-establish themselves.

More information and contact

EcoShape – Building with Nature develops insight into the applications of the Building with Nature concept. EcoShape is a consortium of Dutch government bodies, private enterprises, knowledge centres and NGOs, whose aim is to get Building with Nature established as general practice. It does so by testing innovative applications in pilot projects. For more information, see www.buildingwithnature.nl