Building with Nature

Until now, engineering and nature restoration have not always been each other's allies. The EcoShape consortium (www.ecoshape.nl), consisting of private parties, government institutions, and research institutes in the Netherlands, thinks it is time to change this. We believe it is possible to apply eco-engineering principles more widely and to develop water-related infrastructures that draw on the natural environment, are in line with the natural system, make use of this system's dynamics and to find novel ways to manage water resources. Though not identical, eco-engineering and nature restoration are akin.

EcoShape is about to complete Building with Nature (BwN), a 5-year, 30 million € national innovation programme. Although it includes 19 PhD projects to fill important knowledge gaps, its primary focus is on learning by doing in a number of real-life pilot projects and on translating the knowledge gathered and the lessons learned into guidelines for practical use. Examples of pilot projects are the Delfland Sand Engine, a 20 million m^3 concentrated sand nourishment on the Holland coast, and the use of live oyster reefs on a man-made substrate of oyster shells to protect the intertidal shoals in the Eastern Scheldt from further erosion. The most important result is a wiki-based user guideline, which also includes a portfolio of examples, user tools, tutorials, knowledge pages, and BwN-type solution components. It is accessible via the above website. A booklet with showcases of real-life BwN pilots, launched during the final BwN-symposium in Rotterdam last November, can be downloaded from the website.

BwN is a national programme, but it ties in and actively collaborates with a number of international developments, such as PIANC's Working with Nature initiative, a concept also adopted by the European Commission, and the Engineering with Nature initiative of the US Army Corps of Engineers.

Although BwN presently focuses on sea, estuary and lake shores in the Netherlands and in southeast Asia, there are many parallels with REFORM. An open interdisciplinary collaboration between engineers, natural scientists and social scientists is instrumental to make these projects a success (and takes time, dedication, and energy to develop!). Project monitoring and assessment are important issues and so are the analysis and prediction/projection of natural, administrative, and social system behaviour, ecosystem services, cost-benefit analyses, approaches to risks and uncertainties, stakeholder processes, and the production of user-oriented tools and guidelines.

We are now in the process of preparing a follow-up BwN-programme, shifting focus from 'showing that it works' to 'making it happen', which means even more emphasis on how we can get our ideas implemented in the processes and procedures that lead to a project taking shape and being realised. This new programme, envisaged for 2013-2017, may include a fluvial component, which would create even more possible links with river restoration and research projects such as REFORM. Building with Nature has an open information policy, so there is ample opportunity to share knowledge, tools and lessons learned with other projects, including international river restoration initiatives such as the ECRR, LIFE+ RESTORE and REFORM.

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An oyster reef, naturally formed on an artificially placed substrate of oyster shells, protects the shoal behind it from erosion, thus maintaining a shallow wave-attenuating foreshore in front of a dike in the eastern Scheldt estuary. Photo: Tom Ysebaert, Imares.

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The Delfland Sand Engine 15 months after completion: natural forces are distributing the sand along the shore; a large part of it will end up on the beach and in the dunes, thus feeding this eroding coast. Photo: Joop van Houdt.

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