

Restoring the meanders to a channelised river - DK

1. Policy Objective & Theme

- ADAPTATION TO RISK: Preventing and managing natural hazards and technological (human-made) hazards
- SUSTAINABLE USE OF RESOURCES: Preserving coastal environment (its functioning and integrity) to share space

2. Key Approaches

- Integration
- Participation
- Ecosystems based approach
- Socio-economic
- Technical

3. Experiences that can be exchanged

River restoration, for biodiversity and recreation, involving the re-introduction of the meanders removed following channelisation.

4. Overview of the case

The river Skjern was channelised and deepened in the 1960s and the river valley wetlands were reclaimed for agricultural cultivation. The restoration project described includes re-establishment of the meandering river and the natural water levels and water level fluctuation in the river and its valley. The purpose was to enhance the living conditions for plants and animals, safeguard a high water quality in the river and downstream lagoon and improve possibilities for outdoor recreation.

5. Context and Objectives

a) Context

The Skjern River is the largest Danish river as measured by waterflow. It drains 2,490 km² of cultivated, sandy plains in western Jutland and discharges into the lagoon, Ringkøbing Fjord, at the North Sea coast to which it is connected by sluices. 75 % of the total watershed area is cultivated, 13% forested, 7% is undisturbed countryside and the remaining 5% is urbanised. For many years the purpose of Danish stream management has been to increase the streams ability to transport flood water away as fast as possible from the agricultural land. Therefore most Danish streams (85 – 98% of the total river network) have been channelised and straightened, the wetlands and meadows drained and vegetation cut. The attitude, from the 19th to the late 20th century was strictly about increasing agricultural yield. In the 1960s, some 4000 ha. of wetland and meadows of the river Skjerne were drained and put into agricultural use. The dominating land use was barley and wheat production which together with fish farming led to the deterioration of water quality in the watershed. As a consequence, the flora and fauna in the fjord subsequently disappeared, because of increased nutrients loads, among them the Skjern salmon as well as many EU listed migratory birds.

Towards the end of the last century, the attitude towards the management of streams changed. Biodiversity was on the agenda and the streams now not only have to transport water and maintain a flood defence but also contain a wide variety of species and once again become a living habitat. The idea of restoring channelised streams and rivers, as well as the surrounding wetlands and meadows, is to re-meander the waterways and thereby re-create the natural dynamics of the watersheds. In 1987 the Danish Parliament decided to restore the lower reaches of Skjern River and its valley.

b) Objectives

The objective was to restore the lower 19 km of the Skjern River and its river valley of about 22 km². This entailed restoring the living conditions of animal and plant species, the nutrient retention capacity of the river and its valley, an internationally valuable wetland, fisheries and the recreational and tourist values of the area.

6. Implementation of the ICZM Approach (i.e. management, tools, resources)

a) Management

Most of the nature area is owned by the State. The Danish Forest and Nature Agency under the Ministry of Environment is responsible for managing and maintaining the area. The National Environmental Research Institute, Ringkjøbing County, Danish Institute for Fisheries Research and the Danish Forest and Nature Agency were all involved.

b) ICZM tools

A working group and an advisory board were established with representatives from local and national authorities and NGOs to assess the different restoration possibilities and to act as an advisory body for the Government. A proposal and an Environmental Impact Assessment (EIA) were published in 1997. This was the background for a public hearing. The Ministry of Environment and Energy decided that the project should be statutory and the Skjern River Act (1998) was passed. The project was to restore 2192 hectares of river valley. The construction work started in June 1999 and was largely finalised by autumn 2002. The main activities were the excavation of the new river course, removal of existing dykes and filling of the old channelised river reaches. An old pumping station and a weir were also removed. The activities also comprised construction of bridges, paths, recreational facilities and several car parking lots. Whenever possible, one of the original river banks formed one of the banks of the restored river. In total, 2.7 million m³ soil was moved. As part of the project, a new lake of about 5 km² (Hestholm Lake) was formed in the bottom of the river valley. As a general rule, no river maintenance (weed cutting) will be carried out in the restored river. For the state-owned areas, a nature management plan has been prepared. Extensive grazing with cattle or sheep has been established and some meadows are used as hay fields to avoid unwanted growth of bushes, trees and reed. The grazing fields are fenced but public access is ensured through gates.

Leisure and tourism are a large priority in this nature area. An interest group for leisure activities was set up by the Ministry of the Environment in 1998. The group consisted of representatives of all stakeholders: the group drew up a proposal for access and leisure activities all the while bearing wildlife in mind. An outdoor recreation plan was drawn up with the objective to give the local people and tourists the best possibilities for good nature experiences and recreational activities while safeguarding development of nature and ensuring nature protection. The area around the river has become a natural park complete with walking and biking paths and two small ferries.

There is an obligation to carry out a monitoring programme to evaluate the consequences of the project on the environmental and ecological qualities of the river system and the river valley within the restored area.

7. Cost and resources

The total costs were ca. €38 m., about the same order of magnitude as the cost of the land reclamation in the 1960s. The restoration project was granted EU LIFE support of ca. €3 m.

8. Effectiveness (i.e. were the foreseen goals/objectives of the work reached?)

The restoration project, which aimed at re-meandering the River Skjern to its origin course, has created a 22 km² natural and semi-natural river and river valley ecosystem. 40 km of restored river has been established and the length of the main river has increased from 19 km to 26 km. The old landscape with the cultivated fields has disappeared and the valley has changed into an open valley with a meandering river and with the lower parts of the valley permanently flooded as a shallow lake.

The restored area has become an important breeding area for waterfowl, an important resting area for migrating birds and

consequently a popular area for bird observations. The restoration has improved the breeding and survival possibilities for amphibians, because of the formation of a large number of shallow ponds and bogs surrounded by uncultivated meadows. In the restored and meandering river more diverse habitats have been created as compared to the former channelised river. As the water quality is good, it is expected that the diverse plant and animal life of the Skjern River will further increase the diversity in years to come e.g. in Europe, water-dropwort has a very limited distribution: it was common in the project area and seems to occur more frequently as a result of the restoration; also water-plantain, a very rare species which is threatened in Europe, and only occurs at very few sites in Denmark, was found to occur in the restored Skjern River. The restoration has not led to negative impacts on rare species in the area, except for a minor increase in the mortality of migrating smolts of salmon and trout. This is mainly caused by the increasing predation from cormorants and herons. The number of sightings of otter in the restored area has increased, aiding a general increase in the number of otters in Denmark. It has not been possible to calculate the amount of nitrogen and phosphorous retained in the restored river valley however monitoring results indicate that the retention is small (< 10%) compared to the total transport of nutrients through the river into the coastal lagoon.

In 1987 a many local people were against the nature restoration project and the farmers were bent on preventing the project from taking shape. The attitude of local people to the project has today changed for the better. The process has benefited enormously from local participation. Just as important was the input of farmers where the purchase of lands and rights was concerned. The area now attracts many local people and tourists who visit and use this internationally important nature area for all kinds of leisure activities. Several of the facilities are suitable for wheelchair users.

9. Success and Fail factors

Political will was a strong determining factor.

10. Unforeseen outcomes

None so far.

11. Prepared by

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13. Sources

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- Restoration of Skjern River. Summary of environmental monitoring results 1999-2003. (2005). J.M. Andersen, NERI Technical report no. 531. English summary. (available from http://www.dmu.dk/Udgivelser/Faglige+rapporter/Nr.+500-549/Abstracts/FR531_uk.htm)
- The possible impact of the restoration of River Skjern (2001) A. A. Alwan, G. Appiah-Kubi & P. Majland-Kristensen. Miljølære Århus universitet



Restaurering af Skjern Å Sammenfatning (3.42 MB) 



The possible impact of the restoration (3.59 MB) 