Transforming the river Rhine by international, voluntary co-operation - Europe

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
- Technical

3. Experiences that can be exchanged

The Rhine has been transformed from ‘’an open sewer’’ to one of Europe’s cleanest trans-boundary rivers in a matter of a few decades. It shows that voluntary agreements, provided they are backed by strong political will, and supported by appropriate legislation with a action plan can reverse even major ecological impacts.

4. Overview of the case

The Rhine Action Programme implemented a number of mitigation measures at national level which began to reverse the trend such that, today, 63 species of fish including salmon, sea-trout and river lamprey are again living and breeding in the river after an absence of over 30 years. Much habitat has also been restored as a result of an integrative approach which has seen the emphasis shift from water quality standards to a total ecosystem approach.

5. Context and Objectives

a) Context

The Rhine is one of Europe’s major rivers. From its source in Switzerland it flows through six countries before reaching the North Sea, a distance of 1,320 km. It has a catchment area of ca. 200,000 km2 in which more than 58million live. It provides drinking water for 20 million people yet is the most heavily used shipping waterway in Europe. The waters of the Rhine largely affect the coastal North Sea waters of Netherlands, Germany and Denmark due to the northward movement of the currents. The quality of the river water has been the long-standing problem of the Rhine and has been recognised since the middle of the last century. Industrial renovation following the second World War led to the growth of important chemical, pharmaceutical and other, heavy industries along the river’s banks. With no purification systems in place the water soon became very heavily polluted. This contamination was so severe that the river became almost lifeless as dissolved oxygen levels also plummeted. The anoxic conditions were augmented by large concentrations of heavy metals, pesticides, organic chlorine compounds and other hydrocarbons. By the end of the 1960s, the Rhine was widely regarded as an open sewer. All of these chemicals carried downstream also had the effect of finding their way into the sediments and the coastal waters and sediments of the affected North Sea states. Another issue has been the loss of the natural character of the Rhine and the adjacent coast. Throughout the length of the river, the landscape has changed dramatically. In the early 1830s, the river still moved freely through its floodplain constantly flooding and changing its course. Within forty years, canalisation, largely for shipping transport, hydro-electric power generation and flood protection had changed the river. The meandering nature of the river has been transformed, through damming and straightening, so that it now flows through a fixed bed, largely separated from its flood plain. The loss of its natural dynamics with urban populations now crowding its banks means that the bid to control flooding is

paramount. The state of the river was so bad in the 1950s that it could not be ignored and it was also clear that any action taken would need to be international.

b) Objectives

Focal aspects are the restoration of the habitat patch connectivity along the Rhine, the improvement of flood prevention, the indispensable further improvement of water quality including groundwater protection as well as ensuring that the waters of the Rhine will have good status by 2015 as mandated by the Water Framework Directive.

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

a) Management

The International Commission for the Protection of the Rhine (ICPR) is the operational body and is responsible for international co-ordination. The conference of Rhine Ministers takes decisions related to important political questions and provides the basis for coherent, complementary programmes of measures. Decisions are taken in annual plenary sessions. Working groups and expert groups with defined tasks work on all technical questions arising from the implementation of the convention on the protection of the Rhine and from European legislation. A secretariat and its international staff located in Koblenz support this work.

b) ICZM tools

In 1963, the Bern Convention on the Protection of the Rhine was signed and this was followed in 1976 on a Convention on the Protection of the Rhine against Chemical Pollution. Despite all the political goodwill that had been shown, it was not until the 1970s that internationally agreed measures were taken against organic pollution. The ICPR agreed internationally binding limits for hazardous substances which were implemented at national level. One of the early setbacks was the unforeseen economic effects that reaching the agreed limits would have outside the Rhine area. This meant that the European Commission needed to be involved in the interests of fair trade and this delayed the whole process of implementation. However, the slow progress being made over twenty years after the first agreement, coupled with a disastrous human-made disaster in 1986, led the riparian states to begin a second, parallel approach, the Rhine Action Programme. This Programme ran from 1987 – 2000 and ran parallel to the Convention against Chemical Pollution. It had new, clearly defined, long-term objectives and included the whole basin. Eventually, a new Convention on the Protection of the Rhine was agreed in 1999 which was more comprehensive looking to work towards sustainable development of the Rhine ecosystem, the river, its banks and alluvial areas as well as groundwater but also taking into account the improvement of the ecosystems of the North Sea. The original action plan has now been super-ceded by the Rhine 2020 Plan (2001 – 2020) with a mandate to concentrate on flood prevention and, further, on the rehabilitation of natural landscapes and habitats.

The first Rhine Action Programme had its origins in the fire at the Sandoz insecticide storage site in 1986, near Basle after which tonnes of dead fish and other animals were recovered from the Rhine. The accident produced massive publicity around Europe and generated enormous momentum and political will for the Rhine states to make resources available. New, clearly defined, long-term objectives were adopted for the Rhine with the ultimate aim being the rehabilitation of the migrating salmon, as a symbol not only of the Rhine river itself but the coastal waters of the North Sea and the estuary. The inclusion of the whole basin into a river programme was very new but apart from the other major goal of reducing pollution to such an extent that not only supplies of drinking water could be guaranteed and that Rhine sediments could be used as land-fill it also sought to improve the ecology of the North Sea. The latter was recognised because of the enormous algal blooms of the late ‘80s due to nitrogen and phosphorus loads from the river. Thus the Rhine Action Programme was a watershed in international water management because an explicit commitment was made to broaden the scope of co-operation beyond water quality aspects and embrace clear ecosystem goals in an integrated water management regime for the Rhine River Basin.

What is interesting about this approach is that the Programme is not a legally binding international instrument as is a Convention showing that treaty-related legislation and instruments are not necessarily a pre-requisite for national implementation. The Programme also allowed different objectives to be attained in different areas and different pollutants. This flexible approach leaves more discretion in the hands of the implementing states allowing a more comprehensive approach than mandatory legal requirements. It does, of course, mean that strong political wills must prevail since only political and/or public pressure can prevent any state from defaulting on the agreements. This programme has now been super-ceded by the

Rhine 2020 plan. It's mandate is to concentrate on flood prevention and, further, on the rehabilitation of natural landscapes and habitats. Again, what appear to be ambitious targets have been set with a major target, taken in conjunction with the Water Framework Directive, that the waters of the Rhine will have good status by 2015. This applies not only to the river water itself but also the coastal waters and groundwater.

Flood prevention should lead to reaching greater ecological targets provided the measures taken work with natural processes rather than, as in the past, against Nature. In this respect, it is the intention to re-connect dead river branches, re-establish floodplains as alluvial areas in order to re-create natural flood retention areas. Current thinking on flood prevention is being modelled on more natural river landscapes. Targets are also more ambitious with respect to water quality with fish, mussels and crayfish fit for human consumption to be caught in the Rhine and bathing quality reached in suitable places.

7. Cost and resources

No costs available.

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

Implementation of the Programme has led to an enormous improvement in the water quality of the river Rhine such that it has been transformed into one of the cleanest trans-boundary rivers in Europe.

State-of-the-art techniques and procedures have had to be developed both for industrial effluents and urban waste water treatment. Most of the reduction goals of 50% reduction of industrial wastes by 1995 had been achieved by 1994 with some reductions even reaching 90%. Most importantly, these reductions have led to an enormous improvement in the water quality of the river Rhine. It fully meets the standards for drinking water for all but a few substances. This has been accompanied by ecological progress as well with Atlantic salmon and sea trout not only returning 700 km inland to the river's tributaries but naturally reproducing there as well. A fish inventory has shown a further 61 species in the river that had disappeared and not been seen since 1970.

9. Success and Fail factors

One of the main reasons for success was, perhaps ironically, the fact that the Rhine Action Programme was only a voluntary agreement. With the ''polluter-pays'' principle, industries were made responsible for the problems their effluents were causing. An integrated, ecosystem approach including sediment transport, protection against flooding, restoration of river banks etc has proven to be a better approach than simply looking at water quality alone. The linkage between the OSPAR Convention (strictly North Sea and NE Atlantic) and the ICPR has been very useful. NGOs have been embraced in a participatory approach within the ICPR (and OSPAR). It has needed a very strong political will and good co-operation amongst the various institutes of the riparian states although it took a human-made disaster before assertive action was taken.

10. Unforeseen outcomes

As the river improves, so the public concern lessens and one of the challenges for the future will be to maintain the political will so that advances will continue to be made.

11. Prepared by

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12. Verified by

It has not been possible to verify this case.

13. Sources

- No frontiers for the Rhine: Inventory 2004 in the Rhine river basin. ICPR. 2005.
- Convention on the protection of the Rhine. 1999.
- Conference of Rhine Ministers 2001: Rhine 2020 Programme on the sustainable development of the Rhine. 2001.
- Upstream Outcome of the Rhine Action Programme (2000) International Commission for the Protection of the Rhine

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Upstream action of the Rhine Action Programme (2.65 MB)

conference of rhine ministers 2001 (3.93 MB)

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