A programme of measures for implementation of the Water Framework Directive, Kyrönjoki River Basin - FI

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
- SUSTAINABLE ECONOMIC GROWTH: Balancing economic, social, cultural development whilst enhancing environment

2. Key Approaches

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

3. Experiences that can be exchanged

The development of a comprehensive set of measures designed to bring catchment waters to a good quality status by 2015 as required by the Water Framework Directive.

4. Overview of the case

Human activities in a highly acidic catchment area have led to acid-leaching on a scale that will mean the river and coastal waters will not meet the targets of the Water Framework Directive. A management plan, with a cocktail of necessary measures, has been drawn up with the objective of safeguarding the river and coastal waters for marine and migrating fish.

5. Context and Objectives

a) Context

The River Kyrönjoki is the main river of South Ostrobothnia (catchment area 4,923 km2) and empties into the northern part of the Gulf of Bothnia. By Finnish standards, the land use of the catchment area is very intensive: 25% of the area is arable land and can be as much as 60% in some sub-catchments (compared to 9-29% nationally). There are also several Natura 2000 areas and tourism beaches. The remainder is made up of heathland (50%) and peat (22%). There are ca. 100,000 inhabitants in the Kyrönjoki area, of which 30% are not connected to the municipal sewer system. Agriculture, animal husbandry, settlement, forestry and peat production all have a significant influence on the quality of the surface and ground waters in the area

Peat production is the main point source polluter. In the River Kyrönjoki catchment, at the end of 2003, there were 77 peat mining areas functioning, and their total area was about 7,900 hectares. The acidity originating from the soil has a significant influence to the condition of River Kyrönjoki and its coastal sea area. It occasionally causes fish kills and metal washout due to the low pH complicates fish reproduction. The lowest pH in the river water is annually around 4.7. There is also non-point source pollution from open field cultivation (124,300 hectares of arable land growing grains, grass, oats and barley), animal husbandry (pork 19,700 t/a), beef (4,000 t/a) and milk (103,200 million l/a), fur farming (40,000 mink and fox skins) and forestry (with 2,000 hectares fertilized). However, both the River Kyrönjoki and its coastal sea area is a nitrate vulnerable area.

The River Kyrönjoki is also an important water supply for the population.

b) Objectives

The primary aim of the programme of measures within the water management plan of the River Kyrönjoki is to safeguard the existence of marine white-fish, sea trout and lamprey. The aim in its tributaries, the Kauhajoki and Jalasjoki, is to guarantee the living conditions of brown trout and crayfish populations and in the Seinäjoki the aim is to guarantee the breeding potential of crayfish. Therefore the objective in the water management of River Kyrönjoki catchment is to reduce acidity peaks and nutrient load. In addition, fish migration in all water bodies must be possible. In some ground water areas, habitat restoration is needed.

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

a) Management

The River Kyrönjoki Advisory Board, a stakeholder co-operation group, has participated in preparing the water management plan of the River Kyrönjok catchment. The Programme of Measures was drafted in a working group, which included representatives from the West Finland Regional Environment Centre, the Department of Fishery of the Employment & Economic Development Centre, the Water Protection association of Ostrobothnia and the Central Union of Agricultural Producers and Forest Owners.

b) ICZM tools

In Finland, the Water Framework Directive has been implemented with the Water Management Act (2004). Surface waters were classified in 2004 based on either their ecological or chemical status. This classification was needed to locate the sites where water management is required in order to attain good status by 2015 and to estimate which of them cannot be improved.

A series of targets were then set:-

- the pH should not fall below 5.0 and should be, as often as possible, above 5.5,
- the nutrient load should be reduced by at least by 25% and, if possible, by 50% compared to the situation in the mid 1990s to reduce eutrophication,
- suspended solids should be reduced as efficiently as possible, and
- all obstacles (8) to migrating fish should be removed and the ecological structure of the river improved.

Reducing the impacts of acidification: On the basis of a preliminary cost-benefit analysis, the acidity problem of the River Kyrönjoki cannot be solved with currently used methods. Immediate measures should be directed especially to controlled drainage, liming filter ditches and possibly to liming water bodies locally and removing fields from cultivation locally. However, all of these measures are so expensive that their full scale execution requires functional support funding. It is concluded that the acidity will prevent the River Kyrönjoki, and part of the coastal sea area, reaching a good ecological status by 2015 although the acidity can be reduced.

Reduction of nutrient and sediment load: Open field cultivation contributes more than all other operations combined. Reducing this load will entail reducing, adjusting and specifying fertilising, increasing controlled drainage, building buffer zones for flood vulnerable areas and in fields that slope to water bodies and, additionally, creating wetlands in brook and ditch hollows. Lightened cultivation and green fallowing will be needed to support these measures. Lack of data on the wash-out rate means that a significant reduction may be difficult to achieve and the target may not be reached.

Peat production and forestry: At the river system’s headwaters, where there are no fields, peat production and forestry are significant load sources. Sedimentation basins and ditches between two strips are the most used water protection methods in peat production because overland-flow is not suitable for all areas. A permit system has been introduced and includes, i.a. orders about water protection restrictions in the areas used for production. Reducing the load of forestry requires executing sufficient water protection measures like ditching, cutting and fertilising targets. Water protection of old ditching areas will also be rationalised with nature management projects. It is likely that the more demanding target level nutrient load reduction of

forestry will be attained.

Scattered settlements and waste water treatment plants: During the low flow season of the river, the importance of scattered settlements and waste water treatment plants is larger than open field cultivation. Therefore, a statute on waste water management from scattered settlements was passed in 2004. This concerns both permanent and holiday settlements. Accordingly, 85% of phosphorus, 40% of nitrogen and 90% of organic matter must be removed from the waste waters by 2014 such that the waste waters of scattered settlements will allow a good ecological status in the River Kyrönjoki.

Animal husbandry and fur farming: The load of animal husbandry and fur farming can be decreased by reducing direct discharges, adjusting manure use and spreading, and by treating dairies' washing waters as well as run-off waters. A nutrient load reduction accordant to the more demanding target level should be attained.

7. Cost and resources

No costs for the development of the management plan and programme of measures have been found.

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

The condition of the River Kyrönjoki and its coastal sea area can be fundamentally improved with the measures presented in the programme. However, a good ecological status is probably not going to be attained in the coastal sea area and the whole region of the River Kyrönjoki by 2015. According to a preliminary assessment, the biggest hindrance to good ecological status in the main channel of the River Kyrönjoki is acidity although both nutrient load and structural matters are important. Both acidity and nutrient load are the hindrances for a good ecological status in the inner archipelago and delta of the River Kyrönjoki. However, it is possible to reach a good ecological status in most, but not all, outer sea areas. Ground water areas are mainly in good condition.

9. Success and Fail factors

The status of the waters of Kyrönjoki have been monitored since the 1960s so there is much data available. Achieving distinct results requires that the farmers of the area participate in the large-scale measures taken on arable lands and water bodies especially the most acidic ones.

10. Unforeseen outcomes

None as yet.

11. Prepared by

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12. Verified by

It has not been possible to verify this case.

13. Sources

- River Kyrönjoki Water Management Plan (2006) L.M. Rautio, E-K. Aaltonen and K-I Storberg, West Finland Regional Environment Centre
- Water Quality Management in the Baltic Sea Region Regional Implementation of the EU Water Framework Directive (2006) BERNET CATCH

River Kyronjoki water management plan (3.43 MB)

Water quality management in the Baltic Sea 2006 (10.1 MB)