PROLINE-CE

WORKPACKAGE T2, ACTIVITY T2.1

SET-UP OF PILOT-SPECIFIC MANAGEMENT PRACTICES

D.T2.1.5 SET-UP REPORT ABOUT ADAPTATION OF THE TRANSNATIONAL CONCEPT TO PILOT ACTION LEVEL

PILOT ACTION: PA2.3 – Tisza catchment area

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1. Introduction

The Deliverable DT2.1.5 “Set-up report about adaptation of the transnational concept to pilot action level” presents scheme for implementation of transnational concept, developed in T1, on the level of Pilot Action PA2.3 Tisza catchment area.

GAPs and best management practices (hereinafter BMPs) on national level are presented in D.T1.1.1 - Country report about the implementation of sustainable land use in drinking water recharge areas and D.T1.2.1 – Country-specific best management practice report. Transnational concept is presented in two main T1 deliverables:

- D.T1.1.2 Transnational Synthesis status quo report, where strengths and deficiencies regarding land use and water management in drinking water recharge areas are presented on regional and national level and enhanced with EU level;

and

- D.T1.2.2 Transnational best management practice report, a synthesis of BMPs is presented on regional and national level and enhanced with EU level. This report provides also a structure for sustainable land use regarding drinking water supply issues.

National and transnational reports regarding sustainable land use in drinking water recharge areas and BMPs were the basis for interactive workshop discussion at national stakeholder meetings (D.T1.3.2 and O.T1.1), performed in each country (Pilot Action area). Outcomes of the national stakeholder meeting set guidelines for further work in Pilot Action. On the other hand, outcomes from national workshops were gathered in transnational report D.T1.3.3 Lessons learnt at the national stakeholder workshops, which includes also derivation of measure groups in relation to land use types management and proposal of mitigation of the water-related natural risks.

BMPs and measures for drinking water protection and management, which are derived from T1, will be reviewed and tested in Pilot Actions. Review of main land use conflicts and BMPs on Pilot Action level has already been done in Pilot Action BMPs reports, which were a basis for D.T2.1.2 Transnational case review of best management practices in pilot actions. Description of natural characteristics of Pilot Site is presented in D.T.1.4 Descriptive documentation of pilot actions and related issues. The goal of this deliverable is to set-up activities in particular Pilot Action. In this report a scheme for activities in Pilot Action is presented.

2. Climate Change

For Hydraulical/hydrological and hydrogeological modelling of climate change scenarios daily precipitation, evaporation, temperature and ground water level data with bias correction will be applied.

For PA 2.3 climate change data will be provided by the Hungarian Meteorological Institute and Water Monitoring Network of Water Directorates.

Climate and climate change issues in Pilot Actions will be described in detail and discussed in the deliverable D.T2.3.3 - PA reports about climate change issues in pilots.

3. Implementation of best management practices

The main conflicts between drinking water supply and land use

There are total 165 drinking water resources (155 working, 6 perspective and 2 reserve resources) on the Pilot Area. From these there are 4 bank-filtered resources, 151 groundwater, 4 shallow groundwater and 2 surface drinking water resources.

The productions of surface water represent 35% of extracted water from the Pilot Area, while their protection areas account 1% of the total protection areas.

The total surface of the Pilot Area is 7614 km^2, of which is 5% covered by drinking water protection areas, and from that only 3 km^2 area is surface drinking water protection area.

Among the surface drinking water basins, the Szolnok Tisza (336 + 650 rkm) and the Eastern Canal (48 + 340 rkm) water bases can be found along surface watercourses. There are problems with the introduction of communal and industrial waste water, nitrates and pesticides from the agricultural land on the water basin. In these water basins, flood risk is also significant. However, the assessment under this Regulation does not indicate exceeded limit value in any watercourse.

The main conflicts between drinking water protection and management and flood protection and solutions

One of the surface drinking water sources is situated along the Tisza, so the importance of flood protection is very significant on the PA. The probability of flood hazard below the Lake Tisza is high; the Szolnok area is situated on this part. Above the Lake Tisza the probability of flood hazard is medium. The Kisköre reservoir or Lake Tisza has got important issues in flood protection, and in the maintenance of minimum river flow.

The Keleti Main Channel is protected by driving its water level, but the region between the Keleti Main Channel and the River Tisza is high probability of flood hazard area.

In Hungary the preliminary flood risk assessment has been done based on the readily available information. Hazard and risk maps were supervised and strategic risk management plan was also prepared (2015).

On the PA, along the total length of River Tisza main flood protection dykes have been built. Their establishment and protective ability are on different levels, so the hazard of flooding in the areas they protect varies as well.

Risk management plans include several structural and non-structural measures, like preparation of Flood Riverbed Management Plans.

Along the river Tisza and on the Hungarian water shed of the Tisza catchment there are many sensitive drinking water resources, several are located on possible inundation areas. On the pilot area DWPAs are consistently located along the river Tisza and its tributaries.

They are exposed to different possibility flood events which could contaminate the water supplies, although there is an existing regulation on the protection of these drinking water protection areas. The regulations take into consideration of the flood levels and are adopted to regular or low possibility inundations.

Application of BMPs to solve these conflicts for the purpose of assuring safe drinking water supply

Proposed measures for water courses

- According to the 123/1997. (VII.18). regulation: both on the water body and on the water bank must be designated a protective zone.

- Protection with a grass-covered protective barrier against spatial impacts, and flushing at water bank.

- Agricultural areas should not touch the waterfront.

- - If agricultural areas touch the waterfront, "greening" can help, so farmers do not cultivate part of their territory, but they provide natural plant cover. This is accomplished along the water bank to protect the river from unfavourable effects of spatial drainage.
- Purified sewage water supply is not located directly above the water intake plant, but is located under or above it. If it is located above it, then further and line of drift intake is necessary, thus the mixing is completed as quickly and completely as possible.
- In all cases, calvarias threaten groundwater water resources; it is a safety measure to monitor the water quality of a water body with a continuous measuring instrument. In case of problem, water abstraction is eliminated.
- Water purification technology also provides protection.
- Creation of the grassland along the surface waterway, which is mostly grassy, to withstand the dry matter from the background rainwater.

Proposed measures for protection of surface-, groundwater and bank filtered drinking water resources

Protected areas were initially mapped by distance, but since 1997, access times. A national program was established to lay the foundations for the protection of non-protected drinking water bases, the determination of protective areas by model, the establishment of a monitoring system, the exploration of pollution sources and the preparation of an action plan for safety and maintenance. In the case of residential area, the settlement rules appear in the regulatory plan.

In the drinking water protection areas, the sewerage system of settlements is typically solved. In non-channelled settlements, the collection and transport of sewage in closed containers is a requirement, but the control of it is not solved. In the case of outdoor site constructions, the use of a single sewage treatment plant could be acceptable in the water protection area.

In the case of arable land cultivation in outer territories, enforcing the compliance with water protection methods is the most difficult. This is due to the difficulty of control. It is practically impossible to check what kind of activities the owner is carrying out, how and what nutrients or pesticides apply. Subsequent sampling and testing are possible, which is also cumbersome and costly. A practical solution is voluntary compliance, the importance of it farmers must be defeated. It is not an easy task. In the case, the farmer ecological farming or enters the agro-environment system, the water protection rules will be implemented more or less. In the framework of these systems, control is also solved. Cooperation between water and agriculture is required. Cooperation between the waterworks and the forestry industry is also required. It is a favourable situation if the area is protected from nature conservation.
Another possible measure is the BP PF3 Establishment of agro-forestry systems (grazing) and wood-pastures.

Experiences of land use regulations on DWPAs

Land use regulations are used on the DWPAs, where local experiences and possible contaminations can be examined and elaborated. The adoption of new best management practices into land use regulations can be investigated.

DWPAs on flood reservoirs

The flood reservoirs, implemented along the 'Vásárhelyi Terv Továbbfejlesztése' (VTT) (Development of Vásárhelyi Plan) generate new situations regarding the connection of DWPAs and inundations by the river Tisza. The regulations on the DWPAs in reservoirs should be examined and adopted to the changes.
As conditional measure Middle Tisza District Water Directorate (KÖTIVIZIG) would attempt at some of the „Mid-Tisza" VTT reservoirs a form of landscape management that would still supply water to the reservoir if there is no extraordinary flood. This is most likely not to be done through the intruding instalment, but on the extruding instalment, with water management method similar to flood plain economy. The Water Directorate examines the possibilities and the constraints.

In aspects of drinking water protection the non-structural flood protection measures (modify land use in floodplain and inundation areas, vegetation conversion and reservation) are favourable, because the flood does not remain on the DWPAs for a long time.

From the structural flood protection measures there are several ones (dredging) which effect negatively mainly the bank-filtered system. The PA is focusing to the surface drinking water systems which are also sensitive for dredging.

There is conflict of interest between flood- and drinking water protection, so solving this conflict it is necessary secure strong expert background and multipoint consultations.

Implementation strategies

The implementation strategies are stakeholder involvement and voluntary compliance. Organizing regular interactive workshops with local stakeholders.

4. Modelling

There are existing models: HEC-RAS, HEC-HMS for flood and Modflow application for determinating the DWPZs. These would be corrected with climate change elements and scenarios.

There is hydrological model that can be used to investigate the hydrological effects of climate change.

5. Conclusions

In this report a scheme for Pilot Action activities, which will be performed in Pilot area, is presented.

Description of performance of pilot activities and first outlining of foreseeable solutions will be described more in detail in D.T2.2.4. - Partner-specific interim pilot action progress report. This preliminary report will be discussed and presented during TM4 and Project First Review in April 2018 (D.M.2.5).

Outcomes from the management actions examined in Pilot Actions, description of conducted activities and identified solutions for case-specific adaptations of management concepts will be described in D.T2.2.2. - Partner-specific pilot action documentation. In this report, also gaps between the revised best management practices and actual management practice will be outlined.

6. References

Best management practices report in pilot action, “PA2.3 Tisza Cathment Area” (2017)

D.T2.1.5 Set-up report about adaptation of the transnational concept to pilot action level, PA2.1 Well field Dravlje valley in Ljubljana, (2017)

D.T1.2.2 Transnational best management practice report (2017)

Country Reports about the Implementation of Sustainable Land Use in Drinking Water Recharge Areas, D.T1.1.1 Country-specific reports-Hungary (2017)

PROLINE-CE, Workpackage T1, Activity T1.2, PEER REVIEW OF LAND USE AND WATER MANAGEMENT PRACTICES, D.T1.2.1 Country-specific best management practice reports (2017)

D.T1.1.2 Transnational synthesis status quo report (2017)

Set up of pilot scecific management practices, D.T2.1.4 DESCRIPTIVE DOCUMENTATION OF PILOT ACTIONS AND RELATED ISSUES –Tisza Catchment Area