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: PA3.2 - Along Danube Bend

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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 ***PA3.2 Along Danube Bend***.

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 3.2 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

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.

In the case of forest cultivation, clear-cutting may cause contaminant loads. This may be significant in karst areas. In the karst area, the unfavourable effects of land use interventions can appear directly in the drinking water. As a result of the clear-cutting, the soil may sink into the aquifer causing deterioration of quality. Designating sensitive areas and managing trees as a defence forests can be a solution. This, however, affects the forest manager financially. Cooperation between the waterworks and the forestry industry is required. It is a favourable situation if the area is protected from nature conservation.

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

The bank filtered drinking water sources are situated along the Danube, so the importance of flood protection is very significant on the PA. The probability of flood hazard on the Szentendre Island is high, in the Budapest urban area is medium, and on the south plain part of the PA is low.

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 which effect negatively the bank-filtered system. The dredging risks eliminating the natural filter (gravel and film layer) of the riverbed which is the base of natural purification of bank filtering. Further negative effect is the modification of river line.

In case of bank-filtration the particular challenge is the necessity of protection from both the river side and the background. In the same time the wells are shallow drilled, so the system is exceptional vulnerable. Due to the dual endangering there is conflict of interest with flood protection, so solving this conflict it is necessary secure strong expert background and multipoint consultations.

BMPs, which are recommended to solve the conflicts for the purpose of assuring safe drinking water supply

- BP MF3, BP PF1 Protective forest management and afforestation of DWPA

  Protective forests are especially important for the protection of the bank filtered systems. These forests mitigate or prevent the impact of a natural hazard, including soil erosion, landslide or flooding.
- BP SR1 Protective forest management on floodplain
- BP PF3 Establishment of agro-forestry systems (grazing) and wood-pastures
- BP PA1 “Good Agricultural Practice” guidelines

  On Szentendrei and Csepel Island water protection areas managed by Budapest Waterworks (BW) by establishment of a farm advisory system.

  There are more than 150 wells on Csepel Island and several hundred on Szentendrei Island producing potable water for Budapest and its agglomeration. The long-term sustainability of the excellent quality of that water depends on a number of impacts: the local waste and sewage management, the local industry, its locations and environmental status, mining, presence of open and/or stagnant water and the agricultural activities.
- BP PA4 Controlled application of manufactured fertilizer in high-risk areas
- BP PA6 No-chemicals and organic farming
- BP PA7 Agro-environmental payments under Rural Development Programme of Hungary
- Set up of individual waste water treatment plants for individual houses
- More stringent persecution of contaminated site remediation

Floodplain

On the PA, along the nearly total length of Danube 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.

Best management practice can be BP SR2 Non-structural flood defence measures.

Implementation strategies

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

In the water resources area of Szentendre, the manure storage practice and the effects of manure storage in the soil and groundwater have been thoroughly checked at all livestock farms. After the audit, several farmers voluntarily changed their practice solely on the basis of

measurement results. With the help of financial support, the closed manure storage facilities were built. In view of the fact that improper storage of manure can be observed by visual inspection and because it results locally high concentration of nitrate in groundwater, control and demonstration are relatively simple. So this method is effective, even in the field of voluntary compliance. Authority can also be initiated.

Joining the Agro-environmental system is voluntary, not all farmers enter. Its effectiveness can be measured in comparatively larger agricultural areas, such as on the water resources of the Szentendre Island, where groundwater quality data has been available for a long time. If we associate the agricultural land with environmentally friendly production, and their proportion, it can be statistically examined, if there is a favorable change in groundwater resources. This can be investigated in areas where there is no impact or not change in the intrinsic or other nitrate content. Hopefully it is possible to demonstrate on Szentendre Island whether the continuation of environmentally friendly farming in the area is sufficient for the quality improvement of groundwater, and whether this method is effective.

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, “PA3.2 Along Danube Bend” (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)