PROLINE-CE

WORKPACKAGE T2, ACTIVITY T2.3

IMPLEMENTATION OF BEST PRACTICES FOR WATER PROTECTION IN PILOT ACTIONS

D.T2.3.1 EVALUATION REPORTS FOR EACH PILOT ACTION

PILOT ACTION:,PA2.2 Kozłowa Góra

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1. Introduction

Best management practices (hereinafter BMPs) for drinking water protection and management derived from T1 were reviewed and relevant BMPs were selected for particular pilot action. Implementation status of BMPs was verified in Pilot Actions (T2); in case of lacks identified, possibilities of improvement and implementation were also assessed. Drinking water protection and management and best practices are strategically implemented in the pilot actions, in order to achieve a function-oriented land-use based spatial management for water protection at the operational level. Measures and actions were analysed and proposed concerning mitigation of extremes and achieving a sustainable drinking water level. PROLINE-CE pilot actions reflect the broad range of possible conflicts regarding drinking water protection, such as: forest ecosystem service function; land-use planning conflicts; flooding issues; impact of climate change and land-use changes; demonstration of effectiveness of measures including ecosystem services and economic efficiency.

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.2.1.4 Descriptive documentation of pilot actions and related issues*.

Activities within Pilot Action are described in *D.T2.2.2 Partner-specific Pilot Action documentation report*.

The Deliverable *D.T2.3.1 Evaluation reports for each pilot action* presents an evaluation of actual implementation and thematic interpretation of tested management practices as well as their acceptance among stakeholders and experts is carried out for pilot action PA2.2 Kozłowa Góra.

2. Evaluation of BMPs in Pilot Action

2.1. Implementation of BMPs

Implementation of BMPs action in Kozłowa Góra Pilot Action area focused mainly on establishing DWPZ and thus prohibition and recommendations for land use and water management but other BMPs and measures where implemented as a pre-action to gain full knowledge about sub-basin of the drinking water reservoir and its reaction to possible hazards.

2.1.1. Establishment of constant, multi-aspects water monitoring in the catchment scale

Based on multi-aspect monitoring network in Kozłowa Góra catchment, conducted within WP T2, GPW is preparing procedure to implement constant monitoring studies within Kozłowa Góra

catchment area. Conducting of the monitoring will allow getting full information about water quality, quantity and pressures on water resources observed in the Pilot action area. Results will be also used as an input data to modelling studies. Results of the monitoring investigation phase are included within DT 2.2.2.

2.1.2. Complex catchment modelling

Establishing complex catchment modelling allows simulating tributaries inflow to reservoir under specific climate conditions, load of pollutions. The model, considering period 2012-2017, was set up. Calibrated and validated model, integrated with ecological model, based on data collected within conducted monitoring, will be using as an early warning system.

2.1.3. Establishment of an ecology model of water reservoir

Establishing complex catchment modelling allows simulating tributaries inflow to reservoir under specific climate conditions, concentration of nutrients, amount of phytoplankton (four groups), zooplankton, influence of fishes and retention time. The model, considering period 2012-2017, was set up. Calibrated and validated model, integrated with ecological model, based on data collected within conducted monitoring, will be using as an early warning system.

2.1.4. DWPZ proposal

Together with implementation of the new Water Law Act in Poland, starting from January 2018, the introduction of direct protection zones for each water intake is obligatory. Implementation of DWPZ proposal is now being prepared to legislative procedure. Establishing of the DWPZ is expected to set up approx. in the first half of the 2019. Proposal contains limitation and recommendation concerning land use and water usage to protect water resources, especially water intake Kozłowa Góra.

The proposal, developed within Pilot Action activities, considers establishing of two Drinking Water Protection Zones – primary (DWPZ I) and secondary (DWPZ II).

The DWPZ I, includes the nearest area of the water intake, considering implementation of:

1. Prohibition of the use of land for purposes not related to the exploitation of the water intake;
2. Limitation in the access of unauthorized person on the DWPZ I area
3. Rainwater should be discharged in a way that prevents from reaching the devices used for water intake;

The DWPZ II, covering the area of Kozłowa Góra reservoir bounded by a shoreline at an extraordinary damming level of 278.99 m a.s.l., considering implementation of:

1. prohibition of bathing and water sports, with the exception of angling on the terms set out in the rules of the fishermen entitled to fish and except for one-time canoeing, each time agreed with the administrator of the tank,
2. prohibition of arranging camps and catering places,
3. prohibition of entering into the zone 100 m from the dam for vessels entitled to fishing,
4. prohibition of the use of water vehicles, in particular water powered vehicles, with the exception of vehicles of entities authorized to fish and the administrator of a reservoir performing official duties,
5. prohibition of locating new water intakes,
6. prohibition of mining of stone, gravel and sand,
7. prohibition of carriage of petroleum and dangerous products through the dam and related roads

Limitations and prohibitions respond the provisions of the Water Law Act and internal regulations of Silesian Waterworks PLC.

Both two zones will be signed with special boards, following current regulations.

2.1.5. Raising awareness and increasing knowledge

Raising awareness and increasing knowledge of the society is crucial in the protection of drinking water resources since the level of awareness among society in low.

Silesian Waterworks PLC is planning organisation of set of meetings with society. The first was held in Wymysłów on 15th December 2017. During the meeting GPW presented overview of the PROLINE-CE project, aims of the project, possible impact of human activities on water resources and actions carried out within PA. Second meeting is planned in January 2019.

GPW is also planning to start information campaign. The campaign is including the realization of informational – ecological movies directed to the local community, general society, stakeholders, and to kids to raise their awareness. Also, GPW is planning to organise meetings / happenings with society, f.e. World Water Day celebration, to summarizing Pilot Action activities and bring the participants closer to problem of protection of drinking water resources.

2.2. Acceptance of BMPs among stakeholders

Conception of BMPs implemented within Kozłowa Góra PA was presented during stakeholders and society meetings such as PROLINE-CE First Stakeholders Workshop, during speeches given under scientific conferences and symposia.

During the meetings participants have had an opportunity to get familiar with BMPs proposal and possibilities to implement them within PA areas.

BMPs proposal and possibility of its implementation met with great interest among stakeholders and experts. They underlined the need of raising awareness and increased knowledge of society and improve water policy. They highly recommend including modelling as an important tool in water management.

2.3. Overview table about implementation of BMPs in Pilot Action and their acceptance among stakeholders

Table 1: GAPs and proposed BMPs with recommendations for implementation in Pilot Action.

Actual management practice (GAP)		GAP1: Small scope of water monitoring	GAP2: No complex evaluation of water hazards	GAP2: No information about ecology of water reservoir	GAP4: No DWPZ established	GAP5: Low level of society awareness
Proposed BMP		Establishment of constant, multi-aspects water monitoring in the catchment scale	Complex catchment modelling	Establishment of an ecology model of water reservoir	DWPZ establishment proposal	Raising awareness and increasing knowledge
Proposed solutions and recommendations	adaptation of existing land use management practices	No adaptation required	It is highly recommended that within preparation of local land use management plan procedure results of the catchment modelling should be taken into account	It is highly recommended that within preparation of local land use management plan procedure results of the ecological modelling, integrated with catchment models, should be taken into account	Limitations and prohibitions are included within the proposal	Participants are getting familiar with current land use management practises and proposal for BMP
	Adaptation of existing flood/drought management practices	Investment in monitoring system contains constant monitoring system	It is highly recommended to use results of the catchment modelling simulation in flood/drought management	It is highly recommended to use results of the ecological modelling simulation in flood/drought management	Limitations and prohibitions are included within the proposal	Participants are getting familiar with current management practises and proposal for BMP

	Adaptation of policy guidelines	Need of conducting proper, multi-aspect monitoring of water system should be emphasized in guidelines at local, regional and also national level	Recommendation to include catchment modelling as a one of the tool using to improve water management	Recommendation to include the ecological modelling, integrated with catchment models, as a one of the tool using to improve water management	Proposal considers current Water Law and policy guidelines; Implementation of DWPZ	Participants are getting familiar with current policy
IMPLEMENTATION		YES	YES	YES/NO	YES/NO	YES
In case of NO:	possibility of implementation					
	proposal of procedure for implementation					
	other (please, specify)			**Catchment and ecological model already established, integration of these two models is ongoing**	**Proposal is currently under legal procedures**	
ACCEPTANCE AMONG STAKEHOLDERS AND EXPERTS						
possibility of implementation		Conducting a multi-aspect monitoring is an easy and sufficient solution for gathering information about water ecosystem	Stakeholders and experts recommend implementation of catchment modelling in water management as one of the tool to simulate water environment and	Stakeholders and experts recommend implementation of the ecological modelling, integrated with catchment models, in water management as one of the	High need of establishing DWPZ at Kozłowa Góra reservoir	High need to raise awareness and increase knowledge in society

		impact of possible hazard on water	tool to simulate water environment and impact of possible hazard on water		
proposal of procedure for implementation	Implementation needs first carrying out screening monitoring to gather general spatial and seasonal information about water environmental components and water hazards. Next step is selecting representative monitoring points, which provide reliable information. Within selected monitoring point it is recommended to provide long-term multi-aspect monitoring to gather full knowledge of water environment and possible hazards.	Catchment modelling should be included in policy guidelines as important tool for water management	Ecological modelling, integrated with catchment models, should be included in policy guidelines as important tool for water management		Organisation of meeting at local scale
other (please, specify)					

3. Conclusions

Under realization of PROLINE-CE GAPs in water management in the sub basin area of Brynica River, upstream Kozłowa Góra dam, was underline.

Best Management Practises, currently existing and proposed within WP T1, was recognised and adapted to needs of the problem of Kozłowa Góra reservoir's catchment. The problem the Pilot area meets is algal bloom in the summer time, which is a consequence of inappropriate land use and water/waste water management. Within the PROLINE-CE project several BMP was implemented: multi-aspect monitoring, catchment and ecology modelling, preparation of the proposal for DWPZ and raising awareness and increasing knowledge of the society. Implemented BMP will allow to improve water management. Application of numerical modelling and monitoring together with education of society, will allow to recognise and possibly reduce load of pollution within catchment area.

4. References

Report has been prepared based on:

- PROLINE-CE reports:

  D.T1.2.2 Transnational best management practice report

  D.T1.3.4 Transnational Catalogue of Strategies and Measures to Be Integrated into Existing Policy Guidelines

  D.T2.1.2 Best Management Practices Report in Pilot Action: PA 2.2. Kozłowa Góra;

  D.T2.1.4 Descriptive Documentation of Pilot Actions and Related Issues: PA 2.2 Kozłowa Góra;

  D.T2.1.5 Set up Report about Adaptation of the Transnational Concept to Pilot Action Level: PA 2.2 Kozłowa Góra;

  D.T2.2.2 Partner-Specific Pilot Action Documentations: PA 2.2. Kozłowa Góra;

  D.T2.2.4 Partner-Specific Interim Pilot Action Progress Report: PA 2.2. Kozłowa Góra;

  D.T2.3.3 Pa Reports About Climate Change Issues in Pilots: PA 2.2. Kozłowa Góra;

- internal GPW S.A. reports:

  Task 1: Diagnosis of Land Use Management and Its Impact on Drinking Water Reservoir in the Area of Intensive Human Activity

  Task 2: Report of Best Management Practice of Suitable Water Management Concerning Drinking Water Supplying and Flood Control

  Task 3: Characteristic of Drinking Water Reservoir Kozłowa Góra

  Task 4: Analysis of Pressures Exerted on Drinking Water Reservoir Quality and Quantity

  Task 5: Analysis of Biotic Factors Status in the Kozłowa Góra Reservoir and Its Basin

  Task 6: Identification of Pollutants and Definition of Water Quality in the Kozłowa Góra Reservoir Subbasin

  Task 7: Analysis of Raw Water Quality Influence on Effectiveness of Water Treatment Process on WTP Kozłowa Góra

  Task 8: Proposal of Location of The Water Intake's Protection Zones

  Task 9: Report Summarising Investigation Conducted in The Area of Kozłowa Góra Reservoir Sub-Basin

  Task 10: Development of Hydrological Model of The Kozłowa Góra Reservoir's Catchment Area and Model of Ecosystems of The Reservoir