

OUTPUT FACT SHEET

Pilot actions (including investment, if applicable)

Version 2

Project index number and acronym	CE110 - PROLINE-CE
Lead partner	BMNT
Output number and title	O.T2.2 PA cluster 'Plain agriculture/ grassland/ wetland sites' - implementation, showcasing best management practices
Investment number and title (if applicable)	NA
Responsible partner (PP name and number)	T2 leader: University of Ljubljana, PP04 PA cluster 2 leader: OVF, PP7
Project website	https://www.interreg-central.eu/Content.Node/PROLINE-CE.html
Delivery date	February 2019

Summary description of the pilot action (including investment, if applicable) explaining its experimental nature and demonstration character

Pilot Action Cluster 2 (PAC2) encompasses six Pilot Actions located one in Slovenia, Poland, Hungary, Croatia (2 sites) and in Germany. They are: PA2.1 Well field Dravlje valley in Ljubljana, PA2.2 Water reservoir Kozłowa Góra, PA2.3 Tisza catchment area, 2.4.1 - South Dalmatia: Prud, Klokun and Mandina spring, 2.4.2- Imotsko polje springs, PA2.5 Neufahrn bei Freising.

The Slovenian case study (PA2.1) is 16.65 km². It is a potential well field in the Glinščica river sub-basin (Dravlje valley in Slovenia). It lies within urbanized area crossed by Ljubljana's ring-road, large open spaces (mainly agricultural areas), urban area and industry causing high pressure on land use. Dravlje valley is also a flood area with inappropriate regulated surface waters coming from hilly hinterland. Most of these waters are lead to the urban sewage system, which in high waters cannot receive so much water and are flooded. Most of the identified issues are flood related and causing problems both in qualitative and quantitative aspects. Four out of the five BMPs describe a solution based on hydrological/ hydraulical models.

The Polish pilot action area is the Kozłowa Góra reservoir (PA2.2), it is 193.93 km². Preliminary results of field and laboratory investigations indicate that pollution loads, supplied mainly through inlets, cause yearly phytoplankton bloom. In summer season algal bloom causing decrease in water quality parameters. The motivation to select Kozłowa Góra reservoir as a Pilot Action area was to identify possible sources of pollution and prepare plan of preventive measures and practices implementation. In June 2017 multiscale monitoring of the water resources was set up to investigate and assess water resources, sources of pollution and possible hazards. Based on the results mathematical models of hydrology and ecology of the reservoir was established. Simulations run allowed to assess a.o. an impact of land use and water management to water quality and quantity and its ecology. A proposal for DWPZ was prepared and is being implemented. The proposal includes a.o. limitation in land use, wastewater management, fishery. The most important BMP is reaching the society and raise the awareness. In a situation where the guidelines, policies exist and are not enforced raising awareness among society, especially small, local ones is crucial to implement.

The total surface of the Hungarian Pilot Action area PA2.3 Tisza catchment is 7614 km². The main issues that were identified at the beginning of the project are related to improper agricultural practices, such as improper manure storage and excessive use of fertilizers, and how flood events can affect safe drinking water supply provided by Szolnok Waterworks. During the project data evaluation showed that current practices in livestock farming, plant production and flood mitigation are good enough to keep the raw surface water in an overall good quality. The problem lies in climate change and how it is going to affect the efficiency of the current practices. For instance, open manure storages may not pose a big threat in the current climate conditions, but an extremely intensive rainfall could possibly trigger a surface runoff, even on a flatter land, which could contaminate the nearby watercourses. Current practices should be evaluated in context of future climate conditions.

In Croatia the drinking water source is karst aquifer. On PA2.4.1 and PA2.4.2 the main issues are increased water demand (due to rise in agricultural production), periodical field flooding, poor condition of water supply network, illegal waste dumps, inadequate waste water treatment and non-compliance with regulations and restrictions set out by DWPZ ordinance. BMPs are expected to promote topics such as water protection, pollution and climate change, resulting in an increased awareness among the whole community and water users.

The German case study covers an area of about 48.8 km². On this PA proposed BMPs are continuous monitoring program of hydrological data with a high resolution in time and space as well as hydrological modelling. In the light of continuous changes in management practices as well as strongly economic-driven land use changes, a monitoring of relevant parameters in surface water and groundwater, such as water level, electrical conductivity, temperature, pH, nitrate among others, sets an appropriate frame to detect impacts of ongoing changes in the hydrological system. Given the enhanced database, a hydrologic model serves to relate any kind of changes to particular changes in the management system. Moreover, the hydrologic model allows to pre-evaluate the impacts of a planned action and, thus, supports the decision-making process from the beginning to the end of an implementation process. Moreover, a comprehensive, understandable and applicable modelling framework can serve as a common tool for all stakeholders, from land owner to decision maker, to jointly elaborate action plans, making decision-making more participatory. An enhanced public engagement further helps to reduce the mistrust between the engaged parties.

Most of the issues found on the pilot sites are related to flood events, the lack of measures, tools, or information in water management, or the negative effects coming from agricultural production. All of these factors cause deterioration in both drinking water quality and quantity. In many cases the lack of public awareness worsens the situation, therefore excessive educational programs would be necessary even if the first approach of the problem is related to experts or the government. Later on, best management practices, which were formed and tested in the framework of PROLINE-CE project, could be adapted in other regions with similar issues.

NUTS region(s) concerned by the pilot action (relevant NUTS level)

Slovenia - PA2.1: NUTS3 level code: SIO41
 Poland - PA2.2: NUTS3 level code: PL224, PL228, PL22B
 Hungary - PA2.3: NUTS3 level code: HU322, HU323
 Croatia - PA2.4: South Dalmatia: 2.4.1: Prud, Klokun and Mandina spring NUTS3 level code: HR037
 2.4.2: Imotsko polje springs NUTS3 level code: HR035
 Germany - PA2.5: NUTS3 level code: DE21B

Investment costs (EUR), if applicable

Not applicable.

Expected impact and benefits of the pilot action for the concerned territory and target groups and leverage of additional funds (if applicable)

PA2.1 is a potential well field in the Glinščica river sub-basin. Most of the identified issues are flood related. Four out of the five BMPs (Best management practice) describe a solution based on hydrological/ hydraulic models. Model results will be beneficial for decision makers, while the implementation of the measures (proposed solutions) will be beneficial for consumers.

Within **PA2.2**: multiscale monitoring of the water resources was set up to investigate and assess water resources, sources of pollution and possible hazards. Based on the results mathematical models of hydrology and ecology of the Kozłowa Góra reservoir was established. Simulations run allowed to assess a.o. an impact of land use and water management to water quality and quantity and its ecology. A proposal for DWPZ was prepared and is being implemented. The most important BMP is reaching the society and raise the awareness.

On **PA2.3** Tisza catchment area results gained from data evaluation and comparisons highlighted that current practices in livestock farming, plant production and flood mitigation are good enough to keep the raw surface water in an overall good quality.

On **PA2.4.1** and **PA2.4.2** BMPs are expected to promote topics such as water protection, pollution and climate changes, resulting in an increased awareness among the whole community and water users. Intensive stakeholder involvement is the first step towards the implementation of any BMP.

On **PA2.5** proposed BMPs are continuous monitoring program of hydrological data and hydrological modelling. A monitoring of relevant parameters in surface water and groundwater sets an appropriate frame to detect impacts of ongoing changes in the hydrological system. Given the enhanced database, a hydrologic model serves to relate any kind of changes to particular changes in the management system. The hydrologic model allows to pre-evaluate the impacts of a planned action and, thus, supports the decision-making. A comprehensive, understandable modelling framework can serve as a common tool for all stakeholders, from land owner to decision maker, to jointly elaborate action plan. An enhanced public engagement further helps to reduce the mistrust between the engaged parties.

Sustainability of the pilot action results and transferability to other territories and stakeholders.

Most of the issues found on the pilot sites are related to flood events, the lack of measures, tools, or information in water management, or the negative effects coming from agricultural production. All of these factors cause deterioration in both drinking water quality and quantity. In many cases the lack of public awareness worsens the situation, therefore excessive educational programs would be necessary even if the first approach of the problem is related to experts or the government. Sustainability of the measures and its impact will depend on mostly the interaction between authorities and land users.

Thus, strong stakeholder involvement for implementation of best management practices with several national meetings with particular stakeholder (one-to-one) and regular interactive workshops with local stakeholders are essential during implementation and sustainment of best management practice.

In general, results and experiences of BMPs in PAs represent a useful tool to evaluate the advantages and limits of their applicability even for other territories.

Some BMPs were already implemented in the frame of T2 activities. On the other hand, some BMPs are very complex and require system change or even policy change, which are long lasting procedures.

On the sites there are more implemented hydrological / hydraulic model, which are presented the usability of them for various purposes.

Applications of complex catchment modelling and water monitoring are also transferable.

Several BMP connected to raising awareness and increasing knowledge. The Lessons Learned of awareness raising related to environmental problems also transferable for other countries, how to do it in a more effective way.

Acceptance of best management practices for drinking water protection and flood mitigation among stakeholders and experts is very important. It is important to involve all stakeholders, from land owner to decision maker.

Climate change adaptation and non-structural flood mitigation measures are very complex and the experiences are well useable for other sites or countries.

PAs testing gave the opportunity to improve, share and extend local/regional/national experiences to the project Partners.

Lessons learned and added value of transnational cooperation of the pilot action implementation (including investment, if applicable)

The usefulness of transnational cooperation has been demonstrated in several scopes. On the one hand, it drew attention to the transnational problems concerning drinking water and flood. The help of the description of the national treatment methods (Best Management Practices) it was possible to study the national BMPs and their implementation methods in international level. Countries could be able to adapt technology, especially countries belonging to same PAC. At international level, the applicability and effectiveness of a best management technique can be seen. On the other hand, common lessons learned have been drawn, such as the necessity of involving stakeholders and lesson learned from the methods, how to organize these meetings.

Contribution to/ compliance with:

- relevant regulatory requirements
- sustainable development - environmental effects. In case of risk of negative effects, mitigation measures introduced
- horizontal principles such as equal opportunities and non-discrimination

The solutions developed and tested on riparian Pilot Areas are aimed to provide cutting-edge tools and frameworks for the implementation of several EU policies purposes on such topics (2000/60/EC; 98/83/EC; 91/271/CEE; 2007/60/EC).

BMPs are consistent also with several Sustainable Development Goals (SDGs) set by the United Nations General Assembly in 2015. Among the others, SDG6 “Ensure availability and sustainable management of water and sanitation for all”, SDG13 “Take urgent action to combat climate change and its impacts”, SDG11 “Make cities and human settlements inclusive, safe, resilient and sustainable”, SDG 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss. In this regard, BMPs could have a valuable role to support all the targets included in SDG6 ensuring to all the members in communities drinking water resources, improving reuse and reducing pollution.

On National level, for example Hungary BMPs are consistent with 1155/2016. (III. 31.) Government Decree Water Management Plan, 1146/2016. (III. 25.) Government Decree on Hungary's National Flood Risk Management Plan, 2253/1999. Government Decree on National Agro Environmental Program.

In Slovenia on national level: Decree on the emission of substances in the discharge of meteoric water from public roads (Official Gazette of the Republic of Slovenia 47/2005), Decree, 2015. Decree on the discharge and treatment of urban wastewater (OG, no. 98/15).

The most disadvantaged sectors of the society (poorer, elderly, women, and children) could be those most affected by the detrimental impacts of flood, deteriorating water quality, climate and land use changes (e.g. urbanization). The Improvement of water quality and flood safety has most positive impact for these sensitive groups.

References to relevant deliverables (e.g. pilot action report, studies), investment factsheet and web-links

If applicable, additional documentation, pictures or images to be provided as annex

PROLINE-CE WORKPACKAGE T2, ACTIVITY T2.1 REPORTS:

- D.T2.1.4 Descriptive documentation of pilot actions and related issues: PA2.1 Well field Dravlje valley in Ljubljana, PA2.2 Water reservoir Kozłowa Góra, PA2.3 Tisza catchment area, 2.4.1 - South Dalmatia: Prud, Klokun and Mandina spring, 2.4.2- Imotsko polje springs, PA2.5 Neufahrn bei Freising reports

PROLINE-CE WORKPACKAGE T2, ACTIVITY T2.2 REPORTS:

- D.T2.2.2 Partner-specific pilot action documentations: PA2.1, PA2.2, PA2.3, 2.4.1 -, 2.4.2, PA2.5 reports

- D.T2.2.3 Pilot action cluster report: PILOT ACTION CLUSTER 2

PROLINE-CE WORKPACKAGE T2, ACTIVITY T2.3 REPORTS:

- D.T2.3.1 Evaluation reports for each pilot action. PA2.1, PA2.2, PA2.3, 2.4.1 -, 2.4.2, PA2.5 reports
- D.T2.3.4 Strategic identification of needs for action for clusters. PILOT ACTION CLUSTER 2

PROLINE-CE web shared platform: <http://proline-ce.fgg.uni-lj.si/>

Interreg Central Europe Programme - PROLINE-CE web page: <https://www.interreg-central.eu/Content.Node/PROLINE-CE.html>