

OUTPUT FACT SHEET

Pilot actions (including investment, if applicable)

Version 2

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Lead partner	BMNT
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Responsible partner (PP name and number)	T2 leader: University of Ljubljana, PP04 PA cluster 3 leader: CMCC, PP13
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Summary description of the pilot action (including investment, if applicable) explaining its experimental nature and demonstration character

Pilot Action Cluster 3 (PAC3) encompasses two Pilot Actions, whereof one is located in Italy and the other one in Hungary, namely Po River Basin (PA3.1) and Danube bend (PA3.2). These areas represent key territories for the respective countries not only concerning the local water resources: Po River Basin is one of the main national economic force while the Hungarian case represents the most important water supply area in the country.

In details, Po River Basin is the largest river basin in Italy and has an area of 74.000 km² extending in the Italian, French and Swiss territory. The area is the most developed part of the country, with an important role at environmental, economical, agricultural, and industrial levels. In addition, around 20% of the Italian population live in this area.

The Hungarian case study is located in the Northern part of Central Hungary, in the section of Danube River between Szob and Tass. It includes the municipality of Budapest, Szentendre Island and Csepel Island. On these islands, the two most important bank-filtered drinking water resources of Hungary are located, supplying the capital itself and about 150 other settlements with drinking water.

Land use maps for the investigated areas are shown in Annex 1 (PA3.1) and Annex 2 (PA3.2).

Based on the analysis of the local characteristics of the PAs, it emerges that the main issues for drinking water resources are related to the water quality and water quantity protection and management. Both PAs are characterized by prevalence of agriculture areas and, for this reason, the most relevant threats are associated with agricultural activities, which affect both the quality and the quantity of the drinking water resources. More specifically, in the Po River Basin area, the main issue is the relevant pressure on water resources demand and the associated potential crisis management while in the Danube area drinking water sources (represented mostly by bank-filtration) are particularly vulnerable to contamination and, for this reason, the main issue is represented by an effective protection of the drinking water quality. Furthermore, both Pilot Actions are facing flood problems, potentially enhanced by climate change which can have cascading impacts on freshwater ecosystem services. These characteristics make PA3.1 and PA3.2 very relevant Pilot cases, providing valuable insights for the application and evaluation of selected Best Management Practices (BMPs) and for testing the usefulness of integrated water resources management for protecting water resources (limiting, at the same time, flood risk). The areas are then indicative of riparian areas for very important and strategic European Rivers making the framework and findings collected in these experiences relevant for similar geomorphological contexts all over the Central Europe Domain. Furthermore, the experiences (e.g. Drought Observatory or CC/LUC modeling activities) could act as front-runner in different areas.

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

PA3.1 covers the entire North Italy. NUTS1 code: ITH North-East Italy and ITC (mainly 1 and 4) North-West Italy. PA3.2 is located in the Northern part of Central Hungary. NUTS1 code: mainly HU1 Közép-Magyarország. Both PAs are located in areas characterized by very high economic and environmental importance for respective countries. Furthermore, both PAs face with water management issues, in terms of water availability and water quality, even enhanced by climate change impacts.

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)

The activities carried out for both PAs result deeply driven by the issues frequently experienced by these territories. In PA3.1, the increasing water demand and ongoing CC are inducing issues concerning water availability and consequently potential conflicts among the users exacerbated during drought periods. Observatory for Droughts and the framework for analysis of coupled effects of CC and LUC are expected supporting the dialogue among stakeholders, decision-makers and water operators for operational and planning purposes permitting to limit conflicts and develop adequate adaptation solutions. Both require a strong involvement of stakeholders through bottom-up approaches. Furthermore, a better understanding about dynamics regulating flood events and induced indirect impacts (first of all, on drinking water) is recognized as a priority given the high exposure characterizing the area. The relevance of such improvements may be directly measured by permitted avoided costs. Observatory for Droughts and improving in modeling are expected to be sustained, as public services, within the framework of River Basin and Emergency management initiatives. Furthermore, cutting-edge modeling activities concerning CC and LUC impacts on freshwater resources are expected to be prosecuted within further research (or Research & innovation) initiatives for further consolidation.

In PA3.2, water quality is recognized as the most relevant issue because of the bank-filtered water and the fact that extraction wells are mostly situated near to agricultural and urban areas. Proposed BMPs attempt addressing such issues as coping with pollution induced by agriculture and improving sanitary coverage in urban areas. Furthermore, the indirect impacts of flood events on drinking water is recognized as a crucial issue. Given the relevance of agriculture and urban activities in the PA, BMPs are providing high benefits for communities primarily exploiting public funds (e.g. National Agri-Environmental Program).

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

BMPs sustainability is strictly related to their relevant role as public services. However, in both PAs, they are actually implemented. In PA3.1, BMPs proposed to cope with drought and flood events are based on the empowering of operative systems already existing and implemented in the 2000s. In PA3.2, water chemistry has been deeply examined and monitoring wells have been established in mostly in Szentendre Island, which represents the most vulnerable area. More complex is the mainstreaming in policy of the results provided by CC and LUC for planning purposes requiring further investigation to increase the confidence and the understanding of non-experts for “uncertainty” and “probability” issues.

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

PAs testing gave the opportunity to improve, share and extend local/regional/national experiences to the project Partners. Furthermore, because of environmental challenges related to sustainable water management have a transnational relevance, achieved results are characterized by a high transferability prospective even at international level.

Results highlight that an integrate and effective management of the drinking water resources could provide benefits to all the involved stakeholders. Administrators could benefit from the availability of more detailed data on events occurrence and on the identification of the most vulnerable areas, as well as from the availability of high-resolution climate scenarios. Farmers could benefit from a better land use planning and from the implementation of sustainable agricultural practices, which could also provide possible resolution to the potential conflicts among different stakeholders. Last, an adequate territorial planning, coupled with a more effective modelling and prevision of flood and drought events, will ensure the drinking water supply to the population even during crisis.

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

Main lessons learned concern, first, the pivotal role of stakeholders in decision making processes and then the need of carrying out bottom-up approaches promoting agreed and consolidated solutions. Feedbacks allowed by transnational cooperation permitted a better understanding of dynamics permitting to bridge the gap among academics, decision makers and stakeholders (communities, water operators) and to implement an actual knowledge co-production. Furthermore, for planning purposes, assuming steady-state condition is no longer a feasible solution as CC and LUC could significantly affect magnitude and frequency of issues concerning drinking water. In this regard, the implemented BMPS on PAs exploit different but equally effective strategies (incentives, participative processes) to cope with anthropic forcing (increasing demand, pollution and urbanization). Furthermore, for both cases, an increasing need of limiting indirect impacts of flood on drinking water arises.

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/CE; 98/83/CE; 91/271/CEE; 2007/60/CE). By way of example, Permanent Observatory on water uses (PAC3.1) acts within the framework of Water Balance Plan of Po River Basin; moreover, the relevance for Adaptation purposes of Po River Basin can be recognized considering that the area is selected as Special Focus in National Adaptation Strategy (2014). BMP aimed to reduce water pollution induced by agriculture activities is driven by Hungarian National Agri-Environmental Program Implementation (NEAP, 2253/1999) establishing agricultural practices permitting sustainable use of natural resources.

In this regard, the different promoted 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” and SDG11 “Make cities and human settlements inclusive, safe, resilient and sustainable”. 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. At the same time, for SDG13, several BMPs promoted (in special way, in Po River Basin) could effectively address the request of improving mainstreaming of adaptation in policy and regulations. In this regard, it worth noting that, as stressed by different Official Documents, the most disadvantaged sectors of the society (poorer, elderly, women, and children) could be those most affected by the detrimental impacts of climate and land use changes (e.g. urbanization). Then, promoted BMPs could indirectly act on existing societal gaps permitting to not exacerbate them.

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: PA3.1 Po River Basin and PA3.2 Along Danube bend reports

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

- D.T2.2.2 Partner-specific pilot action documentations: PA3.1 Po River Basin and PA3.2 Along Danube bend reports
- D.T2.2.3 Pilot action cluster report: PILOT ACTION CLUSTER 3 SPECIAL SITES (Riparian Strips)

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

- D.T2.3.1 Evaluation reports for each pilot action. PA3.1 Po River Basin and PA3.2 Along Danube bend reports
- D.T2.3.4 Strategic identification of needs for action for clusters. PILOT ACTION CLUSTER 3 SPECIAL SITES (Riparian Strips)

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>