

The FramWat project

Water management and water quality problems in natural river basins in Central European regions, deteriorating flood safety, increasing droughts and effective management of regular water quality degradation can only be addressed through measures affecting the whole river basin, keeping precipitation in the field, measures to increase the buffer capacity of the landscape by increasing natural small water retention and appropriate land use.

The **FramWat project** supports the idea of using landscape features to help solving environmental problems in water bodies in a sustainable way.

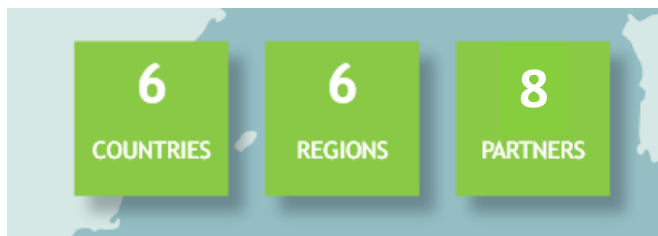
The approach goes beyond traditional engineering tools by using green infrastructure as a natural based solution.

The project aims to strengthen the regional common framework for floods, droughts and pollution mitigation by increasing the buffer capacity of the landscape. It will do so by **using the natural (small) water retention measures (N(S)WRM) approach in a systematic way.**

Partners in the project developed methods which translate existing knowledge about N(S)WRM features into river basin management practice. This will result in improving the water balance, in decreasing sediment transport, and in enhancing nutrients re-circulation. Moreover, it provide decision makers with appropriate tools to **incorporate N(S)WRM into the next cycle of River Basin Management Plans and offer guidance and raise awareness about the importance of horizontal integration of different planning frameworks.**



WHO WE ARE



Partners from six Central European countries were joining forces to tackle environmental problems in river basins using N(S)WRM.

Austria

- WasserCluster Lunz -Biologische Station GmbH

Croatia

- Croatian Waters

Hungary

- Middle Tisza District Water Directorate

Poland

- Warsaw University of Life Sciences - Lead Partner

Slovakia

- Global Water Partnership Central and Eastern Europe
- Slovak Water Management Enterprise

Slovenia

- University of Ljubljana
- LIMNOS Ltd.



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FramWat

SMALL RETENTION – BIG DEAL! Tools developed in the frame of the FramWat project and applied at the 6 Pilot Areas in Central Europe



© Photos: 1 Karst pond in Goče (SI)(GWP CEE);2Nagykunság-subcatchment(HU)(P. Sóllyom); 3 Rehabilitation of clay pit in Renče, (SI) (A. Potokar); 4 J. Józfwik (PL)

Framework for Improving Water Balance and Nutrient Mitigation by Applying Small Water Retention Measures

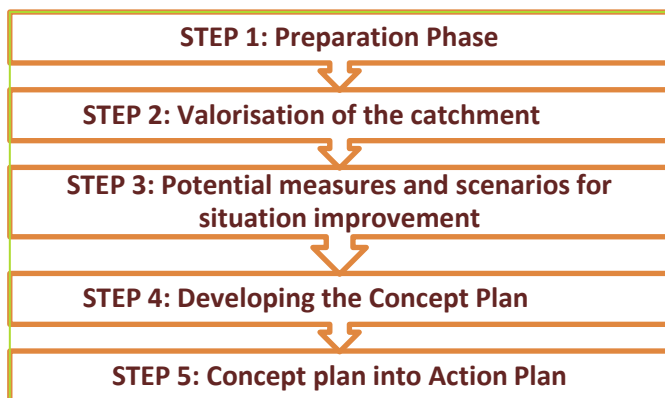
<https://www.interreg-central.eu/Content.Node/FramWat.html>

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WHAT WE ACHIEVED

5 Steps forward within FramWat project

Guidelines offer a connection with all important outputs developed within the FramWat project, best practices from participating countries and practical recommendations from pilot catchments through the 5-step process of N(S)WRM Planning:



In 6 pilot catchments the N(S)WRM approach was tested with the use of Innovative FramWat tools:

- **FroGIS** (Framework for Retention Optimization) (<http://WaterRetention.sggw.pl>)
- **Multicriteria analysis - Analytical Hierarchical Process (AHP)** tool (<http://ahp.framwat.apps.vokas.si/>)
- Impact analysis with **Static tool** and **Dynamic tool**
- **Concept Plan**
- **Action Plan**
- **Cost calculation**
- **Guideline**
- **Decision Support System (DSS)** (<http://planning.waterRetention.sggw.pl>)

Pilot catchments have been selected in order to represent all main landscapes of the Central Europe: Highlands (Aist, Austria and Kamniška Bistrica, Slovenia), Lowlands (Nagykunsági, Hungary; Kamienna, Poland; Slana, Slovakia; Bednja, Croatia)

PILOT ACTIONS

Conclusion from the 6 FramWat Pilot Areas

The tools - FROGIS, Concept Plan, Action Plan, DSS and Guideline - developed in the frame of the FramWat project should not be uniform completely. These depend on the catchments' characters, the major problems and water management issues of the catchments, thus the assessment approach should have its own features.



Country	Catchment	Why it was chosen?
Austria	Aist	Topographic characteristic and siltation, flood management
Croatia	Bednja	Torrents forming after intensive rainfall events, sediment issues
Hungary	Nagykunsági	Pluvial flood, drought and water quality problems
Poland	Kamienna	Ecological status and flood, drought and water quality problems
Slovakia	Slaná/Sajó	Significant flood risk
Slovenia	Kamniška Bistrica	Diverse character (from wooded subalpine hills to lowland plains), flood risk

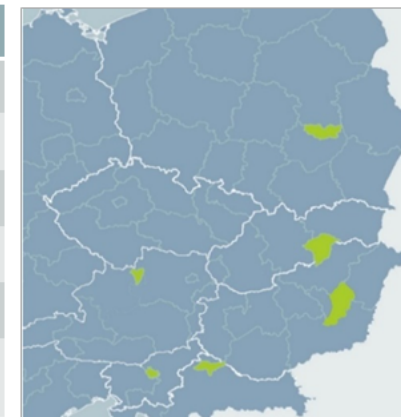


Table 1. Pilot areas of the FramWat Project

Characteristic	Unit	Aist (Austria)	Bednja (Croatia)	Nagykunsági (Hungary)	Kamienna (Poland)	Slána/Sajó (Slovakia)	Kamniška bistrica (Slovenia)
Character of catchment		central uplands (low mountain ranges with plateaus, gorges)	lowland 30% low hills 70%	lowland	lowland/piedmont	plains / higher highlands	Upper part: highland, wooded, Middle and lower part: lowland;
Catchment area (main river)	km ²	647 (Danube River)	616 (Drava River)	2965 (Tisza River)	2020 (Vistula River)	3217 (Tisza River)	539 (Sava River)
Average flow low/avg/high	m ³ /s	5.1/6.4/7.8	0.8/7/77	0/20/30	2.9/8.3/40	19,355 (avg)	2.2/7.9/67.2
Extreme flow low/high	m ³ /s	0.44/336.6	0.003/179	0/44	0.07/113	2,426/470	0.9/282
Annual precipitation low/avg/high	mm	726/835/993	481/931/1312	382,9/513,4/929,5	420/640/920	568/823/1215	998/1383/1851
Annual air temperature min/avg/max	°C	5.4/7.1/9.5	10.4 (avg)	-24,8/10,7/40,8	3/6/12	3/7/10	9/11/13
Agricultural area	%	48.9	30	73	49	40.02	34.5
Urban area	%	3.9	2	5	6.4	3.08	8.2
Forest area	%	46.8	49	5	44.2	56.78	54.1
Open water area	%	0.01	0.1	1	0.4	0.12	0.4
Flooded area (1/100 years)	km ²	1.9	37.7	430,5 (excess water)	55.6	63	39.2
Artificial drainage area	km ²	0	0	2300	59.2	0	0
Ecological status not good/bad	waterbody		3/2 (of 6)	5/21	2/11	8 generally medium/bad	Moderate (4/5) to very good (1/5)
Climate change* Summer temperature [°C]/precipitation [%]		1.5/5	2/15	2/10	1.5/5	1.5/5	1.5/5
Major problems to achieve good ecological status		Phytobenthos, Macrozoobenthos, NO3, o-P, DOC	Phytobenthos, Macrophytes, Macrozoobenthos, Total N and Total P	Biology, hydromorphology	Phytobenthos, Macrophytes, NH4, PO4, Norganic	Phytobenthos, Macrophytes, NH4, PO4, Norganic	Hydromorphological alteration

Remark: the data provided for average and extreme flows, annual precipitation and air temperature is originating from different multiannual statistics of various timescales for each pilot area, for details see the original Concept Plans of the pilot catchments.

Table 2. Characteristics of the 6 pilot catchments