Framwat Final Conference
Online, June 9, 2020

General overview about the FRAMWAT project and the Pilot Catchments

Tomasz Okruszko | WULS

THE MAIN OBJECTIVE

The main objective of the project is to strengthen the regional common framework for floods, droughts and pollution mitigation by increasing the buffer capacity of the landscape using the Natural (Small) Water Retention Measures (N(S)WRM) approach in a systematic way

SMALL RETENTION - DEFINITION

Small retention, in the broadest sense all actions, both investment and non-investment, limiting fast rainwater runoff by collecting (retaining) water on the surface (eg small reservoirs), as well as in geological layers (groundwater) and in soil (soil moisture).

The non-investment activities increasing the retention capacity of the catchment include the appropriate shaping and use of the basin such as afforestation, creation of an appropriate system of arable fields, forests and grasslands, the use of appropriate agrotechnical measures.

TECHNICAL FORMS

Object type	Objects group
Reservoir on the watercourses	Waterbodies
Lateral reservoir	
Rainwater tank	
Pond	
Oxbow	
Dry reservoir	
Polder	
Lake	
Fish ponds (Dike, Dug up)	
Weir	Riverbed devices
Lock (small weir)	
Threshold (sill – grade control)	
Culvert with damming	
Dam	
Irrigation and drainage system (ditch)	Other
River restoration (meandering)	
Wetland restoration	
Constructed-wetlands(biofilters)	

Weir

Polder

Wooden Locks

NON-TECHNICAL METHODS

Planning methods rely on shaping of catchment areas and spatial order of landuse.

There are the following types of activities:

- development of the catchment area and the **corresponding participation arable land, grassland and forests**;
- increasing the surface area of different type of **wetlands and restoring the natural river courses,**
- formation plant protection **buffer** along the banks of streams and ponds and the creation of **midfield woodlots**;
- creating and maintaining possible most numerous **ecological land, grassland and ponds**;
- (re)creation of **floodplains** in the valleys of the rivers;
- **establishment of protected zone for groundwater recharge area** them with appropriate planning, creating reservoirs infiltration;
- catchment **landuse planning according** to the assumptions of sustainable development.

IMPACT ASSESSMENT

Assessment of the impact of selected small retention activities on water resources and the environment

activity	Impact on						threats
	Surface waters	Soil retention	Groundwaters	Landscape	Biodiversity	Water quality	
afforestation of agricultural lands (poorly permeable soils, hilly areas,	++	+/-	+/-	+++	+++	++	giving way to certain plants (weeds)
afforestation of agricultural land (permeable soils - sands, occurrence	+	+/-	+/-	++	+++	++	reduced supply of underground aquifers
mid-field afforestation (restricting wind erosion)	+	++	+	+++	+++	+	introduction of alien species
agrotechnics (improvement of soil structure) poorly permeable soils	++	+++	++	+	+	++	excessive intensification of agriculture
agrotechnics (improvement of soil structure) permeable soils	+++	+++	++	+	+	++	reduced supply of underground aquifers
agrotechnics - accumulation of water on arable fields (small trenches, low dams at the edge of fields)	+++	+++	+++	+/-	++	+++	reduction in the frequency of spring lagoons in alluvial river valleys
buffer zones along watercourses and water reservoirs (poorly permeable	+	+	+	++	++	+++	reducing the area of grassland and arable fields
adjustable water outflow from drainage systems	+	++	+++	+	+	+++	the possibility of excessive waterlogging, the occurrence of reduction pockets
active water management in the drainage system (river valleys)	+++	+++	+	+	+	+	intensification of agriculture
construction of microreservoirs on ditches	+++	++	++	++	+++	++	excessive humidity of arable fields
infiltration tanks and trenches	+	+	+++	+	+	++	groundwater pollution
dry tanks / polders (river valleys used for agricultural purposes)	+++	++	+	+	++	+	periodic destruction of crops, excessive humidity / drying
construction of tanks at the outlet from drainage systems	++	+	+	++	++	+++	loss of agricultural area
reconstruction of disappearing sites for the construction of dug-out	++	+	++	++	++	+	loss of land used for agriculture
construction of small (damming) reservoirs on rivers	+++	++	++	+	++	++	destruction of valuable ecosystems, problems with fish migration
tanks dug in local depressions	+	++	+	+	++	+	destruction of valuable ecosystems
reconstruction of small ponds	++	++	+	++	+++	+++	changing the ecosystem to a less valuable one
watercourse recreation (meandering)	+++	++	+	+++	+++	++	flooding agricultural areas
reclamation of swamps, alders and peat bogs	+++	+++	++	+++	+++	++	excessive restriction of watercourses
anti-erosive treatments (various)	++	+	++	++	++	++	changes in ecosystems

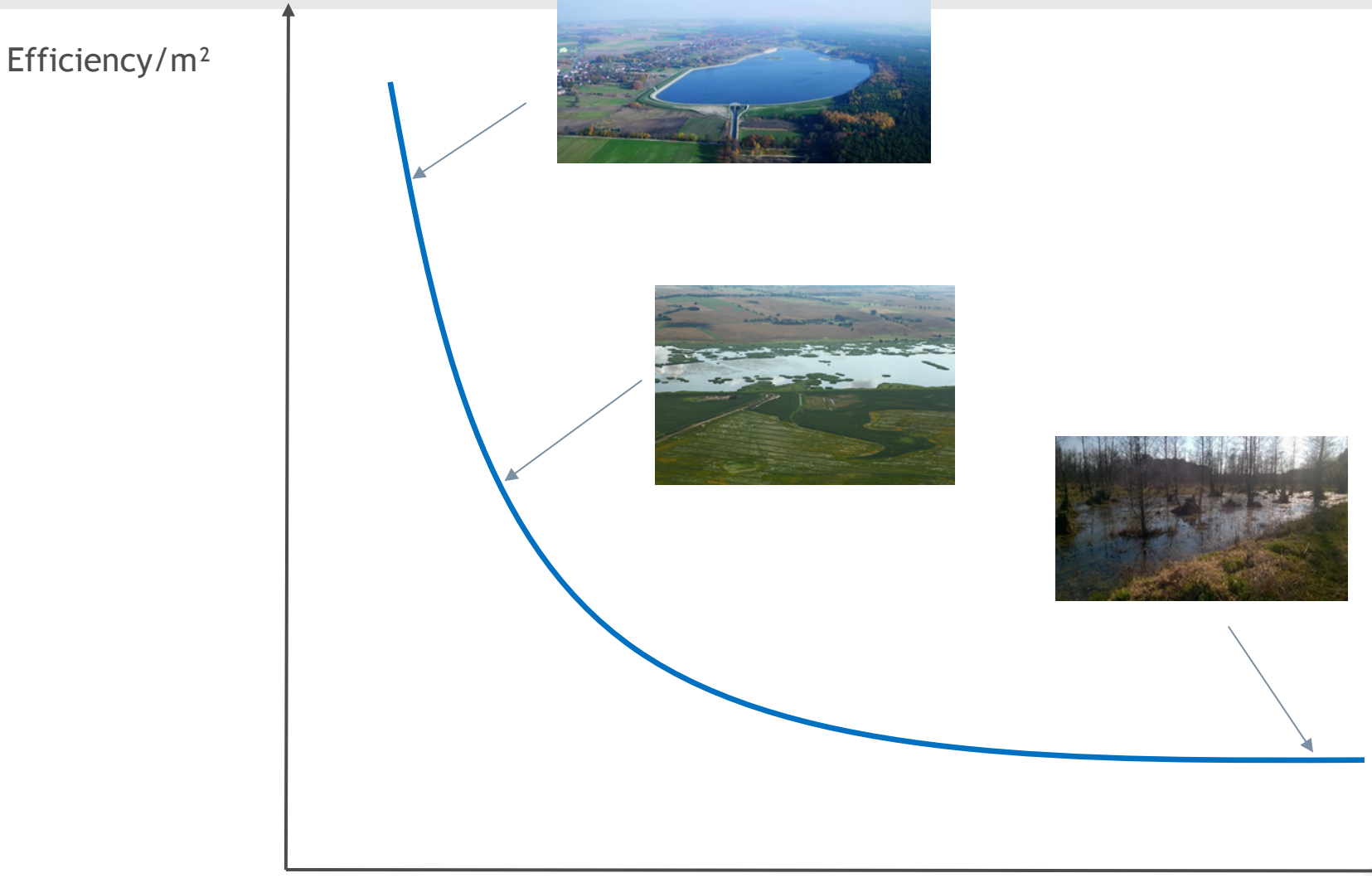
Scale:

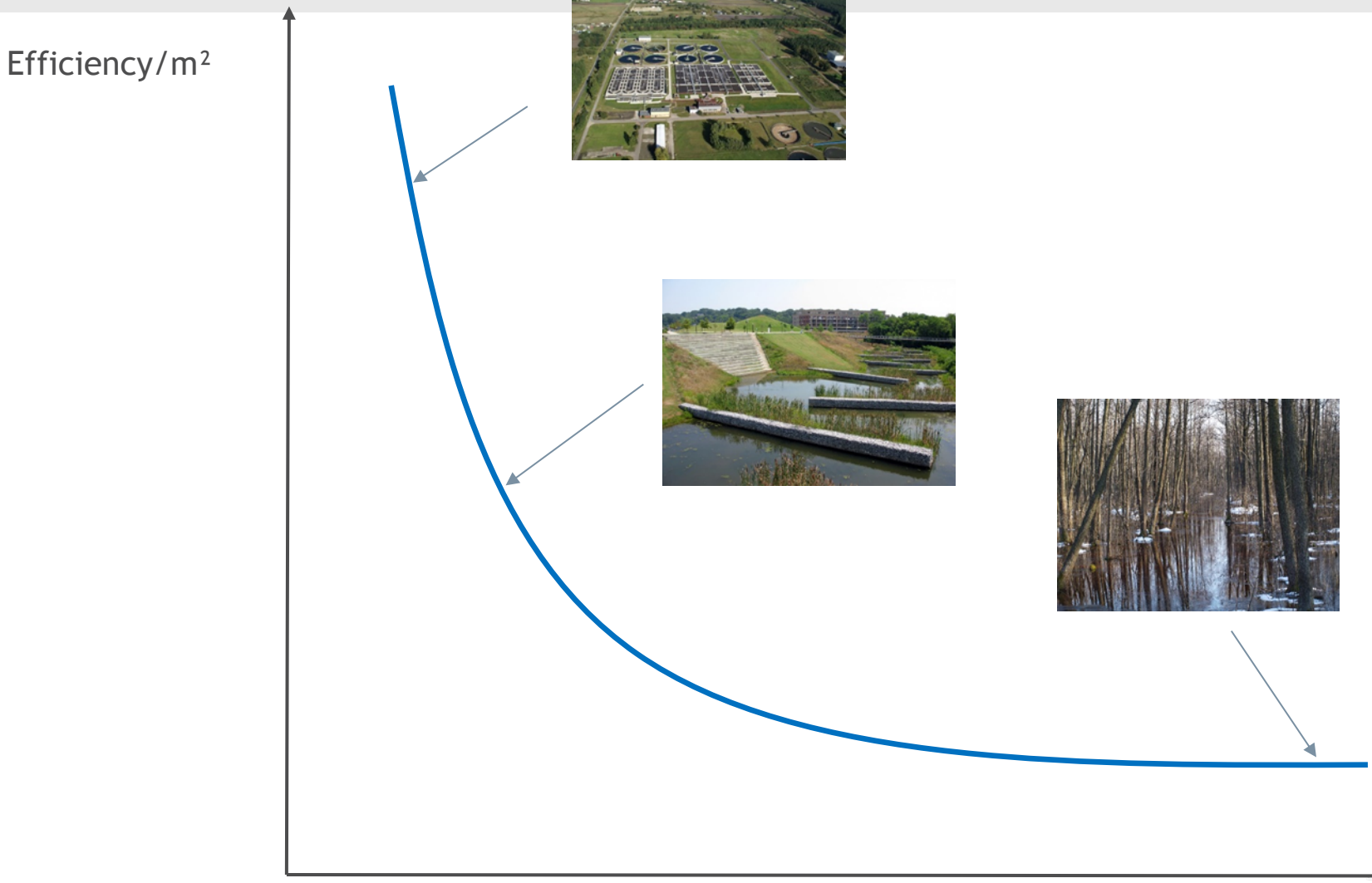
+++ significant impact

++ moderate influence

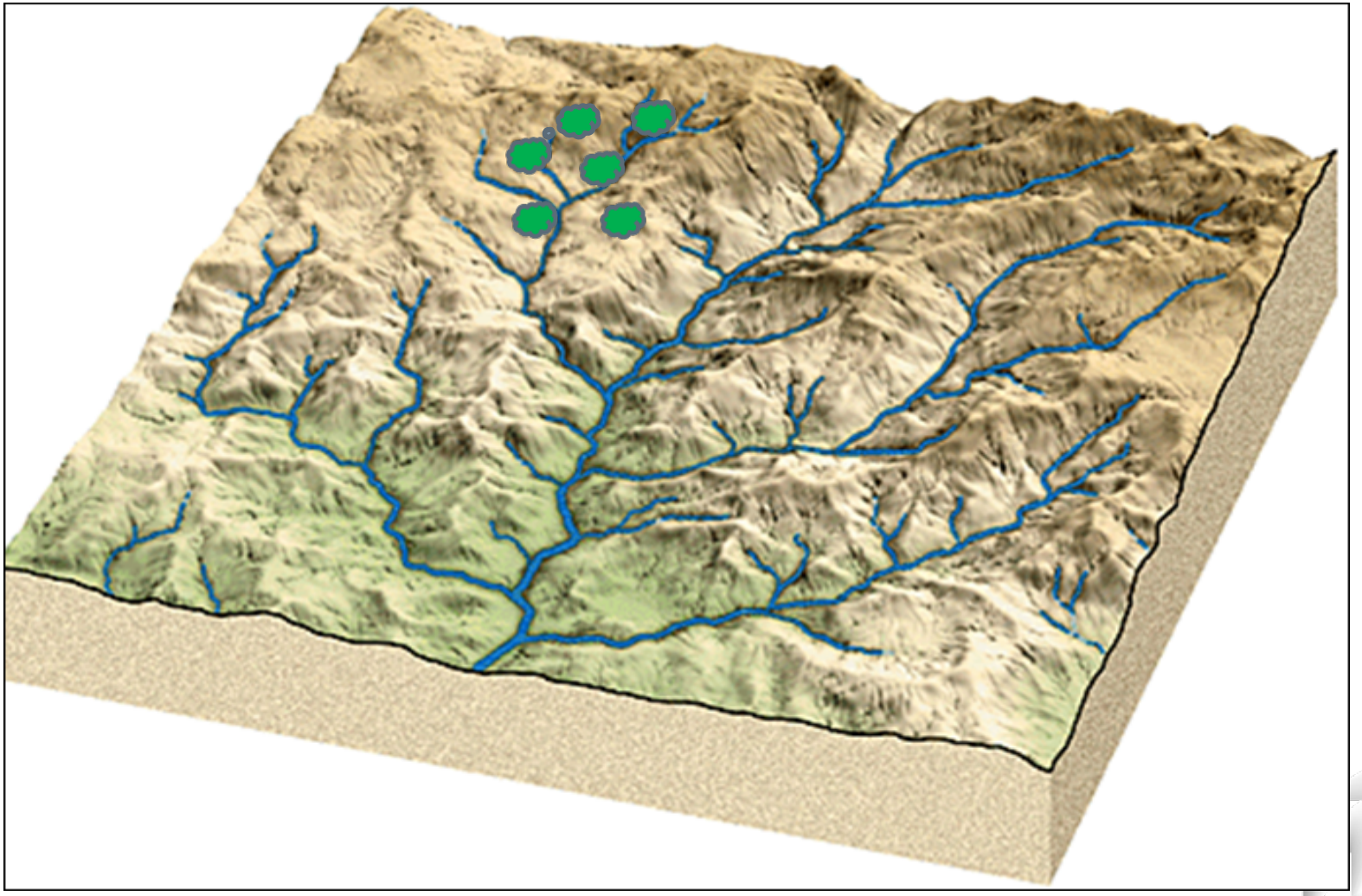
+ little impact

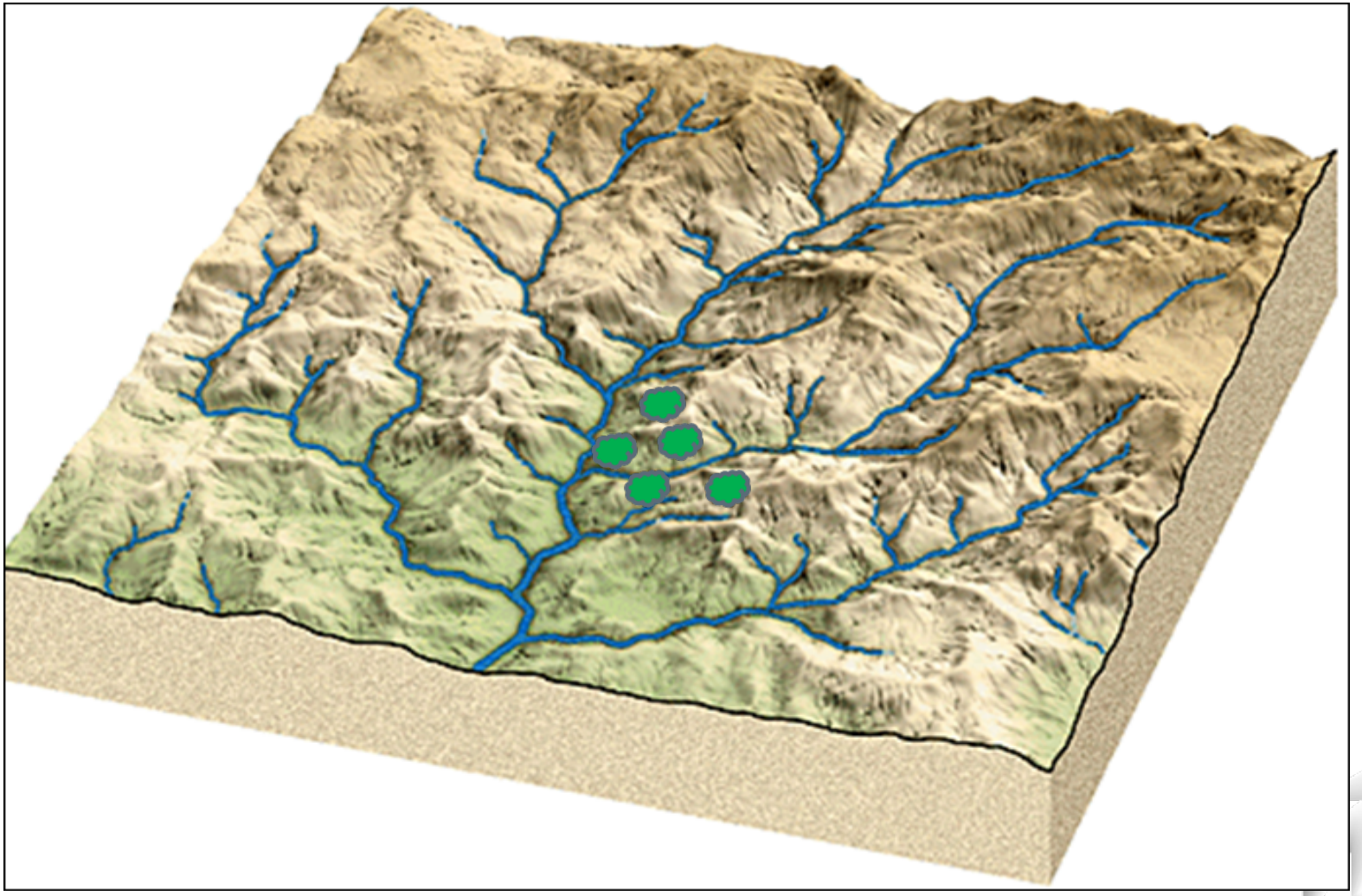
+/- negative or no impact

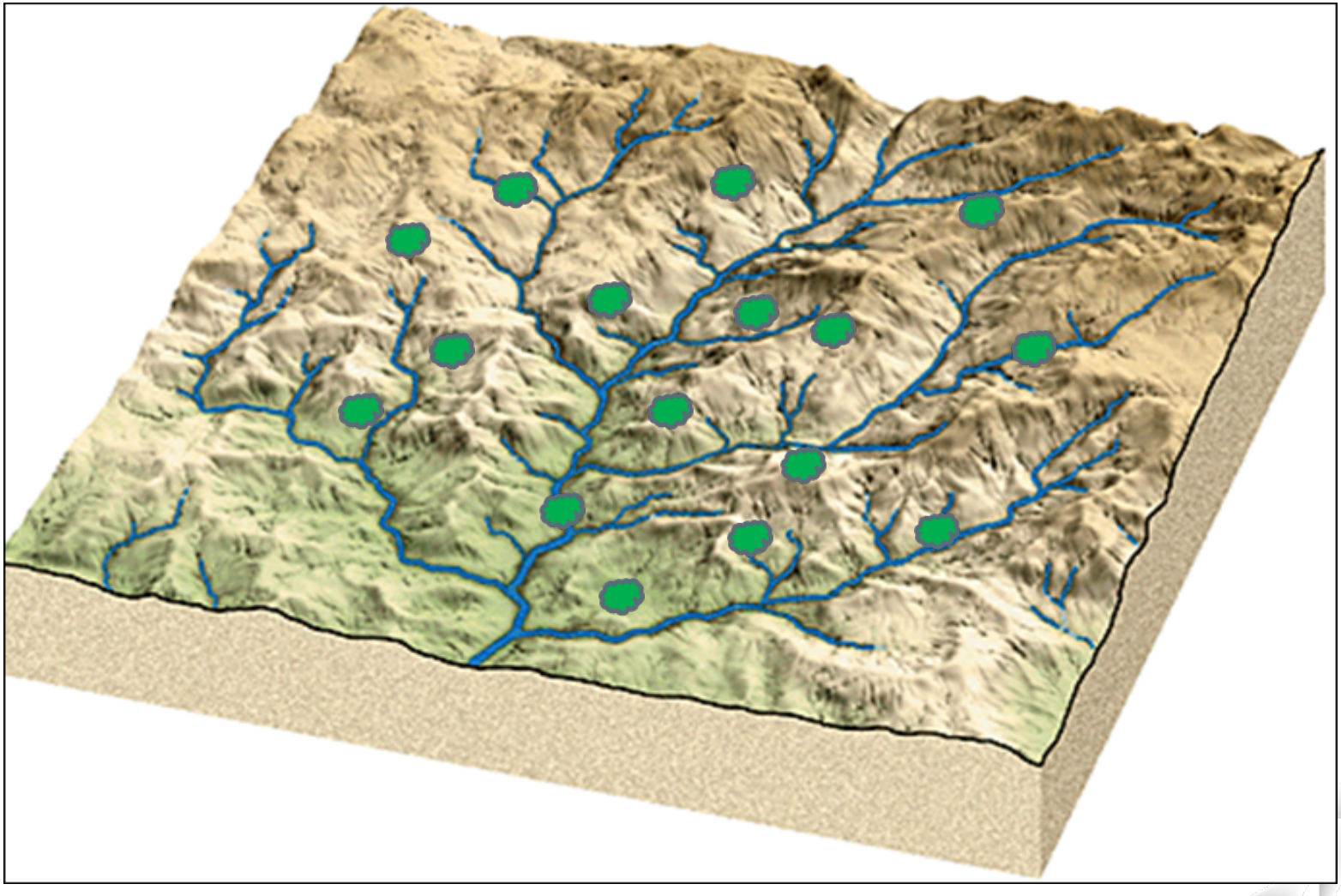

Efficiency/m²
Naturalness/m²


Efficiency/m²
Naturalness/m²

LOCATION STRATEGIES







IDEAS OF FRAMWAT

- **To support idea for using the landscape features to help solving environmental problems** in water bodies in the sustainable way. The innovative way for doing so is to **develop methods, which translate existing knowledge about N(S)WRM features into river basin management practice**.

- Contribute to **improving water balance, decreasing sediment transport, enhancing nutrients re-circulation**. The measures to be proposed will improve the protection of natural heritage, which is an added value comparing to the traditional approach.

- **Provide decision makers with appropriate tools** to incorporate N(S)WRM into the next cycle of River Basin Management Plans.

- In addition, **FramWat** should **provide guidance and raise awareness** about the importance of horizontal integration of different planning frameworks.

OUTPUTS - TOOLS

Firstly, a Valorisation method was be developed for identifying locations in a river basin where N(S)WRM are needed. It was be based on multi-criteria analysis.

Secondly, innovative methods and Tools were developed for river basin authorities to evaluate the cumulative effectiveness of the system of N(S)WRM at river basin scale, as they influence processes in a synergic way.

The final step was a preparation of Guidelines which will provide decision makers with policy options and cost analysis for implementation of N(S)WRMs.

PROJECT IN NUMBERS

Duration (3 years) July 2017 - June 2020

Budget - 1.6 million Euro

9 partners

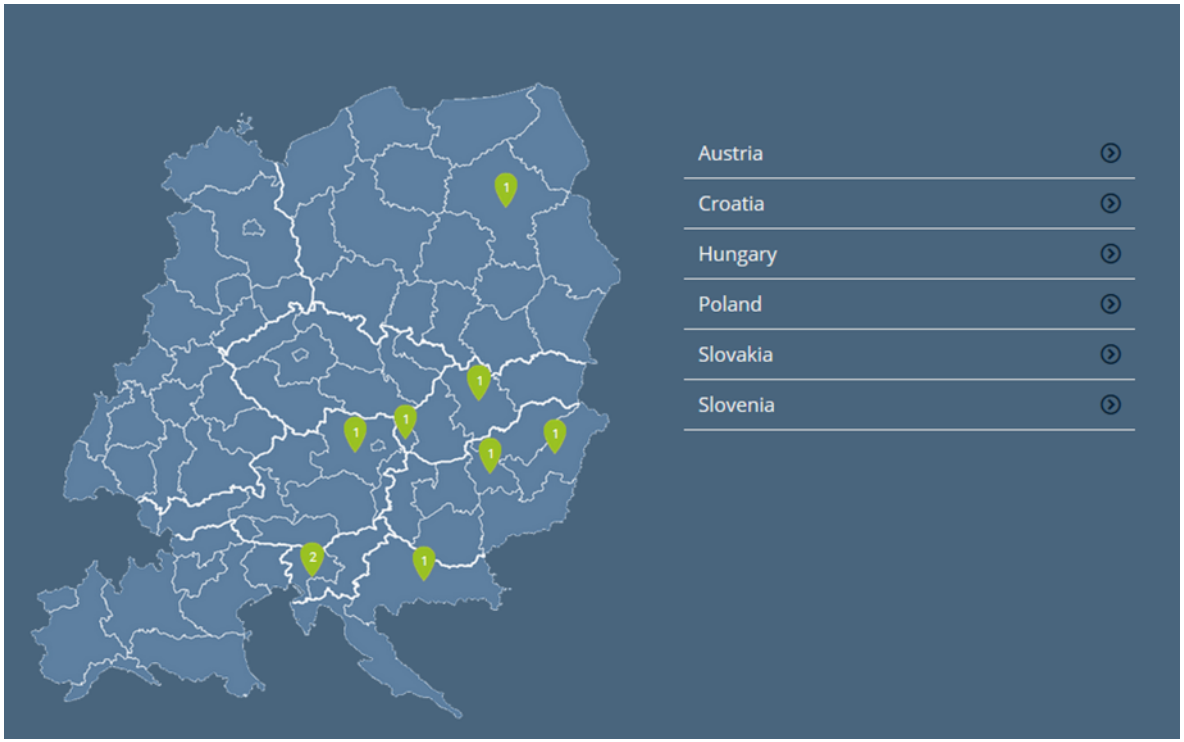
6 countries

Results :

- 3 tools,
- 5 pilot actions,
- 6 action plans,
- 8 trainings.

PARTNERS

9 partners from 6 countries



Austria
- WasserCluster Lunz – Biologische Station GmbH

Croatia
- Croatian Waters

Hungary
- The Regional Environmental Center for Central and Eastern Europe (REC)
- Middle Tisza District Water Directorate

Poland
- Warsaw University of Life Sciences

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

Slovenia
- University of Ljubljana
- LIMNOS Ltd.

ASSOCIATED PARTNERS

6 Associated Partners from 6 countries

ASSOCIATED PARTNERS

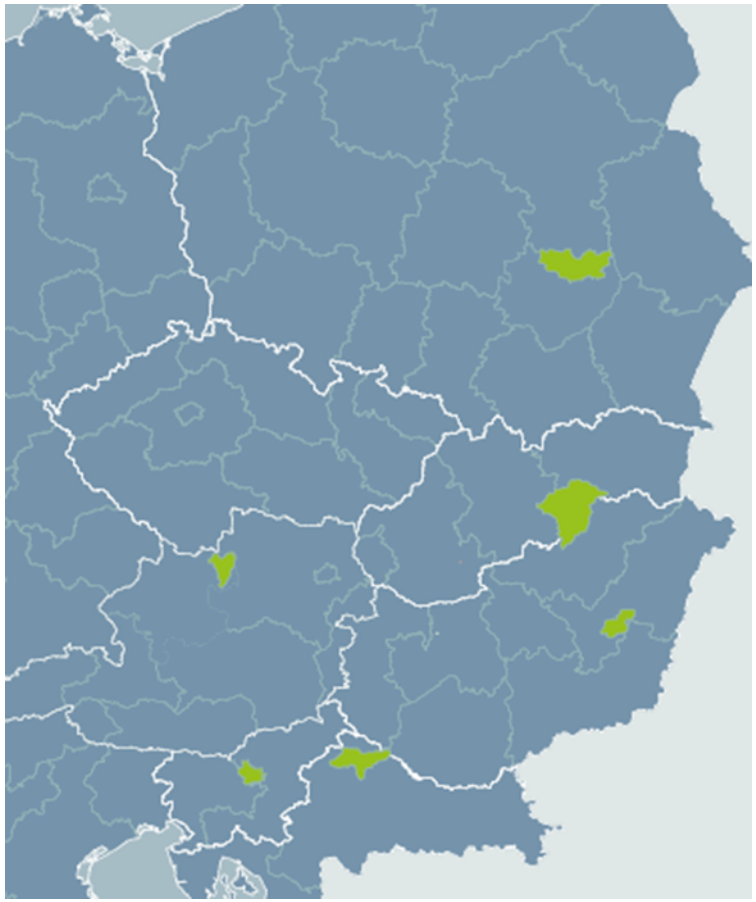
- THE INTERNATIONAL COMMISSION FOR THE PROTECTION OF THE DANUBE RIVER (ICPDR)
- INTERNATIONAL SAVA RIVER BASIN COMMISSION
- MINISTRY OF ENVIRONMENT OF THE SLOVAK REPUBLIC
- HUNGARIAN CHAMBER OF AGRICULTURE
- SLOVENIAN WATER AGENCY
- REGIONAL WATER BOARD WARSAW

PROJECT RESULTS

Method and GIS tool for identifying locations	Method, GIS tool	Method will base on multi-criteria analysis of spatial data, environmental monitoring data in points (flows, precipitation) and measurements (hydro-morphological assessment of water bodies) using outputs from previous projects listed in nwrm.
Manual on how to asses effectiveness of the system of measures	Manual	Output summarizes and systematizes all steps for assessing effectiveness of system of measures in river basin in form of generally applicable tool, which provides algorithm or set of procedures for evaluation of direct or cumulative hydrological responses of basin to different NSWRMs or their combinations for purposes of IWRM, NWMP, water management strategic documents
Guidelines to improve water balance and nutrient mitigation by applying system of N(S)WRMs	Guidelines	Guidelines will use results from previous projects CE-FRAME, LABEL, LIFE-SUMAR, current RAINMAN and provide recommendations how to plan, construct and maintain complex, multi number N(S)WRMs in different conditions of CE to achieve most benefits for protection of natural heritage and resources.
ACTION PLANS for all 6 basins	ACTION PLANS	Plan with concrete steps how to integrate N(S)WRMS into RBMP and recommendations for other river basins.

PILOT CATCHMENTS

6 pilot catchments in 6 countries



Countries	Catchments	Area km^2
POLAND	Kamienna	2 020
HUNGARY	Nagykunsági	2 965
SŁOVAKIA	Slaná/Sájó	3 217
SLOVENIA	Kamniška Bistrica	539
CROATIA	Bednja	616
AUSTRIA	Aist	647

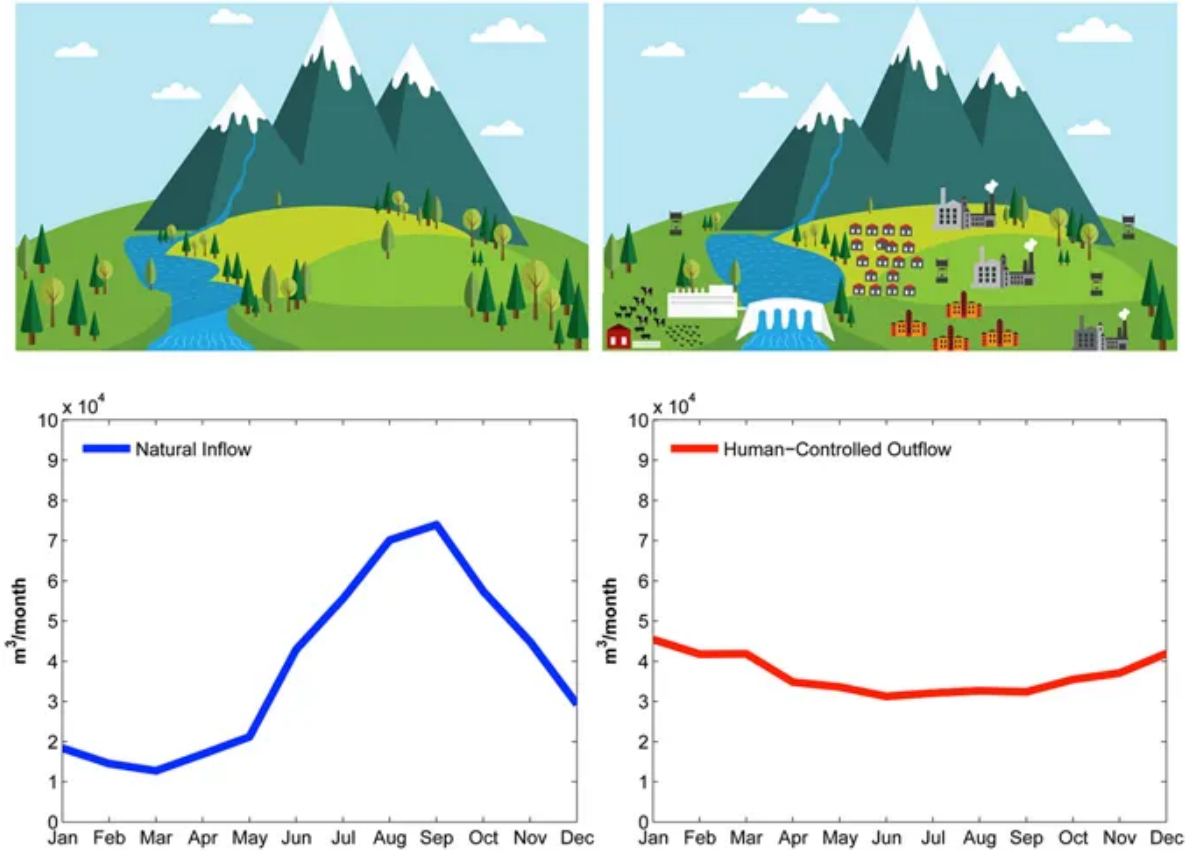
Do we need improved retention capacities?

- ✓ Method has been developed for identifying locations in a river basin where the N(S)WRM are needed. It uses topographic, hydrological, meteorological and land use data,
- ✓ Aims to identify areas with varying degree of predisposition for development of different measures,
- ✓ Is meant to be universal (through statistical analyses) with emphasis on supporting the decision-making process,
- ✓ Makes it possible to present analysis results for selected objectives (flood protection, drought prevention, water quality improvement),
- ✓ GIS tool – named FroGis.

What we can get applying different measures?

- ✓ The purpose of the Static Tool is to compare different variants of N(S)WRM in the catchment,
- ✓ The tool has an universal character (in terms of area, climatic and geographical conditions), but requires involvement of experts,
- ✓ The core element of the Static Tool is a set of relationships between measures' intensity and expected change in water retention properties of a catchment;
- ✓ In case we do need more precise answer on N(S)WRM we have to apply hydrological and/or hydraulic models.

MODELLING HUMAN IMPACT…OR ANTROPHOCEN MODELLING



Ali Mehran, et al., Scientific Reports **Volume 7**, Article number: 6282 (2017)

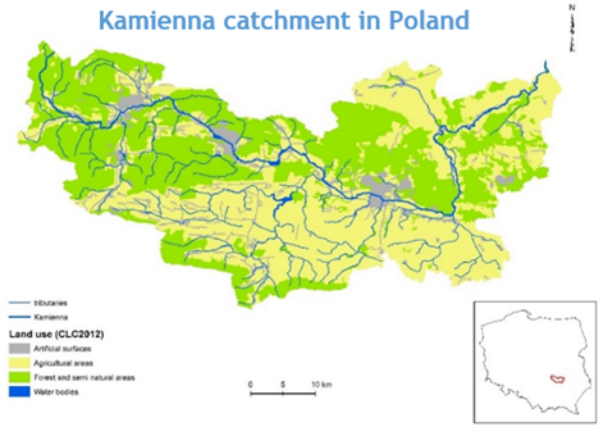
How to make it?

- ✓ Oriented on river basin organization but may be helpful for local (self)governments or potential investors (NGO's, farmers, forest rangers etc.) interested in setting projects aimed on water retention,
- ✓ Organised in two forms – traditional Guidelines book and Decision Support System
- ✓ The goal of the applications is to familiarize the user with the catalogue of N(S)WRM and steps in the planning process including effectiveness issues
- ✓ It help the user in making a decision about the choice of place and type of measures, which fits best to place potential
- ✓ Contains legal and environmental aspects,
- ✓ In the case of DSS - Teaches planning and collects surveys from stakeholders.

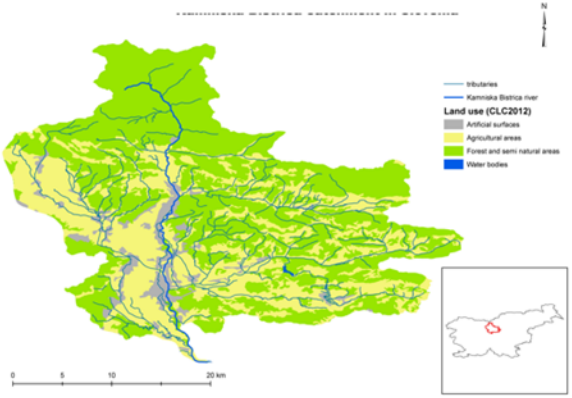
PILOT CATCHMENTS

Interreg CENTRAL EUROPE
European Union
European Regional Development Fund
FramWat

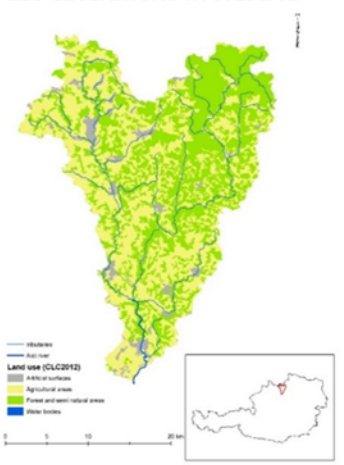
Kamienna catchment in Poland



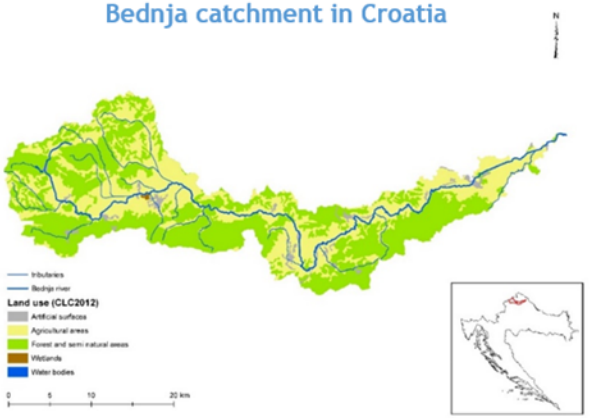
Kamniška Bistrica catchment in Slovenia



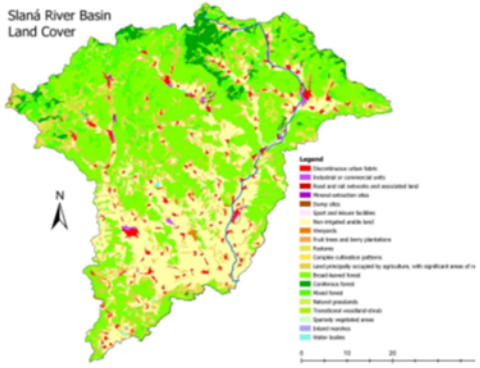
Aist catchment in Austria



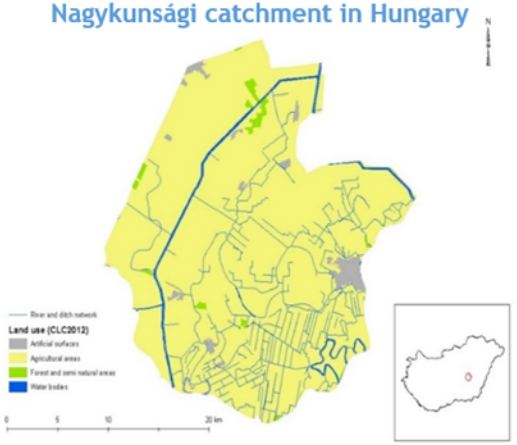
Bednja catchment in Croatia



Slaná catchment in Slovakia



Nagykunsági catchment in Hungary



TAKE AWAY MESSAGE FOR THE NEXT PARTS OF THIS MEETING

- ✓ There is a broad acceptance for applying N(S)WRM as a tool for improvement catchments performance in terms of hydrological extremes and pollution
- ✓ In European conditions public data bases contain sufficient landscape characteristics, hydro-meteorological data and water problems which allow for catchment description in terms of needs and possibilities for natural retention measures;
- ✓ There is a small science based evidence for quantitative impact of small and natural retention measures on flood and drought mitigation or water quality improvement;
- ✓ The ongoing European restoration projects have a limited monitoring systems oriented on detecting changes in flow characteristic or nutrient budget;
- ✓ So far developed tool have to rely on experts knowledge for cumulative effectiveness and can/should be supported by hydrological modelling for verification,
- ✓ **Implementation of N(S)WRM to be successful should be seen as a bottom-up process with active dialog with stakeholders, seen as investors in the „cooperative retention bank”.**

PRODUCS

MANUAL

ON HOW TO ASSESS THE EFFECTIVENESS OF THE SYSTEM OF MEASURES IN THE RIVER BASIN

GUIDELINES

TO IMPROVE WATER BALANCE AND NUTRIENT MITIGATION BY APPLYING SYSTEM OF N(S)WRM

ACTION PLAN

FOR KAMIENNA (PL)

+ Action Plan for Kamniska Bistrica (SL)
  Action plan for Middle Tisza (HUN)
  Action Plan for Slaná (SK)
  Action Plan for Bednja (CRO)
  Action Plan for Aist (AUT)

THANK YOU FOR YOUR ATTENTION

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

Facebook:
https://www.facebook.com/FramWat/

Mail:
framwat@levis.sggw.pl

FramWat Project Manager:
Tomasz Okruszko t.okruszko@levis.sggw.pl