



**EU4Environment**  
Water and Data in Eastern Partner Countries

# EU4ENVIRONMENT WATER AND DATA NATIONAL POLICY DIALOGUE – REPUBLIC OF MOLDOVA NATURE BASED SOLUTIONS IN FRANCE

April 2023

Implementing partners



Co-funded by

With funding from



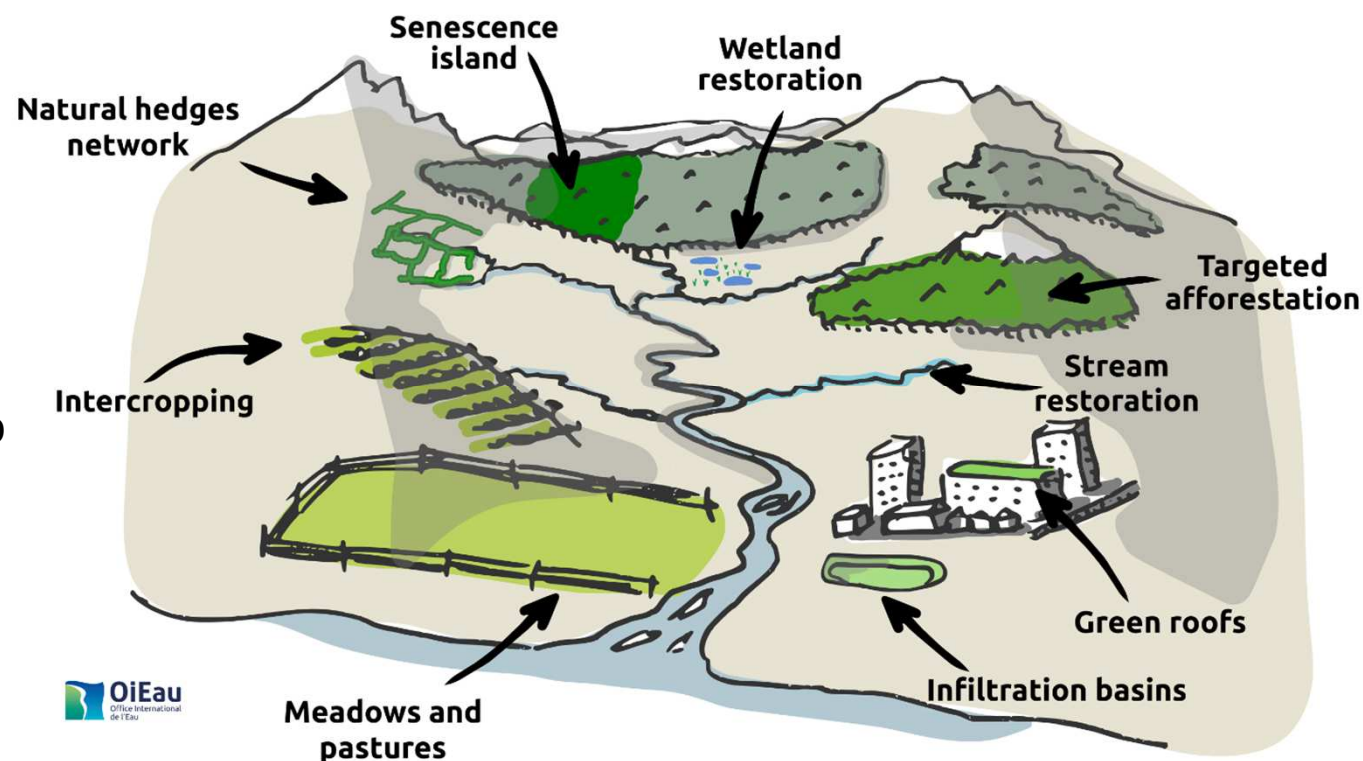


Funded by  
the European Union

**EU4Environment**  
Water and Data in Eastern Partner Countries

## KEY OBJECTIVE 1: IMPROVE NATURAL RETENTION OF WATER IN SOIL OR GROUNDWATER TABLE AND EROSION REDUCTION

- Slowdown runoff and increase infiltration
- Favor natural retention
- Favor natural clean up
- Create & improve habitats



Implementing partners



Co-funded by

With funding from  
Austrian  
Development  
Cooperation

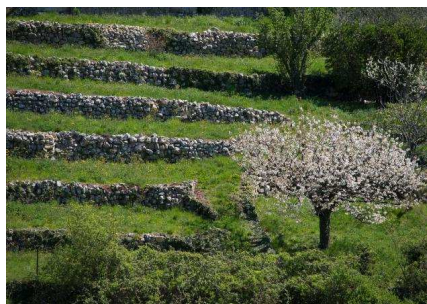




Funded by the European Union

# EU4Environment

Water and Data in Eastern Partner Countries



Many NWRM measures depend on working on agriculture practices improvement (in synergy with No3 Dir. Action Prog.)



Co-funded by





Funded by  
the European Union

**EU4Environment**  
Water and Data in Eastern Partner Countries

## EXAMPLE – MUDSLIDES REDUCTION IN ALSACE

- More frequent spring storms with intense rain (climate change)
- Reduction of edges in the past policy
- Results in mudslides with impacts on soils and downstream



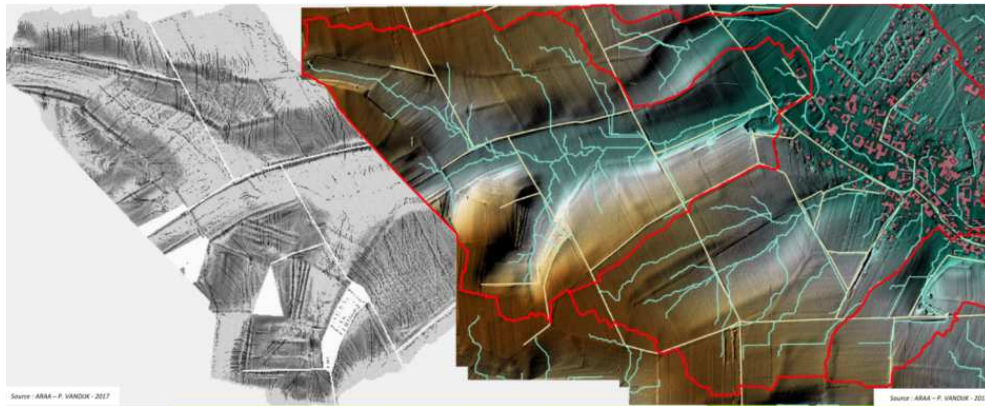


Funded by  
the European Union

**EU4Environment**  
Water and Data in Eastern Partner Countries

## EXEMPLE – MUDSLIDES IN ALSACE

- Analysis of waterflow
- Strategic implementation of hedges, implementation of fascines hedge, adapt crop rotation and soil preparation practice



Implementing partners



Co-funded by





Funded by  
the European Union

**EU4Environment**  
Water and Data in Eastern Partner Countries

## EXEMPLE – MUDSLIDES IN ALSACE

- Positive local acceptance
- Effective reduction of mudslide risks and water retention improvement
- Many co-benefits: landscape diversification, new habitats for biodiversity, water quality improved



# MORE RESOURCES ON EU PLATTFORM: NWRM.EU

<http://nwrn.eu>

Technical  
guide



53 measures sheets:

<http://nwrn.eu/measures-catalogue>

In English

<http://nwrn.eu/implementing-nwrn/practical-guide>

Implementing partners



Co-funded by





Funded by  
the European Union

**EU4Environment**  
Water and Data in Eastern Partner Countries

## KEY OBJECTIVE 2: WATER SANITATION

### “TREATMENT WETLANDS” OR “CONSTRUCTED WETLANDS” TECHNOLOGIES PRESENTATION AND APPLICATIONS

Domestic WWT – from household  
to rural communities



TSS : 98 %  
BOD<sub>5</sub> : 99 %  
COD : 94 %  
KN : 97 %  
TN : 50 – 70 %

Introduction

Mechanisms

Advantages & drawbacks





Funded by  
the European Union

**EU4Environment**  
Water and Data in Eastern Partner Countries

Storm water – Combined Sewer  
Overflow (CSO)

France - CSO treatment – 1,500 m<sup>3</sup>/d



Introduction

Mechanisms

Advantages & drawbacks



Funded by  
the European Union

**EU4Environment**  
Water and Data in Eastern Partner Countries

Sludge treatment

From activated sludge or septage

Mayotte Island – after  
activated sludge  
5,000 Inhab.

France - septage



Implementing partners



Co-funded by





Funded by  
the European Union

**EU<sup>4</sup>Environment**  
Water and Data in Eastern Partner Countries

Industrial – agro food  
industries



Martinique Island – Rum distillery effluent  
– 250 m<sup>3</sup>/d

<https://www.terrerhum.org/>

Introduction

Mechanisms

Advantages & drawbacks



Funded by  
the European Union

**EU4Environment**  
Water and Data in Eastern Partner Countries

Introduced into urban area for  
reuse purpose



Treated WW  
reuse for toilet  
flushing

Introduction

Mechanisms

Advantages & drawbacks

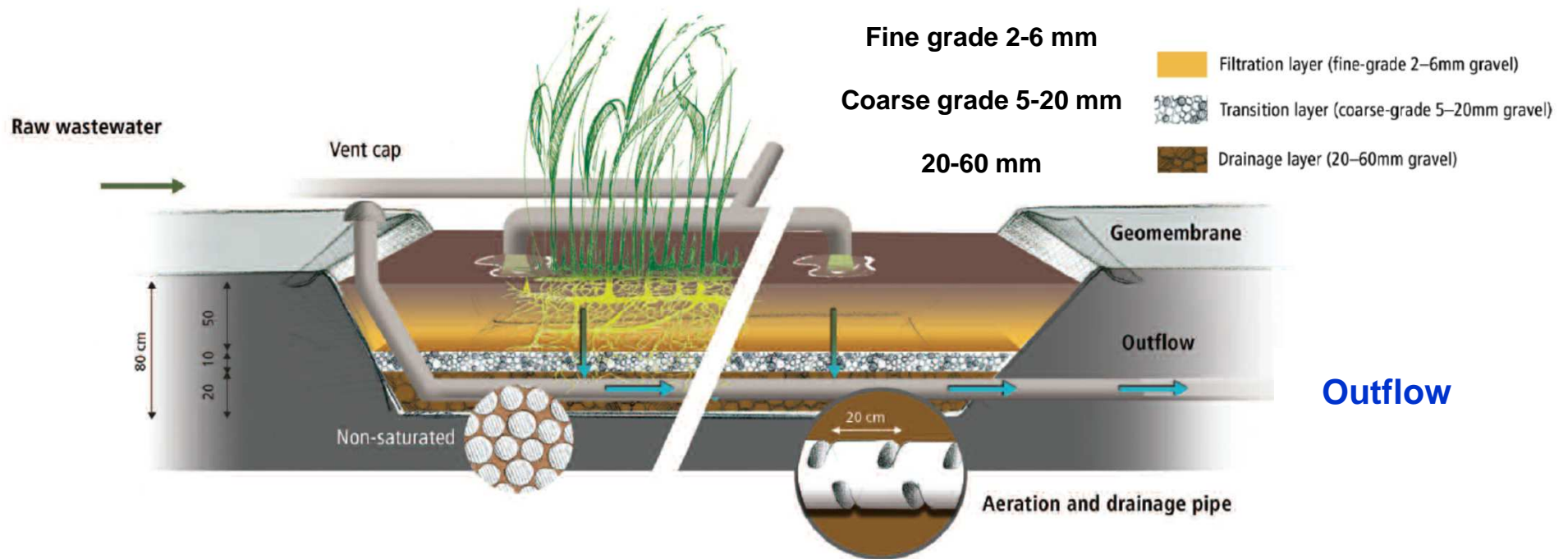


Funded by  
the European Union

**EU4Environment**  
Water and Data in Eastern Partner Countries

# MECHANISMS INVOLVED IN CONSTRUCTED WETLANDS FOR WASTEWATER TREATMENT

## Vertical filters usually used



Introduction

Mechanisms

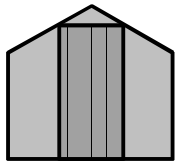
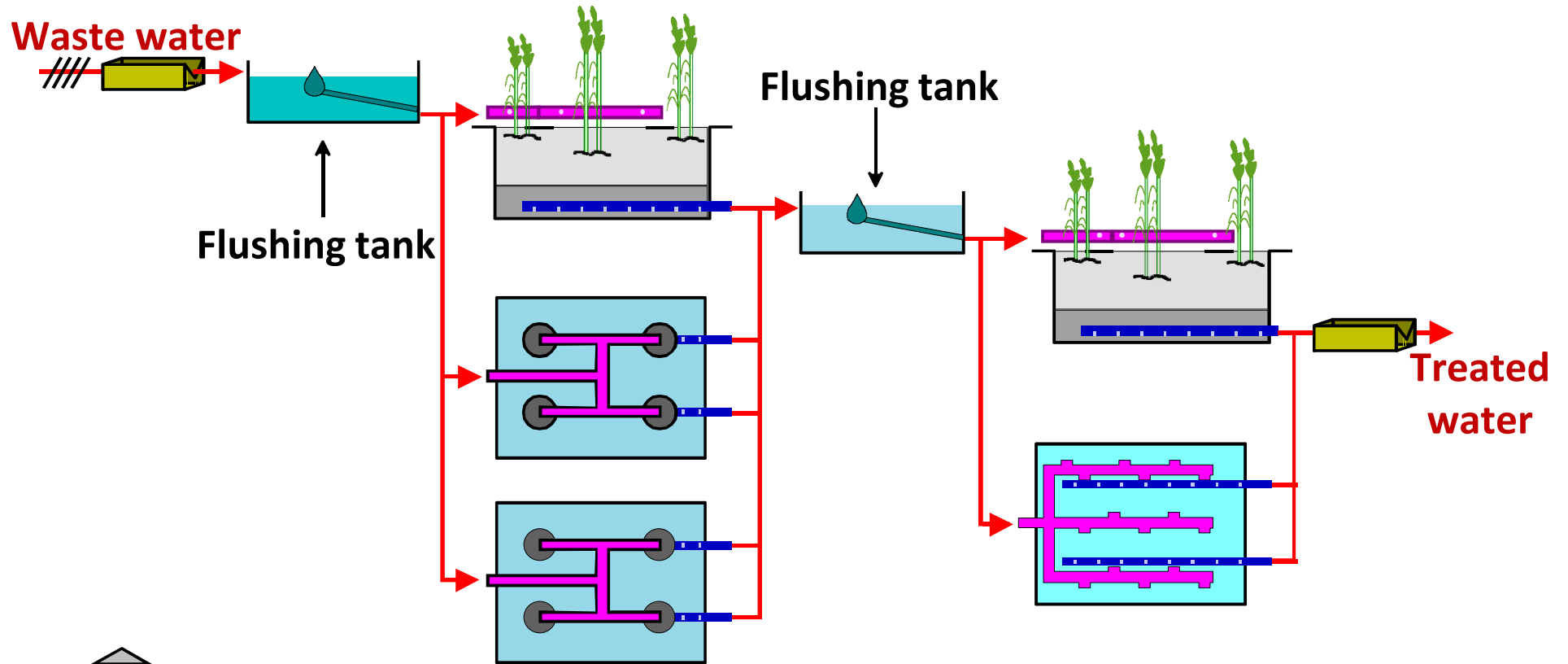
Advantages & drawbacks



Funded by  
the European Union

**EU4Environment**  
Water and Data in Eastern Partner Countries

## Classical WWTP in metropolitan France



Introduction

Mechanisms

Advantages & drawbacks



Funded by  
the European Union

**EU<sup>4</sup>Environment**  
Water and Data in Eastern Partner Countries

## DRAWBACKS OF CONSTRUCTED WETLANDS

- **Required large surface for this extended treatment (but possibility of less than 1 m<sup>2</sup>/P.Eq.)**
- **Annual cutting of vegetal and removal, especially for highest surfaces**
- **Removal of weeds, especially during first years (especially in case of too low hydraulic load)**
- **Availability of fine gravels, coarse and fine sands**
- **High investment cost for large WWTPs capacity (less competitive in comparison with activated sludge, etc)**
- **Finding available local plants with suitable characteristics and local adapted material (sands, gravels) for the filter**

Introduction

Mechanisms

Advantages & drawbacks



Funded by  
the European Union

**EU4Environment**  
Water and Data in Eastern Partner Countries

## ADVANTAGES OF CONSTRUCTED WETLANDS

- **Good removal of suspended solids and organic matter ( $BOD_5 < 25$  mg/l,  $COD < 75 - 125$  mg/l,  $SS < 15 - 50$  mg/l)**
- **Possibilities of nitrification ( $NTK < 6 - 40$  mg/l), denitrification ( $NT < 35$  mg/l), dephosphatation ( $PT < 2$  mg/l)**
- **Able to treat raw waste water. No primary treatment.**
- **Minimal sludge management. Extraction every 15-20 years or more. Decreasing of sludge production. Sludge reuse in agriculture**
- **Easy to operate :**
  - **Filters rotation 1 to 2 times / week**
  - **Weeds removal**
  - **Annual cutting of vegetal**
  - **None or few electromechanical equipment**

Introduction

Mechanisms

Advantages & drawbacks



## ADVANTAGES OF CONSTRUCTED WETLANDS

- **None or low energy consumption (depends on slope)**
- **Capacity to accept organic and hydraulic loads variation.  
Case of little WWTPs**
- **Nature-based solutions (+ fauna – concrete/energy)**
- **Adaptable to different climate**
- **Possibilities to treat other types of wastewater :  
agricultural, industrial, rain, waste waters, sludge, etc**
- **Lower investment cost for little WWTPs in comparison to  
other treatments**
- **Very low operation costs in particular when gravity used**

Introduction

Mechanisms

Advantages & drawbacks

## INSPIRED BY NATURE-BASED SOLUTIONS (NBS)?

- **OiEau is preparing in the frame of EU4Env a catalog of NBS, in view of integration them to the program of measures of new RBMPs**
- **An on-line regional workshop will take place on **Thursday 22 June** for its presentation**

Implementing partners



Co-funded by



## FOR MORE INFORMATION:

EU4Env  
Water&Data  
Web site :

<https://www.eu4waterdata.eu/en/>



<https://www.facebook.com/EU4Envwaterdata>



[p.henry-de-villeneuve@oieau.fr](mailto:p.henry-de-villeneuve@oieau.fr)

Implementing partners



Co-funded by

With funding from

