National University of Life and Environmental Sciences of Ukraine

Path4Med Horizon EU project (101156867)

Demonstrating innovative pathways addressing water and soil pollution in the Mediterranean Agro-Hydro-System

The kick-off meeting

Ukrainian team part of the Path4Med

Co-funded by the European Union

24.12.2024

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Agenda

1. Remind the information of WP’s project
2. Updating DS progress
3. Discussion - needs
4. Next step

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WP's project

Path4Med is designed in seven work packages (WPs) over 48 months

WP2: Benchmarking and Impact Assessment	- Solutions & Practices Overview - Technologies baseline (mapping) - Indicators (based on monitoring and diffuse pollution)	**Identify NBSs**
WP3: Novel Monitoring Technologies	- DNA databases - Monitoring methods and protocol - Weather databases, climate projections, and data sources	**Monitoring data**
WP4: Future pathways to improve water and soil quality	- Assessments of NBS, soil management, and water management practices - Integrated modeling on different scales and Upscaling models to the European basin	**Assess and integrate models**
WP5: Demonstrations and Open Call Management	- Demonstrations implementation and evaluation of results - Open Call: Launch and Management	**DSs**
WP6: Systems Integration and Policies Mainstreaming	- System databased and water pollution in Europe - Future needs - Integrated multi-scale agroecosystem modelling platform production	**Models platform**

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WP's project

Path4Med is designed in seven work packages (WPs) over 48 months

WP2: Benchmarking and Impact Assessment

- Solutions & Practices Overview
- Technologies baseline (mapping)
- Indicators (based on monitoring and diffuse pollution)

3-24 months → **Identify NBSs**

WP3: Novel Monitoring Technologies

- DNA databases
- Monitoring methods and protocol
- Weather databases, climate projections, and data sources

3-36 months → **Monitoring data**

WP4: Future pathways to improve water and soil quality

- Assessments of NBS, soil management, and water management practices
- Integrated modeling on different scales and Upscaling models to the European basin

9-45 months → **Assess and integrate models**

WP5: Demonstrations and Open Call Management

- Demonstrations implementation and evaluation of results
- Open Call: Launch and Management

1-45 months → **DSs**

WP6: Systems Integration and Policies Mainstreaming

- System databased and water pollution in Europe
- Future needs
- Integrated multi-scale agroecosystem platform production

3-45 months → **Models platform**

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WP's project

Path4Med is designed in seven work packages (WPs) over 48 months

WP2: Benchmarking and Impact Assessment

- Solutions & Practices Overview
- Technologies baseline (mapping)
- Indicators (based on monitoring and diffuse pollution)

3-24 months → **Identify NBSs**

8 months

NUBiP duration and timeline

Tasks:	Responsible:	Duration:	Deadline:
T.2.1: Cost-benefit analysis	Oleksandr Labenko and his team	1-6 months (3 months)	January 2025
T.2.2: Assess agricultural policies	Oleksandr Labenko and his team	1-6 months (2 months)	January 2025
T.2.4: Review existing indicators of water quantity and quality	Vita Strokal and her team	1-6 months (3 months)	January 2025

Input to the projects:

Solutions and practices overview that are based on Nature-Based Solution approaches

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WP's project

Path4Med is designed in seven work packages (WPs) over 48 months

WP3: Novel Monitoring Technologies

- DNA databases
- Monitoring methods and protocol
- Weather databases, climate projections, and data sources

3-36 months

NUBiP duration and timeline

16 months

Monitoring data

Tasks:	Responsible:	Duration:	Deadline:
T.3.1, 3.4: Water quality monitoring and assessment	Vita Strokal and her team	1-14 months (6 months)	**July 2025**
T.3.2-3.3: Earth Observation and Monitoring Strategy	Oleksandr Labenko and his team Vita Strokal and her team	1-30 months (6 months)	**May-July 2026**
T.3.5: Date sources (climate, agriculture …)	Vita Strokal and her team	1-6 months (4 months)	**January 2025**

Input to the projects:

Data sources:

- Climate data
- Water monitoring data and water protocols
- Soil data

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WP's project

Path4Med is designed in seven work packages (WPs) over 48 months

WP4: Future pathways to improve water and soil quality

- Assessments of NBS, soil management, and water management practices
- Integrated modeling on different scales and Upscaling models to the European basin

9-45 months → **Assess and integrate models**

NUBiP duration and timeline — **13 months**

Tasks:	Responsible:	Duration:	Deadline:
T.4.1-4.3: Assessment of NDSs, water and soil management	Oleksandr Labenko and his team Vita Strokal and her team	25-42 months (4 months)	**2025-2028**
T.4.5-4.6: Integrated modeling on different scales with solutions	Vita Strokal	25-42 months (2 months)	**2027-2028**
T.4.7: Upscaling models	Vita Strokal	9-45 months (7 months)	**2027-2028**

Input to the projects:

Data sources:

- Datasets of water parameters to upscale and validate models;
- Optimized soil and water management

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WP's project

Path4Med is designed in seven work packages (WPs) over 48 months

WP5: Demonstrations and Open Call Management

- Demonstrations implementation and evaluation of results
- Open Call: Launch and Management

1-45 months → **DSs – DS3**

NUBiP duration and timeline

20 months

Tasks:	Responsible:	Duration:	Deadline:
T.5.1: Stakeholder mapping and analyses	Oleksandr Labenko, Vita Strokal and their teams	1-12 months (3 months)	**February-March 2025**
T.5.2-5.3: Co-development of DS3 and coordinate it	Vita Strokal	1-42 months (9 months)	**D5.3 1 April 2026**
T.5.4: Evaluation of results of DS3	Vita Strokal and team	37-42 months (4 months)	**2027-2028**
T.5.5: Demonstration of DS3 in Lighthouse settings	Oleksandr Labenko, Vita Strokal and their teams	12-42 months (4 months)	**D5.4 1 April 2028**

Input to the projects:

Demonstration Sites:
- DSs Implementation Plan (D5.3)
- Lighthouse (D5.4)

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WP's project

Path4Med is designed in seven work packages (WPs) over 48 months

WP6: Systems Integration and Policies Mainstreaming

- System databased and water pollution in Europe
- Future needs
- Integrated multi-scale agroecosystem modelling platform production

3-45 months → **Models platform**

NUBiP duration and timeline

5 months →

Tasks:	Responsible:	Duration:	Deadline:
T.6.1: Integration of agricultural influences	Oleksandr Labenko, Vita Strokal and their teams	1-24 months (2 months)	**Fabruary-March 2025**
T.6.2: Integration of the needs of agricultural users	Oleksandr Labenko and his team	24-36 months (1 months)	**2025-2028**
T.6.3-6.4: Integrated multi-scale agroecosystem modelling platform	Vita Strokal and her team	18-42 months (2 months)	**2027-2028**

Input to the projects:

- Water and soil pollution
- Water needs for agricultural users
- Databases

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DS3 - Ukraine

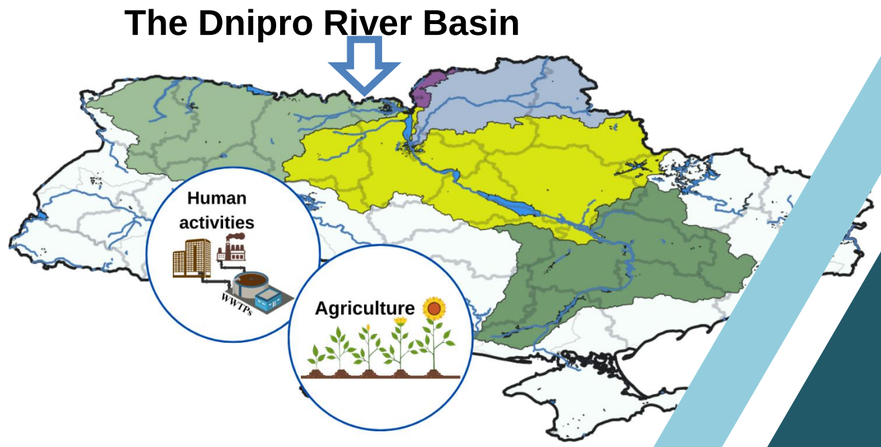
Demonstration site
“Future pathways for zero pollution in the Dnipro Basin under emerging challenges and threats”

Leader: NUBIP of Ukraine

Co-leader: WU-DES (The Netherlands)

- **Scale:** Dnipro River Basin: reservoirs and rivers
- **Tools:** monitoring water quality *to support modeling of future pathways for zero pollution in the Dnipro Basin under emerging challenges and threats*

NUBIP leads DG3, focusing on zero pollution pathways in the Dnipro Basin, including water quality monitoring, soil assessment, and real-time process-based environmental modeling to address emerging challenges



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DS3 - Ukraine

DG3 (Ukraine): CASE STUDY

Case 1 - Farm

WP 2 - Benchmarking and Impact Assessment

Identify Nature-Based Solutions

Cost-benefit analyses will be used to evaluate the economic costs and benefits of different strategies to address water scarcity at the farm scale.

Case 2 - Sub-catchment

WP 3: Novel Monitoring Technologies
WP 4: Future Pathways to Improved Water and Soil Quality

Monitoring Datasets, Climate datasets

This case will investigate recommendations for implementing novel monitoring methods in man-made reservoirs along the Dnipro River. This case includes samplings that cover physical, chemical, microbiological, and pesticide parameters.

Case 3 – Water Basin

WP 4: Future Pathways to Improved Water and Soil Quality
WP 6: Systems Integration and Policies Mainstreaming

Upscaling modeling

This case will investigate the modeling of pathways for zero pollution (related to the Green Deal targets on nutrient reductions) in the Dnipro River under climate change for the post-war recovery.

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DS3 - Ukraine

DG3 (Ukraine): CASE STUDY

Case 1 - Farm

WP 2 - Benchmarking and Impact Assessment

Identify Nature-Based Solutions

Cost-benefit analyses will be used to evaluate the economic costs and benefits of different strategies to address water scarcity at the farm scale.

Start to collect datasets of agricultural activities (2010-2023) and Literature review:

Crop area: grain (wheat, barley, corn, rye, oats), industrial (sunflower, beet, soy, rape), vegetables, fodder, fruits.
Crop yield: grain, industrial, vegetables, fruits.
Fertilizers: mineral, nitrogen, phosphorus, potash, organic

→ T.2.1: Cost-benefit analysis
T.3.5: Date sources (climate, agriculture …)

Identified stakeholder groups:

Four farmers (related to water sampling), **two local stakeholders** (director of Kyiv and Kaniv Hydropower stations), and **policymakers** (Committee of the Verkhovna Rada of Ukraine on Environmental Policy and Nature Management)

→ T.2.2: Assess agricultural policies
T.5.1: Stakeholder mapping and analyses

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DS3 - Ukraine

DG3 (Ukraine): CASE STUDY

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Monitoring Datasets, Climate datasets

This case will investigate recommendations for implementing novel monitoring methods in man-made reservoirs along the Dnipro River. This case includes samplings that cover physical, chemical, microbiological, and pesticide parameters.

We have done two water sampling trips:

The NUBiP's team took the samplings on 2-4 August and 18-20 October 2024

→ T.3.1, 3.4: Water quality monitoring and assessment

Start to collect existing indicators of water quality and quantity of the Dnipro River Basin:

→ T.2.4: Review existing indicators of water quantity and quality

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DS3 - Ukraine

DG3 (Ukraine): CASE STUDY

Case 1 - Farm

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Identify Nature-Based Solutions

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Case 2 - Sub-catchment

WP 3: Novel Monitoring Technologies
WP 4: Future Pathways to Improved Water and Soil Quality

Monitoring Datasets, Climate datasets

This case will investigate recommendations for implementing novel monitoring methods in man-made reservoirs along the Dnipro River. This case includes samplings that cover physical, chemical, microbiological, and pesticide parameters.

We start to collect datasets of historical meteorological data:

Seasonal precipitation and **air temperature** of *all regions of Ukraine* (1981-2020)

Monthly precipitation and **air temperature** of the *meteostation near the water samplings* (1970-2023)

→ T.3.5: Date sources (climate, agriculture …)

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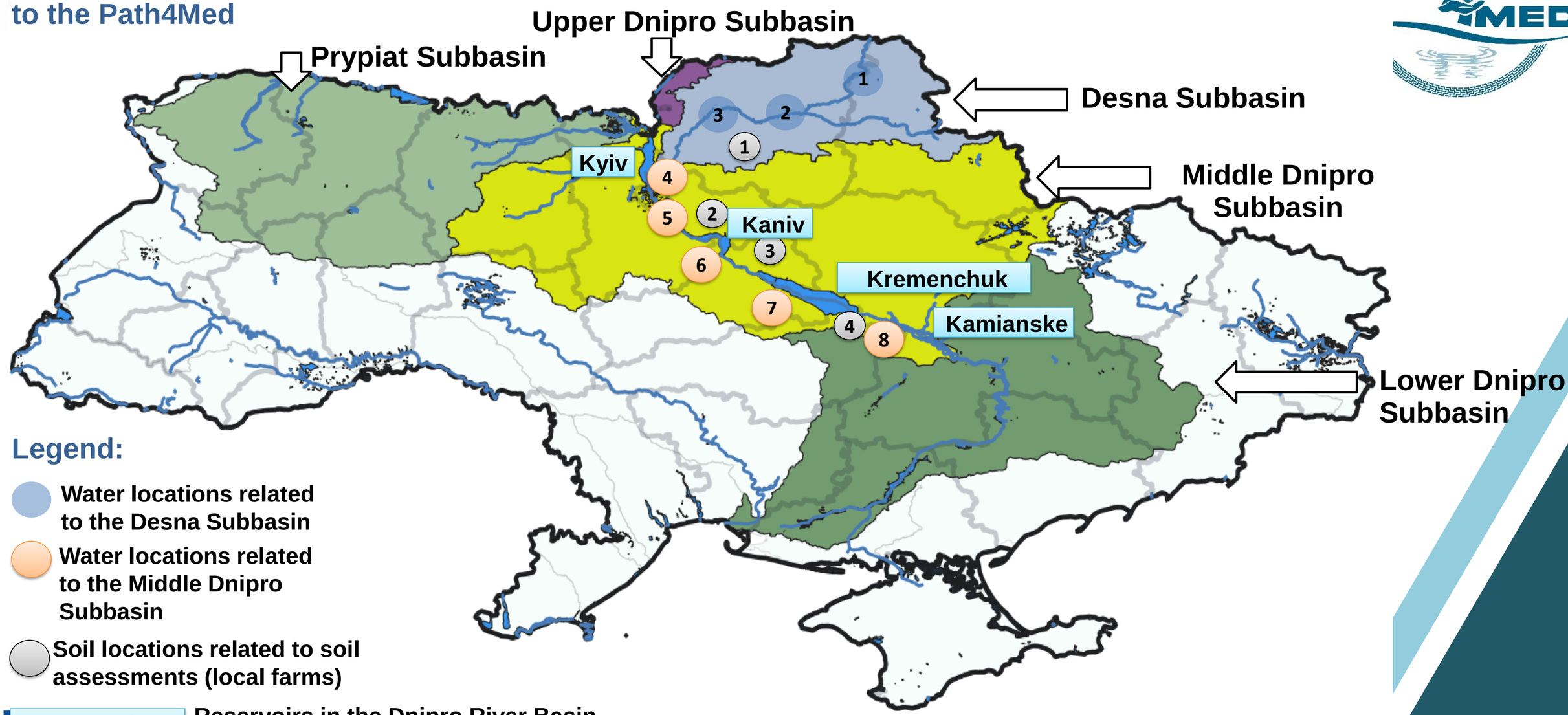
DS3 - Ukraine

Ukrainian engagement to the Path4Med



Legend:

- Water locations related to the Desna Subbasin
- Water locations related to the Middle Dnipro Subbasin
- Soil locations related to soil assessments (local farms)
- Reservoirs — Reservoirs in the Dnipro River Basin related to water sampling

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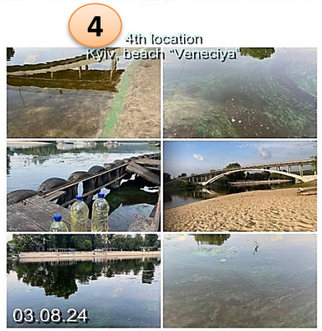
DS3 - Ukraine

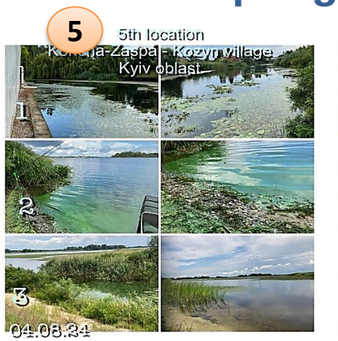
PATHIMED

Demonstration site (Ukraine)

Water sampling:



Water sampling:



Prime Lab Tech – International Quality laboratory analysis of water, soil, fertilizers

- 4 seasons (2 seasons have been done)
- 8 locations, that 24 sampling sites (3 sites per location)
- Water measure parameters:
  - ✓ physical (pH, water transparency);
  - ✓ chemical (nitrogen (ammonium, nitrate, nitrite), phosphates, Copper, Zinc, Lead, Cadmium, Iron);
  - ✓ microbiological (Lactose-positive Escherichia coli index), pesticides (Glyphosate);
  - ✓ pharmacology (Lopinavir, Diclofenac)

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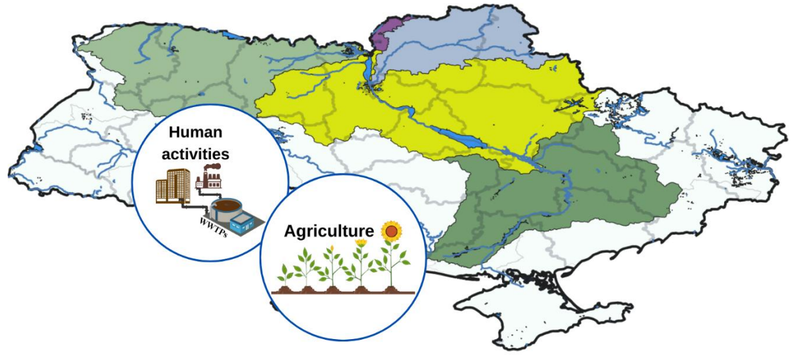
Discussion - needs

Urgent issues!!!

Demonstration Site in Ukraine – Dnipro River Basin



Case 1: Cost-benefit analyses to evaluate the economic costs and benefits of different strategies to address water scarcity on the farm scale

1. What do we need to do to achieve T2.1-2.3?
2. Which parameters do we need to use for cost-benefit analyses?
3. Where can we find how many pesticides were applied to the crops?

Deadline: January 2025

T.2.1: Cost-benefit analysis

T.2.2: Assess agricultural policies

Case 2: Sub-catchment

1.How do we can collect existing indicators of water quantity and quality?
2. We need to discuss with the stakeholders and identify their roles and practices (water and soil management) and needs. Maybe we need to make the survey and ask them. What do you think?

T.2.4: Review existing indicators of water quantity and quality

Identify Nature-Based Solutions

Deadline: January 2025

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DS3 - Ukraine

Next step for the future 6 months:

	Deadline	
Case 1:		
○ to figure out the economic costs and benefits of different strategies to address water scarcity on the farm scale;	January 2025	Labenko Oleksandr
○ to detail the agricultural management in the farms and socio-economic barriers to adopting sustainable practices;	February 2025	Strokal Vita & Labenko Oleksandr
○ Stakeholders mapping	January 2025	Strokal Vita, Ladyka Maryna, Palamarchuk Svitlana
Case 2:		
○ to work on analyses of water parameters (two seasons);	January 2025	Voitenko Larysa
○ to make the shapefiles of the Dnipro River Basin;	January 2025	Strokal Vita
○ to continue collecting datasets of historical meteorological data and agricultural activities;	January 2025	Ladyka Maryna, Palamarchuk Svitl
○ to take water sampling (in the winter and spring);	January 2025, April 2025	All
○ to take soil sampling.	May 2025	All
Case 3:		
○ to start to collect datasets of socio-economic drivers and urbanization of the Dnipro River Basin to investigate the modeling of pathways for zero pollution in the Dnipro Basin	October 2025	Vita Strokal, Naumovska Olena Vagaliuk Luidmyla

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Next meetings

To have the strong achievements of this project I propose to have the kick-off meeting every month!

Data	Time	Important aspects	Tasks that we need to achieve
25.12.2024	14:30	Datasets of meteorological data, agriculture, and social-economic drivers. Cost-benefit analyses (T2.1)	NDSs
29.01.2025	14:30	Assess agricultural policies (T2.2). Review existing indicators of water quantity and quality (T2.4). **Tender (2)** – **water sampling**.	T2.1, T2.2, T2.4, T3.1, T3.4
26.02.2025	14:30	**Water sampling**. Working with stakeholders Stakeholder mapping and analyses (T5.1). NBSs	T5.1
26.03.2025	14:30	Water monitoring analyses. Prepare for soil sampling. **Tender – soil sampling???**. Working with stakeholders	
30.04.2025	14:30	**Water sampling**. Integration of agricultural influences (T6.1)	T6.1
28.05.2025	14:30	**Soil sampling**. Water monitoring analyses.	T3.1, T3.4
25.06.2025	14:30	Prepare the first draft of the report. Soil and water analyses. Overview of what we need. Make the water protocols. Deliverables!!!	Draft report (for the second project meeting)

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Next meetings

To have the strong achievements of this project I propose to have the kick-off meeting every month!

Data	Time	Important aspects	Tasks that we need to achieve
27.08.2025	14:30	Discussion about preparing the first final report that will be presented in the consortium meeting in October. Assessment of NDSs, water, and soil management (T4.1-4.3). Working with stakeholders	Draft final report (for the second project meeting) T4.1-4.3
24.09.2025	14:30	Present the final report that will be presented in the consortium meeting in October. Assessment of NDSs, water and soil management (T4.1-4.3)	Final report T4.1-4.3
29.10.2025	14:30	Integration of the needs of agricultural users (T6.2). Discussion of the consortium meeting	T6.2
26.11.2025	14:30	Inputs the main results in the websites.	
18.12.2025	14:30	Analyses what we need to achieve the tasks.	

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