



**National University of Life and  
Environmental Sciences of Ukraine**

**Стратегії національної політики щодо управління водними та  
земельними ресурсами на території Дніпровського басейну України  
(EU Horizon Path4Med project)**

**Policy strategies addressing water and soil management in the  
Dnipro River Basin in Ukraine (EU Horizon Path4Med project)**

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екологічного контролю НУБіП України**

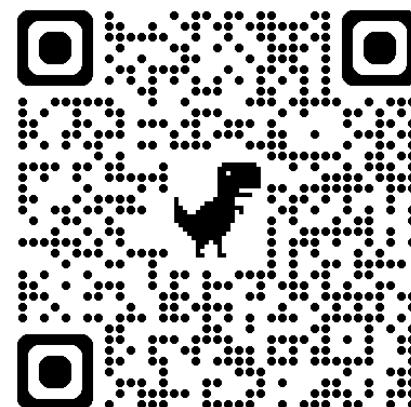
**Strokal Vita, Associate Professor at the Department of Agrosphere Ecology  
and Environmental Control at the NUBiP of Ukraine**

**Міжнародна конференція «Екологія – філософія існування людства»  
International Conference "Ecology – Philosophy of Human Existence"**

**23 квітня 2025 р.  
23 April, 2025**



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## Policy strategies addressing to:

### Soil management



#### Provide:

- Food security and food safety
- Export agricultural products
- Implement innovative green technologies (e.g. irrigation systems)
- Promote cutting-edge agricultural sustainable practices and nature-based solutions
- Develop rural areas and improve social-economic growth in rural areas lands

### Water management



#### Provide:

- Water safety and food security
- Integrated water resources management (IWRM)
- Dnipro River Basin Management Plan
- Provide state water monitoring systems for surface water bodies:
  - diagnostic (assessment of long-term trends in changes in the level and concentrations of pollutants in water);
  - operational (assessment of the level and concentrations of pollutants in water under existing environmental risks);
  - ensure open access to water monitoring data

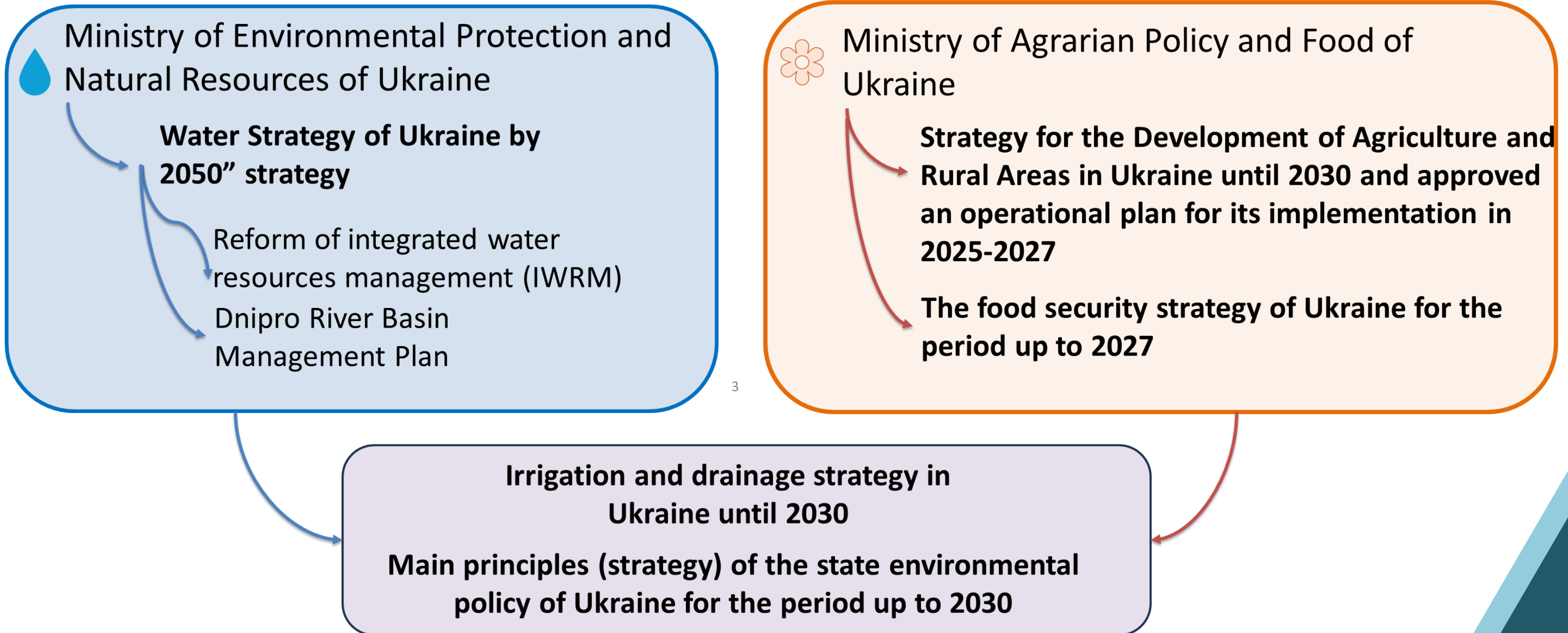
**Support the implementation of innovative green technologies and agricultural practices to protect and safe water resources**







## Regulate and provide policy strategies next government organizations:



3





## Policy strategies aim to introduce innovative technologies to ensure food security

Soil resources

Food security

Soil health

Water quality

### Monitoring and Assessment Technologies

On-the-go soil sensors, IoT-based systems, Diversified cropping systems, AI-soil sensors, AI-water sensors, GiS, and RS

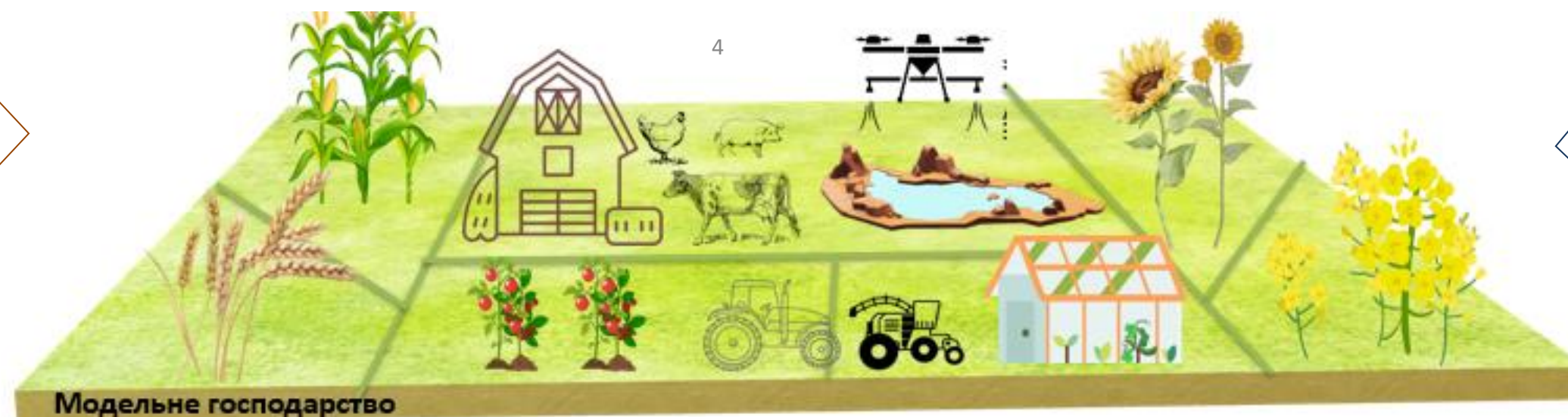
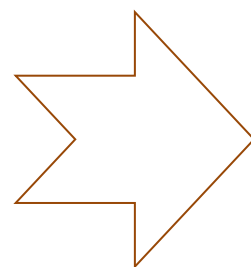
### Pollution Reduction and Control Technologies

Innovative equipment for farms (CloudFarms software), AI-sensors/RS, and Models

### Water Conservation and Management Technologies

Drip Irrigation Technology (Valley, Zimmatic 9500CC, Otech)

Soil management



Water management





## Nature-based solutions (NbSs) provide soil health and water quality in DG3(Ukraine)

### Landscape and soil protection and restoration solutions:

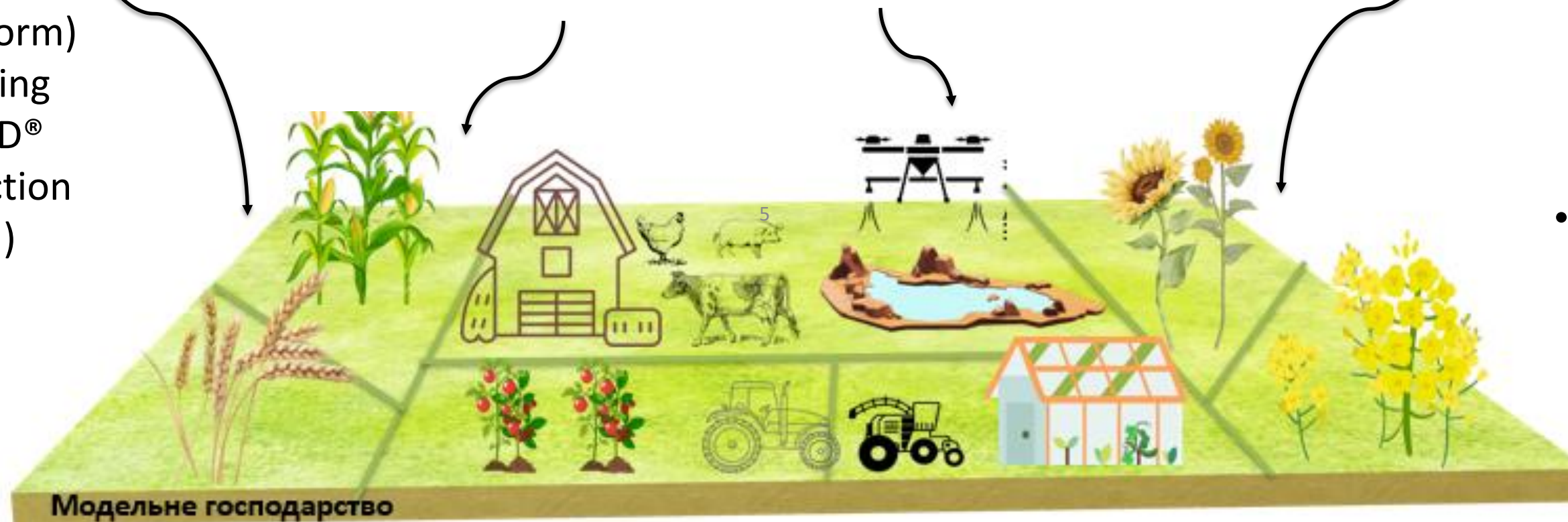
- Precision agriculture (Arc™ farm intelligence platform)
- Diversified cropping systems (3RIVE 3D® plant crop protection delivery platform)

### Water conservation and protection solutions:

- Drought-resistant hybrids such as corn (Optimum® AQUAmax®) and sunflower (ExpressSun®)
- irrigation sprinkler systems (Otech irrigation systems, ZIMMATIC® & Agrodrones sprayers XAG); mobile platforms and FMIS systems; maintenance of Data systems (AFS Connect™, Cartography™); water supply and drainage systems for livestock farms (CloudFarms)

### Nutrient management solutions

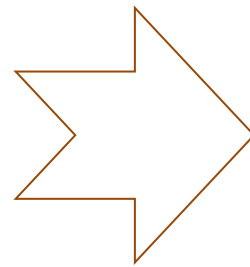
- Meteorological stations (Pessl iMetos IMT300, Meteobot Pro);
- Digital technology, such as Cropwise Seed Selector, innovative technology, such as Interra®Scan, that are based on GIS systems
- Agricultural sustainable practices





## Stakeholders addressing soil management in DG3(Ukraine) that provide, promote, and implement technologies and NbSs

### Soil management



#### Symbols:

#### Sectors:



Academy/Research



Public



Private



Non-governmental

#### Geographical coverage



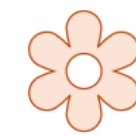
Municipal stakeholders



Provincial stakeholders



National stakeholders



- 1 Ministry of Environmental Protection and Natural Resources of Ukraine
- 2 Ministry of Agrarian Policy and Food of Ukraine
- 3 Central Geophysical Observatory (CGO) named after Boris Srezenevsky
- 4 State Service of Ukraine for Geodesy, Cartography and Cadastre (StateGeoCadastre)
- 5 The State Service of Ukraine on Food Safety and Consumer Protection (SSUFSCP)



- 6 PrimaVera
- 7 Association of Water Utilities of Ukraine
- 8 Ukrainian Water Association (UWA)
- 9 Association "Ukrainian Agribusiness Club" (UCAB)



- 10 Ukravit
- 11 Syngenta Ukraine
- 12 FMC Ukraine
- 13 Corteva Agriscience Ukraine
- 14 Agrotek
- 15 RDO Ukraine
- 16 LandTech
- 17 Titan Machinery Ukraine LLC
- 18 Vada
- 19 Dahmira
- 20 Agrosystem



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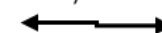
- 21 The National Scientific Center "Institute of Agriculture of the National Academy of Agrarian Sciences of Ukraine (NAAS)"
- 22 Institute of Agroecology and Environmental Management
- 23 Institute of Water Problems and Land Reclamation of the National Academy of Agrarian Sciences of Ukraine (NAAS)
- 24 Institute of Agricultural Microbiology and Agro-Industrial Production of the National Academy of Agrarian Sciences of Ukraine (NAAS)
- 25 Universities



- 26 Water supply services
- 27 Wastewater treatment plants



- 28 Local municipalities (villages and cities)



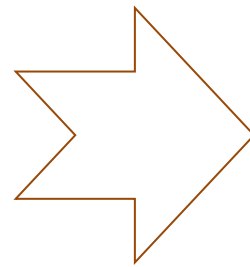
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## Stakeholders addressing soil management in DG3(Ukraine) that provide, promote, and implement technologies and NbSs

### Soil management



#### Symbols:

#### Sectors:

Academy/Research

Public

Private

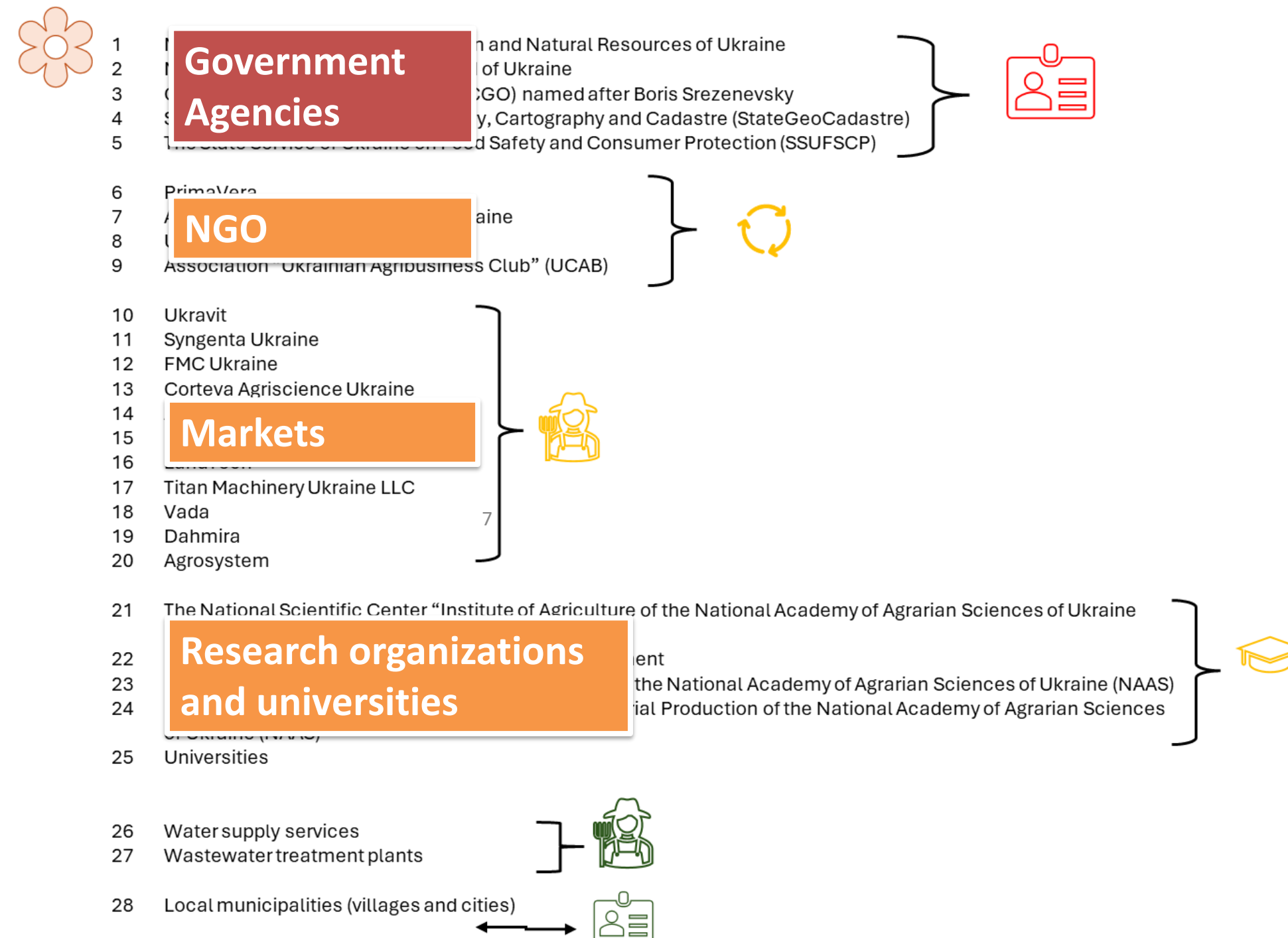
Non-governmental

#### Geographical coverage

- Municipal stakeholders
- Provincial stakeholders
- National stakeholders



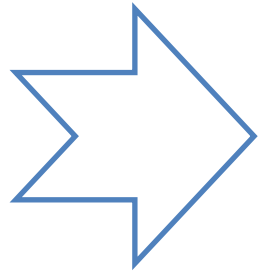
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## Stakeholders addressing water management in DG3(Ukraine) that provide, promote, and implement technologies and NbSs

### Water management



#### Symbols:

#### Sectors:

 Academy/Research

 Public

 Private

 Non-governmental

#### Geographical coverage

 Municipal stakeholders

 Provincial stakeholders

 National stakeholders



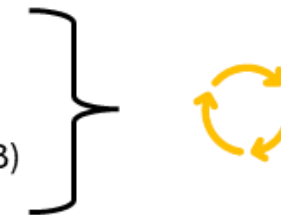
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- 1 Ministry of Environmental Protection and Natural Resources of Ukraine
- 2 State Water Resources Agency of Ukraine
- 3 Basin Management Councils of Dnipro Sub-Basins
- 4 Interregional Office of Protective Arrays of Dnipro Reservoirs of SAWR
- 5 Central Geophysical Observatory (CGO) named after Boris Srezenevsky



- 6 PrimaVera
- 7 Association of Water Utilities of Ukraine
- 8 Ukrainian Water Association (UWA)
- 9 Association "Ukrainian Agribusiness Club" (UCAB)



- 10 The National Scientific Center "Institute of Agriculture of the National Academy of Agrarian Sciences of Ukraine (NAAS)"
- 11 Institute of Agroecology and Environmental Management
- 12 Institute of Water Problems and Land Reclamation of the National Academy of Agrarian Sciences of Ukraine (NAAS)
- 13 Institute of Agricultural Microbiology and Agro-Industrial Production of the National Academy of Agrarian Sciences of Ukraine (NAAS)
- 14 Universities



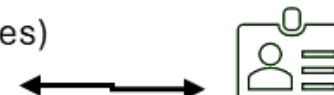
- 15 Agro-Oven Corporation
- 16 APK-INVEST
- 17 Public Limited Company "UkrLandFarming"
- 18 IMC-Smart Green Company



- 19 Water supply services
- 20 Wastewater treatment plants



- 21 Local municipalities (villages and cities)

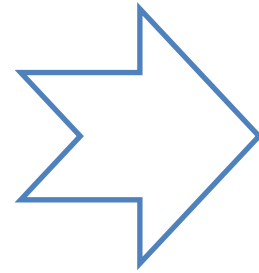






## Stakeholders addressing water management in DG3(Ukraine) that provide, promote, and implement technologies and NbSs

Water  
management



### Symbols:

### Sectors:

Academy/Research

Public

Private

Non-governmental

### Geographical coverage

Municipal stakeholders

Provincial stakeholders

National stakeholders



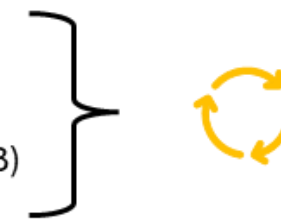
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- 1 Ministry of Environmental Protection and Natural Resources of Ukraine
- 2 **Government Agencies**
- 3 State Agency of Ukraine
- 4 State Agency of Dnipro Sub-Basins
- 5 State Agency of Dnipro Reservoirs of SAWR
- 6 Central Geophysical Observatory (CGO) named after Boris Srezenevsky



- 6 PrimaVera
- 7 **NGO**
- 8 State Agency of Ukraine (UWA)
- 9 Association "Ukrainian Agribusiness Club" (UCAB)



- 10 The National Scientific Center "Institute of Agriculture of the National Academy of Agrarian Sciences of Ukraine (NAAS)"
- 11 **Research organizations and universities**
- 12 Institute of Management and Information of the National Academy of Agrarian Sciences
- 13 Institute of Agro-Industrial Production of the National Academy of Agrarian Sciences of Ukraine (NAAS)
- 14 Universities



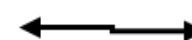
- 15 Agro-Oven Corporation
- 16 **Farms**
- 17 IMC-Smart Green Company
- 18



- 19 Water supply services
- 20 Wastewater treatment plants

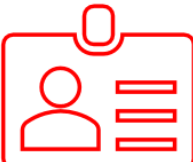









- 21 Local municipalities (villages and cities)





## Comparative analyses and categorization of stakeholder engagement









Group of stakeholders	Examples of technologies	Examples of agricultural practices based on NBSs
 <b>Government Agencies</b> <i>Provide policy strategies</i>	Strategies  	Support stakeholders to implement precision agriculture technologies, monitoring approaches (e.g. measures of ecological and chemical status of water)
 <b>Non-governmental organization</b> <i>Support and promote the implementation of technologies</i>	 Solutions for sustainable land and water use and irrigation systems      The water supply technologies and effective sewage treatment technologies 	Support policymakers, farms, and agribusiness in implementing green technologies based on nature-based solutions
 <b>Markets</b> <i>Distribute technologies and promote approaches</i>	 Precision agriculture digital technologies (Cropwise Seed Selector), irrigation sprinkler systems (Otech irrigation systems, ZIMMATIC®), meteorological stations (Pessl iMetos IMT300, Meteobot Pro)	Provide drip and sprinkle irrigation systems for soil protection, build crop disease models, and implement drought-resistant hybrids







## Comparative analyses and categorization of stakeholder engagement

Group of stakeholders	Examples of technologies	Examples of agricultural practices based on NBSs
 <b>Markets</b> <i>Distribute technologies and promote approaches</i>	 Data systems (AFS Connect™, Cartography™); water supply for livestock farms (CloudFarms), irrigation sprinkler systems (ZIMMATIC® & Agrodrones sprayers XAG)	Apply innovative water supply and drainage systems in livestock farms to support water protection; provide 3RIVE 3D® plant crop protection delivery platform for supplying sustainable water management
 <b>Farms</b> <i>Produce products (crops, poultry, pork, cattle)</i>	 Modern technologies for high-quality harvest (drip and sprinkler irrigation technologies, GPS-monitoring machinery)  Water supply and drainage systems for livestock farms (CloudFarms), satellite monitoring technology (NDVI and drones)	Provide modern technologies for high-quality harvest in sustainable agriculture practices; ensure various schemes of crop rotation to improve land use and soil fertility
 <b>Research and innovation institutions</b> <i>Provide new knowledge</i>	  Knowledge of the development of irrigation technologies, providing the biological preparations in crop production for sustainable agriculture practices.	Support farms in applying climate-resilient hybrids of fodder, industrial, and vegetable crops by providing advice





Developed the stakeholders mapping  
framework by NUBiP’s team

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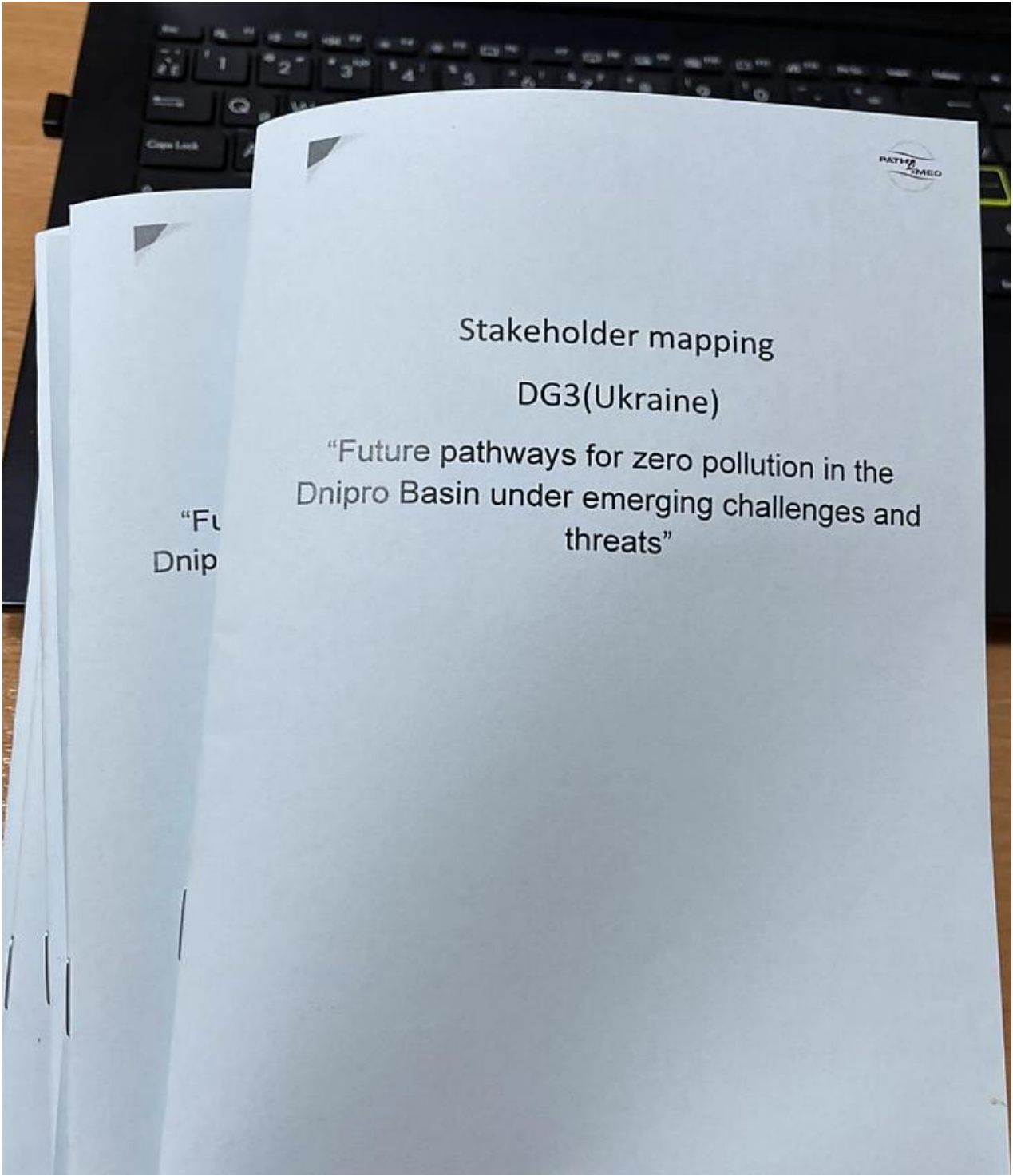
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Comparative analyses and categorization of stakeholder engagement in the Dnipro River Basin (DG3 Ukraine)

Table 1. Comparative analyses and categorization of stakeholder engagement in the Dnipro River Basin (DG3 Ukraine)

Stakeholders	Role	Distribution Level	Examples of technologies		Examples of agricultural practices based on RIBs	
			To support Soil Management (soil health)	To support Water Management (water quality)	Water conservation	Climate resilience
Government Agencies	Provide policy strategies	National	The three strategies are oriented towards food security, the availability of irrigated water and systems to produce food and rural development	The one strategy includes the integration components towards the EU regulations to implement the Dnipro River Basin Management Plan	Support stakeholders to implement precision agriculture technologies (e.g. measure of ecological and chemical status of water)	Support municipalities to manage practices such as the restoration of meadows and pastures
Non-governmental organization	Support and promote implementing technologies	Regional / provincial	The modern policy strategies are oriented towards sustainable and water use and irrigation systems	The water supply technologies and effective sewage treatment technologies	Support municipalities to implement new effective wastewater treatment technologies	Support agribusinesses in implementing green technologies based on nature-based solutions
Markets	Distribute technologies and promote approaches	Regional / provincial	Green chemistry approaches, precision agriculture digital technologies (Cropwise Seed Selector, Aut™ & Farm intelligence platform, GIS devices, and NDVI maps, Agrolabers & UAV and others) irrigation sprinkler systems (Etech irrigation systems, ZIMANICA™ & Agrolabers sprayers 3AG2), Meteorological stations (Fima) - Meteo (Meteobot Pro)	Meteorological stations (Fima) - Meteo (Meteobot Pro); Irrigation sprinkler systems (Etech irrigation systems, ZIMANICA™ & Agrolabers sprayers 3AG2); Use meteorological systems; Maintenance of Data systems (GPS, Coase™, Cartography™); water supply and drainage systems for livestock farms (CloudFarm)	Provide Maintenance of Data, irrigation systems for the maintenance of soil protection and promote restoration solutions; Use meteorological sensors to conduct remote field monitoring; pest monitoring, build crop disease models, and manage farm resources in real and remote time that support soil quality	Implement drought-resistant hybrids such as corn (Optimum® AQUAmax®) and sunflower (ExpressSun®)
Farms	Produce products (crops, poultry, pork, cattle)	Regional / provincial	Modern technologies for high-quality harvest: soil treatment technologies, drip and sprinkler irrigation technologies, GPS monitoring machinery, satellite and drones	Water supply and drainage systems for livestock farms (CloudFarm); drip and sprinkler irrigation technologies; precision agriculture; various schemes of crop	Implement drip and sprinkler irrigation technologies that deliver water directly to the roots of the plants in a uniform manner	Provide modern technologies for high-quality livestock in sustainable agriculture practices to adapt agriculture to be more climate-resilient







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