

Waterdrive findings and strategic recommendations

Holistic water management for landscape- and field level action.



Water driven rural development in the Baltic Sea Region, Nr. R094 WATERDRIVE

PROBLEM DEFINITION

It is well recognized that agriculture is a major source of nutrient enrichment and eutrophication of inland surface waters and the Baltic Sea. Agricultural diffuse source pollution accounts for up to 50 % of nitrogen and 30 % of the phosphorous load to the Baltic Sea. Even higher when looking at inland waters in agricultural landscapes of the Baltic Sea Region. The losses of nutrients is a complex process and involves the aspects of soil health, its capacity to transform and store nutrients, nutrient uptake by crops and what farmers add to fertilize crops to produce food. Water play a key role as the transporter of nutrients for crops to grow but also the transporter of surplus nutrients from the fields to surrounding water courses. Streams and lakes downstream the agricultural fields also play an important role for cleaning the water on the way to the sea. In severe eutrophic conditions lakes and streams can work in the opposite direction to and release nutrients from the sediments, through what is called internal loading. So, that is why it is important to take action at different scales including at field, stream and landscape level.

In some areas the best option is action on the fields (soil, crop and nutrient management), while in some areas downstream action such as water and nutrient retention measures will be more effective. Though, in most cases the effective solution is a combination of action on the fields and downstream. However, everything is not only about nutrients and diffuse source pollution. It is as essential to secure continued food production in a changing climate in parallel with healthy and productive ecosystems. Access to water is becoming a limiting factor for food production in the southern part of the Baltic Sea Drainage basin.

The ongoing international conflicts will additionally put pressures on the agro food systems in the Baltic Sea Region and more resilient practices. How we manage water in the fields, the streams and landscape will play a pivotal role in that transfer towards more secure food production and healthy ecosystems.

Ainis Lagzdins, Latvian University of Life Sciences and Technologies

Waterdrive findings and strategic recommendations

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Preface

The Waterdrive partnership would like to forward our sincere thanks to all stakeholders around the Baltic Sea Region (farmers, local authorities, advisors, governments, agencies and organizations) who have engaged in questionnaires, workshops, planning and delivering outputs. Your valuable experiences and commitments are the backbone of the achieved results.

The covid pandemic has affected project implementation but nevertheless we have managed to keep the exchange of ideas and experiences open. The cooperation between countries within, and outside EU, has been intense and valuable in our joint mission for water and agriculture in the Baltic Sea Region.

During our work, we have lost two dear friends and very experienced colleagues. First, we lost Uwe Rammert from LLUR in Germany and then recently Kaja Peterson from SEI-Tallinn in Estonia. Uwe and Kaja were front runners in the design and implementation of Waterdrive. Uwe as the strong ambassador for increasing local participation and Kaja as the strong ambassador for strengthening policy action. We are proud and favored to have had them in our team. They are warmly kept in our hearts and minds.

Thank you very much Uwe and Kaja and thanks to all for having contributed with your engagement, ideas and experience for water, agriculture and rural development.

The Waterdrive partnership 2019–2021

Summary

Waterdrive is an Interreg Baltic Sea Region Program funded project 2019-2021 working with win-win solutions for water management in agricultural landscapes. Participating countries are Poland, Estonia, Russia, Denmark, Latvia, Lithuania, Finland and Sweden. The aim is to explore more holistic and integrated win-win solutions for agriculture and environment. Solutions that combine benefits for water, climate, drought, food security and rural development.

The starting point of Waterdrive was to understand and provide good cases of holistic water management initiatives. The project assumption was that such initiatives can make a change and “turn the tables”. Therefore, a method of supporting nine local cross-sector and joint action teams was studied. The results were aggregated and evaluated and success factors defined to enable policy recommendation. The general finding is that local cross-sector joint action is an excellent method for solving complex issues concerning water management and other sustainability challenges in parallel.

However, policies needs to more strongly recognize these opportunities and enhance support for up-scaling especially in intensive agricultural areas. Waterdrive has identified 5 areas for attention.

1. Increased support to local cross-sector joint action
2. Policies for holistic water management solutions
3. Strengthened leadership
4. Attention to motivational factors – financing
5. Development of new support services

Each country is different and stakeholders are recommended to initiate and pilot local cross-sector joint action projects, especially in the agricultural most intensive areas of the Baltic Sea Region.

More information about the project results are available on www.water-drive.eu.

Background

The Baltic Sea Region in Northern Europe is a fantastic part of the world with an abundance of beautiful environments and living space for people, animals and plants. Water has been a concern for the region since decades because of abundant eutrophication and algae blooms of the Baltic Sea.

Water is a common resource flowing across all borders. Substantial efforts and financing has been allocated to reduce diffuse source pollution from agriculture but with rather limited impacts on the water quality. During recent years the concern for management of water resources on land has increased. This concern is raising the call for more integrated water management solutions which incorporates both the needs of productive agriculture, healthy ecosystems as well as water protection and mitigation and adaptation to climate change.

Local cross-sector joint action on catchment basis has been tested in some pilots and the project was designed to further test and assess such solutions in nine case areas around the Baltic Sea Region.

The Waterdrive partnership includes members from research, authorities, organizations and agricultural communities with a long-term commitment and interest to find solutions to these challenges.

By combining the experiences from the case areas with more strategic policy recommendations we hope the Waterdrive results will inspire and stimulate further action. Moreover, enhance the understanding of the important role of water management for sustainability and food security in the Baltic Sea Region.



External factors

Climate change

Climate change will increase temperatures and evapotranspiration, which is forecasted by climate change models. The effect of climate change on precipitation has been more difficult to model. However, a common understanding is that precipitation during summer months will not increase and can even decrease. These two processes will lead to increased water demand by agricultural crops. Figure 1. shows the estimated change in meteorological drought frequency between 1981–2010 and 2041–2070 under scenario RCP4.5. The values show the change of drought events between above mentioned time periods. The projected change of

drought frequency is expected to be highest in northern parts of Germany and Poland. After 20 to 50 years the number of drought events is estimated to increase from 3 to 5 events during 100-year period. Only in some parts of the Baltic Sea Region the probability of drought is expected to decrease. The adaptation to more frequent drought periods requires investments in irrigation machinery and water storage reservoirs. Soil management and drainage systems must also be developed for increased water retention capacity during summer periods.

Tapio Salo, LUKE, Finland

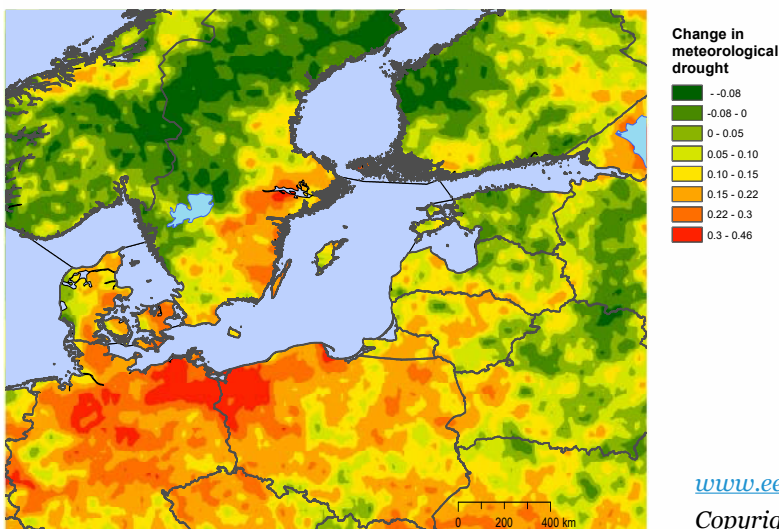


FIGURE 1. Projected changes in annual meteorological drought frequency for the Baltic Sea Region between 1981–2010 and 2041–2070 under climate scenario RCP4.5.

www.eea.europa.eu/legal/copyright

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Water resources

Water is essential for every form of life, for all aspects of socio-economic development, and for the maintenance of healthy ecosystems. Water use increased at almost twice the rate of population increase in the last century. On average, agriculture accounts for 70% of global freshwater withdrawals (FAO, 2017).

Agriculture is the sector exerting the highest pressure on renewable freshwater resources in Europe, being responsible for 59% of total water use in Europe in 2017 (see EEA link below). However, agricultural water use can differ between European regions, as well as between countries in the Baltic Sea Region.

Water use for agricultural purposes in the Baltic Sea Region has decreased in the period 1990–2017 (Figure 2).

However, in Denmark the agricultural sector uses more water compared to other BSR countries. Approximately 17–20% of the agricultural land in Denmark is irrigated. This is far higher than the EU average (7–8%), and higher than southern Europe where approximately 15% of agricultural land is irrigated. Irrigation is particularly intensive in Jylland because of sandy soil. Estonia and Latvia are not included in Figure 2 because of very low levels of agricultural water use.

Tiaa Pedusar, SEI-Tallin, Estonia

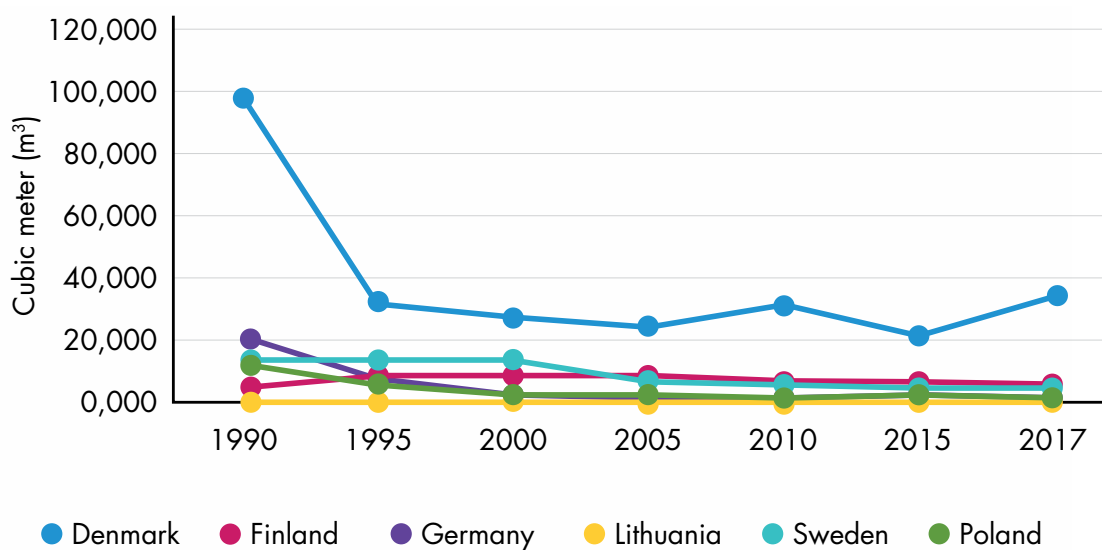


FIGURE 2. Agricultural water use per capita in the period of 1990–2017.

www.eea.europa.eu/data-and-maps/indicators/use-of-freshwater-resources-3/assessment-4



The story

The Waterdrive story is that of an experienced and committed partnership working across the Baltic Sea Region dedicated to improve water management in agricultural landscapes. A partnership with a strong sense for water, agriculture, environment and rural communities.

The story is about shifting focus from grand regional and national programs, towards supporting local cross-sector collaboration and partnerships. It is the story of the individual landowner and farmer working with others and managing complex ecosystems to produce food and stay in business.

It is the story of farmers investing in productive and valuable ecosystems for next generations. It is the story about governments and organizations difficult task to respond to water management challenges for productive ecosystems and increased food security.

It is the story about what YOU and I can do.

It is the story about how local level leadership and engagement can

TURN THE TABLES!

Stakeholder communication

The initial communication strategy built on setting up personal meetings to discuss project design, results and impacts. However, the covid situation required an adaptation. The target groups are local authorities and farming communities as well as national agencies and authorities. The covid adapted communication strategy focused on attempting to maintain personal meetings on the local level in the case areas and a different approach for international communication via digital means such as Zoom etc. Waterdrive has created a large variety of results for the purpose of continued inspiration and capacity building within the target groups.

Two of the results and deliverables are listed below but there are many more on the website www.water-drive.eu.

- A digital educational package for holistic water management in agricultural landscapes. The package can be used for all forms of educational purposes from advisory services, agricultural schools and universities. The package is available in multiple BSR languages. *More information on:* waterdrive.pl/en/educational-materials
- An interactive digital and inspirational toolbox for local participation, leadership and spatial planning is also available. Languages are English and Polish. *More information:* waterdrive.cdr.gov.pl



Main findings

Many aspects of water management in the Baltic Sea Region are moving forward, but it is still difficult to detect changes in water quality of surface waters. However, governments and interest organization are aware and attempts to take reasonable action. The Waterdrive findings and recommendations are a support in additionally improving the situation. The field level action needs to be more strongly coupled with actions on the stream and landscape level. The findings have come out of the nine case areas but the conditions are different in each country. There is no one formula.

Some countries like Denmark with its large proportion of agricultural land has maybe the most extensive experience attempting to combat severe nutrient enrichment for decades. While countries like Poland during the last years have suffered from severe drought conditions and therefore implement support outside CAP for water management actions securing access to water for agricultural purposes. Latvia, Estonia and Lithuania keep to the traditional CAP agri-environment measures. Finland and Sweden applies support outside CAP/RDP to support bottom-up local water management actions.





MAIN FINDINGS:

1. LOCAL CROSS-SECTOR JOINT ACTION

The Waterdrive case areas have identified the local cross-sector joint action as an effective method for solving complex problems. All countries have agri-environment programs addressing the individual farms. However, the local cross-sector joint action is in most cases poorly stimulated or not at all. The interest for such initiatives is growing in the region.

2. HOLISTIC WATER MANAGEMENT

The agri-environment support is mostly geared towards single environmental challenges like nutrient management or biodiversity etc. However, from a farm and/or catchment water management perspective the challenges are holistic and multifaceted. Secure food production, access to clean water, soil fertility, biodiversity and climate change adaptation/mitigation are all parts of a whole. The interest for such more holistic policies is meagre, but slowly growing and picking up speed in the Baltic Sea Region.

3. LEADERSHIP

There is a lack of leadership especially on national and central levels advocating for more holistic water management approaches. In contrast leadership, advocating for more holistic water

management approaches, is however, clearly demonstrated on the local level in the Waterdrive case areas. In general, there is still a divide between agricultural and environmental interests although the divide is narrowing. Leaders within organizations and authorities additionally bridging that divide will be front-runners in opening new opportunities for sustainable rural communities.

4. MOTIVATION

According to Waterdrive studies, farmers have a strong interest in water management and nature. However, farmers are lacking time and resources to engage in agri-environment programs. The level of financing for agri-environment programs does not compensate enough for complicated bureaucracy and long-term commitments. However, as mentioned farmers have a strong interest in water management issues.

5. NEW SERVICES

Some countries have invested in new services to facilitate local water management names “catchment officers/facilitators/experts”. The interest from all countries for learning more about such services has been very high during Waterdrive.

Findings by activity

Below is a selection of findings and for those interested in a deeper understanding of the results and outputs we recommend the website www.water-drive.eu. The video recordings of the digital final workshops by topic, are also available on the website.

More info on: water-drive.eu/toolbox-2

Workpackage 1. Management and coordination

STAFFAN LUND, HALLVARD WIE, SLU AND ZANDA MELNALKSNE, Latvian Farmers Parliament in close cooperation with the Project Coordination Team (PCT).

FINDINGS:

1. The transnational requirement by the Interreg Baltic Sea Region Program works well to re-think and re-package challenging issues within water management and add aspects of innovation.
2. The composition of the partnership with multiple experiences from different sectors and countries was important to avoid staying in the “business as usual box”.
3. It was a good experience to work with digital communication through Zoom etc and it served the project well to a low cost.
4. The bureaucracy in Interreg is complicated and therefore highly dependent on the facilitation of skillful program officers and first level controllers. This has worked well in Waterdrive.
5. The co-financing requirement is definitely a challenge for some actors especially in the private sector.

PROJECT COORDINATION TEAM, PCT

STAFFAN LUND AND HALLVARD WIE, Swedish University of Agricultural Sciences, SLU, WP 1 Management and coordination.

ZANDA MELNALKSNE, Latvian Farmers Parliament, WP1 Communication.

FRANK BONDGAARD, Danish Innovation, SEGES, Danish team coordinator and WP2 lead (Cross-sector local participation).

AINIS LAGZDINS, Latvian University of Life Sciences and Technologies, LLU, WP3, Latvian team coordinator and WP3 Lead (Advancing new technologies and methods).

KAJA PETERSSON AND TIIA PEDUSAAR, Stockholm Environment Institute – Tallinn, SEI-Tallinn, Estonian team coordinator and WP4 Lead (Adapting Policies and Financing).

KATARZYNA IZYDORCZYK, European Regional Centre for Ecohydrology PAS, Polish team coordinator and WP5 Lead (Strategic impacts and environmental investments).

ELVYRA MIKSYTE AND JUSTAS GULBINAS, Baltic Environment Forum in Lithuania (BEF), Lithuanian team coordinator.

KAJ GRANHOLM, Baltic Sea Action Group, BSAG and Finnish team coordinator.

MIKHAIL PONOMAREV, St. Petersburg Federal Research Centre, SPC RAS.

Workpackage 2. Cross-sector local implementation

The general finding is that local cross-sector joint action is an excellent method for solving complex issues concerning water management and other sustainability challenges. Denmark, Sweden and Finland are now supporting local water management groups. Of special interest is that Denmark, having implemented a tough general legislative control program for water management in agricultural areas, now is shifting to support of voluntary local cross-sector joint action. During the implementation of Waterdrive Poland has also introduced the concept of “Local water management partnerships” and the Polish Agricultural Advisory Services in Brwinow (CDR) is now introducing water management experts called Water advisors. Some countries have support for this type of collaboration and others do not. Outputs of activity 2 are a “Local participatory toolbox”, a “Leadership manual for practitioners” and a “New services for water management – catalogue of ideas and experiences”. One of the main finding is the general lack of long-term funding for local catchment officers, catchment teams, water advisors or local facilitators.

FRANK BONDGAARD, SEGES Innovation has coordinated the WP2 work in cooperation with partners.

More information: water-drive.eu/toolbox-2

Activity 2.1 Local participation

LEAD: Frank Bondgaard, SEGES, Denmark

Methods of enhancing local participation were tested in 9 case areas around the Baltic Sea Region. Some of them have started their work earlier and some in connection with their participation in Waterdrive. All of them were active in agricultural landscapes with challenges concerning water management. The work included identification of success factors, local action plans and also the visualization and communication for sharing of experiences and results.

WATERDRIVE CASE AREAS

- Kutno County, Poland
- Zuvintas Reserve and agriculture case area, Lithuania,
- Gurjevsk, Kaliningrad, Russia
- Jelgava, Latvia
- Põltsamaa, Estonia
- Ljuga River, Leningrad, Russia
- Southern Finland drainage, Finland
- Västervik, Sweden
- Odense, Denmark



2.1 FINDINGS:

1. Additional support to “local cross-sector joint action” is probably the most strategic action to further enhance sustainable water management in agricultural landscapes of the Baltic Sea Region.
2. The local holistic approach is appreciated by involved stakeholders and brings new perspectives to all actors – a joint platform for learning and action.
3. The local cross-sector work can accommodate complex issues concerning water and climate combined with community development, but it takes time before sufficient trust is developed.
4. Long-term financial support is needed for facilitation and advisory support.
5. The operational mode of local cross-sector joint action needs to be adapted to each country and local conditions.

More information: water-drive.eu/toolbox-2 and www.waterdrive.dk.



DEFINING HOLISTIC WATER MANAGEMENT

“In agricultural and forestry areas, water management means practices and solutions that affect the quality and quantity of surface and ground waters in the catchment. In practice, holistic sustainable water management involves drainage, flood management, drought mitigation as well as minimizing nutrient losses and enhancing biodiversity.”

Finnish Ministry of Agriculture and Forestry

Activity 2.2 Leadership

LEAD: Magnus Ljung, SLU Sweden

The complexity of many water and land management cases are related to multiple issues: stakes, goals and parties at hand, as well as the difficulties of predicting the consequences of measures taken in socio-ecological systems. Such complexity suggests that progress is only possible if we continuously learn from our experiences. Qualified leadership who can navigate through this complexity for instance by catchment officers is essential. Waterdrive has been working with what is called the “progress triangle” comprising of the domains (1) relationships, (2) procedures and (3) substance. If you have a specific interest in issues of leadership we recommend reading the Waterdrive Leadership Manual. The manual makes a distinction between three levels of leadership; the policy-oriented and administrative level, the collaborative level, and process facilitation.

More information: water-drive.eu/toolbox-2

2.2 FINDINGS

1. Decisions and multi-stakeholder partnerships must consider all the domains of the “progress triangle” mentioned above.
2. And additionally, accepting complexity, managing multiple interests, acting systemic, and learning by doing.
3. A core competence is in process design, consciously deciding on the approach, applied methods and tools.

Activity 2.3 New services

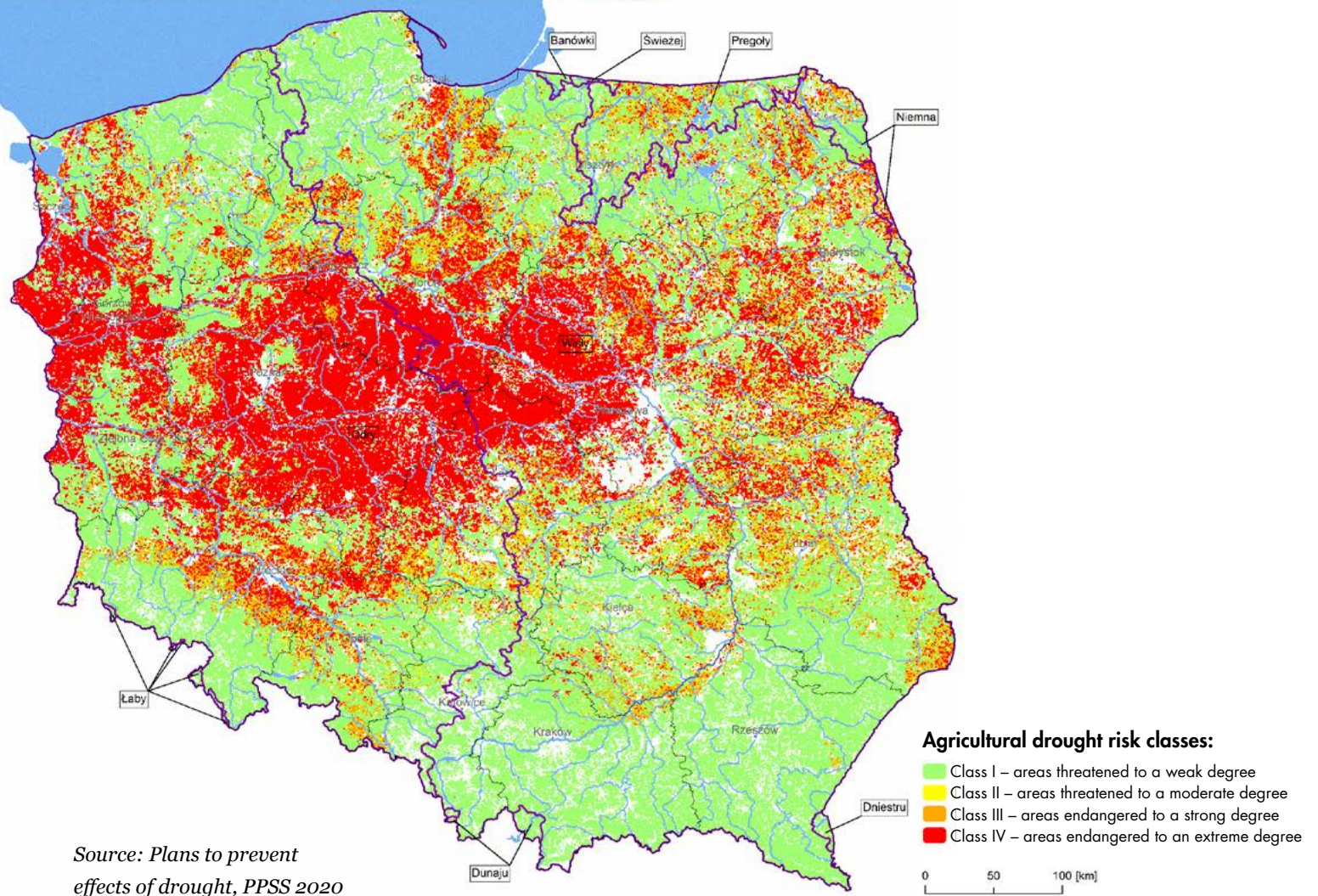
LEAD: Janusz Dabrowski, CDR Poland

New methods for tackling environmental and climate challenges often require new legislation, new environmental and agricultural schemes, land reclamation and other ways of working. It is important to train advisory officers for such work, build capacity and find the financial means to ensure smooth and collaborative implementation in close co-operation with landowners. The Waterdrive service catalogue offers various examples of what new services are needed to ensure the implementation of environmental and climate initiatives in practice. Many challenges can often be solved in close collaboration with local stakeholders. The examples derives from the challenges and experiences found in the Waterdrive case areas and from other agri-environmental projects in the Baltic Sea Region.

2.3 FINDINGS

1. New services need to be developed to support and solve the challenging multiple issues concerning future water management in the agricultural landscapes of the Baltic Sea Region.
2. A more holistic view, both in terms of geography (catchment) and in terms of substance (water management), will increase benefits for ecosystems and communities affected by poor water quality, flooding and drought.
3. Governments, regional- and local authorities are strongly encouraged to pilot, test and expand the use of water management expertise and facilitation on catchment level.

More information: water-drive.eu/toolbox-2



Source: Plans to prevent effects of drought, PPSS 2020



EXAMPLE OF HOLISTIC WATER MANAGEMENT

One of the case areas for holistic water management is the Kutno County and Beldno Commune. This is a large-scale example of holistic water management in an intensive agricultural region heavily affected by drought. Here farmers have joined forces with the local water company, the municipal authorities and national Polish programs and financing.

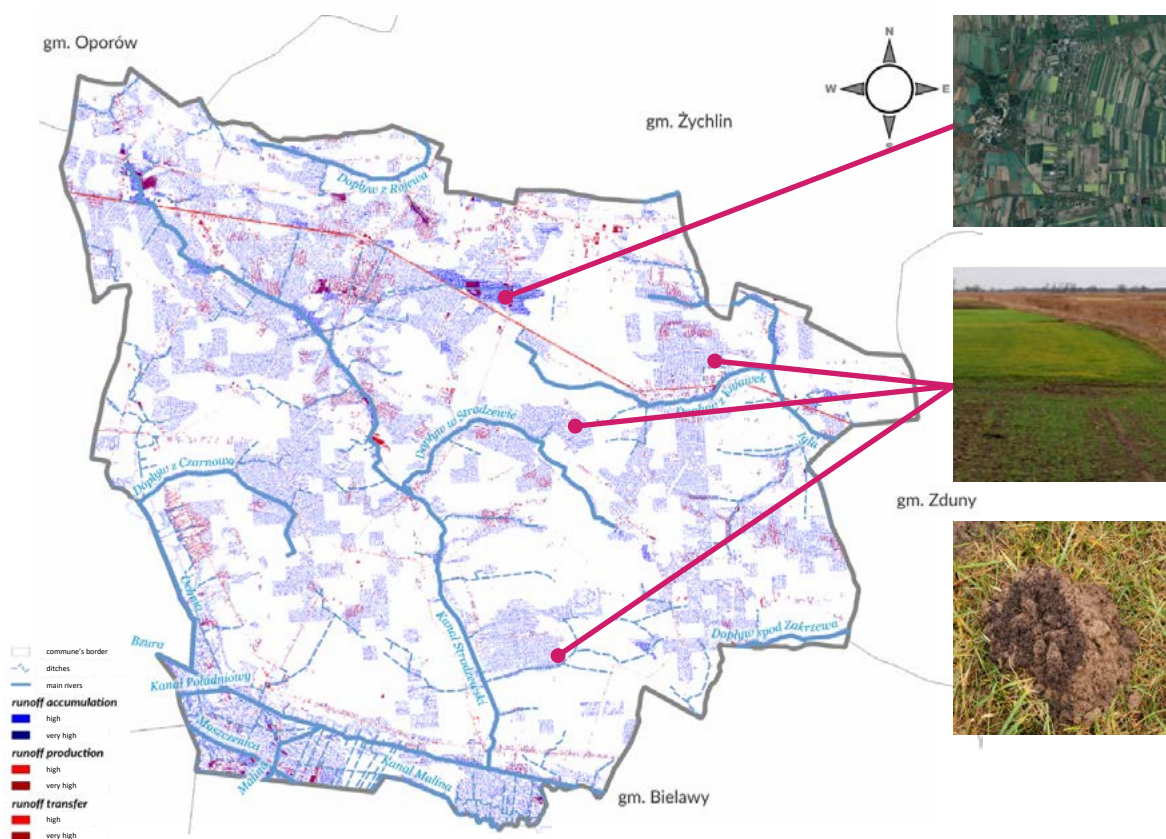
Their work involves more than 5000 hectares and uses the existing channels and drainage infrastructure to regulate water level to the needs of agriculture, ecosystems and society. This has been achieved through cross-sector cooperation building on local knowledge, committed institutions, research insights and national financing.

The aim was to increase water retention in agricultural areas through:

1. Renovating the drainage system and switching to a controlled drainage system.
2. Landscaping – protection, restoration, construction of new measures (buffer zones, mid-field shrubs and trees, small wetlands and ponds).
3. Building capacity for local cooperation.



ANALYSIS OF SURFACE WATER RUN-OFF FOR IMPROVED SPATIAL PLANNING AND NBS LOCATION



Settlements located in run off accumulation area: conflict of infrastructure with potential for ES delivery (water retention, flood control, sequestration)

Areas requiring implementation of land protection schemes and NBS for protection of soils and improved water management.

3.1 CATALOGUE OF MEASURES

FIELD MEASURES:

1. Subsurface application of manure (RU),
2. Nutrient application planning (RU),
3. Structural liming (SE),
4. Gypsum for improved soil structure (FI).

STREAM MEASURES:

1. Grassed buffer zones (FI),
2. Two-stage ditches (FI).

DRAINAGE SYSTEM MEASURES:

1. Renovation of drainage systems (LV),
2. Controlled drainage (FI),
3. Subsurface flow constructed wetlands (LV),
4. Constructed wetlands (FI).

LANDUSE MEASURES:

1. Areas allowed for flooding (FI),
2. Land reclamation (RU).

Workpackage 3. Advancing new technologies and methods

The development and application of new technologies and methods are pivotal to the implementation of sustainable water management solutions. New digital maps and the use of different information layers will be increasingly important in the ongoing work to reach the sustainability and water quality targets.

Waterdrive highlights three areas for special attention, namely:

3.1 Documentation and dissemination of the characteristics of new and innovative agri-environment measures – catalogue of measures

3.2 Digital multiscale decision support system – a new application to optimize location of measures in the agricultural landscape.

3.3 Spatial data and planning methods for water management

AINIS LAGZDINS at the Latvia University of Life Sciences and Technologies (LLU) has coordinated the work in cooperation with partners.

Activity 3.1 Information on characteristics of new and innovative agri-environment measures – catalogue of measures

LEAD: *Katarina Kyllmar, SLU, Sweden*

There is an obvious need for easily accessible information concerning measures in general and more explicitly to add information about the measures multi-functional impact. The landscape perspective is vital in water management, including field-level measures and stream and down-stream measures.

The team has identified 12 measures of specific interest and more information concerning their multifunctional impact is available on water-drive.eu/toolbox-2.

3.1 FINDINGS:

1. The farmers' main concern was the implementation of measures in the drainage systems.
2. More knowledge is needed on functionality and efficiency under various local conditions to enhance targeted and cost-effective localisation.
3. There is a gap in integrating the practical experiences from farmers with the scientific assessments of the research community.
4. The measures multi-functionality in the landscape responding to several sustainability targets needs more attention.

More information: water-drive.eu/toolbox-2

Activity 3.2 Digital decision support system (DSS) – a new application to optimize location of measures in the agricultural landscape

LEAD: Mats Söderström, Omran Alshihabi, SLU, Sweden

The main goal was to develop a decision support system (DSS); WaterGUIDE as a first version of an interactive DSS for optimizing the

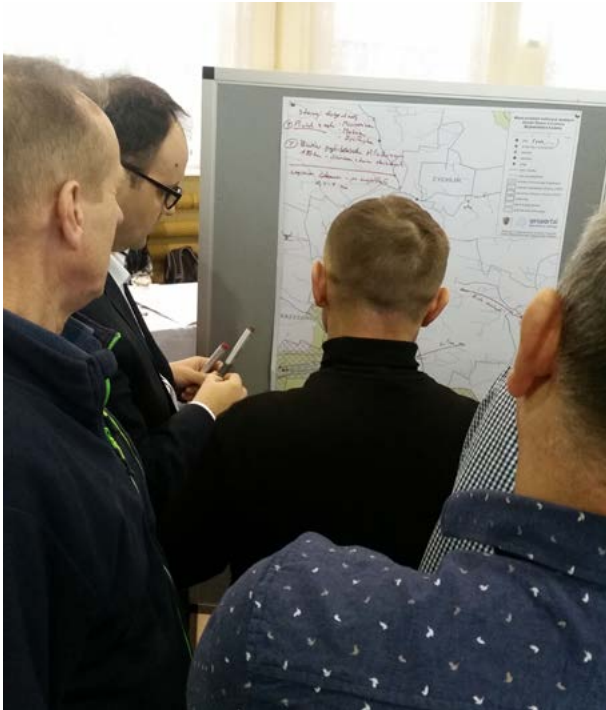
selection of measures, their location, as well as the cost, at the field or even within field level. The primary target group was advisors and farmers. Waterguide (DDS) is available at the website waterguide.online/nutrient-loss. The DSS is fully developed for application in four pilot areas in the Baltic Sea Region, Sweden (Roxen and Örsundaån), Finland (Pyhäjärvi) and Latvia (Svete River). In the Roxen pilot area the DDS was tested for supporting result-based payment schemes.

3.2 FINDINGS:

1. There is a significant interest for digital decision support systems among all concerned stakeholders around the Baltic Sea Region.
2. WaterGUIDE discussions revealed a concern among farmers that the information can be used by authorities for top-down steering instead of bottom-up dialogue.
3. However, systems like WaterGUIDE are an excellent way to support dialogue at the local level and demonstrates the importance of promoting local measures in the landscape through local cross-sector dialogue.

More information: water-drive.eu/toolbox-2 or waterguide.online/nutrient-loss





Activity 3.3 Spatial data and planning methods for water management

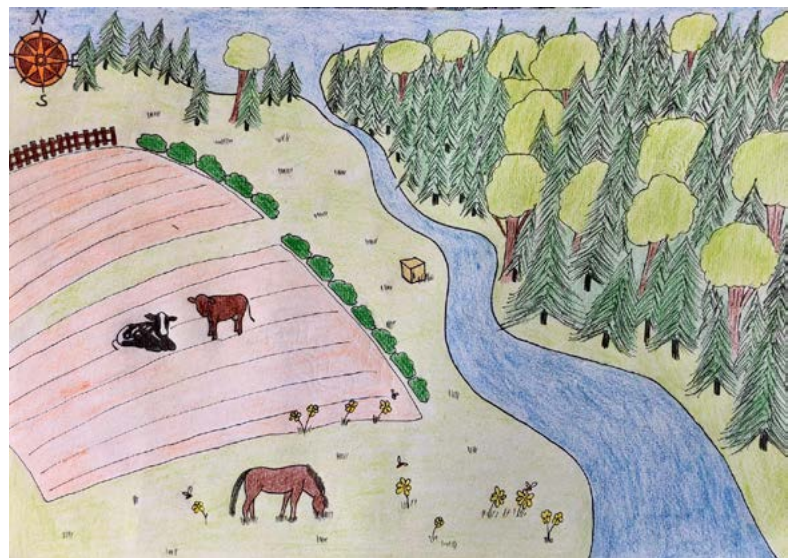
LEAD: *Sirkka Tattari, SYKE, Finland, Malgorzata Grodzicka-Kowalczyk, PHENO, Poland*

The main task for activity 3.3 was to construct a Story Map which gives map based, visual information about different water management and protection actions. The aim of the Story Map is to provide examples of water protection solutions and how existing web-based material can be used in practice in selected BSR countries. The Story Map was created using ArcGIS StoryMaps web application. With the application it was possible to create visual internet presentation consisting of interactive maps, narrative texts and multimedia content. Data for the interactive maps can be presented after it is published as map layer or application in ArcGIS online. All other multimedia data for the StoryMap was imported as separate files. The Story Map is available online arcg.is/05Xu1Po.

3.3 FINDINGS

1. Combining aspects of watermanagement in a spatial planning context is highly relevant especially for purposes of communication with stakeholders.
2. There is a number of different data sets and maps accessible in the Baltic Sea Region available through the Waterdrive Story Map.
3. Across BSR there is a rather varied nomenclature of soil types. The diversity of nomenclature significantly hampers international co-operation, and in particular cross-border co-operation. The need to use soil maps is substantial, e.g. in assessment of erosion risk areas, flood sensitive areas and nutrient leaching. Soil data is also used as input for many models. The harmonization of soil classification is highly needed.
4. Spatial data must be made freely available for everyone.
5. Training in the use of spatial data should be increased for the vaious user groups.

More information: water-drive.eu/toolbox-2



By: Pauliina Pesonen

Workpackage 4. Adapting policies and financing

Indeed, over the past decades, hundreds of research projects, meetings and working groups have proposed ways to deal with eutrophication in the Baltic Sea. There is also HELCOM – a regional policy organization involving nine countries and the EU that aims to protect the Baltic’s marine environment from all sources of pollution. Perhaps the recommendations developed in the Waterdrive project are different because they are based on input from a broad spectrum of stakeholders. First, we made a literature review of recommendations made in the past six years by the European Commission, HELCOM and the EEIG BONUS. Second, we made a point of consulting with project partners on what needs to be done differently, and thirdly, we asked farmers and local governments around the Baltic Sea what the obstacles are to good water and soil management. So, these policy recommendations are based on a really broad foundation of past and current experience of many actors in the field.

KAJA PETERSON AND TIIA PEDUSAAR

at the Stockholm Environment Institute (SEI Tallinn) have coordinated the WVP4 work with partners.

Activity 4.1 Policy gaps and bottlenecks for smarter water management in agricultural landscapes

Waterdrive has taken a closer look at the gaps and bottlenecks in agriculture related water policy and aims at providing recommendations for improvement.

4.1 FINDINGS:

1. It is important to develop further the value- and result-based compensation schemes in rural development support systems, especially in the next CAP period of 2023–2027.
2. Waterdrive partners also point to the value of collective actions among farmers and other stakeholders at the catchment level since the benefits increases from joint, cross-sector cooperation rather than individual efforts.
3. Setting framework conditions for market and other actors to provide multiple benefits. Both legal and financial frameworks should support payments for ecosystem services and enhance nature-based solutions, which provides for multiple benefits at the same time.
4. Effective implementation of water policy at different levels (at national, catchment level, local level). The respondents emphasized the key role of catchment level administration in agricultural water protection.
5. Result-oriented requirements for governmental support measures (new and current) should aim at achieving better results in water management. For example, the planning of the support measures needs to be based on a comprehensive and useful monitoring system.
6. Stakeholders’ engagement should be carried out more systematically, especially at the catchment level. Create opportunities for dialogue with farmers on the multiple and long-term benefits of sustainable water management.

More information: water-drive.eu/toolbox-2

Activity 4.2: Pilot cases on policy integration, implementation and financing

Waterdrive project partners were asked to make a short overview of their pilot cases by answering questions like: why was this pilot case chosen and what are the challenges? Then they were asked to describe the pilot area and its water governance system. Also, they were asked to highlight the main causes of the challenge and propose possible solutions. The aim of the work was to get an overview of governance policy-related issues. Finally, each partner compiled the lessons learned. Eight partners (Sweden, Finland, Russia, Poland, Estonia, Latvia, Lithuania and Denmark) summarized the pilot cases.



4.2 FINDINGS:

1. Difficulties in maintaining cooperation over time was definitely the most often highlighted challenge although in different context and wording/formulation.
2. Poor coordination, engagement of all stakeholders, need for dialogue, awareness rising and need for trust building were mentioned.
3. Unclear responsibilities or roles between institutions and fragmentation of public policies were pointed out. All these “key words” are interrelated and can be classified under the need for better cooperation, better governance.
4. Inefficient advisory system for farmers or lack of such services was found to be challenging by many partners.
5. Payment system/subsidies for farmers do not motivate to implement agri-environmental measures.

More information: water-drive.eu/toolbox-2

Activity 4.3. Policy recommendations and strategies (farmers)

The current Rural Development Plan (RDP) expires and a new single strategic plan for 2023–2027 is currently developed by each of the EU member states covering direct payments, rural development and sectoral strategies. Waterdrive conducted a survey among farmers in the Baltic Sea Region to capture their motivational factors for entering the future programs and policies (Peterson et al, 2020). The interviews with farmers focused on the motivators of managing land and applying measures that provided environmental benefits, such as maintaining water availability, water quality, soil fertility and biodiversity or mitigate climate effects.

4.3 FINDINGS:

1. Farmers concluded the importance of maintaining soil fertility and high water accessibility and quality both in short and long term perspective of land management.
2. Biodiversity, climate change and landscape issues are also prioritized as important components of good land management.
3. As to investments the farmers would prioritize drainage projects. In their comments the farmers repeatedly emphasized field drainage as the single most important measure to maintain soil fertility and ensure high yields.
4. Farmers prioritized agri-environment investments in the following order: (1) field drainage, (2) construction of wetlands and ponds and (3) precision farming technologies.
5. The three most important obstacles for taking any environmental measure are related to small economic benefits, too big paperwork for applying the governmental support and too much regulation and control.
6. The respondents regarded advisory service important in the application process for governmental support (such as assisting in paperwork), but also in decision making on the best solutions and location of investments, such as where and how to construct an artificial wetland, or a drainage system.
7. However, the farmers are least likely to invest into the advisory services themselves, but rather expect that the government provides that service.

More information: water-drive.eu/toolbox-2



Workpackage 5: Strategic impacts and investments

KATARZYNA IZYDORCZYK at the European Regional Centre for Ecohydrology PAS, Poland has coordinated the WP5 work in coordination with other partners.

Activity 5.1 Recommendations for water management in agricultural areas of the Baltic Sea Region

LEAD: Staffan Lund, SLU and Kaja Peterson, SEIT

Please, see separate headline below concerning National Pathways

Please, see separate headline below concerning Recommendations.

Activity 5.2 Educational package for holistic water management

LEAD: Katarzyna Izydorczyk, ERCE, Poland

Water management in agricultural areas requires multi-stakeholder cooperation but also multi-sectoral knowledge. It is necessary

to gather knowledge in hydrology, ecology, agriculture, but also in economics and social communication. The Waterdrive digital educational package for holistic water management in agricultural landscapes is available on waterdrive.pl/en/educational-materials.

The educational package covers water, soil and landscape interactions, providing the necessary information according to the principle of understanding that the processes involved is the basis for proper resource management. The education material highlight the ecosystem services of agricultural areas, as well as the water requirements of agricultural production and the possibilities of reducing the water footprint of farms. The package also includes presentations for other deliverables of the project, like the catalogue of agri-environmental measures. An important part of the material concerns the multi-stakeholder local cooperation in the Waterdrive case areas and the 10 strategic policy recommendations.

The package is suitable for all forms of educational purposes from advisory services, agricultural schools and universities. The package is available in multiple BSR languages.

More information: water-drive.eu/toolbox-2 or waterdrive.pl/en/educational-materials

WATERDRIVE EDUCATIONAL PACKAGE

Explore it now on waterdrive.pl/en/educational-materials

5.3 Activity: Development of large technical investment projects – A roadmap/report

LEAD: *Kaj Granholm, BSAG, Finland.*

Waterdrive findings have revealed substantial difficulties in development and financing of larger water management infrastructure projects. Even with public support, these involve substantial long-term investment component for the farmers, which cannot be justified with current low profit margins, short land rental contracts and general uncertainty. For the same reasons, it is difficult to develop bankable farm environmental investment cases for large banks, such as NIB, NEFCO, EIB and EBRD in the Baltic Sea Region. Flexibility is needed to allow value added through collaborative investments, support to coordination and planning. However, Waterdrive finds that there is interest in the food value chain and the finance sector to reward farmers for the extra environmental effort they put in farm management and soil health and this either can improve their economy or be directly linked to environmental investments. The climate is a big driver in this. As an output from this activity, the report “Shared value – an outlook on market driven environmental funding innovations in agriculture” explores these opportunities.

FINDINGS:

1. Overall, there is a lack of public funding to support large green investments in agriculture, as well as undeveloped business cases to draw private investment.
2. Supply chain sustainability and climate strategies increase investment opportunities for environmentally motivated business partnerships between farmers and the food industry.
3. Availability and access to accurate and reliable data is a prerequisite for increased market financing for environmental measures and investments.

More information: water-drive.eu/toolbox-2

5.1 National Pathways

Motivated by the differences between countries and opportunities to act, the partnership decided to develop what was called “National Strategic Pathways”.

The National Pathways are proposals for governments and actors to work with some key processes and actions strengthening water management.

The Pathways are more of systemic processes and fill observed gaps in the present national governance structures. The Pathways will differ between countries depending on the national contexts for water management. However, together they form a strategic roadmap for improved water management in agricultural landscapes in the Baltic Sea Region until 2030.

BELOW THE NATIONAL PATHWAYS ARE LISTED. *More information:* water-drive.eu/toolbox-2



ESTONIA:

Strengthening local water management:

1. More effective cooperation between the national, regional and local authorities and farmers,
2. More effective financing mechanisms,
3. More effective advisory system,
4. More effective digital decision support for farmers.



LATVIA:

Effective coordination and cooperation between stakeholders on all levels including:

1. Policy planning level,
2. Operational level,
3. Information and control level.



DENMARK:

Going local for more effective water management:

1. New local services, for example catchment officers,
2. Enhancing local water spatial planning,
3. Strengthening the advisory services in relation to multi-actor collaboration.



POLAND:

Strengthening of local partnerships to facilitate adaptation of rural landscapes to climate change:

1. A new type of advisors operating within the network of the public agricultural advisory services,
2. Use of development instruments of local governments as vehicle for water management,
3. Integrated strategic planning as a method of implementing measures for landscape water retention.

KEY FINDINGS:

1. All country teams emphasize strengthening the local cross-sector joint action initiatives.
2. All country teams support more holistic water management approaches on the local scale.
3. All country teams observe a gap in cooperation and coordination between authorities, which can block or provide a barrier in strengthening sustainable water management.
4. All country teams emphasize creating platforms for cooperation, learning and innovation.



LITHUANIA:

Pathways for better water management:

1. Improved water protection in natura 2000 areas,
2. Sub-catchment based water management – catchment officers,
3. More effective financing mechanisms.



FINLAND

Towards catchment level coordination:

1. Catchment coordination and stakeholder involvement,
2. Better use of data for water management,
3. Market valuation of agricultural land properties.



RUSSIA

Strengthening water management in agricultural landscapes:

1. Strengthening the monitoring systems,
2. Improving water management and spatial planning through digital methods and means,
3. Strengthening advisory activity for business and raising the awareness of local public authorities and population,
4. New and more effective financing mechanisms.



SWEDEN

National competence platform for sustainable water management in agricultural landscapes:

1. Emphasizing the need for increased knowledge about the multiple benefits of agri-environment measures and their combined impacts on water, climate and food production,
2. Need for better precision in choice of measures, location and follow-up,
3. Enhancing knowledge sharing and innovation.



5.1 General recommendations

Waterdrive finds a lack of strategic water governance vision at the systems level. Both on national and Baltic Sea Region levels, such vision and dialogue is needed to integrate climate development and water policies with agricultural and rural policies. A balanced and systematic action-oriented transition framework would take us toward secured food production, ecosystem services and rural sustainability in a changing climate. Such a transition could be developed and tested as pilot projects within the present National CAP Strategic Plans. Despite the continued separation and fragmentation of policies, progress is made on the local level. However, we should be concerned that disintegrated

policies and fragmented implementation will be expensive, reduce food production and security, hamper ecosystem services and innovation in agricultural landscapes. Moreover, the eutrophication of inland waters and the Baltic Sea will continue.

Furthermore, we lack differentiated approaches between intensive and less intensive cultivated agricultural areas. A new climate and water action framework can improve the efficiency and site-specific allocation of resources and most importantly the commitment from farmers and landowners.

BASED ON THE ABOVE FINDINGS AND OBSERVATION 10 STRATEGIC RECOMMENDATIONS ARE PROPOSED

1. **LEADERSHIP AND STRATEGIC VISION – INTERMINISTERIAL COORDINATION/COMMISSION.**

Waterdrive recommends governments to enhance coordination and initiate inter-ministerial commissions for water- and food security in a changing climate. The aim is to build strategic awareness, knowledge and vision. Especially concerning climate change induced risks and impacts on water availability (ground- and surface), water quality, food security and ecosystem services. Waterdrive findings reveal that the leadership and strategic vision in many cases is present at the local level but is lacking on governmental and ministerial levels.

2. **CLIMATE AND WATER PRIORITY AREAS – IMPLEMENTING MULTIPLE POLICY AREAS AND SECURITY.**

Waterdrive findings reveal the need to re-think water management as part of adaption to climate change. These findings have emerged from the priorities of farmers/landowners and from the priorities of municipalities and local governments. Their challenge with water management is clearly broader than nutrient management. Waterdrive, therefore recommend governments to identify the sensitive climate- and water priority areas and as part of the present National CAP Strategic Plans develop and test innovative pilot projects. The aim is to effectively steer resources and support towards the most

sensitive and high-risk areas. The selection criteria need integrated cross-sector assessment and can include environmental pressures, food production intensity, climate risks, drought/flooding, particular values (local landscape, environment) and socio-economic factors.

3. **FARMERS MOTIVATION AND RESPONSABILITY – FINANCING, INCENTIVES AND TAKING THE LEAD.**

Waterdrive findings reveal a weak interest from the farming/landowner community to join agri-environment programs. The findings indicate that this is not due to a low interest from farmers. Rather, the low interest is an effect of the non-motivating incentive structure, such as rules and regulations regarding financial compensation and/or contracts and distrust. Waterdrive recommends governments to oversee and update the incentive structure especially in the climate and water priority areas to ensure engagement and commitment from the farmers and landowners. Farmers and landowners can take a more leading role if the incentive structure and motivational factors are right, which has been demonstrated in some case areas around the Baltic. The farmers' umbrella organizations and advisory services also have an important role in taking a stronger leading role.

4. CATCHMENT OFFICERS AND WATER EXPERTISE – NEW COMPETENCIES AND EXPERTISE.

Waterdrive findings reveal a significant lack of capacities and competencies to support a transition towards more holistic water and landscape management.

Waterdrive has identified the need to expand the existing agricultural advisory services with competencies in integrated water management.

Waterdrive recommends governments to invest in new services like catchment officers or similar water management experts either they are employed by agricultural advisory services, municipalities or related organizations. The new services discussed include a combination of expertise, both in water management like “catchment officers” and “water legislation experts”. Such services form a prerequisite to support the transition and secure the involvement of local actors.

5. SPECIFIC LOCAL CATCHMENT SUPPORT PROGRAMS – FINANCING FOR CROSS-SECTOR LOCAL COLLABORATION.

Waterdrive findings reveal the important role of catchment initiatives and local cross-sector cooperation. All such catchment initiatives are important, however, the local conditions vary between countries. Therefore, the organization and implementation will and should be different between countries.

However, emphasizing catchment initiatives involving innovation and living labs from the local context will be one of the most important change drivers for next generation programs. Present programs are too bureaucratic and not flexible enough to support innovation and development on the local scale. Waterdrive recommends governments to open flexible financial mechanisms to support local catchment initiatives. Waterdrive recommends a

financial mechanism especially targeted to facilitate cooperation water management between actors and for hiring of expert support and consultancy.

6. LARGE-SCALE INVESTMENTS – CLIMATE AND WATER COLLABORATIVE INVESTMENTS.

Waterdrive findings have revealed substantial difficulties in development and financing of large-scale climate- and water infrastructure investments. Waterdrive sees potential in large scale investments, where environmental management in the food value chain is connected to catchment level water management projects. However, this requires close alignment and coordination between public and private interventions spatially, concerning infrastructure and in stakeholder relations. Yet, it would be worthwhile to pilot this approach in prioritized areas with particular potential for values added for rural economies and the environment.

7. ROLE OF LOCAL AUTHORITIES AND MUNICIPALITIES – PUBLIC AND PRIVATE PARTNERSHIPS.

Public and private partnerships are needed to stimulate water and land use management in spatial planning and local action with the aim of providing leadership and decision support to local actors. Waterdrive results indicate interest from local authorities and municipalities. However, local authorities and municipalities in general lack capacities and resources to work with water management. Waterdrive recommends that local authorities, especially in the climate and water priority areas, are provided with the resources, mandate and competence to undertake this task.

8. RESEARCH FOR INTEGRATED CLIMATE- AND WATER RISK MANAGEMENT.

Research is presently highly focused on single agri-environmental challenges. Waterdrive suggest the initiation of research programs supporting a transition of food- and water management systems integrating several sustainability targets including other sectors. Not only from a natural science point of view but also from a social science perspective. Further, attempt to integrate more applied research as Integrated LIFE and Interreg Baltic Sea Region Program projects with research-oriented financiers as Horizon Europe.

9. DECISION SUPPORT FOR ACTORS ON THE LOCAL SCALE.

Waterdrive findings indicate a gap in availability of digital decision support. The availability is quite ok on national- and regional levels but there is a lack of digital decisions support with maps etc. on the catchment or farm level scale. Relevant local information with maps etc. for catchment officers, farmers and other local actors is highly requested. Most urgent is the need to better target implementation of agri-environment measures and doing the right thing at the right place. The environmental performance of e.g. wetlands will significantly vary depending on the site-specific conditions.

10. LEARNING FOR ACTION IN THE BALTIC SEA REGION.

Agri-environmental conditions in the Baltic Sea Region are unique due to the large drainage basin, quite intensive agriculture and long water exchange time of the Baltic Sea. Waterdrive findings indicate a good potential for further exchange of experiences between the countries and a closer cooperation between larger development projects and existing national and international bodies. Such interesting topics for continued cooperation are:

- Providing frameworks and guidance for national water management within the CAP national Strategic Plans.
- Identifying and designating “Climate- and water priority areas”.
- New services for climate- and water management within agricultural advisory services and consultancy.



5.1 Targeted recommendations

Governments and national agencies

Transition towards more sustainable water management practices in agricultural landscapes is a long-term commitment requiring leadership and vision on the governmental and ministerial levels. Overseeing the closest planning cycle until 2027 we recommend governments and national agencies to take the following immediate actions:

- Demonstrate a stronger leadership from the governmental policy level towards supporting water management actions integrating several sustainability targets. Such as water quality, water availability, food production, biodiversity and rural development in parallel.
- Use the CAP National Strategic Plans to implement local pilot-projects testing innovative holistic water management approaches by initiating multi-actor projects on the local scale, especially in high-risk areas.
- Strengthening financial support for planning and coordination of local water management projects including financing of catchment officers and/or water management experts.
- Overseeing the financial support and reducing bureaucracy for farmers willing to engage in challenging agri-environmental work within their farms or in collaboration with others.

Agricultural advisory services

It is recommended that agricultural advisory services strengthen their agricultural support through water management expertise and thus expand their offer to customers. Farmers need qualified support in this process. The case area projects and workshops of Waterdrive indicate the central role of the agricultural advisory system in transferring knowledge and experience to the farming communities and other local actors concerning water management. The most significant front-runner in the Baltic Sea Region is maybe the Danish Agricultural Innovation Service, SEGES. The most significant change following the implementation of Waterdrive is the Polish Agricultural Advisory Service (CDR) and their central branch in Brwinów introducing “water experts” as part of their work in collaboration with farmers and local authorities.

Taking into account the substantial differences between the countries regarding how they organize agricultural advisory services, we suggest the following:

- Include water management as a strategic area of concern for the agricultural advisory services.
- Emphasize the combined concern in availability of water and need for water of high quality.
- Invest in recruitment of catchment officers, alternatively water management experts.
- Invest in local multi-actor and catchment based water management projects that can act as pilots and front-runners.
- Study and learn from the good example of the Danish SEGES with long-term experience and from the current development by the Polish Agricultural Advisory Service (CDR).

Local municipalities in agricultural areas

Local authorities have a key role in enhancing sustainable water management and act as catalysts and facilitators. The local authorities can be a facilitator and intermediate in transferring national and EU policies to local level action. However, the circumstances, resources and competences at the local level can differ. Sometimes the local authority is the driver and sometimes the local authority is more of a participant.

Many local authorities around the Baltic Sea Region are implementing fantastic work to enhance sustainable water management.

We recommend contacting the following local authorities for further exchange and inspiration:

- Västervik municipality, Sweden
- Odense municipality, Denmark
- Bedlno municipality, Poland

More information: water-drive.eu/toolbox-2





Farmers interest organizations

An important finding of Waterdrive is the interest from farmers to enroll on activities towards sustainable water management. However, still the interest from the farmers around the Baltic Sea Region to embark on agri-environmental contracts is low. It is not due to a lack of interest but an issue of compensations level and worry about uncertain and uncompetitive contracts in an extremely pressed business. Still, the Waterdrive studies indicate an interest to take a more leading role moving towards more sustainable water management.

Waterdrive recommends the following:

- Include sustainable water management into the organization's strategic documents.
- Enhance in-house leadership for sustainable water management.
- Take a stronger ownership for the water management issue to secure farmers interests.
- Initiate and/or participate in local/catchment based water management projects.

Strengthening the role of farms – what are the key ways forward?

1. Improving economic benefits for investments in agri-environment measures.
2. Strengthening cross-actor cooperation on the local and landscape levels.
3. Strengthening advisory services/capacity building.
4. Implementing catchment officers.
5. Participate in research based tests and pilots.
6. Providing easy to use digital decision support.
7. Monitoring at farm and landscape level.
8. Enhancing the leadership role in farming communities.
9. Other priorities.

HELCOM – continue to strengthen the joint knowledge base

Rural water management and agricultural drainage was raised in the 2013 Ministerial Declaration and has since been addressed by the HELCOM Agri Group. Also, relevant to rural water management, a process to increase coordinated approaches on the river basin level and with River Basin Authorities has been initiated. These should be continued. A key overall value of HELCOM is the coordinated scientific cooperation and systematic assessment of ecosystem state and pressures. Going forward, to improve the countries' and stakeholders' capacity to respond to the climate change challenge and increase sustainability and resilience of agriculture, HELCOM's contribution could focus on two aspects:

1. Strengthen assessment of water and aquatic ecosystem quality, pressures and sustainable measures on the river basin and catchment scales. The knowledge about pressures and effect of different land use in the catchment is still inadequate to establish effective approaches to minimize land-based waterborne pressures. On the other hand, targeted place-based management requires better data and the use of advanced decision support tools and methods, such as those developed in Waterdrive.
2. Build joint capacities to find best approaches that deliver the multiple benefits of water quality improvements, climate change mitigation and adaptation and improved viability of agriculture. The Waterdrive case areas and existing good examples offer a comprehensive reference basis for national and local initiatives, including also elements in national institutional organization as well as target and pilot programmes, such as the ones testing the position of catchment coordinator.

EUSBSR – embrace a more strategic role

When preparing and implementing Waterdrive we observed that the EU Strategy for the Baltic Sea Region EUSBSR is poorly influential concerning policy transfer and implementation for issues on water, agriculture and climate. However, our belief is that the present situation could be changed with a stronger engagement from EUSBSR. There is definitely room for an actor taking a stronger lead for integrating multiple sustainability targets and cross-actor cooperation related to water, agriculture and climate. Issues of utmost importance for the Baltic Sea Region but now lacking mechanisms for sharing and learning at the governmental levels. In this sphere of work we think that the EUSBSR could be an influential actor and carrier of substance to the policy level. We welcome any further discussion concerning the Waterdrive 10 strategic recommendations.



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Project Partners

COUNTRY	NAME	LOGOTYPE
Sweden	Swedish University of Agricultural Sciences	
Sweden	South Baltic Water District Authority/Kalmar County Administrative Board	
Sweden	Swedish Board of Agriculture	
Sweden	Västervik Municipality	
Lithuania	Baltic Environmental Forum Lithuania	
Finland	Baltic Sea Action Group	
Finland	Natural Resources Institute Finland	
Finland	Finnish Environment Institute	
Finland	Water Protection Association of the River Kokemäenjoki	
Finland	Finnish Field Drainage Association	
Estonia	Stockholm Environment Institute Tallinn Centre	

COUNTRY	NAME	LOGOTYPE
Latvia	Jelgava Local Municipality	
Latvia	Latvia University of Life Sciences and Technologies	
Latvia	Union Farmers' Parliament	
Poland	Agricultural Advisory Service in Brwinow	
Poland	European Regional Centre for Ecohydrology PAN	
Poland	PhenoHorizon OLP SP. zO.O.	
Denmark	L&F SEGES	
Russia	St. Petersburg Federal Research Center of the Russian Academy of Sciences (SPC RAS)	
Russia	Institute for Engineering and Environmental Problems in Agricultural Production – branch of Federal State Budgetary Scientific Institution "Federal Scientific Agroengineering Center VIM (IEEP)	
Russia	Administration of Guryevsk city district	

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