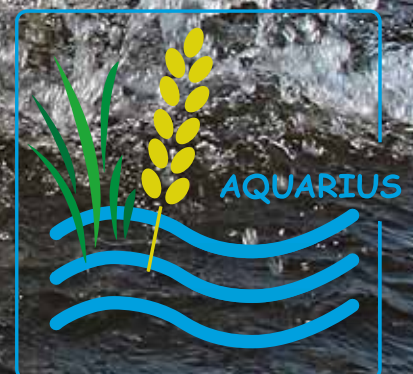


THE FARMER AS **WATER MANAGER**

- Recommendations on measure development through participatory partnerships, Final Conclusions



Farmers as water managers

The Aquarius project

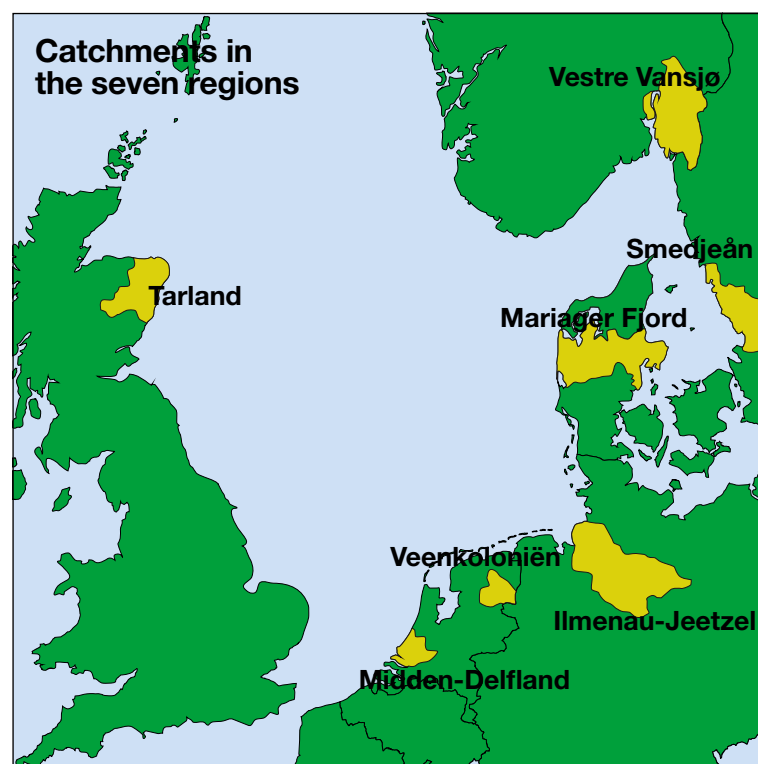
The climate is changing, and in future we will experience higher temperatures, more rainfall, and more instances of extreme weather: storms, droughts, and floods. Extended periods of rainfall will increase erosion and the input of nutrients and pathogens to waterways. Furthermore, periods of drought will hinder the water's ability to dilute diffuse inputs which will have a severe impact on ecosystems.

Climate changes and environmental regulations pose new challenges and opportunities for farmers in the North Sea region. In order to continue a viable agricultural production and improve or maintain a good water status as set out in the Water Frame Directive (2000/60/EC), farmers need to adapt their production to the changed conditions.

Within the Aquarius project, the overall objective has been to gain practical experience of how to enable European farmers to become future water managers and guardians of the water environment under the changing climate conditions. This objective has been reached by developing farming-related measures mitigating the consequences of flooding, droughts, and water shortages and/or improving water quality while maintaining farming viability. Technical and financial methods have been developed and applied in order to meet this end. All Aquarius measures have been developed through participatory partnerships of multiple stakeholders representing environmental authorities, land managers, and scientists.

Aquarius contributes practical experience to the Water Framework Directive's call under article 14 for public involvement (2000/60/EC) due to its development of farm-related measures through participatory partnerships. Additionally, the project contributes to the "Common Implementation Strategy for the Water Framework Directive" concerning public participation (EC 2003).

Aquarius map



The Aquarius Project consists of 15 partners from six countries with seven pilot areas around the North Sea.

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Introduction

In this “Final conclusions” document, the focus is on Aquarius’ contributions to understanding the key role of participatory partnerships. It draws out common lessons from stakeholder involvement in different pilots and measure developments. For more details of the development of technical and financial methods, the reader is referred to the “Main Findings from Aquarius” report and to the Aquarius home page aquarius-nsr.eu.

The final conclusions below set out the recommendations on participatory partnerships. The conclusions are based on the “Main Findings from Aquarius” report, the Aquarius End Conference in October 2011, and the Aquarius pilot “Fact Sheets”. In these Fact Sheets, focus has been on specific measure development processes and lessons that are considered to be especially important for the project. For information of the full list of measures developed under the umbrella of Aquarius, the reader may again refer to “Main Findings” and the project homepage.

The target group for the present report is people that are interested in how to find ways where farming, the water environment, and a changing climate goes hand in hand and especially people with a deep interest in conclusions and recommendations on participatory partnerships.

Good reading!

Aquarius methods

During the first phase in Aquarius, focus was on making a common platform for the work to be carried out in the project. A baseline description of existing land and water management and its impact on ecosystems in the project areas was produced together with baseline descriptions of direct stakeholders, their socio-economic structures, and cultural traditions. Based on these descriptions, the future challenges for farmers and the environment under changing climate conditions was identified.

During the second phase, focus was on identification and description of key methods for farmers to deal with increased temperatures, nutrient losses, flooding, and droughts in the future.

Key methods were divided into three categories:

- Technical methods
- Financial and legal methods (including institutional aspects)
- Participatory planning

During the third phase, the opportunities for farmers to act as water managers by using new measures and techniques were identified and demonstrated at farm and catchment level.

During the fourth phase, the lessons from the project were evaluated. This phase led to recommendations on future land and water management planning.

CLIMATE CHANGE CHALLENGES

EXAMPLES OF MEASURES TO ADDRESS THEM

Within the pilot areas, the problems vary greatly: water shortages, flooding, and water quality. The urgency of these problems vary as well. At the beginning of the project, expected climate changes in the North Sea Region were identified together with immediate challenges in the 7 pilot areas of the 6 participating countries.

The general trends as identified in the project “Baseline Report” are briefly presented below. This is followed by a schematic presentation of immediate pilot challenges and Fact Sheet examples of the specific measures developed to address them:

- Decreasing precipitation trends suggest that potentially an increased irrigation (Denmark, Drenthe, Germany, Norway, Sweden, Scotland) and inlet of non-local surface water (Delfland) might be required - this may lead to a shortage of irrigation water (Drenthe), decreased water quality (Delfland), and a downgrading of protected aquatic ecosystems (Germany).

- Warm, moist conditions in spring/summer may lead to a need for more pesticides and fungicides (Denmark, Drenthe, Scotland); may create problems in accessing the land for cultivation (Denmark, Norway, Scotland), and lead to growth of toxic green blue algae (Delfland).
- There may be increased salinisation due to the upward flow of salt-bearing groundwater or the influx of salinised surface water (Delfland).
- Winter floods or heavy rain may damage new crops (Germany, Sweden, Scotland), increase nutrient leaching to ground and surface water (Denmark, Norway), and lead to an increase of nutrient-rich drainage water due to nutrients leaching from drained soils (Delfland).
- Changing weather patterns will increase volatility of farming profits (Germany, Drenthe), have an impact on farmer access/operations (Scotland) as well as water system control (Delfland, Drenthe).

- High temperatures may scorch crops (Sweden, Drenthe).

For the purpose of developing measures to mitigate the consequences of climate change as well as improve water quality, it was necessary for the pilots to prioritise their efforts. Each pilot has chosen to work with measures addressing the most urgent water challenges in their specific context and to report them in the “Main Findings” report. Among these measures, each pilot has selected one measure that has been especially important to them when simultaneously considering their experience with participatory partnerships. These measures and the bio-physical challenges that they face are shown in figure 1.



CHALLENGES - MEASURES DEVELOPED

Figure 1: Prioritised measures and the challenges they face.

| Measures to meet challenges ¹⁾ | Challenges | | |
|---|--------------------|----------|---------|
| | Poor water quality | Flooding | Drought |
| Multifunctional wetlands | X | X | X |
| Natural Flood Management | | X | |
| Water Sensing Decision System | | | X |
| Specific Environmental plans | X | | |
| Rain harvesting | | | X |
| Willow plantation | X | | |
| Active cooperation | X | X | |

¹⁾ The different methods and tools are explained in detail in the Fact Sheets you find on www.aquarius-nsr.eu. The Fact Sheets contain information about: The specific method or tool, The main benefits, Boosters and barriers for further implementation and Policy Recommendations.



Willow plantations benefit many stakeholders.

FINAL CONCLUSIONS - PARTICIPATORY PARTNERSHIPS

A foundation for common values for participatory partnerships

As a result of the participatory baseline analysis, it became clear that the following need to be considered at the beginning of a project process:

- 1) who are the direct stakeholders in water related problems
- 2) what are the constraining socio-economic and institutional structures of e.g. tenure-ownership, private or public extension structures and levels of regulation); and
- 3) is there an existing culture of participation?

The shared principle for participatory partnerships was that measures in all 7 pilots' should be of benefit to the water environment, farming businesses, and the local

community, "creating win-win solutions". Aquarius differs from other European participatory partnerships in its tripartite environmental, agricultural and societal win-win premises for participatory measure development.

While the tripartite win-win principle served as a shared value foundation, specific pilots differed in how the environmental, agricultural and societal benefits were prioritised. Further, the degree and way which a measure should be in order to benefit the stakeholders involved, varied. Examples of different views on what constituted a win-win solution are listed below:

- With respect to green blue services, Delfland considered a win-win solution to be obtained when Dutch national authorities were allowed by the EU to fully compensate farmers for the services they provide to the surrounding community.
- In Denmark, a win-win measure had to improve or at least not damage water quality and farm economy. Societal benefits were seen in economic terms as implementation based on market premises or at least involving no additional

public expenditure in the form of direct compensation.

- In Drenthe, a win-win solution implied improved water use efficiency, production economic value to farmers, and business opportunities for SME's producing the necessary technical devices.
- In Norway, win-win solutions linked improved water quality with no negative consequences for farm production economy. Public schemes provided means to reach this end.
- In Sweden, a win-win measure was developed to store nutrients, enlarge biodiversity, decrease risks of flooding, mitigate the consequences of droughts for agricultural production and provide benefits to rural society, simultaneously.
- In Scotland, increased biodiversity went hand in hand with protecting the local community from the consequences of flooding, increased amenity for the rural population and opportunities to continue agricultural production in areas of water storage.
- In Germany, protection of ground water deposits and the ecosystem of water courses were improved together with the provision of more irrigation water to farmers.



PARTNERSHIPS

Common findings for win-win solutions based on participatory partnerships

For participatory partnerships to be likely to produce win-win solutions, Aquarius has drawn the following conclusions:

Win-win solutions do not only depend on the number of stakeholders

Whereas all Aquarius pilot projects were based on the active involvement of stakeholders in one or more project phases, the pilots differed with respect to what specific stakeholders were involved and at what stage. Figure 2 provides an overview of these differences, based on the Fact Sheets provided by each pilot.*

From this figure, and the fact that all pilots were able to identify, plan or implement what they considered to be win-win measures or solutions, a conclusion can be drawn that win-win solutions are not determined by stakeholders' participation in specific project phases alone. It is also important to be aware that until a measure has been implemented in practice, its win-win consequences cannot be definitively evaluated.

The complexity of reaching win-win solutions increases with the number of stakeholders and the number of project phases in

Figure 2: Different durations of participatory partnerships

| Participatory project phases / Country | Idea exploration | Planning | Implementing | Monitoring |
|--|------------------|----------|--------------|------------|
| Delfland (Netherlands) | ←→ | | | |
| Denmark | ←→ | | → | |
| Drenthe (Netherlands) | | | ←→ | → |
| Germany | ←→ | | → | |
| Norway | | ←→ | → | |
| Scotland | | ←→ | → | |
| Sweden | | ←→ | → | |

Stakeholders involved in the different project phases: (Delfland: authorities, facilitators, farmers) (DK: authorities, agricultural advisory organisations, farmers) (Drenthe: university, SME's farmers, authorities) (Germany: farmers, authorities) (Norway: authorities, university, farmers) (Scotland: university, authorities, facilitators, farmers) (Sweden: authorities, farmers organizations/agr. advisory organisations, farmers).

which they are involved. Provided that the complexity can be successfully managed, there may however be reason to believe that stakeholder' involvement in all project phases increases the quality of measures as well as the acceptability of measures and their long term sustainability.

This is what is hypothesised by the EU Commission in Guidance document No. 8: Public Participation in relation to the Water Frame Directive. On the basis of the Aquarius project, this hypothesis can neither be confirmed nor denied, but a recommendation can be made to future projects to investigate the hypothesis in greater detail.

Win-win solutions are easier to identify on a local scale

A local scale (farm, catchment or community) is often a prerequisite for reaching win-win solutions. This is due to large differences in bio-physical conditions, agricultural production structures, and community characteristics. Furthermore, it has been a shared experience for all pilots that win-win solutions become visible to stakeholders only when they are very concrete.

For location specific win-win solutions to be realised in practice, it is necessary for both EU-regulations and national regulations to be less prescriptive in terms of measures, focusing instead on defining the desired outcomes and not how to best achieve them.

* The Fact Sheets can be found on www.aquarius-nsr.eu.

Win-win solutions require integrated measure development procedures

The pilots have approached measure development from different starting points. In figure 3 (below), it is shown that Delfland has taken an economic perspective on measure development by focusing on green blue services provided by farmers to society. By focusing on open innovation of win-win measures in a sub catchment stakeholder group, the Danish pilot has taken a participatory partnership perspective. In Drenthe, Germany and Sweden, focus has primarily been on developing and implementing technical aspects of the measures. As for the Scottish pilot, there has been a shared focus on technical modeling in close dialogue with farmers.

In all Aquarius pilots, successful measure development and implementation has depended on taking all aspects into consideration (technical, economic and participatory). All pilots have also identified the need for changes to the legal framework in terms of better coordination between different EU directives (Scotland), increased flexibility in EU rules for compensation to farmers (Delfland), improved national schemes for compensating farmers (Norway), national regulations enabling and encouraging farmers to act in the interest of the environment (Denmark, Drenthe, Germany). Together, these insights generated the “problem solution wheel.” (figure 4).

The wheel can be considered a heuristic procedural tool to be used with the

stakeholders throughout the measure development process in order to ensure all relevant aspects are covered.

Win-win solutions depend on stakeholders’ views being taken into account

Barriers to creating win-win solutions in practice arose when the farmers were not persuaded (Sweden), not asked (Delfland) or did not explicitly judge (Denmark) the measure to be in the interest of farming.

This means continuing to adapt a measure until all stakeholders are able to see the benefits to be gained from implementing it. Stakeholders need to be able to clearly express their doubts and have their viewpoints explicitly included.

Figure 3: Different starting points for an integrated measure development.

| Measures/ country | Delfland (Netherlands) | Denmark | Drenthe (Netherlands) | Germany | Norway | Scotland | Sweden |
|-------------------------|--|---|---|--|---|--|------------------------------|
| Technical | Removal and application of biomass (reed, grass) | Willow plantation Constructed wetlands Changed cropping systems | Water Sensing decision systems | Rain Harvesting | Buffer strips Wetlands No tillage in autumn | Modelling of natural flood alleviation | Multifunctional wetlands |
| Economic (post project) | National Catalogue of Green-blue Services | Public schemes + private market-based investments | Private market-based investments | Private market-based investments | Public schemes | Public schemes | Public schemes |
| Participatory | Participatory possibility exploration through local tender process | Participatory possibility exploration, planning and implementation | Participatory implementation and monitoring | Participatory exploration and implementation | Participatory farm specific planning and implementation | Participatory knowledge sharing | Participatory implementation |

The dark blue color indicate which aspect was the initial focus point of measure development. The diagram is based on the participants’ fact sheets and does not necessarily cover all activities that have taken place in the pilot areas.

The problem solution wheel

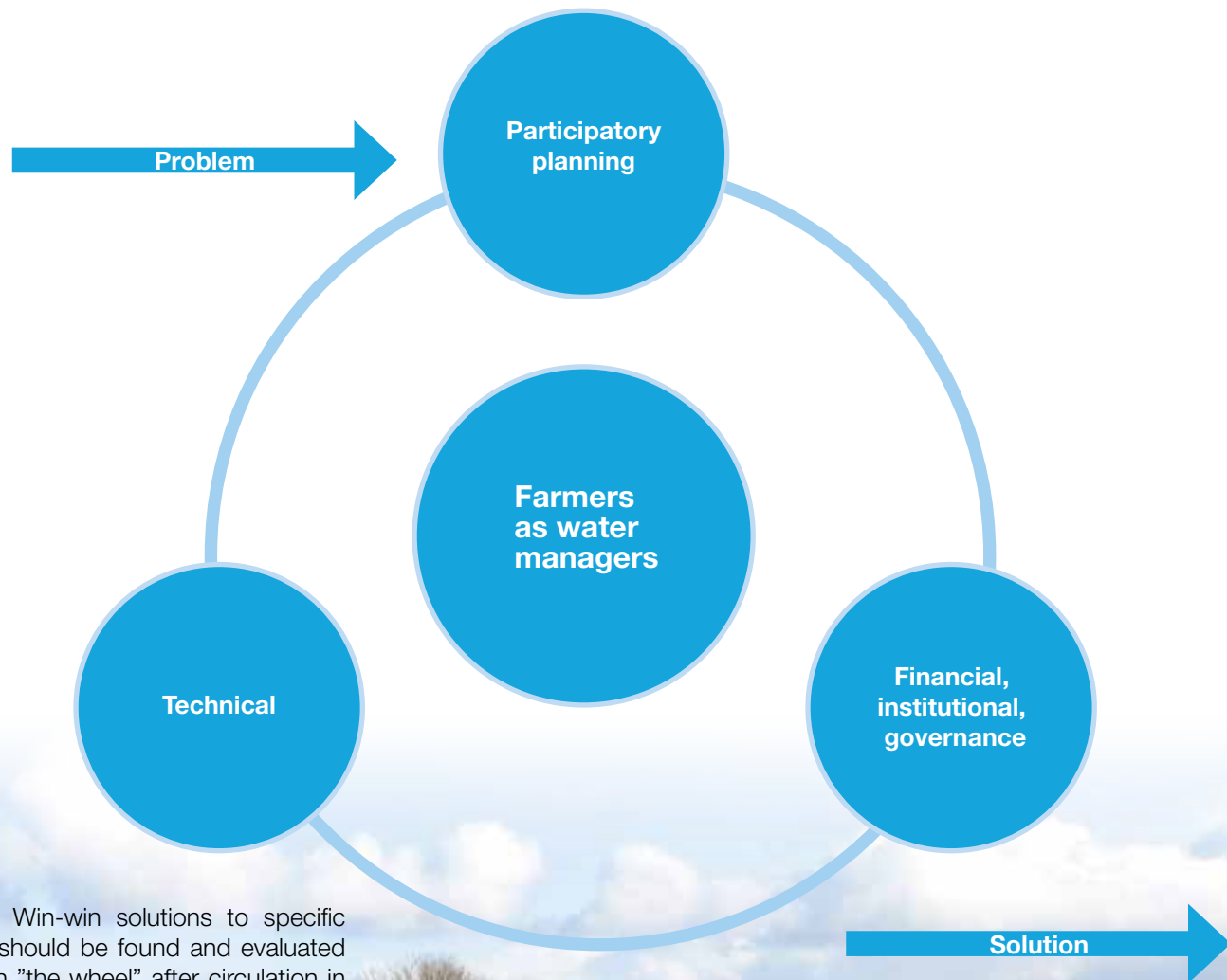


Figure 4: Win-win solutions to specific problems should be found and evaluated from within "the wheel" after circulation in its three parts

RECOMMENDATIONS - HOW TO CREATE **WIN-WIN SOLUTIONS**



For participatory partnerships to be able to produce win-win measures and solutions, Aquarius provides the following recommendations:

- 1) Decide which stakeholders should participate in the particular project phases based on a location specific approach to the creation of win-win solutions. Consider whether the success of win-win measures is likely to improve with the number of phases in which stakeholders participate.
- 2) Make sure that all involved stakeholders agree on the specific pilot premises on which win-win solutions should be based, which very much depend on the specific cultural context.
- 3) An appropriate scale when defining win-win solutions will provide the right opportunities for relevant stakeholders to participate. Appropriate scales vary but can include farm specific, catchment specific or community specific approaches.
- 4) When participation of stakeholders is a prerequisite for successful implementation, make sure that all relevant stakeholders have an opportunity to make their viewpoints heard in terms of the benefits they need to achieve, to actively contribute to measures being implemented.
- 5) Stakeholders must be allowed to evaluate the technical, economic, legal, institutional and participatory aspects of win-win measure development. If one of these aspects is not taken into consideration, it is likely to later become a barrier for implementation.
- 6) Improve the congruity of legal regulations and make them less prescriptive, allowing more innovation at farm, catchment and community level. Allow regulations to consider win-win solutions rather than setting minimum standards.
- 7) There is much to be gained from actively sharing experiences on a regional, national and international scale with other pilots looking for win-win solutions. However, for a win-win solution to become a reality, there is always a need for local specification and adaptation.
- 8) Find a moderator to support the win-win process. The moderator should be accepted by all parties.
- 9) Avoid pseudo involvement of stakeholders.

Aquarius is partly funded by The Interreg IVB North Sea Region Programme

The North Sea Region Programme 2007-2013 works with cutting edge policy areas in regional development through transnational projects

A principal objective of the Programme is to expand the scope of territorial cooperation and focus on high quality projects in innovation, the environment, accessibility, and sustainable and competitive communities.

The 2007-2013 Programme connects regions from seven countries around the North Sea, incorporating policy-level planning and the long-lasting and tangible effects of projects. These are the foundations of the future transnational projects which will create added value to partner regions and beyond.

The aim of the programme is to make the North Sea Region a better place in which to live, work, and invest.

For more info about the programme visit www.northsearegion.eu.

Main beneficiaries in Aquarius:

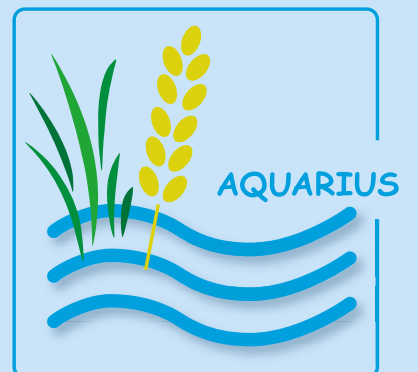
1. Knowledge Centre for Agriculture, Denmark
2. Danish Nature Agency, Aalborg, Denmark
3. Landwirtschaftskammer Niedersachsen, Germany
4. Hoogheemraadschap van Delfland, Netherlands
5. Provincie Drenthe, Netherlands
6. Waterschap Hunze en Aa's, Netherlands
7. County Governor of Østfold, Norway
8. Bioforsk Institute, Norway
9. Aberdeenshire Council, Scotland
10. The James Hutton Institute, Scotland
11. County administration of Halland, Sweden
12. Halmstad University, Sweden
13. Rural Economy and Agricultural Society of Halland, Sweden
14. Municipality of Laholm, Sweden
15. Regional Development Council, Halmstad, Sweden

Read more about Aquarius on:
Aquarius-nsr.eu

European Union  The European Regional Development Fund

The Interreg IVB North Sea Region Programme

*Investing in the future by working together
for a sustainable and competitive region*



Farmers as water managers