



## Actor's feedback on practices for improvement of water quality in FAIRWAY case studies and interim project results

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## **LIST OF ABBREVIATIONS**

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DST – decision support tools

SME – small and medium-sized enterprises

NGO – nongovernmental organisation

WP – work package

DG AGRI – directorate general for agriculture

DG ENVI – directorate general for environment

JPC – joint policy conference

MAP – Multi-Actor Platforms

# Actor's feedback on evidence based practices for the improvement of water quality in Fairway case studies and interim project results

## 1. SUMMARY

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The task 7.2 aims: (i) to obtain feedback on the evidence-based practice in the different FAIRWAY case studies to improve water quality, based on the results of Task 7.1 *Evaluation on barriers and issues in providing integrated scientific support for EU policy*, (ii) to obtain detailed views on FAIRWAY project interim results and (iii) to obtain view of different EU land managers on the applicability, cost and adoptability of chosen best practises and measures to reduce pesticides and nitrates in drinking water resources. The researchers conducted three surveys.

The first survey was performed among project's Multi Actors Platform (MAP) stakeholders in the form of paper questionnaire to evaluate possible correlations between the EU and local level on practices for the improvement of water quality in FAIRWAY case studies. This part includes the reflection on the main findings from discussions with actors in task 7.1.

The second survey was performed among different recognised stakeholders at EU level to obtain reflection on interim project findings. The stakeholders in both surveys were selected based on their field of expertise in water policy regulations/protection or by any other different involvement in protection/pollution of water resources in EU, national or local level.

The third survey was a continuation of work done in D4.3 Evidence based best practices and measurements for reducing the pesticides and nitrates in drinking water resources. We collected the few best practices and made a survey where we asked wider group of EU land managers (coming mostly from COPA-COGECA and EUFRAS associations) to choose 5 most promising practices according to their applicability, cost and adoptability. We analysed the results and compare them with the results from D4.3.

Regarding the main findings from discussions with actors in task 7.1, stakeholders in all FAIRWAY project MAPs agree that **stronger involvement of all actors in the science-policy interface is a solution** for science integration into policy. Most respondents also agree or strongly agree that **it is good that member states have a voice in solving problems on local level** relating agricultural pollution of drinking water resources and that **MAPs are the right way to engage stakeholders** in this issue **closely**. However, the idea of **separation of pesticides and nitrates in projects and policy communications** has considerably lower support in the MAPs as on EU level.

In the second survey, the respondents stressed that there is an **absolute need to have the key and essential final project results presented shorter and, in a language, understandable to policymakers**.

The idea of possible long-term relationship/communication flows between research projects and political agenda, including **Taskforce water intending to design project clusters** seems very useful to the vast majority (i.e., 86 %) of respondents.

Finally, the respondents agreed that the most effective ways to receive interim project results are presentations at conferences and workshops or via executive summaries of deliverables. Meanwhile, the final results of the project can be best communicated via executive summaries of deliverables, and secondly by conferences/workshops, articles in scientific journals and YouTube videos.



And in the third survey the results showed that for EU land managers the most promising practices **for reducing pesticides in drinking water could be biobed filters**. The most promising practices **for reducing nitrates in drinking water could be grassed waterways**. These are the practices that received the highest ranking in applicability, cost and adoptability of practice.

# 1. INTRODUCTION

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## 1.1 GENERAL INTRODUCTION TO TASK 7.2

The aim of Task 7.2 is to obtain feedback on the evidence-based practices in the different FAIRWAY case studies to improve water quality. This paper is a continuation of the work in task 7.1 *Evaluation on barriers and issues in providing integrated scientific support for EU policy*. The results of the report D 7.1 were based on a desk study research, workshop and individual interviews on barriers and issues in providing integrated scientific support for EU policy. Its main objective was to discuss the EU regulations related to drinking water resource protection against pollution of nitrates and pesticides with representative EU-level actor organisations.

The deliverable Task 7.2 consists of three parts. The first part summarises and discusses the actor's feedback on the evidence-based practices for water quality improvement of the different Fairway case studies. This part includes the evaluation of the main findings of discussions with actors in task 7.1 in the project's Multi-Actor Platforms (from now on the MAP), using paper questionnaires. The questionnaire aimed to evaluate possible correlations between the EU and local level on barriers and issues in providing integrated scientific support for policy regulations related to drinking water resource protection against diffuse pollution of nitrates and pesticides from agriculture.

In the second part of this deliverable, a survey was conducted based on a questionnaire for all stakeholders that received an invitation to the Joint Policy Conference meeting held in Brussels on 7<sup>th</sup> December 2018, organised as part of the work in Task 7.2 (Milestone 7.2). This survey was conducted to measure the usefulness of interim findings of work packages 3 to 8 of Fairway project for different stakeholder groups, such as researchers, local, regional and national authorities, agro-industry, SMEs, NGOs and farmers.

In the third part of this deliverable, an e-survey was sent to a wider group of stakeholders (COPA-COGECA member, EUFRAS network and others) to see how different EU land managers perceive project's best practises and measures for regulating the intake of pesticides and nitrates in drinking water resources. Especially regarding their applicability, cost and adoptability of proposed best practises. Best practises and measures were obtained through the results that occur in D4.3 and were compared afterwards.

## 2. ACTOR'S FEEDBACK ON PRACTICES FOR THE IMPROVEMENT OF WATER QUALITY IN CASE STUDIES

### 2.1 METHODOLOGY

#### 2.1.1 The questionnaire

The researchers assessed the responses of MAP leaders to a questionnaire sent by email. The duration of the survey was 40 days, starting with 10<sup>th</sup> April 2019 and finishing with 20<sup>th</sup> May 2019. In this period, two reminder emails were sent to obtain more results. 30 finished questionnaires arrived at that point, so the work group decision was to postpone the deadline until 1<sup>st</sup> of August 2019. MAPs responded and obtained more data, so at the end we exceeded our goal of 44 questionnaires, and we received 46 finished questionnaires which showed good cooperation between MAPs and WP7.

The questionnaire included both close-ended questions with single choice answering and open-ended questions with predefined answers, offering respondents the possibility to grade on a Likert scale of agreement (from 1= do not agree to 7= very much agree) with the findings from task 7.1. For open-ended questions, additional questions were provided, to ask respondents if they have a different (not already presented) view on specific topics. This part is considered of great importance for the survey as it provides additional valuable material for recognising specific needs on the local level.

The questionnaire included four blocks. The first and second blocks focussed on nationality and stakeholder groups, respectively. The third block dealt with barriers and issues concerning integrated scientific support between the national and local level. Moreover, the fourth block focussed on the improvement of the system; what are the possible solutions for integrated scientific support for policy on protecting drinking water resource against nitrates and pesticides pollution.

#### 2.1.2 Survey sample

The survey was targeting all MAPs presented in the Fairway project (11 MAPs). From each MAP at least four different fully finished paper questionnaires had to be supplied, which meant four different stakeholder group representatives per MAP, which would result in a survey sample of 44 questionnaires. Finally, 46 questionnaires were supplied from 10 MAPs, coming from ten countries: United Kingdom, Slovenia, Portugal, Germany, Denmark, France, Netherlands, Northern Ireland, Romania and Greece (see Table 1). Only Norway MAP did not cooperate and did not supply any data.

*Table 1: Origin of Multi-Actor Platforms that contributed to the results, number of returned questionnaires per Multi-Actor Platform, a stakeholder group that corresponded (farmers, advisory, policy makers, water policy implementation, retail, research and science, regional management and water company)*

MAP origin	Number of returned questionnaires	Stakeholders group							
		Farmers	Advisory	Policy makers	Water policy implementation	Retail	Research and science	Regional management	Water company
United Kingdom	5	1	2			1	1		
Slovenia	7	3	2		2				
Portugal	5	1		1			1	1	1
Germany	4		2		1		1		

Denmark	4	1			1		2		
France	3						3		
Netherlands	4		1		2		1		
Northern Ireland	4		2		2				
Romania	5	1	1	1			2		
Greece	5	2	1		1	1			
All together	46	9	11	2	9	2	11	1	1

MAPs are conducted of different stakeholder groups and involve case studies and national authorities. Better presented is below in Figure 1 of Fairway conceptual framework.

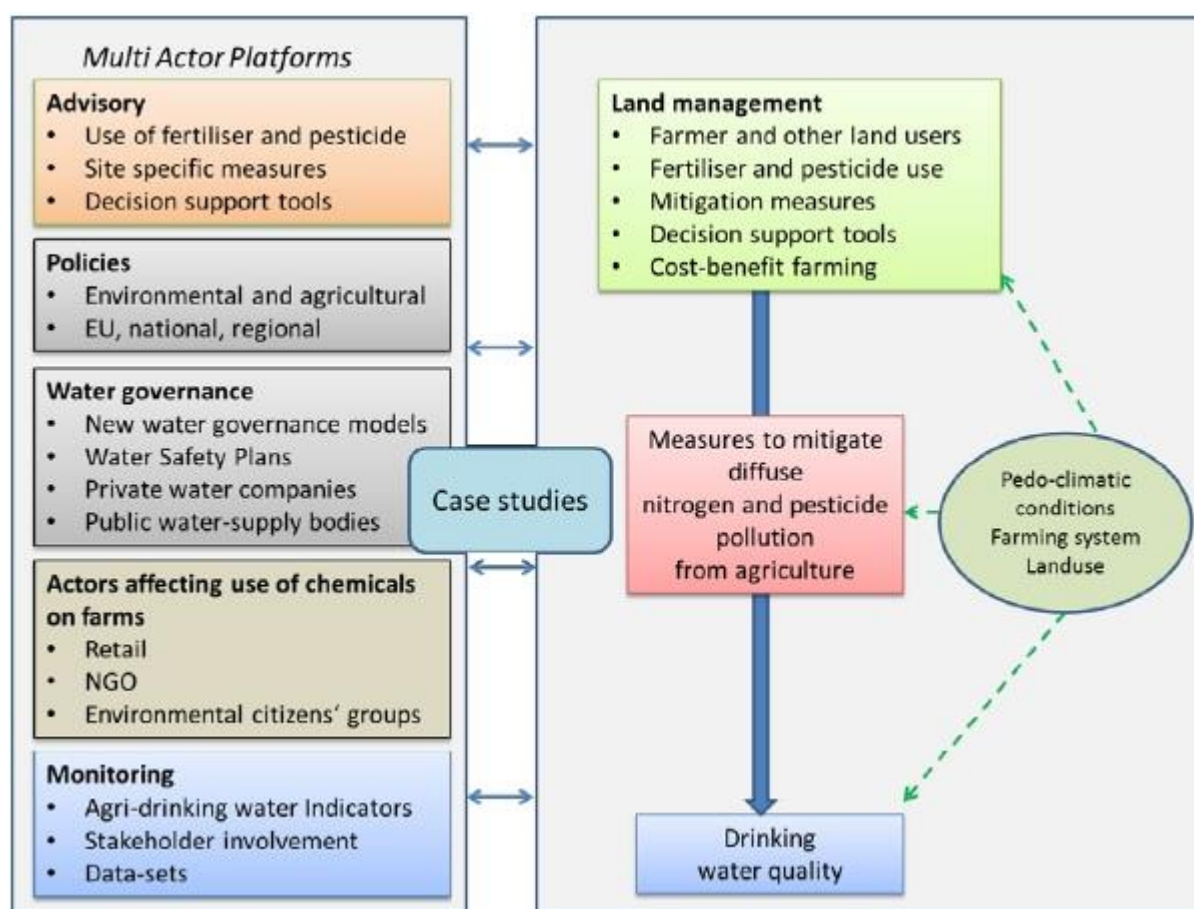


Figure 1: Fairway conceptual framework

The representatives of the different stakeholder groups that were asked to fill out the questionnaires are not necessarily experts in the field of protecting water resources. They are within their professional duties involved in the process of making decisions or otherwise influencing how to maintain drinking water resources protected on a daily or regular basis. Selected representatives gave as a survey sample of important actors involved in different fields of the protection of drinking water resources.

The responses received enabled to conduct a so-called incomplete DELPHI method.

The **Delphi method** (also known as Estimate-Talk-Estimate (ETE)) is a structured communication technique or method, originally developed as a systematic, interactive forecasting method, which relies on a panel of experts (Dalkey and Helmer, 1963). In the complete DELFI method researchers want to connect experts and structure communication about the idea so that consensus can be

achieved. A selection of experts is a critical element. They are chosen based on professionalism and not a coincidence. Likewise, a selection of presenters of different characters involved in different fields of protection drinking water resource was made in this incomplete DELPHI method to get their feedback on the evidence-based practices for water quality improvement of the different Fairway MAPs. MAPs placed in different EU countries enabled to observe and analyse the difference between them in the context of their legal system, geographical position and in the historical context of connecting new and old members of EU. Last but not least, the opinion/feedback of united MAP's data was also analysed and commented.

For statistic analyse an average of Likert scale, standard error and coefficient of variation was calculated for every statement presented in figures. **The coefficient of variation** (from now on CV) ranged between 6 and 75 %, in most statements it ranged between 15 and 45 %. Data sample with CV of up to 25 % goes in first quartile (Q1), 25 to 35 % goes in second quartile (Q2) and 35 to 45 % goes in third quartile (Q3). This means that statements that received CV in Q1 contain least fragmented data sample and therefore they could show a sufficiently high certainty in comparison to other statements taken into account in the claims. Statements that received CV in Q2 have more fragmented data sample. Statements that received CV in Q3 contain most fragmented data sample and should be taken with great caution in interpretation.

## 2.2 RESULTS

In task 7.1, EU representatives were asked to define some major issues and barriers for solving issues related to drinking water resource protection against diffuse pollution of nitrates and pesticides from agriculture in the EU. The researchers were interested if representatives of different stakeholder groups could agree with the opinion of EU representatives, concerning their national and local level and to what extent. Their answers are presented in three forms.

In the first form, as a structure of responses in the Likert scale. In the second form, as an average of Likert scale for all MAPs in the sample. The coefficient of variation (from now on CV) and standard error was calculated as well. The CV is essential because it gave a percentage of variation between statements within MAPs. A decision was that average of Likert scale that has CV in Q1 (< 25 %) in figures is coloured with a yellow point.

Lastly, in the third form, an average of Likert scale calculated for five individual MAPs that contributed at least five complete questionnaires, i.e., MAPs coming from the United Kingdom, Slovenia, Portugal, Romania and Greece. Their differences in average of Likert scale are presented. A CV and standard error for every type of answer was calculated and discussed if necessary. Here the decision was that statements that receive CV in Q2 or Q3 (> 25 %) are presented in figures with labels in stripes, because we wanted clearly to see in which countries on what topics there was statistically non-uniform opinion between stakeholders.

### 2.2.1 Type of stakeholders that the respondents represent

The majority of answers came from the advisory sector (23 %), farmers (20%), research and science (25%) and water policy implementation (18 %) (Figure 2).

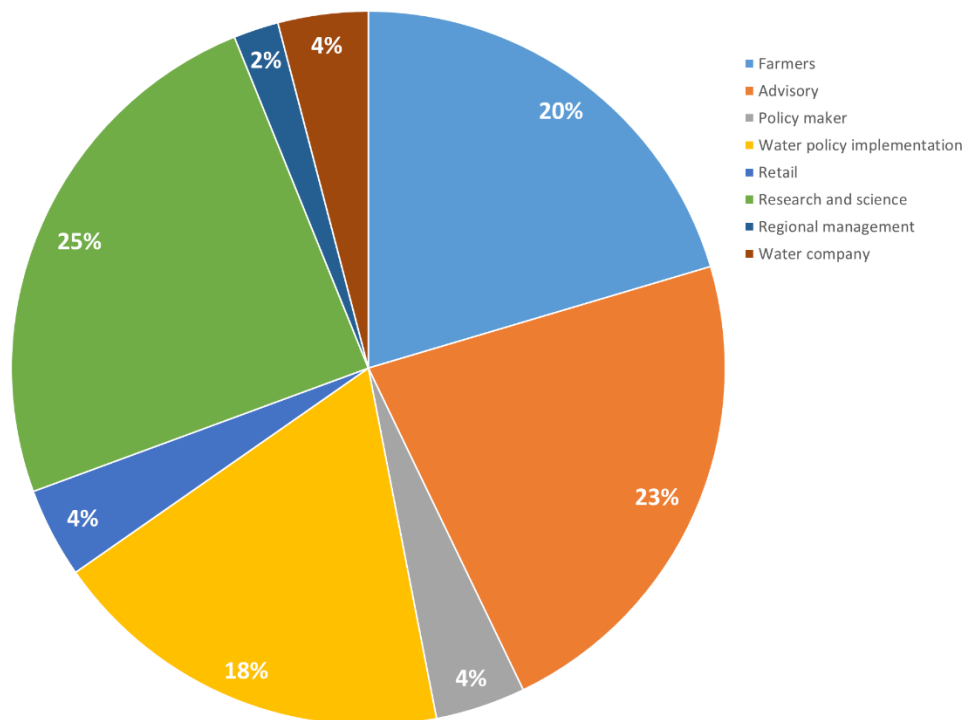


Figure 2: Percentage of stakeholder groups that the respondents represent, n=46

## 2.2.2 Do you agree with the opinion of EU representatives of issues concerning the protection of drinking water resource?

Figure 3 presents the structure of responses of the MAP representatives on the opinion of EU representatives. The structure of responses shows that more respondents slightly agree to strongly agree with all the issues presented.

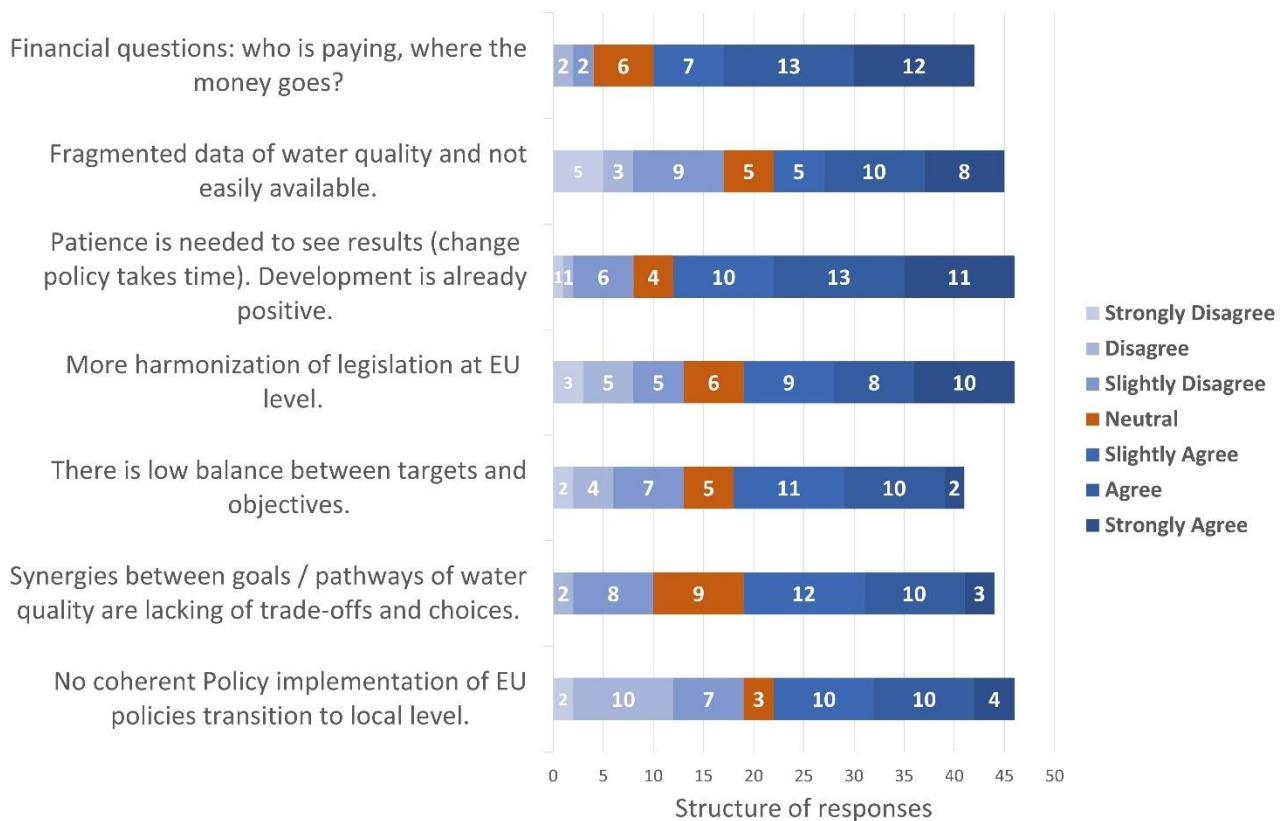


Figure 3: Structure of responses in the Likert scale for all MAPs on issues concerning the protection of drinking water resource on the local level, n=41-46

Next, the average of Likert scale showing differences in agreement with the statement (Figure 4). It shows which statements are more agreeable among respondents and which are less. The *Financial question* “who is paying, where the money goes?” has the highest average in the Likert scale and could be the most crucial issue for all MAPs. However, all statements have CV more than 25 % and that shows that we are dealing with statistically important fragmentation of data and that we cannot make a conclusions with certainty.

A more extensive survey is needed to obtain more reliable results for all statements. Nevertheless, the average Likert scale is between 4 and 6, which means that the stakeholders are neutral to agreeable for recognition of these issues in their local environment. However, stakeholders do not recognise specific issues between them to the same degree, as we will better see in Figures 4 and 5.

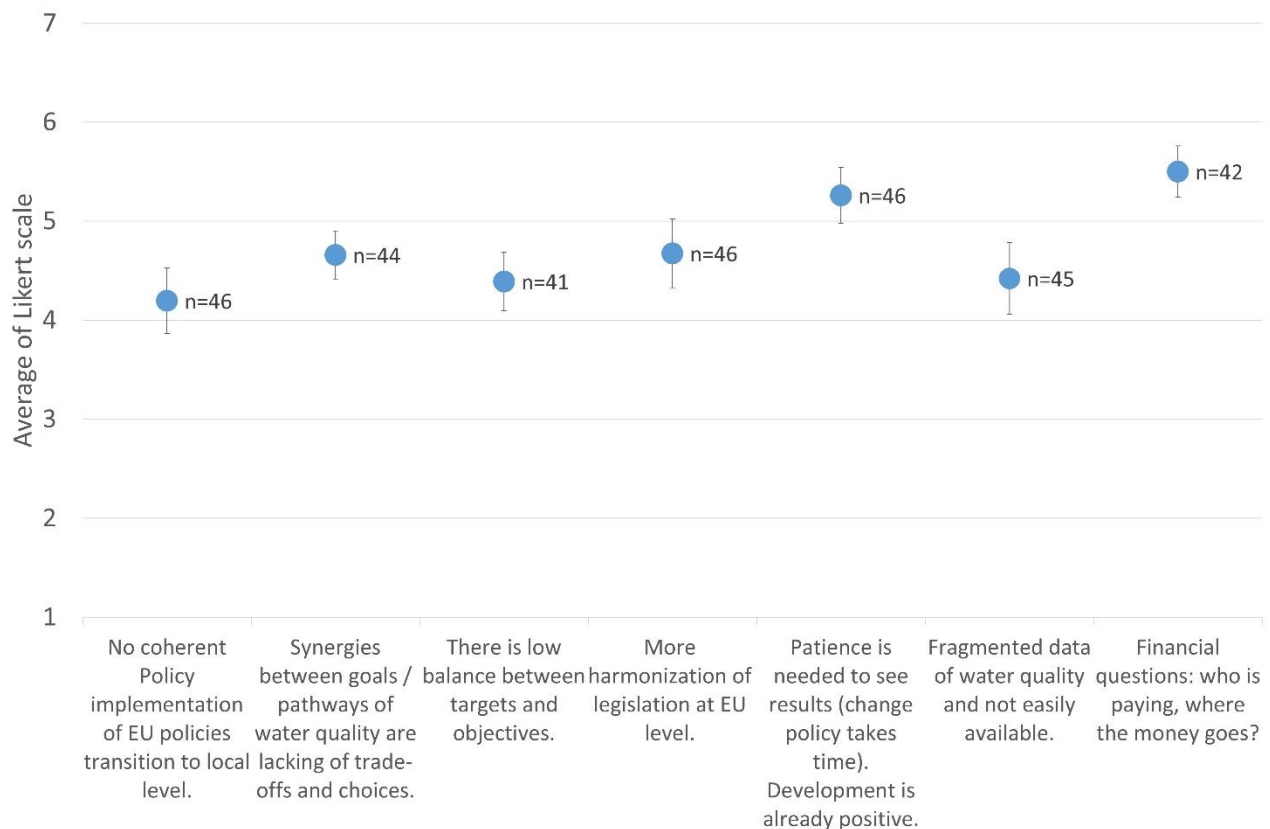


Figure 4: Average of Likert scale for all MAPs on issues concerning the protection of drinking water resource on the local level, n=41-46

The results also show substantial differences between the five MAPs that delivered more than 5 finished questionnaires: United Kingdom (UK), Slovenia (SLO), Portugal (POR), Romania (ROM) and Greece (GRE) (Figure 5). Analyse shows how different member states of the EU have different individual issues for the protection of drinking water resources and respond differently with proposed issues that are of high importance at the EU level.

Figure 5 presents responses with CV higher than 25 % with points with vertical stripes. For the United Kingdom, the statement with the lowest average on the Likert scale was (CV 54 %): *No coherent Policy implementation of EU policies transition to the local level*. In the Slovenian MAP, the lowest average on the Likert scale was for *Fragmented data of water quality and not readily available* (CV 75 %). In the MAP of Portugal two statements: *No coherent Policy implementation of EU policies transition to the local level* and *there is a low balance between targets and objectives* had CV of 60 %.

Romanian MAP strongly did not agree with statements: *No coherent Policy implementation of EU policies transition to the local level* (CV 58 %) and *More harmonisation of legislation at EU level* (CV 51%). Nevertheless, they all slightly to strongly agree that *patience is needed to see results (change policy takes time). Development is already positive*. This statement was also the only one with more certainty (CV < 25 %) for four MAPs, only Greece had CV of 31 % on this issue.

Greece stakeholders also did not agree among them with statements: *Synergies between goals / pathways of water quality are lacking trade-offs and choices* (CV of 34 %) and *More harmonization of legislation at EU level needed* (CV of 41 %).



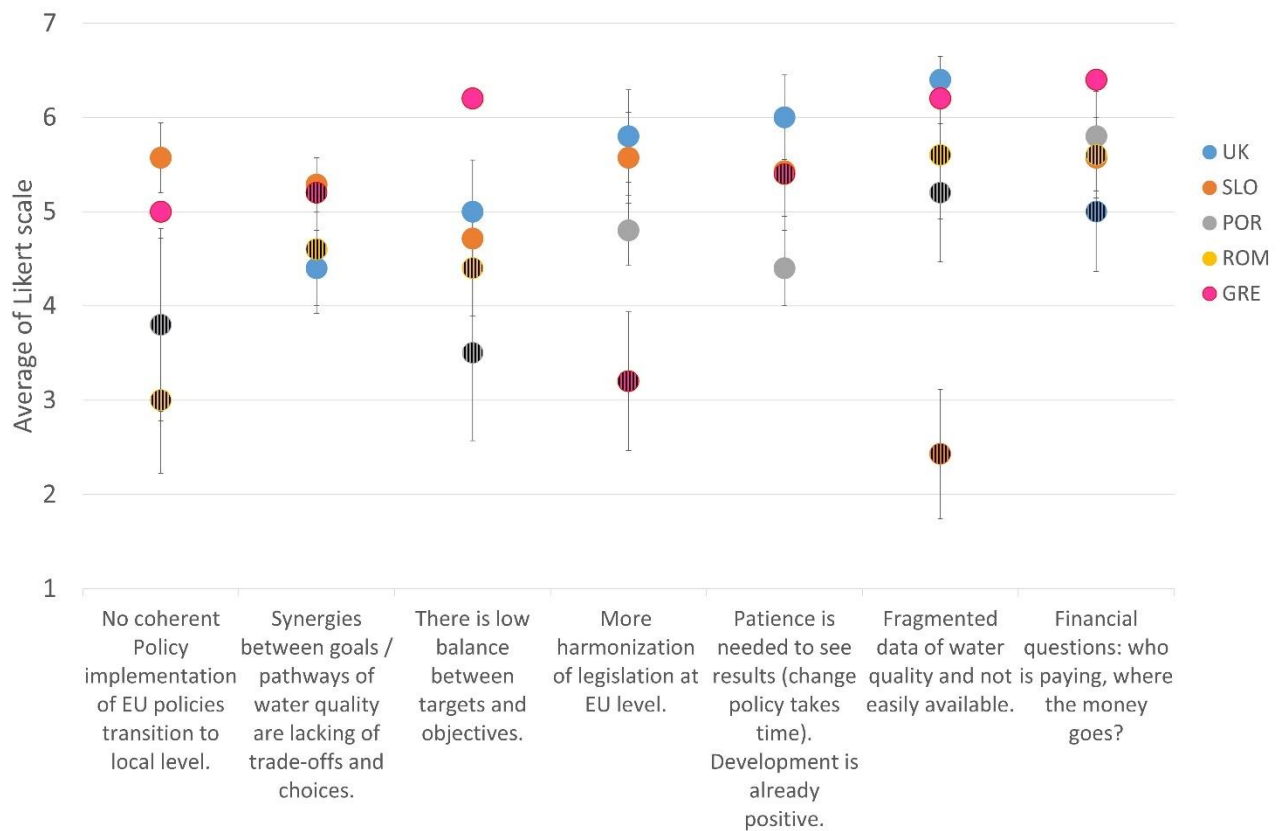


Figure 5: Average of Likert scale between five MAPs on issues concerning the protection of drinking water resource on the local level, labels with stripes showing statements that have CV > 25 %, n=5-7

### 2.2.3 Do you agree with these barriers in solving the issues of EU representatives within your national and local regulations?

The structure of responses (Figure 6) shows us more strong agreement than in the previous question. Most of the respondents decided that for barriers presented in the questionnaire, they could agree and strongly agree that they are also present in their local environment. 23 respondents decided that they strongly agree with the barrier *There is a time lag between action (measures) and results (water quality)* and 20 that *Financial means to apply certain measures are needed*. More than 70 % of respondents agree and strongly agree with these barriers.

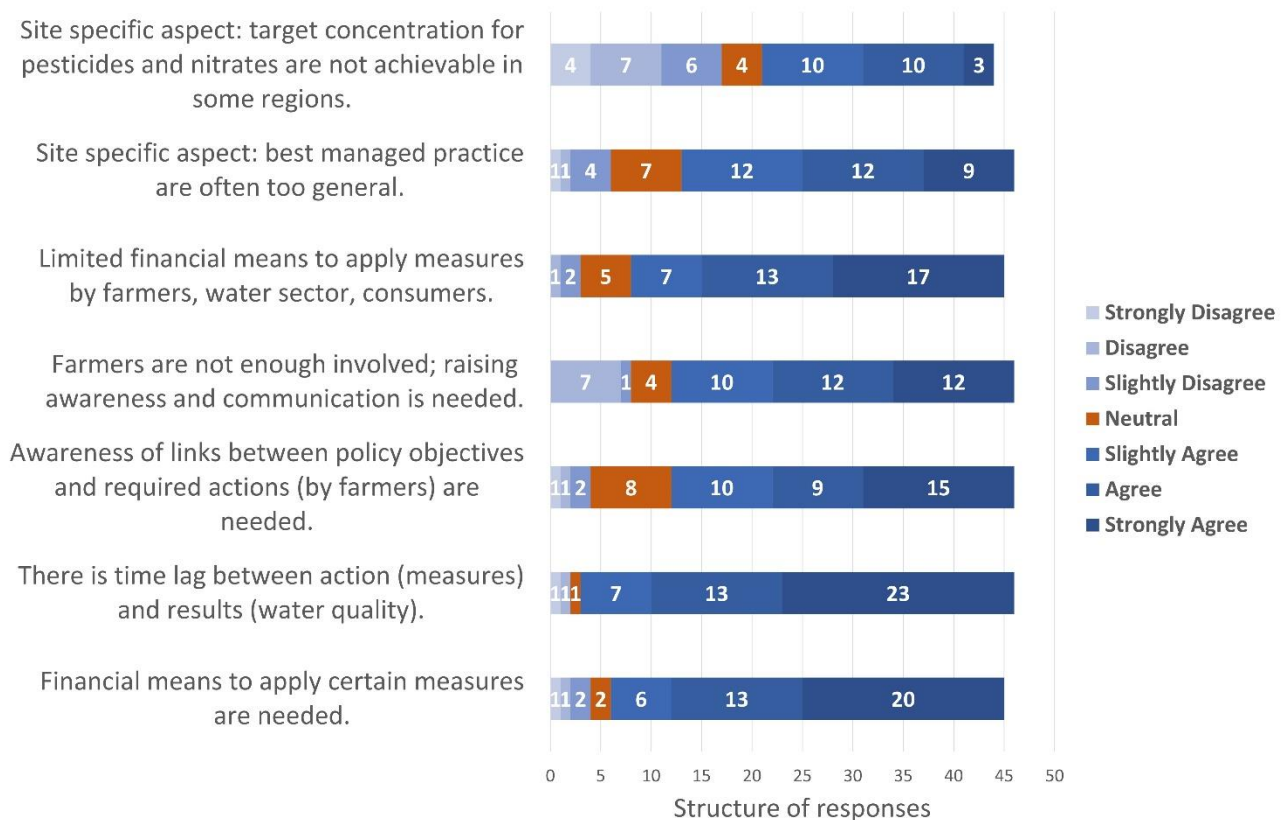


Figure 6: Structure of responses in a Likert scale for all MAPs on barriers in solving the issues concerning the protection of drinking water resource on the local level, n=44-46

The responses to this question (Figure 7) are showing a high average of Likert scale for the barriers related to the protection of drinking water resources on the local level. Most of the recognised barriers (6 of 7) have an average of Likert scale 5.2 or more, which means that these barriers are highly recognisable within all MAPs in the sample. Three statements have CV less than 25 % (coloured with yellow). Only barrier *Site-specific aspect: target concentration for pesticides and nitrates are not achievable in some regions* has CV 44 %, which means there are problems with a unified opinion of the importance of this barrier for all MAPs. Other barriers have CV 21 to 32 %, which makes data quite unified and trustable. A reasonable conclusion can be made that in most cases, the barriers that were recognised among EU representatives are also moderately to highly recognisable among all MAPs.



Figure 7: Average of Likert scale for all MAPs on barriers in solving the issues concerning the protection of drinking water resource on the local level

Figure 8 shows the difference in response between the five different MAPs. In contradiction to the other MAPs only in Portuguese MAP (CV of 53 %) stakeholders do not have unified opinion if this barrier: *Site-specific aspect as target concentration for pesticides and nitrates are not achievable in some regions* is indeed barrier also on their local level. The average of Likert scale is highest among MAPs for the barriers:

- There is a time lag between action (measures) and results (water quality),
- Farmers are not enough involved; raising awareness and communication is needed and
- Limited financial means to apply measures by farmers, water sector, consumers.

Strong (Likert scale of 6 to 7) and unified opinion (CV is 0 to 10 %) had MAPs as follows:

Greece for barriers:

- Financial means to apply certain measures are needed.
- Limited financial means to apply measures by farmers, water sector, consumers.

Romania for barriers:

- There is time lag between action (measures) and results (water quality).
- Farmers are not enough involved; raising awareness and communication is needed.

Slovenia for barrier:

- There is time lag between action (measures) and results (water quality).

Moreover, United Kingdom for barrier:

- Site specific aspect: target concentration for pesticides and nitrates are not achievable in some regions.

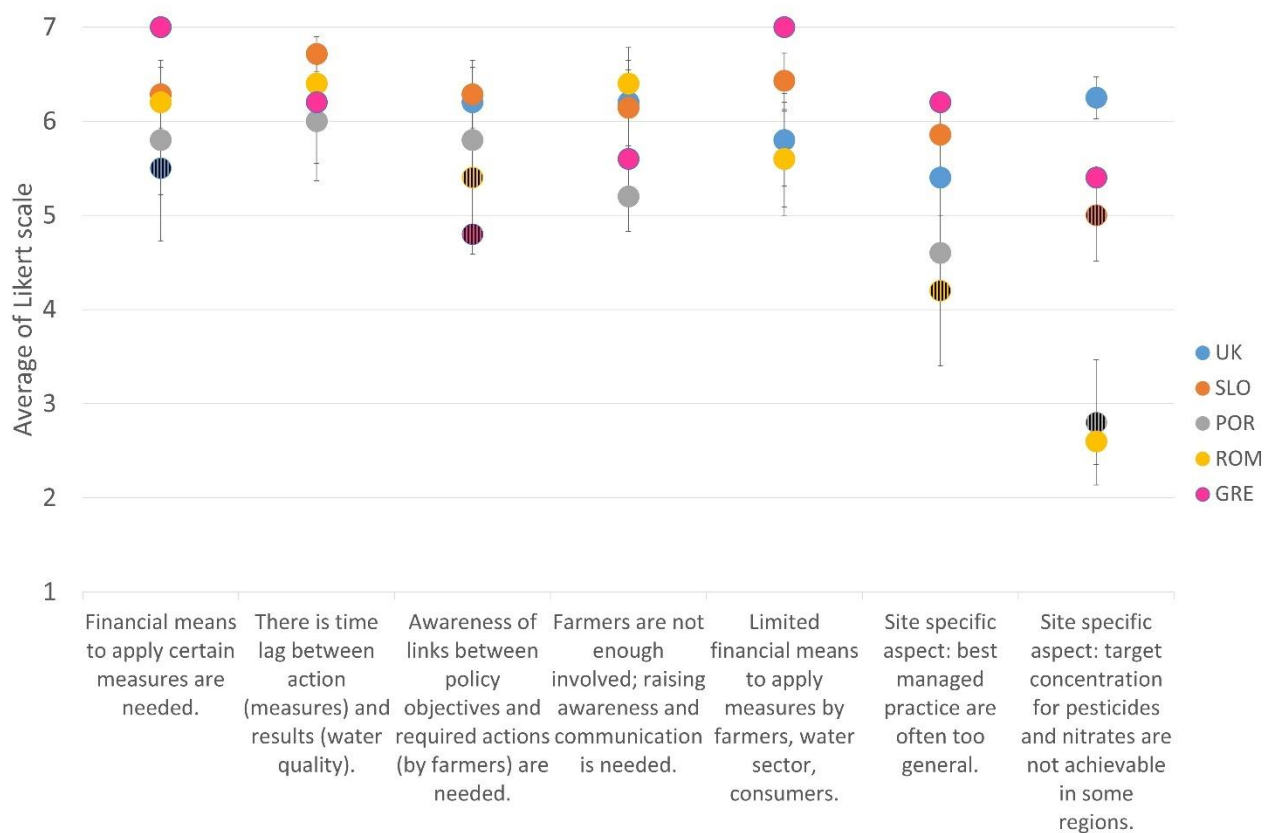


Figure 8: Average of Likert scale between four MAPs on barriers in solving the issues concerning the protection of drinking water resource on the local level, labels with stripes showing statements that have CV > 25 %, n=5-7

## 2.2.4 Do you agree with the opinions of EU representatives about the relationship between experts and policy within your national and local regulations reflected in your legislation?

The EU representatives were also asked to define how the relationship between experts and policy in the EU regulations reflects in EU legislation and how the system at EU level can be improved. The question was asked: What are the possible solutions for integrated scientific support for EU policy, with particular attention to drinking water resource protection against diffuse pollution of nitrates and pesticides from agriculture. In this bloc of questions, stakeholders of MAPs marked how much they agree with the opinions of EU representatives.

The results show that most respondents slightly agree to strongly agree in all statements concerning the actor's issues of science integration into policy on the local level (Figure 9). The statements where respondents most agree on are:

- *Science - policy relationship could be improved; we can see both populist and economically driven decisions* (34 respondents slightly to strongly agree) and
- *It is good that member states have voice in solving problems on local level; Multi Actor Platforms (MAP) are good way to closely engage stakeholders* (30 respondents slightly to strongly agree).

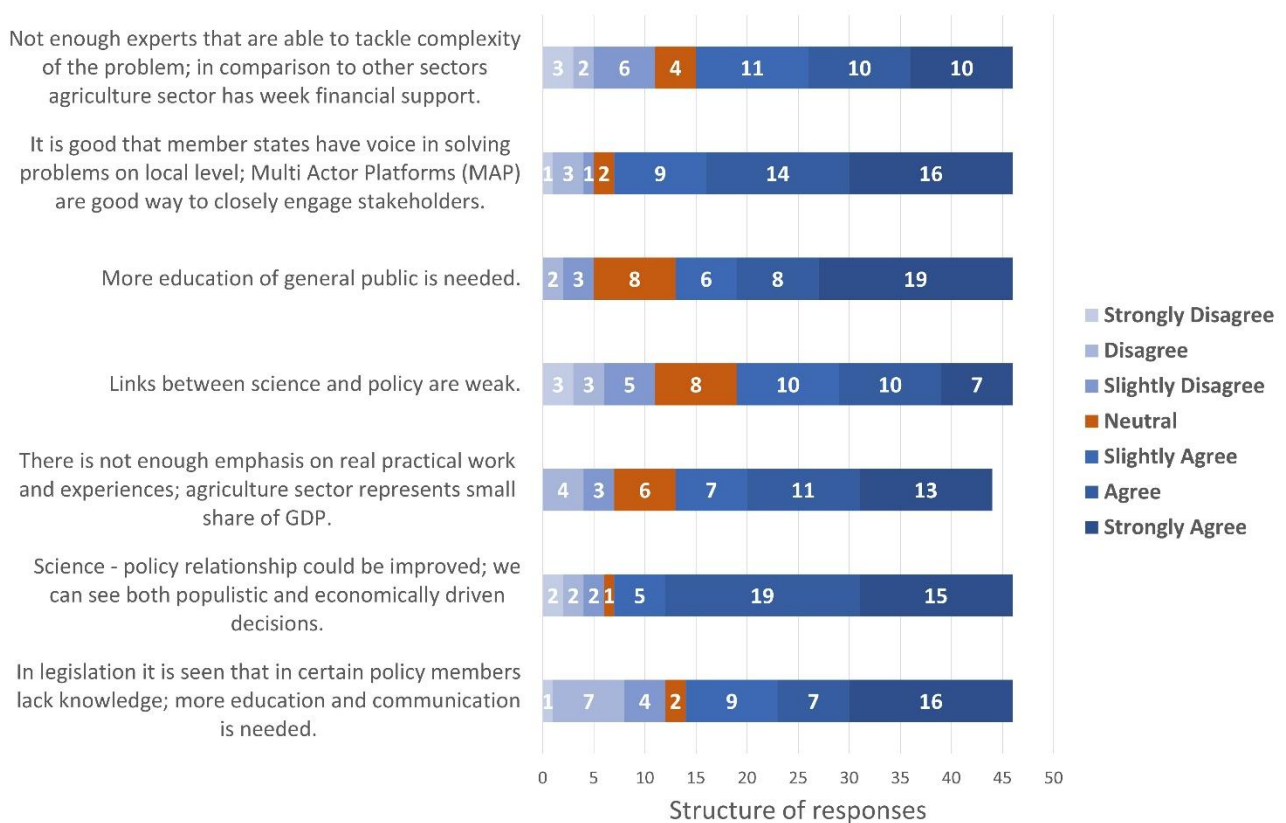


Figure 9: Structure of responses in a Likert scale for all MAPs on reflection of science integration into policy on the local level, n=43-46

Next, the results show a moderate average of Likert scale with all statements concerning the actor's issues of science integration into policy on the local level (Figure 10). The average Likert scale was between 67 and 81 %, which means that these issues are also moderately recognised at the local level and not exclusively at EU. The CV was for all statements higher than 25 % which means that there is ununified opinion between MAPs on the matter. This could suggest that there is a local significance of MAPs that effects different opinions.

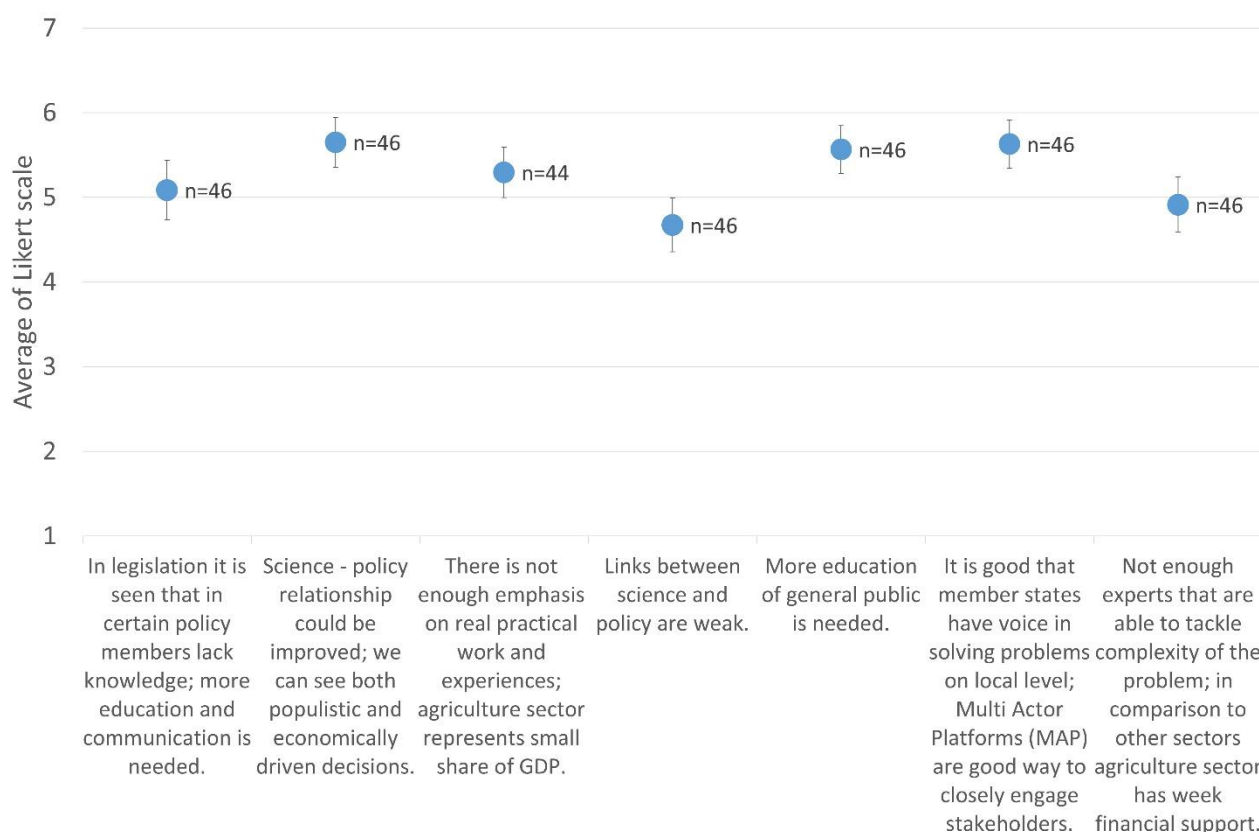


Figure 10: Average of Likert scale for all MAPs on reflection of science integration into policy on the local level, yellow colour showing statements that have CV < 25 %

In contradiction to the previous questions, there were small differences between the five MAPs for almost every statement (Figure 11). United Kingdom had the highest CV (30 %). In Slovenia statement *Legislation shows that certain policymakers lack knowledge, more education and communication is needed*, scored a CV of 0 %, which means a unified opinion. However, Slovene actors show highly fragmented data with the statement that there are *Not enough experts that can tackle the complexity of the problem; in comparison to other sectors agriculture sector has weak financial support* (CV of 28 %). For the Portugal case, three statements had CV more than 25 %. These statements are: *In legislation it is seen that in certain policymakers lack knowledge, more education and communication is needed* (CV 38 %); *science - policy relationship could be improved; populist and economically driven decisions are observed* (CV 38 %); *there is not enough emphasis on real practical work and experiences; and agriculture sector represents a small share of GDP* (CV 27 %). In the MAP in Romania, the CV was 29 % for statement *In legislation it is seen that in certain policymakers lack knowledge, more education and communication is needed*, and 41 % for *Links between science and policy are weak*.

Unified opinion (CV is less than 25%) among all five MAPs is presented in two issues of integration science into policy:

- More education of the general public is needed and
- It is good that member states have a voice in solving problems on the local level, Multi-Actor Platforms (MAP) are the right way to closely engage stakeholders.

The first one is very general, and the second one being particular and gives a good sign that the conceptual framework of FAIRWAY is recognised as a right solution at all MAPs in the sample and needed for integration of science into policy.

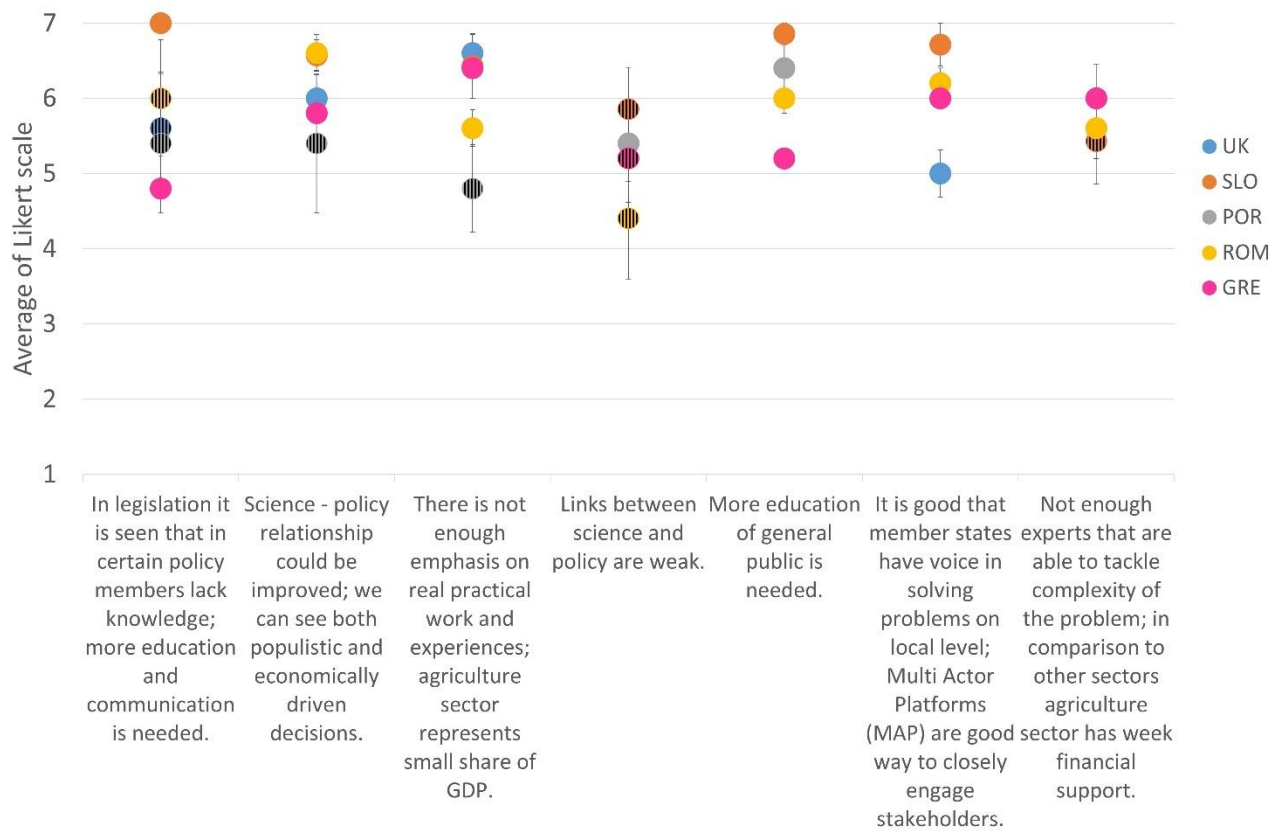


Figure 11: Average of Likert scale between four MAPs on reflection of science integration into policy on the local level, labels with stripes showing statements that have CV > 25 %, n=5-7



### 2.2.5 Do you agree with these solutions of integrated scientific support within your national/local policy?

MAPs were asked to present their opinion on solutions for better integration of science into policy. Most respondents decided that with most solutions (5 of 6) slightly agree to strongly agree (Figure 12). However, a solution to *Separate Pesticides and Nitrates in projects and policy communications* has quite equally distributed responses between slightly disagree to disagree (16 in total) and agree to strongly agree (24 in total). This result can mean that this solution is not a solution for all MAPs in the sample and that further research should be done to investigate reasons beyond.

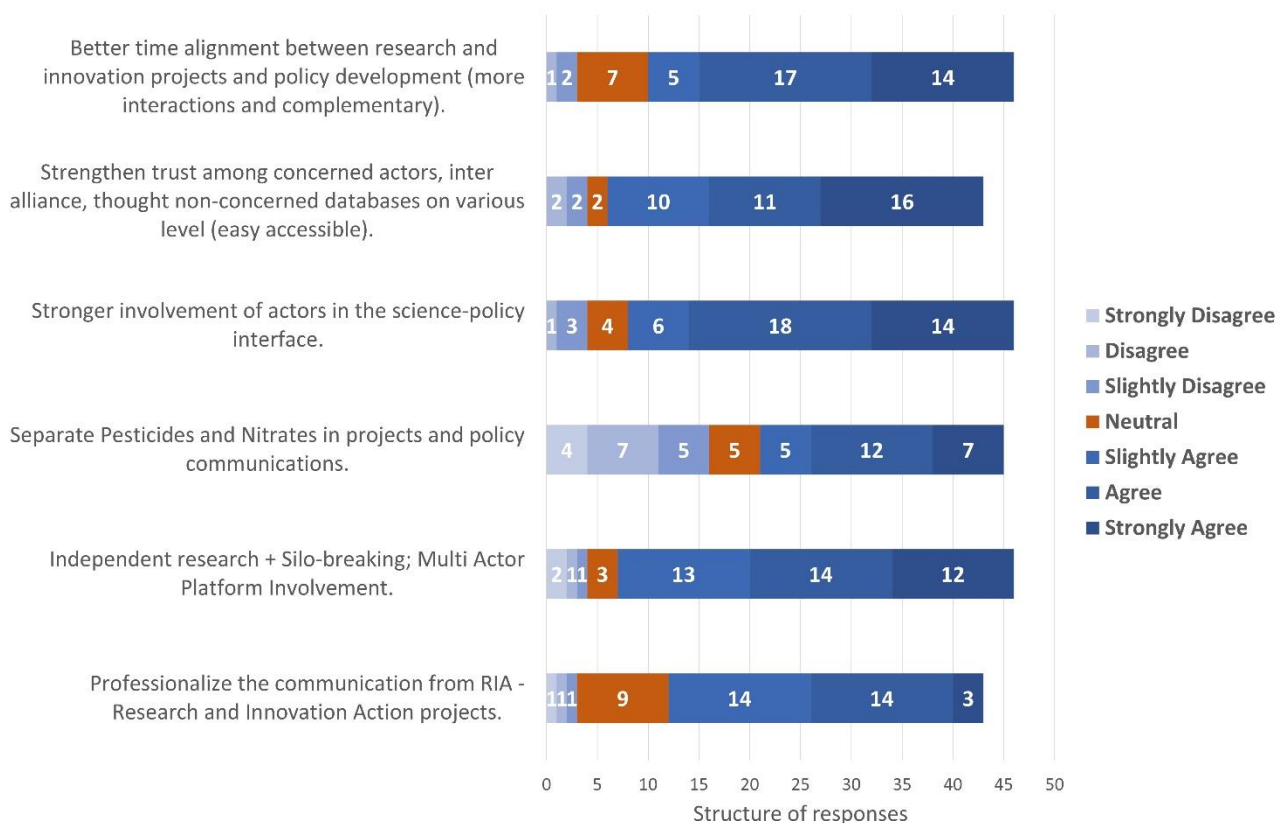


Figure 12: Structure of responses in a Likert scale for all MAPs on solutions of science integration into policy on the local level, n=43-46

The results (Figure 13) show a moderate to high average of Likert scale (between 63 and 82%) in the opinions of different stakeholders in different MAPs with the proposed solutions. The average of Likert scale was noticeably lower for the statement **Separate Pesticides and Nitrates in projects and policy communications (only 63 %)**. This statement had a CV of 45 %, and an average of Likert scale of 63 %, suggesting this solution does not work for all stakeholders and MAPs. Results suggest that if EU representatives seriously think about separating Pesticides and Nitrates in projects and policy communications, they should invite different MAPs to share their opinion on the matter and listen to them. There should be a possibility to rethink of separating Pesticides and Nitrates only on national level if the local environment supports this.





Figure 13: Average of Likert scale for all MAPs on solutions of science integration into policy on the local level, yellow colour showing statements that have CV < 25 %

In Romania, the proposed solution to *Separate Pesticides and Nitrates in projects and policy communication* scored the lowest average (CV was 16 %; Figure 14). Other solution scored high average in the Romania case and had a high agreeability among stakeholders (CV between 14 and 19 %) for all solutions except one: *Strengthen trust among concerned actors, inter-alliance, thought non-concerned databases on various level (easily accessible)* (CV 27 %). Also, in Portugal case, the solution to separate pesticides and nitrates scored low, but the CV was relatively high (43 %). This result points on different opinions of the stakeholders (very fragmented data) in the Portugal MAP. These results are essential because a solution for a particular issue has the highest perspective if it has the support of a broad group of stakeholders. In the United Kingdom case, the CV was less than 25 % for only one statement: *Stronger involvement of actors in the science-policy interface* (CV 16 %). For all the other solutions proposed stakeholders have different views, having a CV between 27 and 43 %. **In the Slovenia case, all presented solutions have a high average of Likert scale and quite unified opinion among stakeholders (CV between 6 and 23 %).**

The solution **Stronger involvement of actors in the science-policy interface** has a unified opinion (CV < 25 %) among all MAPs. This result makes sense according to previously mentioned results were MAPs recognised that **It is good that member states have a voice in solving problems on the local level; Multi-Actor Platforms (MAP) are the right way to closely engage stakeholders.**

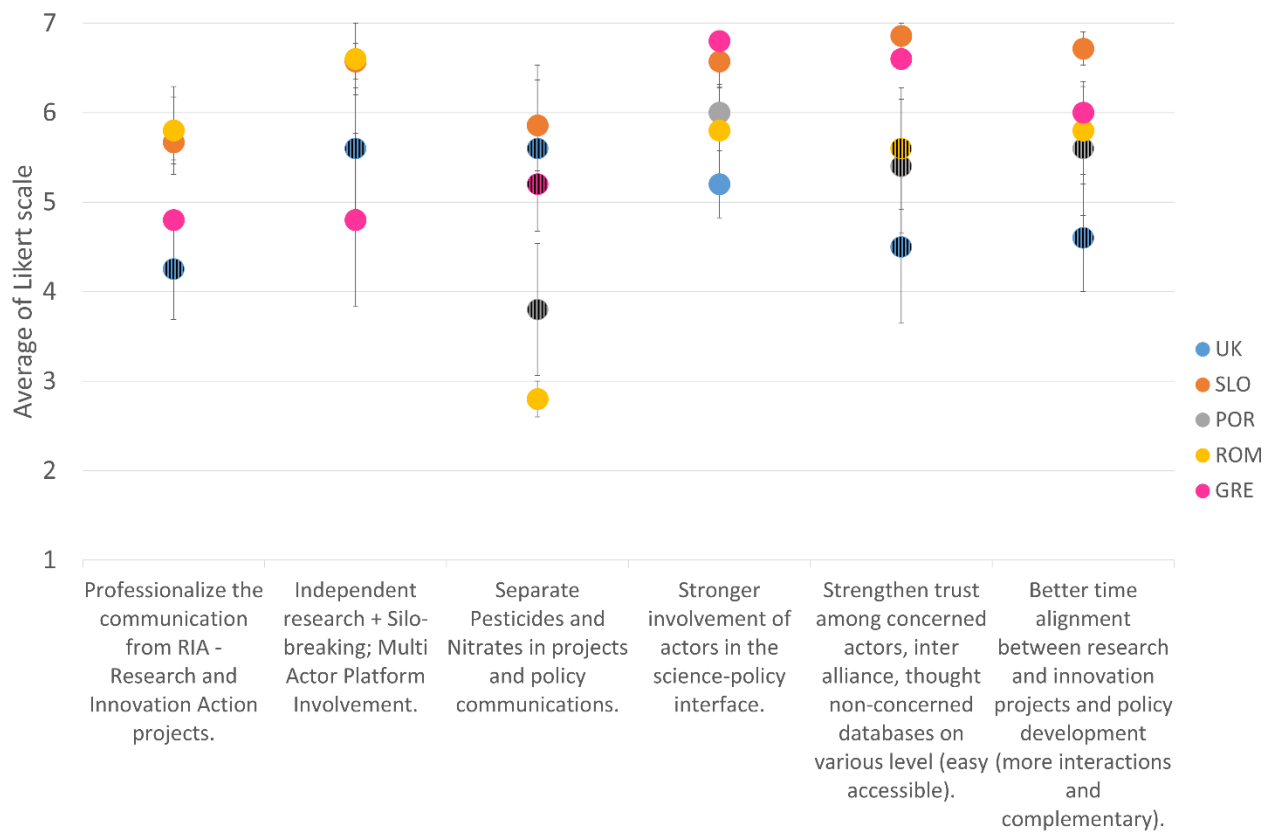


Figure 14: Average of Likert scale between four MAPs on solutions of science integration into policy on the local level, labels with stripes showing statements that have CV > 25 %, n=5-7

## 2.3 CONCLUSION ON FAIRWAY CASE STUDIES

The findings from WP 7.1 were distributed among all project's MAP leaders in the form of paper questionnaire to evaluate possible correlations between the EU and local level, on barriers and issues in providing integrated scientific support for policy regulations related to drinking water resource protection against diffuse pollution of nitrates and pesticides from agriculture.

Different stakeholders that were asked to fill out the questionnaires were not necessarily experts; however, they are involved daily in the process of making decisions of how to maintain drinking water resources protected. The survey sample thus included the critical stakeholders involved in different fields of protection drinking water resource. The sample size (46 questionnaires) was satisfactory, and we were able to conduct an incomplete DELFI method (explained in the introduction), which provided higher result importance.

An average of Likert scale to statements for each MAP was calculated and presented in Figures. Also, a coefficient of variation (CV) and standard error was calculated. Results showed that CV ranges from 0 to 70 %; results with a CV less than 25 % are considered as a high agreement among all MAPs or among all stakeholders in the MAP.

MAPs were asked to decide how much could they agree or disagree on the Likert scale of 1 to 7 for different issues that EU representatives recognised as necessary for the protection of drinking water resources. The average Likert scale for these issues was always higher than 60 %. Stakeholders recognise that these issues are also at least moderately important in their local environment. However, specific issues are considered as not essential or not evenly important between stakeholders (fragmented data). The issue: **Patience is needed to see results (change policy takes time). Development is already positive** is highly agreed by all presented MAPs (CV < 25%).

The results of the assessments show a higher average of Likert scale with the statements on barriers that are present in solving the issues concerning the protection of drinking water resources on the local level. The agreeability among MAPs was highest for the barriers:

- **There is a time lag between action (measures) and results (water quality),**
- **Farmers are not enough involved; raising awareness and communication is needed** and
- **Limited financial means to apply measures by farmers, water sector, consumers.**

These results imply that EU representatives should work on solving these barriers because they are uniquely recognised among different MAPs and different stakeholder groups.

In the third part, results show a high average of Likert scale with statements concerning the actor's issues of science integration into policy on the local level. Average was between 71 and 86 %, which means that this is recognised issues also at the local level and not exclusively at EU. CV ranged between 0 and 30 %, which gave in most cases satisfactory unified opinion on the matter. Integration of science into policy is quite a challenge in all MAPs in the sample.

Two issues of integration science into policy have higher agreeability among all MAPs:

- **More education of the general public is needed** and
- **It is good that member states have a voice in solving problems on the local level; Multi-Actor Platforms (MAP) are the right way to engage stakeholders closely.**

The first one is very general. However, the second one is particular and gives a good sign that FAIRWAYS conceptual framework is recognised as the right solution at all MAPs in the sample and needed for integration of science into policy.

MAPs were also asked of their opinion on solutions for better integration of science into policy. There was a high average of Likert scale for all statements, except for the solution **Separate Pesticides and Nitrates in projects and policy communications**. This statement had a CV of 45 %, and a relatively low average (63 %), suggesting that this solution is not a solution for all stakeholders and MAPs. Results indicate that if EU representatives seriously think about separating Pesticides and Nitrates in projects and policy communications, they should invite different MAPs to share their opinion on the matter and listen to them.

The agreeability among all MAPs was highest for the solution: **Stronger involvement of actors in the science-policy interface**. Stronger involvement corresponds with a reflection on science integration into policy, where MAPs recognise that **It is good that member states have a voice in solving problems on a local level; Multi-Actor Platforms (MAP) are the right way to engage stakeholders closely**.

## 3. ACTOR'S FEEDBACK ON PRACTICES FOR WATER QUALITY IMPROVEMENT IN INTERIM PROJECT RESULTS

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### 3.1 METHODOLOGY

#### 3.1.1 The questionnaire

The first idea was to use only the responses from questionnaires filled in by attendants of the Joint Policy conference held in Brussels on 7<sup>th</sup> of December 2018. There were 53 attendants, and 12 fully finished paper questionnaires. It was decided to increase the sample of solved questionnaires with the use of CAWI method (Computer-Assisted Web Interviewing), which is a data gathering via the internet. A link to the web questionnaire was sent to all stakeholders that have accepted to be on the Fairway mailing list for receiving information or invitations to an event. This list has also been used for the invitation for the Join Policy conference. The link to the web questionnaire of 306 mail addresses was sent on 27<sup>th</sup> of February 2019 with eight days to finish the web questionnaire. In this period, no other type of emails or other ways were used to increase the number of received questionnaires. After the due date, we received 23 questionnaires, of which 11 were fully finished (48% completion rate), but we were able to use 17 of 23. For the full analysis, we took answers of both the paper and web questionnaires (total of 29 fully finished questionnaires) and analysed them together.

Completion rates lower than 60 % in web questionnaires should be examined for possible major errors in the survey design or logic (Liu and Wronski, 2018). The duration of the questionnaire was approx. 10 minutes. This is a questionnaire with long duration (10 – 15 minutes) according to Trouteaud (2004), and the completion rate of the questionnaire with this duration is statistically lower than in questionnaires with a short duration (3 – 5 minutes). This questionnaire is considered as more complex, as it contains open-ended questions and multiple-choice questions with many words. The inclusion of difficult questions reduces a survey's participation rate and increases the chances of respondents engaging in undesirable survey practices, such as item nonresponse or the use of heuristics like straight lining (Liu and Wronski, 2018). The survey literature has shown that some survey formats are inherently more challenging to respond to than others. For example, a lengthy question imposes both comprehension and mapping difficulties (Holbrook, Cho, & Johnson, 2006). Also, open-ended questions are typically associated with higher dropout rates because they are more burdensome and require higher cognitive efforts than closed-ended questions (Manfreda & Vehovar, 2002). In a mail survey experiment, Dillman, Sinclair, and Clark (1993) found that the completion rate decreased when a difficult question was asked.

The primary goal of the survey was to gain suggestions for direction and improvement of Fairway and obtain a measure of the quality of interim findings of the Fairway project. This means that the number of responses is meaningful, even with lower completion rates (Archer, 2008). The web questionnaire was designed in the free licensed Slovene web program 1KA ([www.1ka.si](http://www.1ka.si)), which is specialised in constructing web surveys of this kind.

The questionnaire combined open-ended questions and multiple-choice questions with predefined answers offering respondents the possibility to choose and/or rank among several options or the possibility to grade on a "very low" to "very high" scale. The questionnaire had four blocks. The blocks were divided according to the work packages, in the first block there were findings of WP 3 to 6, in the second and third block there were findings and solutions of WP 7, and in the fourth block, there were questions of WP 8.

In the questionnaire held in Brussels, we designed some explanatory questions, asking respondents to explain their opinion on matters concerning the interim findings of WP 7. Analysis of answers showed that they often repeated, a decision was made that for the web questionnaire the explanatory questions will be upgraded into multiple choice questions were the section *Other* (for other opinions

different than proposed) was permitted.

Questions with the Likert scale were used when we wanted to find out how useful or not are interim findings to the respondents. We used a Likert scale for the interim findings of WP 3 (indicators), WP4 (measures), WP5 (decision support tools) and WP6 (governance). Questions in the survey and web survey were based according to the Likert scale from 1 to 7, where one meant not useful, and seven meant extremely useful to the respondent. Respondents were asked to put their choice according to the Likert scale proposed in the instructions. In the analysis of the results, we presented an average of Likert scale for each interim finding for each work package. Standard error and coefficient of variation (CV) were calculated.

In WP 7 (policy support) we wanted to know if the respondents agree with a solution (which was explained through the sketch in survey and e-survey) that the lead partners of WP 7 proposed as an answer to the interim findings of this WP. Only close-ended questions were proposed. In addition, the respondents were asked if they would choose other solutions, and if so, which solution.

For the interim findings of WP 8 (communication and dissemination) the respondents had some troubles understanding the instructions in the questionnaire, and to ease them answering an upgrade into multiple choice question in web questionnaire was made.

### **3.1.2 Survey sample**

In total, 306 experts, actors, policymakers, farmers, non-governmental organisations, small and medium-sized enterprises and big companies from European Union countries were selected to conduct the Survey. They received an invitation to attend the Joint Policy Conference (JPC) held in Brussels and 53 of them respond and attend. At the conference, the paper questionnaires were distributed among all attendants. After the conference, the decision was made by WP 7 lead partner (UNI LJ) to send a link to an upgraded web questionnaire to all stakeholders that first received an invitation mail to join the JPC.

The stakeholders were selected by their field of expertise in water policy regulations/protection and the Pesticides and Nitrate Directives of EU or field of involvement in protection/pollution of EU water resources or integrated life within water protection areas.

## 3.2 RESULTS

### 3.2.1 Respondents

The majority of respondents were from research institution (27 %), followed by the industry sector (20 %), regional institution (13 %), EU commission (13 %), national institutions (10 %), NGO (10 %) and 7 % respondents from SMEs. From the industry sector, the respondents defined their enterprises as fertiliser company, water supply company and pesticides industry. No respondent came from the stakeholder group – farmer (Figure 15).

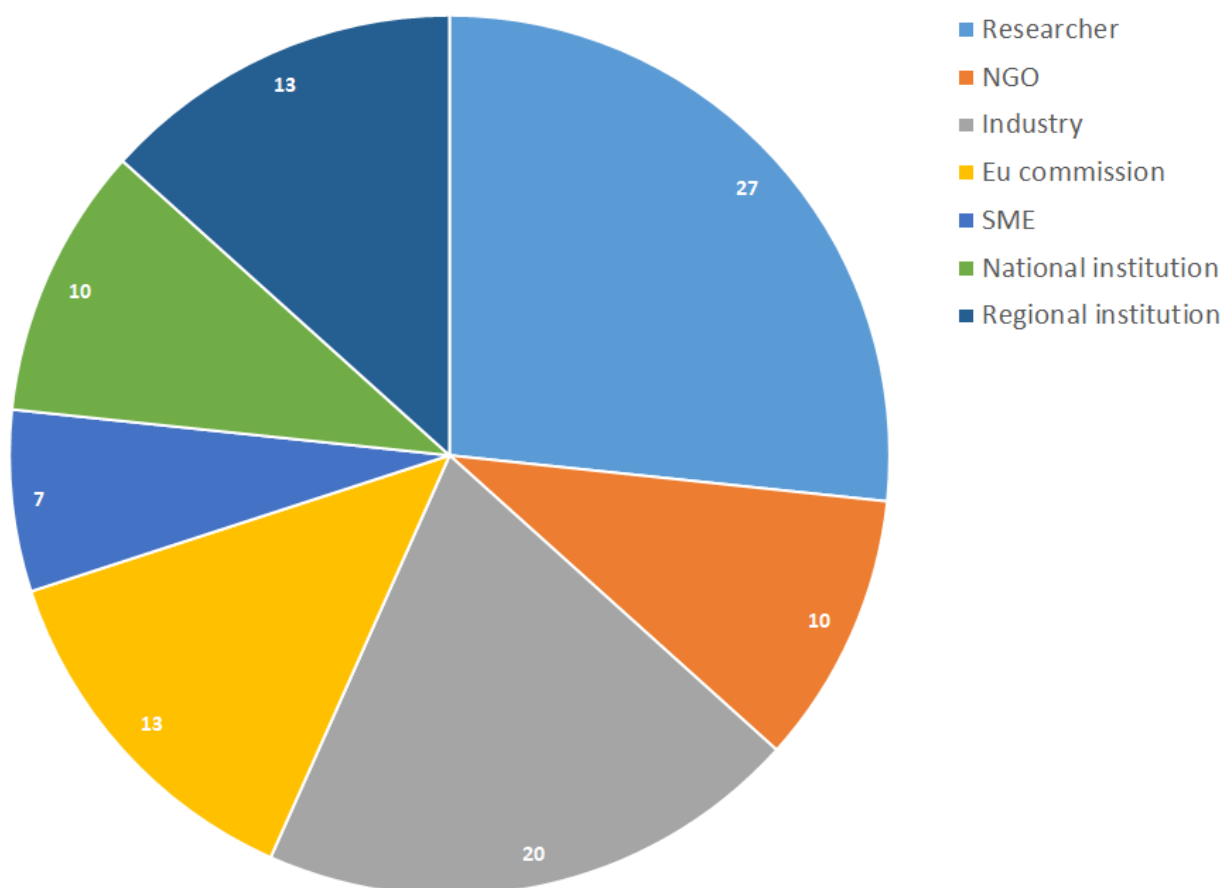


Figure 15: Type of institution that the respondents represented (%) in the survey and e-survey together

### 3.2.2 Interim findings of WP 3 to 6 – How useful are the interim findings to the respondents?

In this block, the interim findings of WPS: WP3 (indicators), WP4 (measures), WP5 (decision support tools) and WP6 (governance), were presented in sentences. The respondents were asked to state the usefulness of these findings with the help of a Likert scale from 1 to 7, where one meant not useful, and seven meant extremely useful. The answers were collected from survey and e-survey and combined, and the arithmetic mean was calculated. Standard error and CV were calculated for each of the interim findings of each of the work package. The interim findings are presented below, and the results are presented in the paragraph.

Interim finding WP3\_a:

*The most critical pressure indicators for the quality of drinking water on farms depend on the type of catchment.*

Interim finding WP3\_b:

*Some link between pressure indicators and states indicators can statistically be performed.*

Interim finding WP4\_a:

*There are many possible measures to decrease the pesticides pollution of drinking water supplies. Most effective measures are (i) spray drift reduction through technical modifications of the spraying technique, (ii) pesticides input reduction through integrated pest management measures, (iii) no spraying zones and vegetated buffer zones, and (iv) erosion reduction measures. Tillage measures appear to have little effect.*

Interim finding WP4\_b:

*There are many possible measures to decrease the nitrate pollution of drinking water supplies. Most effective measures are (i) nitrogen input control, (ii) adjustment of crop type and/or crop rotation, (iii) growth of cover crops, (iv) minimum tillage and surface mulching, and (v) nitrification inhibitors. Fertiliser type appears to have little influence, while the effectiveness of buffer strips greatly depends on soil and hydrological conditions.*

Interim finding WP4\_c:

*The estimated costs greatly vary between measures and also between countries. Some measures are cost-effective. Accurate cost information is scarce.*

Interim finding WP5\_a:

*All participating countries have their own decision support tools (DSTs) developed to support water quality/agri/environment policy makers operating at a regional or national level, and those intended to support sustainable nutrient management at the farm level.*

Interim finding WP5\_b:

*Only a few of the evaluated DSTs, evaluated at FairWay project, are primarily aimed at improving water quality. Instead, they are a farm (nutrient/pesticide) management tools based on the assumption that the efficient use of nitrogen and pesticides indirectly improves water quality. Only a few DSTs consider the impact of mitigation methods on water quality.*

Interim finding WP5\_c:

*Decision support tools are not easily transferred from one country to another because they all operate within the context of the more comprehensive advisory frameworks in place in*



*their respective countries, in addition to issues around language and requirements for country/specific data, calibration, etc.*

Interim finding WP6\_a:

*The regulatory structures in all countries are very comprehensive and fragmented, to the extent that stakeholders are not able to fully understand them.*

Interim finding WP6\_b:

*The governance structures between countries have considerable differences. Partly explanation lays in historical, cultural and political differences between countries.*

Interim finding WP6\_c:

*Between countries, it is a high degree of divergence in scales of governance.*

Results show that most findings were considered as useful to strongly useful (Figure 16). However, neutral reaction to interim findings is also quite strong. The most useful interim findings are WP5\_b and WP6\_a, where only 3 and four respondents (out of 25) decided that these findings are neutral or not useful to them.

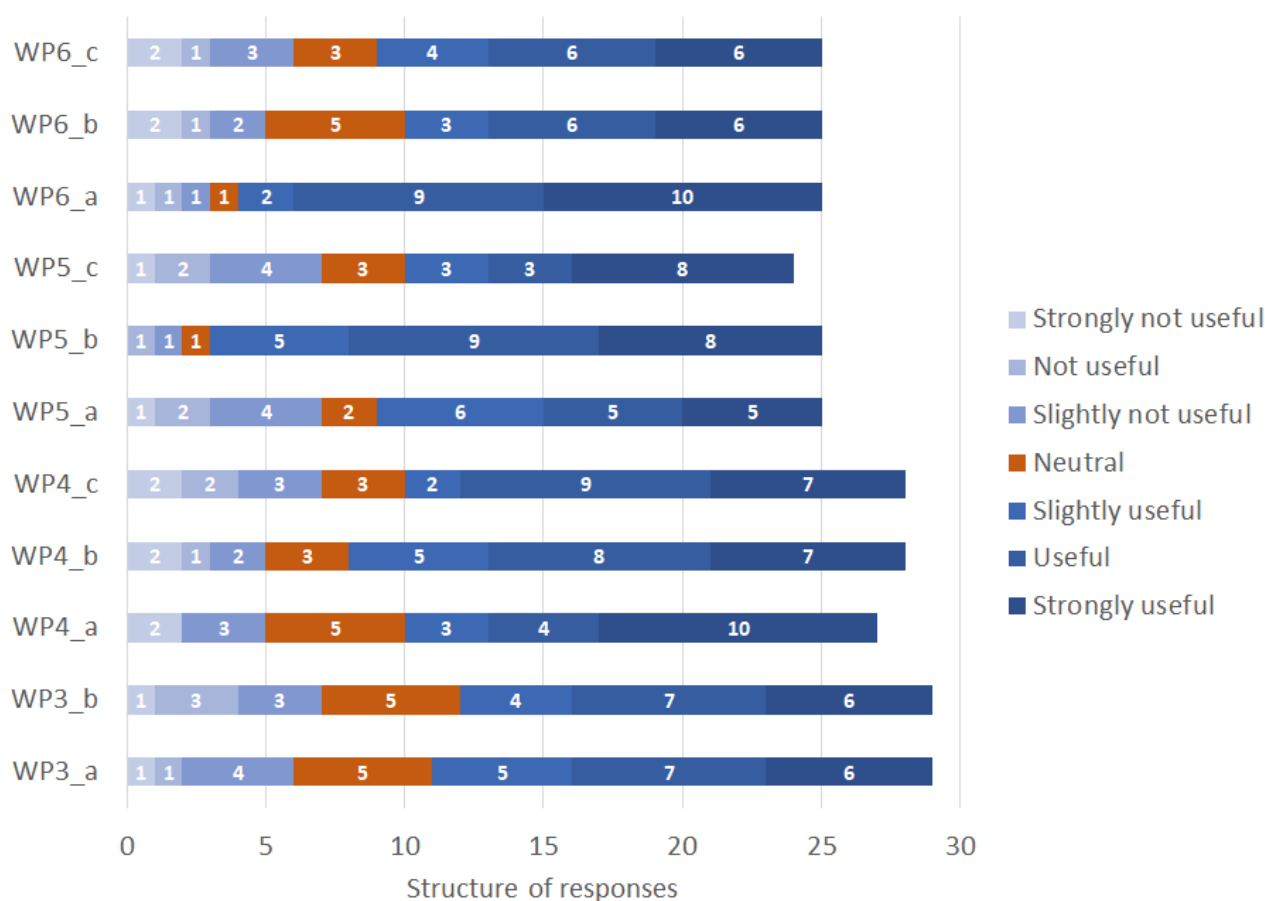


Figure 16: Structure of responses of interim findings of WP 3 to 6, (see text for explanation of the interim findings), n=25-29

The majority of answers has an average of Likert scale (Figure 17) between 70 and 74 %. The interim findings of the FairWay project's WP 3 to 6 are considered as at least slightly useful to the majority of the respondents. However, the average is higher when the findings are more precise, not so general, and therefore ready for further consideration.

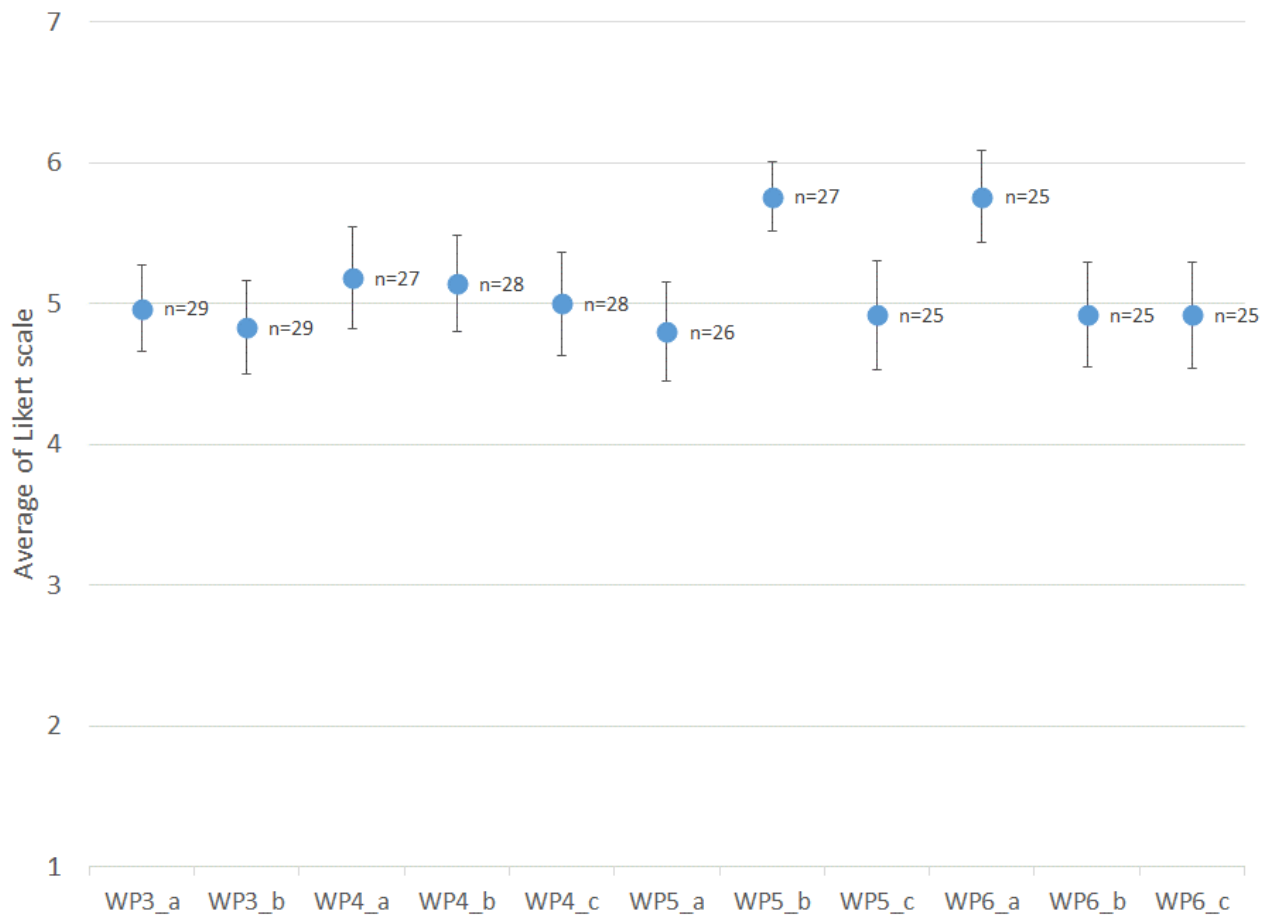


Figure 17: Average of Likert scale of interim findings of WP 3 to 6, (see text for explanation of the interim findings).

### 3.2.3 Interim findings of WP 7– feedback on barriers and issues concerning low interaction of projects findings between researchers and policymakers in the EU

In the first part of WP 7.1. we discussed with EU members about barriers and issues concerning low interaction of project dissemination between researchers and policymakers in the EU.

#### 3.2.3.1 Interim finding WP7\_a

The first finding of WP 7.1. was as follows:

*Results show that EU research project dissemination is not followed through to the European Commission.*

We wanted to know the opinion of respondents, the reason why this occurs, and their suggestion for improvement. In the questionnaire on paper, the questions were open-ended and explanatory, that means we gave respondents the freedom to express their opinion, without any forewarning possible answers. During the analysis of the answers, it was shown that answers were repeated and can be put together into common points. Therefore, we upgraded the explanatory questions into multiple choice questions for web questionnaire and added the section *Other*, for letting express their opinion if it could not be put into any of suggested common points. However, the analysis of the web questionnaire results showed that all the answers could be still put together within the common points. The results are shown below with the paragraph.

The most frequently cited answer was **Complex governance system where key measures are easily lost.** (cited ten times), followed by **Often to academic terminology** (cited eight times) and **Not well communicated** and **Not sufficiently bottom-up approach** (both cited seven times). These answers were the crucial issues that respondents recognise as problematic for inefficient project dissemination followed through to EU (Figure 18).

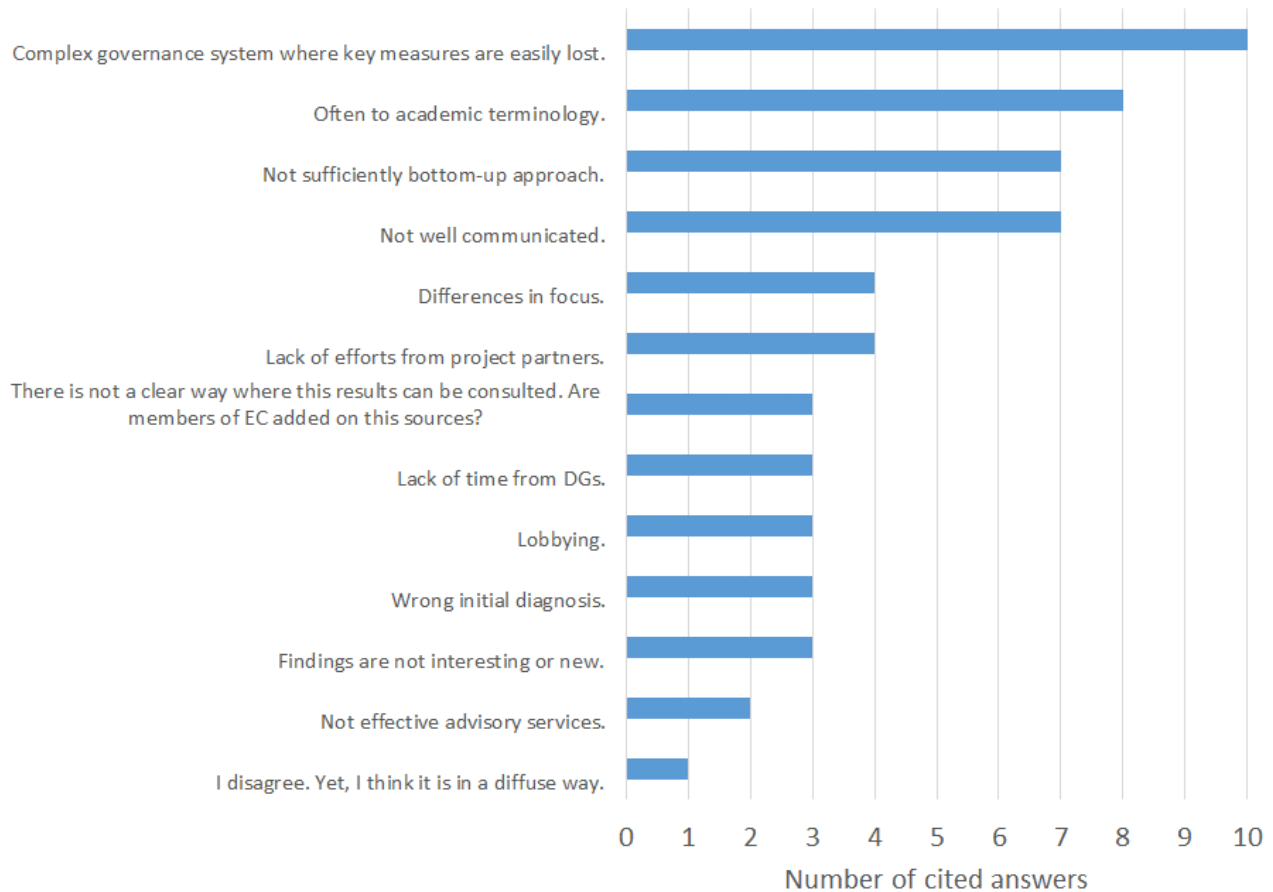


Figure 18: Number of cited answers for question: Why is project dissemination not followed through to EU?

Almost all of the answers offered were equally selected among respondents, which suggests that the respondents recognised solving these issues in multiple ways and on multiple scales. The cited answers range from 5 to 8, showing that solutions cited eight and seven times, could be preferred and solutions cited 6 and five times, could be supplementary for improvement of project dissemination efficiency (Figure 19).

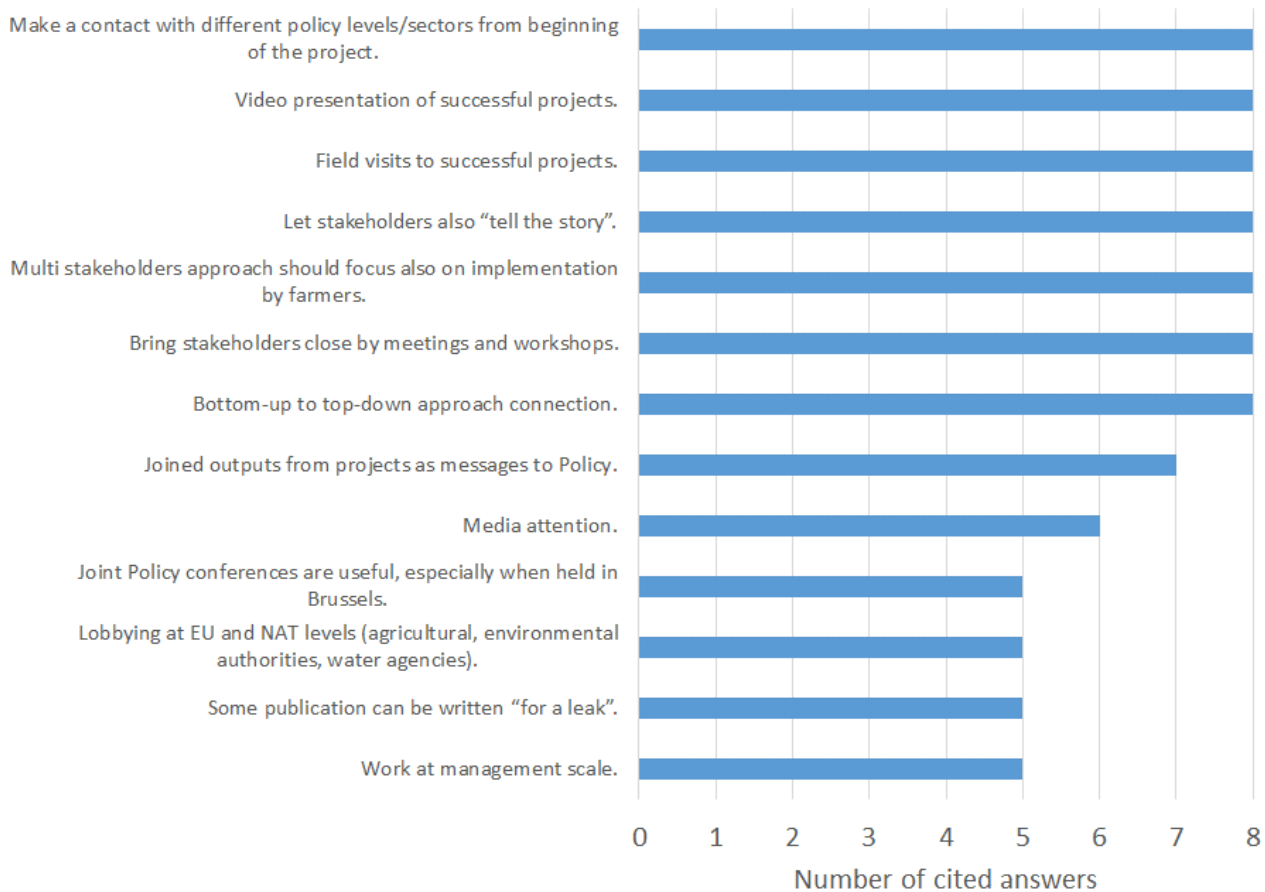


Figure 19: Number of cited answers for a suggestion for the improvement of more efficient project dissemination followed through to EU

### 3.2.3.2 Interim finding WP7\_b

Next, we asked respondents how much they agree with the statement:

*The need is to have key and important final project results shorter and, in a language, understandable to policymakers.*

We asked to rate this last interim finding of WP 7.1. With a Likert scale from 1 to 7, where 1 meant not agree, and 7 meant very much agree. It can be seen from Figure 20, that the structure of responses is undoubtedly pointed to the right, where most of the respondents chose that they agree or strongly agree with the statement.

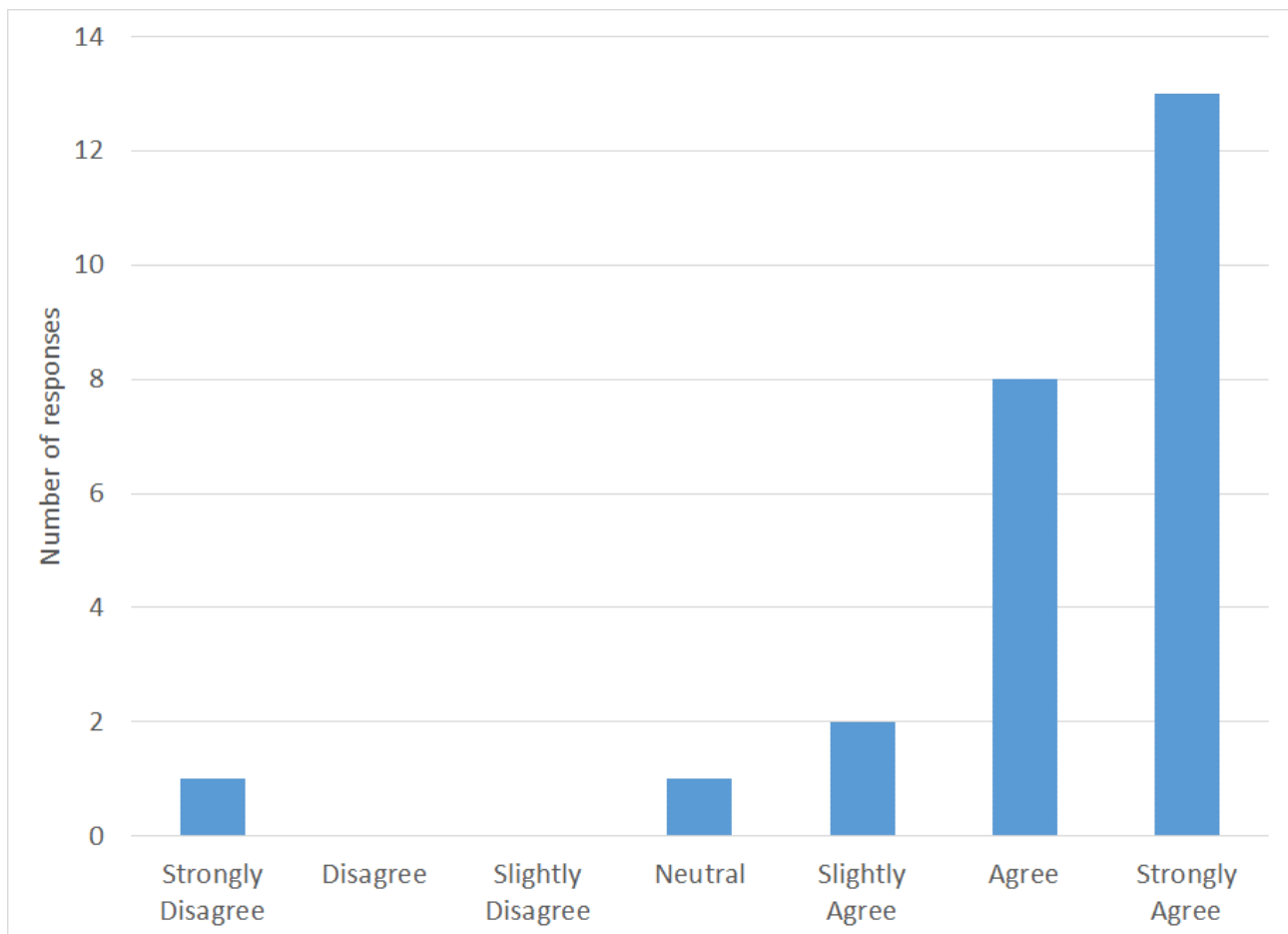


Figure 20: Structure of response of how much respondents agree with the statement The need is to have key and important final project results shorter and in a language understandable to policymakers, n=25

The average of Likert scale was extremely high 6.2, which meant that most of the respondents strongly agree with this interim finding. This is also our most important conclusion within WP 7.2, and it points out the absolute need to have **key and important final project results shorter and, in a language, understandable to policymakers.**

### 3.2.3.3 Interim finding WP7\_c

The lead partner of WP 7, UNI LJ came out with its idea of how to communicate better with the European Commission. The interim finding of WP 7.1 shows that:

*Some research projects focus on findings and fulfilling the Grant Agreement obligations, disregard whether the topic is on the political agenda.*

To make the research projects more connected to the political agenda, the European Commission could establish **Task forces with the aim of designing project clusters**. The proposal of a lead partner in WP 7 was a unique type of long-term relationship/communication flows in issues concerning quality of drinking water that is presented in the scheme below and was presented in questionnaires to all respondents (Figure 21).

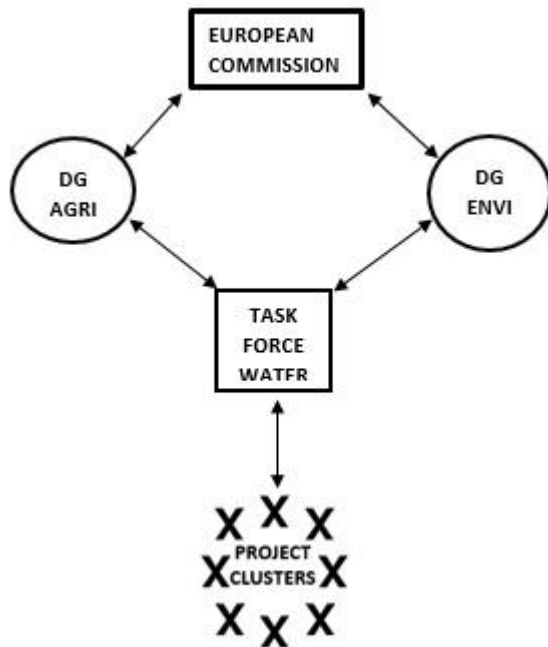


Figure 21: Scheme of possible long-term relationship/communication flows between research projects and political agenda

We asked respondents if they think this could be a good suggestion for solving the “gap” between science and policy. Only close-ended question with answering yes or no was possible. The analyse show that 86 % of respondents find this solution as good. Next, we also asked which solution would be better for solving the “gap” between science and policy, and here multiple-choice questions were proposed, also with the section *Other*, but none has used it. The results are shown in the paragraph below.

The solutions: **Through various events** and **Open communication flow between DG AGRI and DG ENVI** were most cited (8 times) and are thus the preferred solutions. The other two (cited 6 and 5 times), can be considered as supplementary solutions (Figure 22).

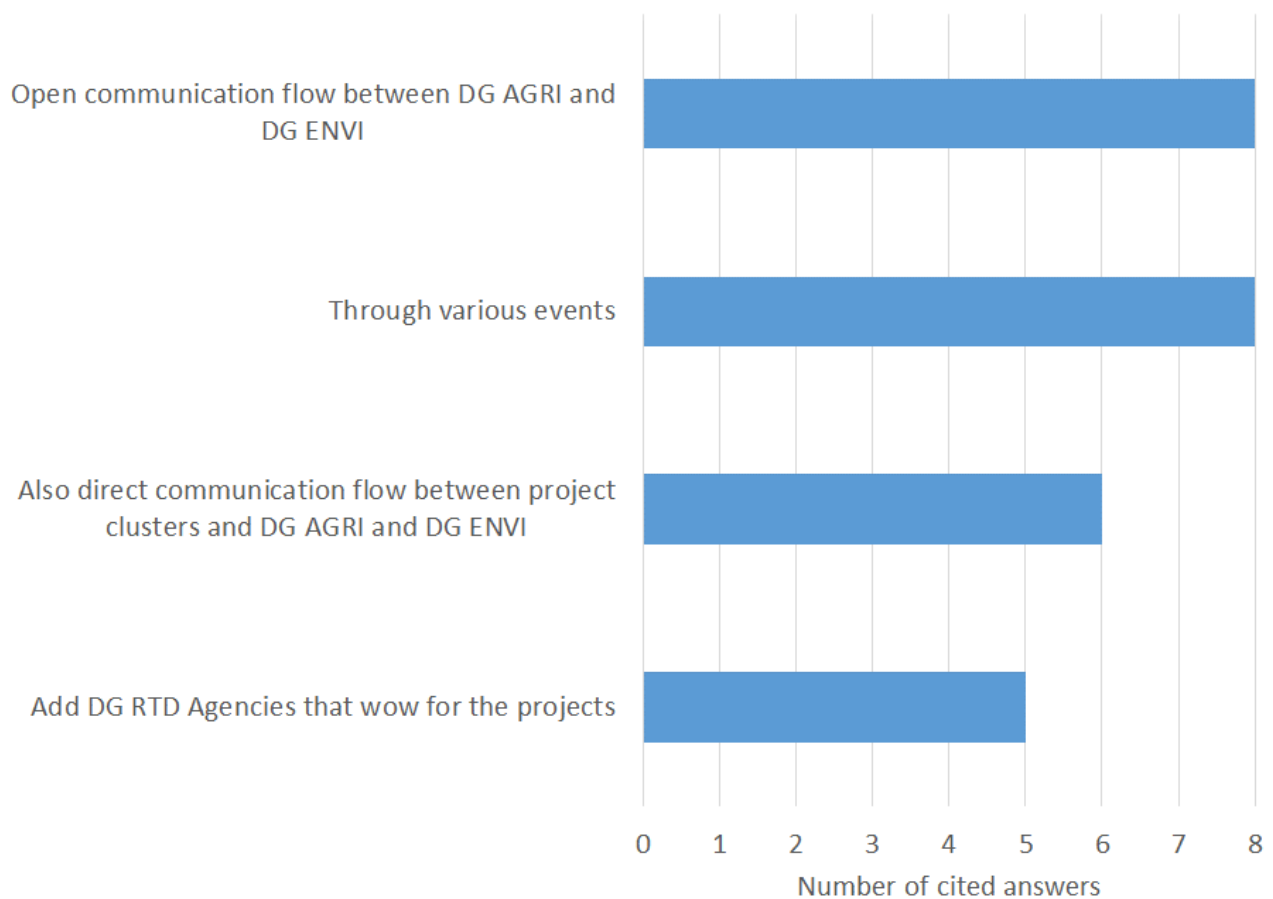


Figure 22: Number of cited answers on Other solutions for filling the “gap” between science and policy, n=27

### 3.2.4 Interim findings of WP 8

Work package 8 has its mandatory deliverable to ensure that the interim and final research findings are distributed among interested public site in the most efficient way. For this purpose, they wanted to know from the respondents which way of distributing the project results are the best for respondents. The results are presented in this paragraph.

The respondents agree that it is the best way to receive the interim findings of the project **via conference/workshops or executive summaries of deliverables**. The second-best way is via short media news like YouTube channel, short policy briefs and subscription to the Newsletter. **Field visits** were an additional suggestion from one respondent answering the web questionnaire. This suggestion was not presented to all respondents to choose, and therefore, it cannot be concluded as the most unattractive way for respondents to receive interim results of the project, as suggested in Figure 23.

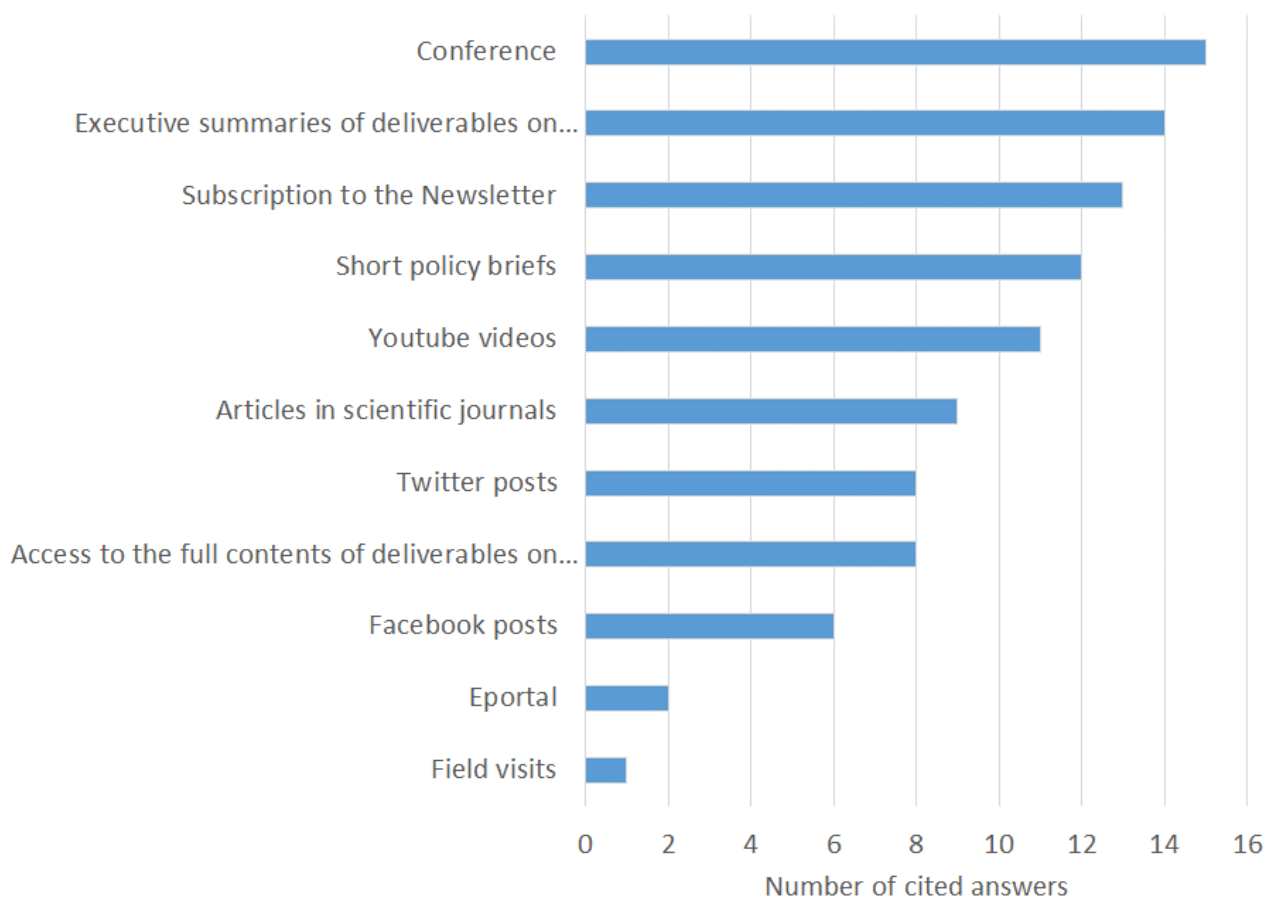


Figure 23: Number of cited answers for the best type of form to receive interim results of the project



The best ways of communication and dissemination of the final results of the project are **executive summaries of deliverables, followed by conference/workshops, articles in scientific journals and YouTube videos** (Figure 24). These findings can serve for further development of the WP 8 deliverables in order to help distribute the findings of the project to the respondents within the most effective communication channel. For field visits, the same comments hold as for Figure 23.

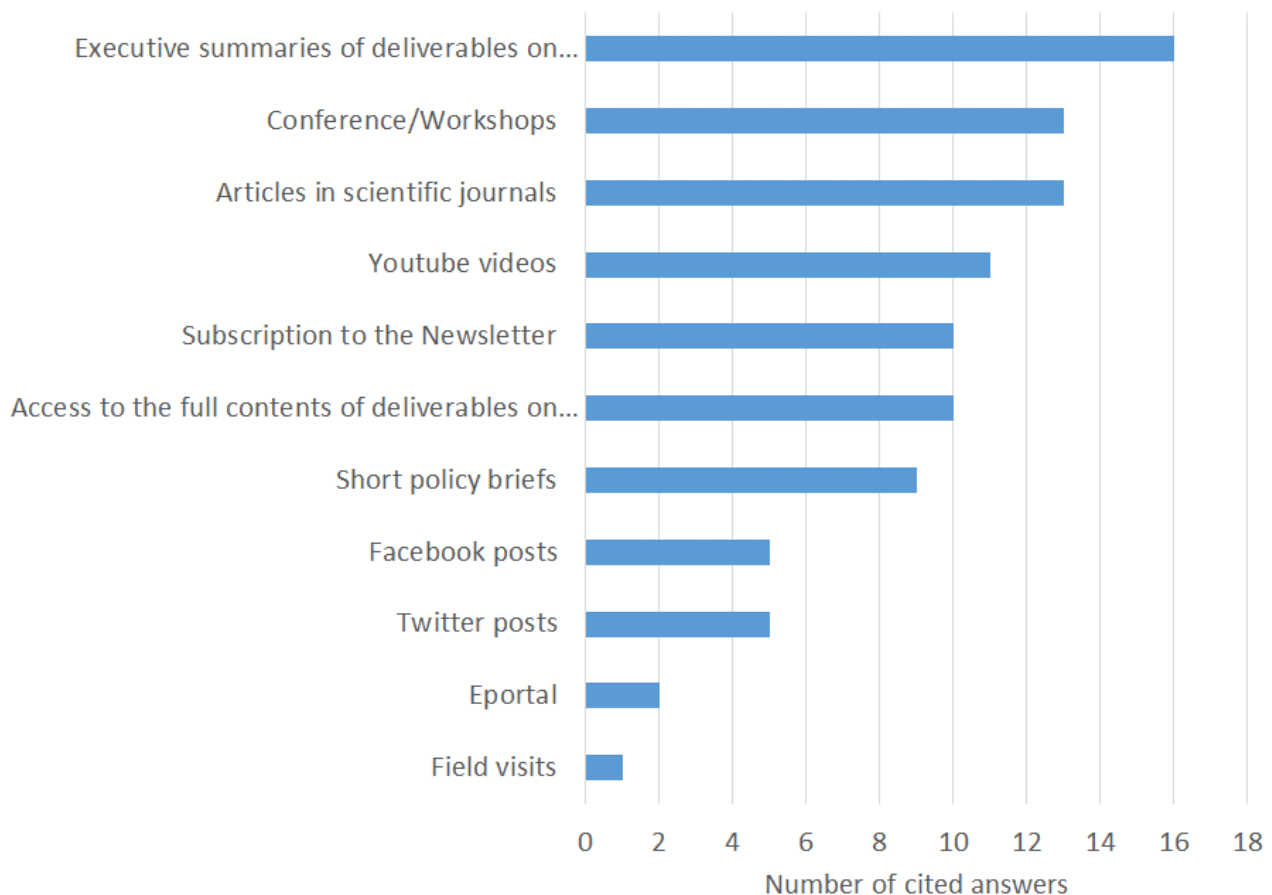


Figure 24: Number of cited answers for the best type of form to receive the final results of the project

#### 3.2.4.1 The importance of communication style

Fig. 23 and Fig. 24 summarises different communication channels, but also the communication style is important and should be discussed further. We know that there are some useful communication styles that work better between science and policy. Safford and Brown (2019) discussed this issue in their article called *Communicating science to policymakers: six strategies for success*. We feel it is in place that we shortly introduce their work:

6 Strategies for success (Safford and Brown, 2019):

1. **Know who you want to reach.** If you are not sure who you need to reach, ask around!
2. **Have clear and actionable recommendations.** Your suggestions should be feasible. Every government body is constrained by its mission and budget. Do your best to propose actions that fall within your target agency's authority.
3. **Repackage your work.** The peer-reviewed article is the currency of the scientific realm, but it is not going to get you far in policy. A new audience demands a new format — one that is accessible and understandable.
4. **Write well.** Conversations and presentations are great ways to introduce a topic, but policymakers will want a written product to react to or to share with colleagues.

- a. Organization, brevity and clarity are more important than wit or style when it comes to policy writing. State your key points first, then provide more explanation. Make sure there is a clear one-sentence takeaway in the very first paragraph.
5. **Pick your moment.** Strategically selecting when to engage increases the chance that your idea will fall on receptive ears. Electoral and legislative calendars can help you to choose a good time. Meetings with elected officials tend to be much more effective towards the beginning of a term (when policy priorities are being set) than towards the end.
6. **Sustain and amplify your engagement.** Building support takes time and ongoing effort. Collaborating with people and institutions who have an agenda like yours is a great way to strengthen your collective case.

Some of the greatest weaknesses in communication style between science and policy in water policy issues that were observed among most respondents were (Fig. 18):

- **complex governance system where key measures are easily lost,**
- **often to academic terminology,**
- **not well communicated** and
- **not sufficiently bottom-up approach.**

These answers were the crucial issues that respondents recognise as problematic for inefficient project dissemination followed through to EU and should be concerned further. If we look the 6 strategies for success and the results coming from the survey we can see that we have most problems in using strategies 1, 2, 3 and 4 (Safford and Brown, 2019). The Table 2 presents weaknesses and strategies to solve this weaknesses by Safford and Brown (2019).

*Table 2: Recognized weaknesses in communication style between science and policy and strategies to solve these weaknesses by Safford and Brown (2019)*

<b>Weakness</b>	<b>Strategy by Safford and Brown, 2019</b>
Complex governance system where key measures are easily lost.	Know who you want to reach. If you are not sure who you need to reach, ask around!
Often to academic terminology.	Repackage your work. The peer-reviewed article is the currency of the scientific realm, but it is not going to get you far in policy. A new audience demands a new format — one that is accessible and understandable.
Not sufficiently bottom-up approach.	Have clear and actionable recommendations. Your suggestions should be feasible. Every government body is constrained by its mission and budget. Do your best to propose actions that fall within your target agency's authority.
Not well communicated.	Write well. Conversations and presentations are great ways to introduce a topic, but policymakers will want a written product to react to or to share with colleagues.

To ensure that the findings of the project will follow through to the policy makers scientists need to combine the knowledge of which communication channels are more appropriate for stakeholders and to properly use the right communication style to improve on informing politicians and other policymakers on how to make decisions.

### 3.3 CONCLUSION ON FAIRWAY INTERIM FINDINGS

Our primary goal of the survey was to gain suggestions for direction and improvement and obtain a measure of the quality of interim findings of the Fairway project. The stakeholders were selected by their field of expertise in water policy regulations/protection and the Pesticides and Nitrate Directives of EU or field of involvement in protection/pollution of EU water resources or integrated life within water protection areas.

Results show that the most useful interim findings of WP 3 to WP 6 were:

- Only a few of the DSTs evaluated in the FairWay project are primarily aimed at improving water quality. Rather they are a farm (nutrient/pesticide) management tools based on the assumption that the efficient use of nitrogen and pesticides indirectly improves water quality. Only a few DSTs consider the impact of mitigation methods on water quality.
- The regulatory structures in all countries are very comprehensive and fragmented, to the extent that stakeholders are not able to fully understand them.

The majority of responses on the Likert scale ranged between slightly useful to useful. This shows that the interim findings of the FairWay project's WP 3 to 6 are useful to the respondents. However, the average of the Likert scale is higher when the findings are more precise, not so general, and therefore ready for further consideration.

The respondents recognised the following issues as most problematic for inefficient projects dissemination followed through to EU:

- Complex governance system where key measures are easily lost,
- Often too academic terminology,
- Not well communicated and
- Not sufficiently bottom-up approach.

Almost all the answers offered for solving the problem of inefficient projects dissemination are equally selected among respondents, which suggests that the respondents recognise solving these issues in multiple ways and on multiple scales.

One of our most essential conclusions within work package 7.2 is that there is an **absolute need to have a short key summary and important final project results and, in a language, understandable to policymakers**. Most respondents decided that they strongly agree with this statement. The average of Likert scale was extremely high, 6.16 out of 7. The number of responses for this statement was 25.

We presented a scheme of possible long-term relationship/communication flows between research projects and political agenda to respondents (a proposal of a lead partner in WP 7). The analysis showed that 86 % of respondents agreed with this solution.

Finally, the respondents were also asked how they like to receive interim and final project's findings. The respondents agreed that the most effective way to receive the interim findings of the project is presentations at a conference/workshops or via executive summaries of deliverables. The final results of the project can be best communicated via executive summaries of deliverables, and secondly conference/workshops, articles in scientific journals and YouTube videos.

In the end, it should be explained that this gathered data is highly appreciated for the project findings and will help in many ways with further research. The studied samples in both questionnaires were small (30 and 29 respondents). Therefore, larger samples of respondents at EU level or inclusion of local level stakeholder groups not included in the project (MAPs) could impact on the result.

## 4. ACTOR'S FEEDBACK ON THE POTENTIAL OF EVIDENCE BASED PRACTICES FOR WATER QUALITY IMPROVEMENT FROM EU LAND MANAGERS

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### 4.1 METHODOLOGY

#### 4.1.1 The questionnaire

The questionnaire was conducted with the help of the results coming from D4.3 Report on most promising measures and practices and additional interviews with actors on EU level on evidence-based practices. The interviews were taken from 3. to 6. jun. 2019. The results from these interviews were linked with findings from D4.3, where the opinion of 9 case studies across EU on evidence-based practices was already taken. The measures and practices that received at least two ++ for applicability and adoptability and up to three €€€ for cost were chosen for the collection of best practices/measures to be introduced to the respondents in this survey.

##### 4.1.1.1 *Best practices for reducing intake of pesticides*

For best practices for reducing intake of pesticides in drinking water were then chosen the following 9 measures:

1. Vegetated filter strips (VFS)
2. Crop rotation improvement
3. Input reduction
4. Integrated pest management (IPM)
5. Obligatory reduced input
6. Bio filters/beds
7. Economic/tax management
8. Drift reduction
9. Constructed wetlands

Measures were quickly explained prior to answering the question as follows:

#### 1. **Vegetated filter strips (VFS)**

Most filter strips are located at the downstream end of a field, where runoff water leaves the field. VFS have been shown to be effective in reducing overland flow and soil erosion.

#### 2. **Crop rotation improvement**

Crop rotation is the practice of growing a series of different types of crops in the same area across a sequence of growing seasons. If you improve your crop rotation knowledge you can increase farm system resilience.

#### 3. **Input reduction**

Managing the amount of pesticides that are applied to the system is an effective way of reducing pollution. When the input is reduced this will likely also show in a reduction in pollution.

#### 4. **Integrated pest management (IPM)**

IPM is an ecosystem-based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, and use of resistant varieties.

#### 5. **Obligatory reduced input**

If the reduction of pesticides input is prescribed by law, then we call that obligatory reduced input.

#### 6. **Bio filters/beds**

A biobed is a mixture of peat free compost, soil and straw (biomix) covered with turf that is placed in a lined pit. A biofilter uses the same biomix but does not require turf and uses a series of intermediate bulk containers instead of a pit.

#### 7. **Economic/tax management**

These measures increase the price of pesticides, as an extra incentive to look for alternative crop management methods.

#### **8. Drift reduction**

In an ideal world, 100% of a pesticide that is sprayed onto a field will reach its intended target. However, in reality, this does not happen, and it is more likely that some of the product will drift away from the intended target. The terminology used to describe this off-target movement of a pesticide, if spray drift and the technology used to reduce spray drift is known as DRT (drift reduction technology).

#### **9. Constructed wetlands**

A constructed wetland is an artificial wetland. Similarly, to natural wetlands, constructed wetlands also act as a biofilter and/or can remove a range of pollutants (such as organic matter, nutrients, pathogens, heavy metals) from the water.

The respondents were then asked to rank proposed measures by their applicability, cost and adoptability of measure to their land. The applicability, cost and adoptability were explained before answering the question as follows:

**Applicability** of a measure refers to how appropriate it is in each situation (do you have enough knowledge to implement it, does the soil/climate/crop rotations allow the implementation of measures, do you have the necessary tools/machinery to implement it, etc.).

**Cost** refers to your estimation of price that would need to be spent to apply certain measure in practice.

**Adoptability** of a measure is the willingness to apply such a measure for keeping water resources safe. The adoptability refers to your own will of applying certain measures to your fields.

Afterwards we asked them to rank proposed measures as follows:

*Please rank presented measures BY APPLICABILITY\*. Choose only 5 most suitable for you. Rank them from 1 to 5, using a "drag & drop", meaning 1 the most APPLICABLE method and 5 the least applicable method for you.*

*Please rank presented measures BY COST\*. Choose only 5 most suitable for you. Rank them from 1 to 5, using a "drag & drop", meaning 1 the most COSTLY method and 5 the least costly method for you.*

*Please rank presented measures BY ADOPTABILITY\*. Choose only 5 most suitable for you. Rank them from 1 to 5, using a "drag & drop", meaning 1 the most ADOPTABLE method and 5 the least adoptable method for you.*

#### **4.1.1.2 Best practices for reducing intake of nitrates**

The same methodology was performed also for the best measures for reducing nitrates intake in drinking water resources. Only this time we had different measures. 10 most appropriate measures from the Report D4.3 and interviews were chosen with this methodology:

1. Changes in cropping system or crop rotation
2. Changes in fertilization timing
3. Changes in the application method
4. Changes in application dose
5. Cover crops
6. Reduced tillage

7. Buffer strips
8. Grassed waterways
9. Farm-scale nutrient management scale
10. Outreach and information events

And also, here a short explanation prior answering the questions was given:

**1. Changes in cropping system or crop rotation**

Without much change in nitrogen fertilization input, this measure includes a change to high-yielding crop varieties and energy crops.

**2. Changes in fertilization timing**

Precision nitrogen fertilization builds on balanced fertilization; this includes measures like a ban on fertilization in winter, on sloping land, on frozen land, etc.

**3. Changes in the application method**

This measure includes sprinkler irrigation, drip irrigation, furrow irrigation, flood irrigation, and fertigation.

**4. Changes in application dose**

Matching nitrogen input to the average nitrogen demand of the crop is termed balanced nitrogen fertilization; this measure includes terms like “reduction in fertilization”, nutrient management planning, and more drastic measures such as withholding nitrogen fertilizer inputs; it also includes the combined use of synthetic fertilizers, animal manures, organic fertilizers, bio-based fertilizers, composts, etc.

**5. Cover crops**

These crops are grown after the harvest of the main crops, and serve to mop up residual mineral nitrogen from the soil and/or to improve soil quality; these crops may be sown in between the main crops (relay cropping) or after the harvest the main crop.

**6. Reduced tillage**

A decreased reliance on inversion tillage; it means less intensity, shallower depth, and less area disturbed.

**7. Buffer strips**

Refer to the strips of land along with watercourses; these strips have adjusted management (fertilization, crops, tillage) and thereby minimize the leaching and overland flow to surface waters; they are placed either between crops and waterways or between rows of crops.

**8. Grassed waterways**

Grassed waterways are broad, shallow and typically saucer-shaped channels designed to move surface water across farmland without causing soil erosion.

**9. Farm-scale nutrient management scale**

It is more important for cattle than arable farms; this kind of management has up to date information of every nutrient input and output and can optimize nutrient management; it uses certain informational tools such as computer programs or apps.

**10. Outreach and information events**

Conferences, workgroups on topic, agricultural advisory.

#### 4.1.2 Survey sample

The questionnaire was open for 30 days, from 10.2.2021 till 13.3.2021. A request for sending this survey to a wider group of interested audience was sent to farmers' associations that confirmed support to the project FAIRWAY in the Letters of Support. First, we send it only to COPA-COGECA association (on 10<sup>th</sup> of February 2021) and asked them to distribute further to all interested audience. Mr. Miles (Policy advisor for COPA-COGECA) answered that they will share the survey amongst their members, as well as include it in their weekly briefing. Unfortunately, we only received 17 answered questionnaires, so we decided to try and reach more people by sending

the link to the survey also to other organizations that signed the Letter of Support with Fairway project. But only to farmer's organizations, this were:

- National Farmers Union, UK
- Danish Agriculture & Food Council Association Ltd, DK
- Agri-Nord, DK
- Landvolk Niedersachsen Landersbauernverband, DE and
- EUFRAS, EU farmers' advisory association

Unfortunately, only EUFRAS decided to cooperate and sent the link further to 84 recipients (on 18<sup>th</sup> of February).

At the end of the survey, there were 212 entrance to the first page of the survey, and we received 40 finished questionnaires. 28 of that were eligible for further analyses. The number of questionnaires is too low for any serious statistical analyses; however we are pleased that a completion rate (people that started to answer the survey and finished it) of more than 70 % was performed.

Completion rates lower than 60 % in web questionnaires should be examined for possible major errors in the survey design or logic (Liu and Wronski, 2018). This questionnaire had demanding questions containing measures and practices that are not widely known and could be considered as a demanding survey, so a completion rate lower than 60 % was expected. However, with the completion rate of 70 % our expectations were exceeded. This could mean that the communication between COPA-COGECA and EUFRAS and their recipients is better than normal and that our introduction to the questionnaire and short explanations kept respondents on answering the survey. This can also suggest that the questionnaire was prepared wisely and that respondents understand the importance of delivering the answers.

# 4.2 RESULTS

## 4.2.1 Respondents

We had a sample size of 28 respondents. That came from 13 countries. The Figures 25 and 26 show this data, respectively.

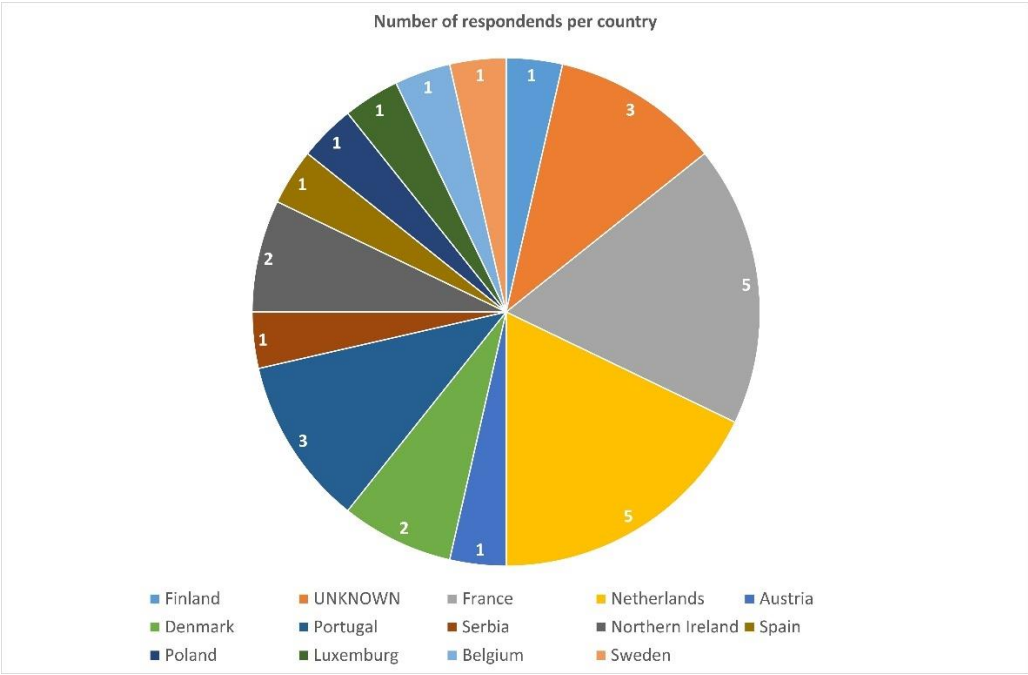


Figure 25: Number of respondents per country, n =13

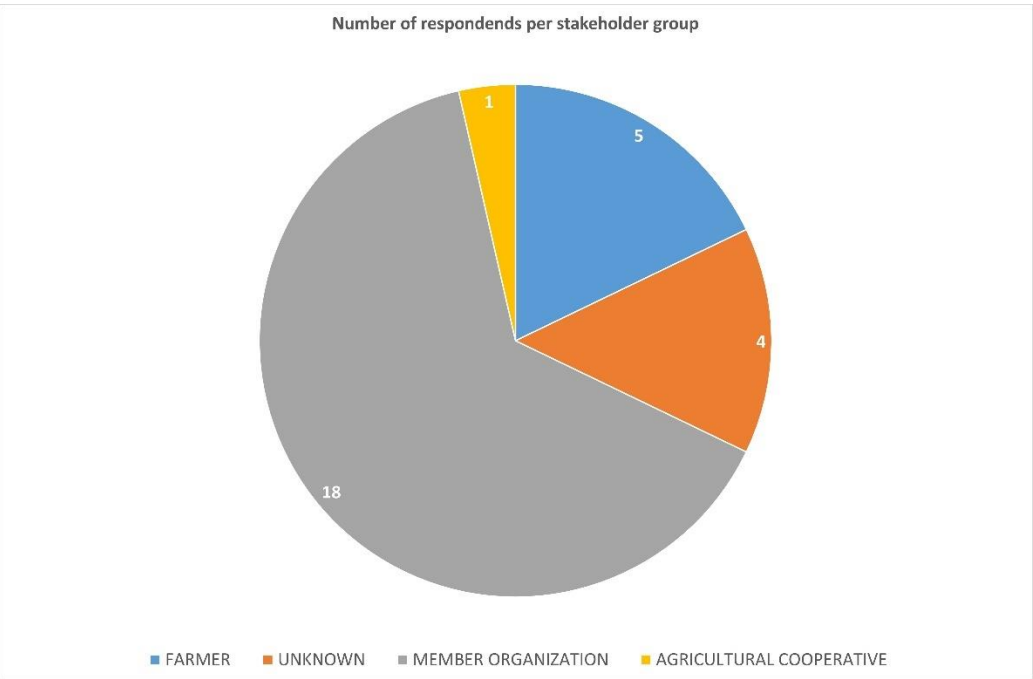


Figure 26: Number of respondents per stakeholder group, n=28



For farmers we also asked them what type of cultivation do they have (Figure 27) and **if they should pay attention to the risks of polluting water resources?** All 5 of farmers agreed that they should pay attention to the risks of polluting water resources.

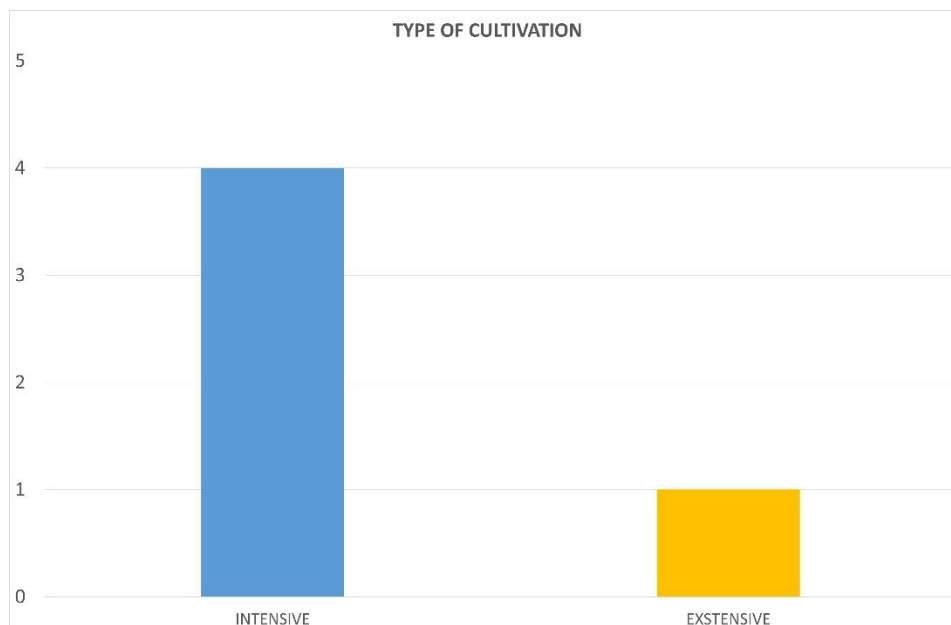


Figure 27: Type of cultivation for farmers, n=5

#### 4.2.2 The potential of selected evidence based best practices/measures for reducing PESTICIDE INTAKE in drinking water resources

We calculated average of points for each proposed measure. We highlighted with green colour the measures/practices that received the best potential for applicability, cost and adoptability in the field. The Figures 28, 29 and 30 show this data.

	Applicability
Obligatory reduced input	0,64
Economic / Tax Management	1,14
Constructed wetlands	1,18
Bio beds / filters	1,39
Integrated Pest Management	1,64
Crop rotation improvement	2,11
Drift reduction	2,14
Vegetated filter strips	2,25
Input reduction	2,50

Figure 28: Average of points for proposed 9 measures to reduce pesticide intake, highlighted with the green colour the 5 measures that have highest potential for easiest applicability of proposed measures among EU land managers, n=28

For applicability the average of points that is nearer the number 1 shows easiest applicability according to the respondents, the average of points that is nearer the number 5 shows the hardest applicability according to the respondents.

The 5 measures that have highest potential for **easiest applicability** of proposed measures among EU land managers are:

1. Obligatory reduced input
2. Economic / Tax Management
3. Constructed wetlands

4. Bio beds / filters
5. Integrated Pest Management

	Cost
Drift reduction	2,56
Integrated Pest Management	2,04
Crop rotation improvement	1,78
Bio beds / filters	1,67
Vegetated filter strips	1,52
Constructed wetlands	1,48
Input reduction	1,33
Obligatory reduced input	1,22
Economic / Tax Management	0,96

Figure 29: Average of points for proposed 9 measures to reduce pesticide intake, highlighted with the green colour the 5 measures that have highest potential for lowest cost of proposed measures among EU land managers, n=27

For cost the average of points that is nearer the number 1 shows highest cost according to the respondents and is therefore the opposite of the best potential for respondents. The average of points that is nearer the number 5 shows the lowest cost according to the respondents and is therefore the highest in potential for respondents.

The 5 measures that have highest potential for **lowest cost** of proposed measures among EU land managers are:

1. Drift reduction
2. Integrated Pest Management
3. Crop rotation improvement
4. Bio beds / filters
5. Vegetated filter strips

	Adoptability
Economic / Tax Management	0,44
Obligatory reduced input	0,6
Constructed wetlands	1,36
Bio beds / filters	1,56
Input reduction	1,84
Drift reduction	2,08
Integrated Pest Management	2,24
Crop rotation improvement	2,28
Vegetated filter strips	2,6

Figure 30: Average of points for proposed 9 measures to reduce pesticide intake, highlighted with the green colour the 5 measures that have highest potential for easiest adoptability of proposed measures among EU land managers, n=25

For adoptability, the average of points that is nearer the number 1 shows easiest adoptability according to the respondents, the average of points that is nearer the number 5 shows the hardest adoptability according to the respondents.

The 5 measures that have highest potential for **easiest adoptability** of proposed measures among EU land managers are:

1. Economic / Tax Management
2. Obligatory reduced input
3. Constructed wetlands

4. Bio beds / filters
5. Input reduction

We can clearly see that the measures that have highest potential in applicability and adoptability (the Economic/Tax Management and The Obligatory reduced input) are also the costliest measures according to the respondents. We will be thinking in the way of finding some win-win solutions and the findings of this part of Report will be extremely valuable for the next Report D7.3 where we will deal with “most promising approaches to improve drinking water quality”.

#### 4.2.3 The potential of selected evidence based best practices/measures for reducing NITRATE INTAKE in drinking water resources

As for the pesticides, we also collected and analysed answers for measures that are reducing nitrates in drinking water. We used the same methodology and the Figures 31, 32 and 33 show the applicability, cost and adoptability of proposed measures. In addition, here, we highlighted with green colour the measures/practices that received the best potential for applicability, cost and adoptability in the field.

	Applicability
Grassed waterways	0,61
Changes in the application method	0,83
Changes in application dose	1,33
Farm-scale nutrient management tools	1,39
Cover crops	1,50
Changes in fertilization timing	1,56
Changes in cropping system or crop rotation	1,61
Reduced tillage	1,89
Buffer strips	1,89
Outreach and information events	2,33

Figure 31: Average of points for proposed 9 measures to reduce pesticide intake, highlighted with the green colour the 5 measures that have highest potential for easiest applicability of proposed measures among EU land managers, n=18

For applicability, the average of points that is nearer the number 1 shows easiest applicability according to the respondents, the average of points that is nearer the number 5 shows the hardest applicability according to the respondents.

The 5 measures that have highest potential for **easiest applicability** of proposed measures among EU land managers are:

1. Grassed waterways
2. Changes in the application method
3. Changes in application dose
4. Farm-scale nutrient management tools
5. Cover crops

	Cost
Farm-scale nutrient management tools	2,39
Outreach and information events	2,28
Buffer strips	2,06
Changes in cropping system or crop rotation	1,56
Grassed waterways	1,33
Changes in the application method	1,28
Cover crops	1,17
Reduced tillage	1,11
Changes in application dose	0,89
Changes in fertilization timing	0,78

Figure 32: Average of points for proposed 9 measures to reduce pesticide intake, highlighted with the green colour the 5 measures that have highest potential for lowest cost of proposed measures among EU land managers, n=18

For cost, the average of points that is nearer the number 1 shows highest cost according to the respondents and is therefore the opposite of the best potential for respondents. The average of points that is nearer the number 5 shows the lowest cost according to the respondents and is therefore the highest in potential for respondents.

The five measures that have highest potential for **lowest cost** of proposed measures among EU land managers are:

1. Farm-scale nutrient management tools
2. Outreach and information events
3. Buffer strips
4. Changes in cropping system or crop rotation
5. Grassed waterways

	Adoptability
Grassed waterways	0,39
Changes in the application method	1,06
Outreach and information events	1,33
Changes in cropping system or crop rotation	1,44
Changes in application dose	1,56
Farm-scale nutrient management tools	1,61
Cover crops	1,67
Changes in fertilization timing	1,83
Buffer strips	1,94
Reduced tillage	2,11

Figure 33: Average of points for proposed 9 measures to reduce pesticide intake, highlighted with the green colour the 5 measures that have highest potential for easiest adoptability of proposed measures among EU land managers, n=18

For adoptability, the average of points that is nearer the number 1 shows easiest adoptability according to the respondents, the average of points that is nearer the number 5 shows the hardest adoptability according to the respondents.

The 5 measures that have highest potential for **easiest adoptability** of proposed measures among EU land managers are:

1. Grassed waterways
2. Changes in the application method
3. Outreach and information events
4. Changes in cropping system or crop rotation

## 5. Changes in application dose

Now, the quick overlook gives as one measure that is included in all 5 best measures for applicability, cost and adoptability. This is the **Grassed waterways, that is on 1<sup>st</sup> place for applicability and adoptability and on 5<sup>th</sup> place for cost**. This is already one of the win-win solutions that is suitable among EU land managers, among stakeholders from MAPs and among actors on EU level- the decision makers.

For further investigation, the report D7.3 is preparing and there we will also use the findings from this report.

## 4.3 CONCLUSION ON THE POTENTIAL OF MEASURES/PRACTICES FROM EU LAND MANAGERS

Nine and ten measures were placed for ranking from easiest to hardest applicability and adoptability and from highest to lowest cost according to the respondents.

For pesticides we can clearly see that the measures that have highest potential in applicability and adoptability (the Economic/Tax Management and The Obligatory reduced input) are also the costliest measures according to the respondents. This suggests that here an exceptionally good win-win solution will be harder to find and apply on field. However, we can still find one measure that is a potential win win solution, because it is placed in the top 5 measures for applicability, cost and adoptability. **And this are the Bio beds/filters that are in the 4<sup>th</sup> place, respectively in all three categories**. Constructed wetlands could also be a potential win-win solution, placed on 3<sup>rd</sup> place for applicability and adoptability and on 6<sup>th</sup> place for cost.

For nitrates, we have better prognosis. The analyse showed that there are certain measures that are at the same time in the middle scale of cost and in the top 5 on scale for applicability and adoptability, like Changes in the application method, Grassed waterways and Changes in cropping system and crop rotation. We can also see that one measure is included in all 5 best measures for applicability, cost and adoptability. This is the **Grassed waterways, that is on 1<sup>st</sup> place for applicability and adoptability and on 5<sup>th</sup> place for cost**. This could be one of the win-win solutions that is suitable among EU land managers, among stakeholders from MAPs and among actors on EU level- the decision makers.

The Bio beds/filters for reducing pesticides and the Grassed waterways for reducing nitrates could be one of the main findings of this project.

For further investigation, the report D7.3 is preparing and there we will be thinking in the way of finding win-win solutions and the findings of this part of Report will be extremely valuable for the next Report D7.3 where we will deal with “most promising approaches to improve drinking water quality”.

## 5. CONCLUSION OF REPORT D7.2

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This deliverable summarises the actor's feedback on the evidence-based practices and on the usefulness of the project, through surveys. Different actors' typologies are well represented.

The number of finished questionnaires of MAPs was high. 46 of questionnaires were returned from 10 MAPs, representing Denmark, England, France, Germany, Greece, Netherlands, Northern Ireland, Portugal, Romania and Slovenia. Only one missing (Norway).

**In D7.2 we included all aspects of policy making:** functioning of the MAPs (1<sup>st</sup> part of the Report), key EU representatives for water policy regulations and protection (2<sup>nd</sup> part of the Report) and an EU land managers (3<sup>rd</sup> part of the Report). In the surveys we included all different stakeholders' groups that exist in our project.

Beginning with MAPs, the obligation of the MAPs was to present with at least 4 questionnaires per MAP, coming from 4 different stakeholder groups. The stakeholder groups that corresponded were: farmers, advisory, policy makers, water policy implementation, retail, regional management and water company. Some of them also came from case studies (Denmark, Germany, Slovenia).

Further, the key EU representatives were selected by their field of expertise in water policy regulations/protection and the Pesticides and Nitrate Directives of EU or field of involvement in protection/pollution of EU water resources or integrated life within water protection areas. They came from many stakeholders' groups but had same purpose, to protect drinking water resources. An incomplete DELPHI method was applied to "evaluate possible correlations between the EU and local level, on barriers and issues in providing integrated scientific support for policy regulations related to drinking water resource protection against diffuse pollution of nitrates and pesticides from agriculture.

Last, EU land managers, were asked to follow **the identification of best options** of evidence-based practices. An online survey to a much wider group of actors was sent, to all farmers' organizations that signed a Letter of Support with the Fairway project (COPA-COGECA members, EUFRAS association etc.). All potentially better options of evidence-based practices were included in the survey and respondents were asked to rank/prioritize the most effective options of evidence based practises for them.

All this stakeholder groups can be involved into policy making and they are the linkage between science and policy.

**The contribution of MAPs is clear.** The average Likert scale was always higher than 60 % for different issues that EU representatives recognised as necessary for the protection of drinking water resources. This means that MAPs recognise that these issues are also important in their local environment. However, specific issues are considered as not essential or not evenly important between MAPs nor stakeholders (fragmented data). The agreeability among all MAPs was highest for the solution: Stronger involvement of actors in the science-policy interface. Stronger involvement corresponds with a reflection on science integration into policy, where MAPs recognise that it is good that member states have a voice in solving problems on a local level and that Multi-Actor Platforms (MAP) are the right way to engage stakeholders closely. The data also suggests that MAPs should be included in the policy making cycle on local level because they can have quite different perspectives on issues that has to be considered. There is no unified opinion among them.

The national dimension of the science-policy interface is not yet considered, but this aspect is relevant, especially for implementation purposes, as national research agencies could support competent authorities in implementing the relevant European legislation at local scale e.g., as

providers of specific training to farmers or farmers advise. In the future we shall indicate how different actors might help overcome the barriers.

Many useful communication channels are discussed. Also strategies to overcome observed weaknesses in communication style are firstly introduced. Of course it is important where you publish all the written material, otherwise it can go unnoticed. Equally important is the usage of proper communication style, both in written and verbal communication activities. Policy makers have to have written material in a form that could be distributed and understood quickly among fellow members. Scientists have to understand that and properly adjust key messages for targeted audience.

In the report the suggestions for the improvement of more efficient project dissemination followed through to EU were presented, weighted and commented (Figure 23 and 24). What is important in the next phase is to take all the necessary actions to ensure that the findings of the project do inform practices in MAPs and boost innovation. Therefore, besides the means (one- vs. two-way communication tools), we would recommend flagging up the outcomes like presented in Table 2, p.42.

We should also try to engage directly with policymakers and key stakeholders for the benefit of how to better communicate science. The best ways of communication and dissemination of the final results of the project are:

1. executive summaries of deliverables,
2. conference/workshops,
3. articles in scientific journals and
4. YouTube videos (Figure 24).

**Scientists need to combine knowledge of best communication channels and good strategies in communication style to distribute project's findings to relevant decision-making actors.** These findings can serve for further development of the WP 8 deliverables in order to help distribute the findings of the project to the respondents within the most effective communication channel and to effectively use the right communication style to improve on informing politicians and other policymakers on how to make decisions.

**Finding the best options of evidence-based practices** regarding their applicability, cost and adoptability, has showed that there are some potential win-win solutions for all stakeholders involved. For pesticides regulation good potentials are showing the practices:

1. Bio beds/filters and/or
2. Constructed wetland.

And for nitrates regulation good potentials are showing the practices:

1. Changes in the application method,
2. Grassed waterways and/or
3. Changes in cropping system and crop rotation.

In next tasks we will find measures and practices for water quality improvement that have best potential in their applicability, cost and adoptability on field by different actors that are involved in water quality disturbance (task 7.3) and investigate weak and strong communication channels and style to distribute project's findings to relevant decision-making actors (task 7.4).

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## 7. APPENDIX

### A1. Questionnaire for MAP

Dear Sir / Madam, thank you for your collaboration. Please, fill this questionnaire with your opinion on a specific topic of knowledge transfer to policy/legislation related to maintenance of quality drinking water at your local and national level. Your opinion is highly valuable and of high importance for the FairWay project. This survey will take less than 10 minutes of your time.

#### 1.) Please write to your country of origin.

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#### 2.) Please choose (with X) the stakeholder's group you represent:

- ☐ Farmers
- ☐ Advisory
- ☐ Policymaker
- ☐ Water policy implementation
- ☐ Retail
- ☐ Non-governmental organization
- ☐ Research and Science
- ☐ Other:

**In task 7.1. We asked EU representatives to define some major issues and barriers** for solving issues related to drinking water resource protection against diffuse pollution of nitrates and pesticides from agriculture in the EU. Below you will find their opinion. We are interested in how much could you relate to these issues and barriers concerning your national and local level.

#### 3.1) How much could you relate to these issues within your national and local level? Please, rate the findings from 1 = do not agree to 7 = very much agree.

Findings from WP 7.1	1 - 7
No coherent Policy implementation of EU policies transition to local level.	
Synergies between goals/pathways of water quality lack of trade-offs and choices.	
There is a low balance between targets and objectives.	
More harmonisation of legislation at EU level.	
Patience is needed to see results (change policy takes time). Development is already positive.	
Fragmented data of water quality and not easily available.	
Financial questions: who is paying, where the money goes?	

**3.2) Can you think of some other issues** that you consider important for your environment related to drinking water resource protection against diffuse pollution of nitrates and pesticides from agriculture?

--

**3.3) How much could you relate to these barriers in solving the issues** within your national and local regulations? Please, rate the findings from 1 = do not agree to 7 = very much agree.

Findings from WP 7.1	1 – 7
Financial means to apply certain measures are needed.	
There is a time lag between action (measures) and results (water quality).	
Awareness of links between policy objectives and required actions (by farmers) are needed.	
Farmers are not enough involved; raising awareness and communication is needed.	
Limited financial means to apply measures by farmers, water sector, consumers.	
Site-specific aspect: best-management practices are often too general.	
Site-specific aspect: target concentration for pesticides and nitrates are not achievable in some regions.	

**3.4) Can you think of some other barriers** in solving the issues that you consider important for your environment related to drinking water resource protection against diffuse pollution of nitrates and pesticides from agriculture?

--

The EU representatives were also asked **to define how the relationship between experts and policy in the EU regulations is reflected in EU legislation and how the system at EU level can be improved**; what are the possible solutions for integrated scientific support for EU policy, with special attention to drinking water resource protection against diffuse pollution of nitrates and pesticides from agriculture. Below you will find their opinion.

**4.1) How much could you relate to their opinions within your national and local regulations reflected in your legislation? Please, rate the findings from 1 = do not agree to 7 = very much agree.**

Findings from WP 7.1	1 – 7
In legislation, it is seen that in certain policy members lack knowledge; more education and communication is needed.	
Science - policy relationship could be improved; we can see both populist and economically driven decisions.	
There is not enough emphasis on real practical work and experiences; the agriculture sector represents a small share of GDP.	
Links between science and policy are a weak.	
More education of the public is needed.	
It is good that member states have a voice in solving problems on a local level; Multi-Actor Platforms (MAP) are a good way to engage stakeholders closely.	
Not enough experts that can tackle the complexity of the problem; in comparison to other sectors agriculture sector has weak financial support.	

**4.2) Do you have some other opinion of how the relationship between experts and policy at your national/local regulations is reflected in legislation?**

--

**4.3) How much do you agree with these solutions of integrated scientific support within your national/local policy? Please, rate the findings from 1 = do not agree to 7 = very much agree.**

Findings from WP 7.1	1 – 7
Professionalise the communication from RIA - Research and Innovation Action projects.	
Independent research + Silo-breaking; Multi-Actor Platform Involvement.	
Separate Pesticides and Nitrates in projects and policy communications.	
Stronger involvement of actors in the science-policy interface.	

<b>Findings from WP 7.1</b>	<b>1 – 7</b>
Strengthen trust among concerned actors, inter-alliance, thought non-concerned databases on various level (easily accessible).	
Better time alignment between research and innovation projects and policy development (more interactions and complementary).	

**Q12 - 4.4) Do you have some other solution to integrate scientific support to your policy?**

**Q13 - 4.5) Do you think that the solution you proposed could be transferred to EU policy also?**

- ☐ Yes.  
☐ No.  
☐ I do not know.

Thank you very much; your information will be analysed anonymous and will not be particularly exposed.

## A2. Questionnaire for the workshop participants

We kindly ask you to express your opinion on the interim results of the FairWay project that are presented in this survey. Your opinion is highly valuable and of high importance for FairWay project further research and will be used for further improvement. The survey takes approx. 8 minutes of your time.

**Q1 - 1.) Please choose the type of institution you represent:**

- ☐ Research institution -international
- ☐ Research institution - national
- ☐ Research institution - regional
- ☐ Small or Medium size enterprise (SME)
- ☐ Non-governmental organization (NGO)
- ☐ EU commission
- ☐ Industry
- ☐ Farmer
- ☐ Other:

**Q2 - 2.1) Findings from WP3: How useful are below listed information for your professional work? Please, rate the findings from 1 = not useful to 7 = very useful.**

	1	2	3	4	5	6	7
The most important pressure indicators for the quality of drinking water on farms depend on the type of catchment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Some link between pressure indicators and states indicators can statistically be performed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q3 - 2.2) Findings from WP4: How useful are below listed information for your professional work? Please, rate the findings from 1 = not useful to 7 = very useful.**

	1	2	3	4	5	6	7
There are many possible measures to decrease the pesticides pollution of drinking water supplies. Most effective measures are (i) spray drift reduction through technical	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	1	2	3	4	5	6	7
modifications of the spraying technique, (ii) pesticides input reduction through integrated pest management measures, (iii) no spraying zones and vegetated buffer zones, and (iv) erosion reduction measures. Tillage measures appear to have little effect. There are many possible measures to decrease the nitrate pollution of drinking water supplies. Most effective measures are (i) nitrogen input control, (ii) adjustment of crop type and/or crop rotation, (iii) growth of cover crops, (iv) minimum tillage and surface mulching, and (v) nitrification inhibitors. Fertiliser type appears to have little influence, while the effectiveness of buffer strips greatly depends on soil and hydrological conditions.							
The estimated costs greatly vary between measures and also between countries. Some measures are cost-effective. There is scarcity of accurate cost information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q4 - 2.3) Findings from WP5: How useful are below listed information for your professional work? Please, rate the findings from 1 = not useful to 7 = very useful.**

	1	2	3	4	5	6	7
All participating	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	1	2	3	4	5	6	7
countries have their decision support tools (DSTs) developed to support water quality/agri/environment policy makers operating at a regional or national level, and those intended to support sustainable nutrient management at the farm level.							
Only a few of the evaluated DSTs, evaluated at FairWay project, are primarily aimed at improving water quality. Rather they are a farm (nutrient/pesticide) management tools based on the assumption that the efficient use of nitrogen and pesticides indirectly improves water quality. Only a few DSTs consider the impact of mitigation methods on water quality.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decision support tools are not easily transferred from one country to another because they are all operated within the context of the wider advisory frameworks in place in their respective countries, in addition to issues around language and requirements for country/specific data, calibration, etc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q5 - 2.4) Findings from WP6: How useful are below listed information for your professional**

work? Please, rate the findings from 1 = not useful to 7 = very useful.

	1	2	3	4	5	6	7
The regulatory structures in all countries are very comprehensive and fragmented, to the extent that stakeholders are not able to fully understand them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The governance structures between countries have extensive differences. This can at least partly be explained by historical, cultural and political differences between countries.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Between countries it is a high degree of divergence in scales of governance.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q6 - 3.) Results show that EU research project dissemination is not followed through to the European Commission.**

**Q7 - 3.1) Why do you think this is happening?**

Multiple answers are possible

- ☐ Complex governance system where key measures are easily lost.
- ☐ Often too academic terminology.
- ☐ Findings are not interesting or new.
- ☐ Not well communicated.
- ☐ Wrong initial diagnosis.
- ☐ Not sufficiently bottom-up approach.
- ☐ Lobbying.
- ☐ Lack of time from DGs.
- ☐ Lack of efforts from project partners.
- ☐ Differences in focus.
- ☐ Not effective advisory services.
- ☐ There is not a clear way where these results can be consulted. Are members of EC added on these sources?
- ☐ I disagree. I think it is in a diffuse way.
- ☐ Other:

**Q8 - 3.2) Do you have any suggestions for improvement?**



Multiple answers are possible

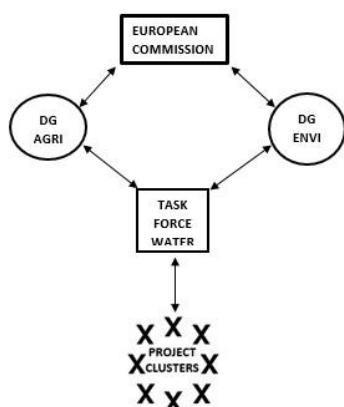
- ☐ Work at management scale.
- ☐ Bottom-up to top-down approach connection.
- ☐ Some publication can be written, "for a leak".
- ☐ Bring stakeholders close by meetings and workshops.
- ☐ Multi stakeholders approach should also focus on implementation by farmers.
- ☐ Let stakeholders also "tell the story".
- ☐ Field visits successful projects.
- ☐ Video presentation of successful projects.
- ☐ Joined outputs from projects as messages to Policy.
- ☐ Make contact with different policy levels/sectors from the beginning of the project.
- ☐ Lobbying at EU and NAT levels (agricultural, environmental authorities, water agencies).
- ☐ Media attention.
- ☐ Joint Policy conferences are useful, especially when held in Brussels.
- ☐ Other:

**Q9 - 4.) How much do you agree with the following statement? Please rate the findings from 1 = not agree to 7 = very much agree.**

	1	2	3	4	5	6	7
The need is to have key and important final project results shorter and in a language understandable to policy makers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q10 - 5.) Some research projects just focus on findings and fulfilling the Grant Agreement obligations, disregard whether the topic is on the political agenda. To make the research projects more connected to the political agenda, the European Commission could establish Task forces to design project clusters. Our proposal of long-term relationship/communication flows in issues concerning the quality of drinking water is presented in the scheme below.**

**Q11 -**



**Q12 - 5.1) Do you think this is a good suggestion for solving the "gap" between science and policy?**

- ☐ Yes
- ☐ No

**Q13 - 5.2) Which solution would be better for solving the "gap" between science and policy?**

Multiple answers are possible

- ☐ Through various events
- ☐ Add DG RTD Agencies that work for the projects
- ☐ Also direct communication flow between project clusters and DG AGRI and DG ENVI
- ☐ Open communication flow between DG AGRI and DG ENVI
- ☐ Other:

**Q14 - 6.) In what form would it be most useful for you to receive the project INTERIM research findings?**

Multiple answers are possible

- ☐ Articles in scientific journals
- ☐ Access to the full contents of deliverables on the FAIRWAYiS website
- ☐ Executive summaries of deliverables on FAIRWAYiS
- ☐ Short policy briefs
- ☐ Subscription to the Newsletter
- ☐ Twitter posts
- ☐ Facebook posts
- ☐ Youtube videos
- ☐ Conference
- ☐ Other:

**Q15 - 7.) In what form would it be most useful for you to receive the project FINAL research findings?**

Multiple answers are possible

- ☐ Articles in scientific journals
- ☐ Access to the full contents of deliverables on the FAIRWAYiS website
- ☐ Executive summaries of deliverables on FAIRWAYiS
- ☐ Short policy briefs
- ☐ Subscription to the Newsletter
- ☐ Twitter posts
- ☐ Facebook posts
- ☐ Youtube videos
- ☐ Conference
- ☐ Other:

### A3. Questionnaire for the EU land managers

Dear visitor, the project Fairway aims in finding the most promising methods for keeping water resources safe for future generations. Many drinking water resources face an increased risk of pollution by nitrates (NO<sub>3</sub>) and pesticides, resulting mostly from agriculture. We already identified which are the most promising methods in our case studies (D4.3). Now, we need to link the view of case studies with the view of different EU land managers. We ask you to rank proposed methods in your own way regarding the applicability, cost and adoptability. We believe that your input can become meaningful if enough surveys will be completed. So please, forward the link to relevant people within your network. This can be done at the end of the survey. This survey will take you approx. 10 minutes. Thank you for your support. Fairway project team For any further activities regarding the project Fairway please follow our official webpage: <https://www.fairway-project.eu/>

**Q1 - This survey is anonymous and the data will be used exclusively for research purposes only.**

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**Q2 - What country do you come from?**

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**Q3 - To what stakeholder group do you belong?**

- ☐ Farmer
- ☐ Agricultural cooperative
- ☐ Member organization

(1) Q3 = [1]

**Q4 - What farm type do you have? Please pick one option.**

- ☐ arable
- ☐ cattle
- ☐ orchards
- ☐ mixed
- ☐ Other:

IF (1) Q3 = [1]

**Q5 - How would you describe your agricultural cultivation? You can pick more than one option.**

Multiple answers are possible

- ☐ extensive cultivation
- ☐ intensive cultivation
- ☐ ecological cultivation
- ☐ biodinamic cultivation

☐ Other:

IF (1) Q3 = [1]

**Q6 - Do you think you should pay attention to the risks of polluting water resources?**

☐ Yes

☐ No

☐ I think there is no risk on water pollution in my farm system.

☐ Unknown

☐ Other:

**Q7 - On the next page, you will find presented 9 different methods that can be applied in agriculture cultivation for reducing the input of PESTICIDES in water resources.**

---

**Q8 - We shall ask you to rank presented measures in your own way regarding the applicability, cost and adaptability. For better understanding of what we mean with the terms, here are short explanations:**

**Applicability of a measure refers to how appropriate it is in a given situation (do you have enough knowledge to implement it, does the soil/climate/crop rotations allow the implementation of measures, do you have the necessary tools/machinery to implement it, etc.).**

**Cost refers to your estimation of price that would need to be spent in order to apply certain measure in practice.**

**Adoptability of a measure is the willingness to apply such a measure for keeping water resources safe. The adoptability refers to your own will of applying certain measures to your fields.**

---

**Q9 - Let us quickly explain the 9 proposed methods. Put your mouse over the term and the explanation will appear.**

**Vegetated filter strips (VFS)**

**Crop rotation improvement**

**Input reduction**

**Integrated pest management (IPM)**

**Obligatory reduced input**

**Bio filters/beds**

**Economic/tax management**

**Drift reduction**

## Constructed wetlands

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**Q10 - Please rank presented measures BY APPLICABILITY\*. Choose only 5 most suitable for you. Rank them from 1 to 5, using a "drag & drop", meaning 1 the most APPLICABLE method and 5 the least applicable method for you.**

\*Applicability is the appropriateness of measures for a particular task of keeping water resources safe. The applicability of a measure refers to how appropriate it is in a given situation (do you have enough knowledge to implement it, does the soil/climate/crop rotations allow the implementation of measures, do you have the necessary tools/machinery to implement it, etc.).

Available categories:

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Ranked categories:

---

Vegetated filter strips  
Crop rotation improvement  
Input reduction  
Integrated Pest Management  
Obligatory reduced input  
Bio filters/beds  
Economic/tax management  
Drift reduction  
Constructed wetlands

1. \_\_\_\_\_  
2. \_\_\_\_\_  
3. \_\_\_\_\_  
4. \_\_\_\_\_  
5. \_\_\_\_\_

**Q11 - Please rank presented measures BY COST\*. Choose only 5 most suitable for you. Rank them from 1 to 5, using a "drag & drop", meaning 1 the most COSTLY method and 5 the least costly method for you.**

\*Cost refers to your estimation of price that would need to be spent in order to apply certain measure in practise.

Available categories:

---

Ranked categories:

---

Vegetated filter strips  
Crop rotation improvement  
Input reduction  
Integrated pest management

1. \_\_\_\_\_  
2. \_\_\_\_\_  
3. \_\_\_\_\_  
4. \_\_\_\_\_

Obligatory reduced input

5. \_\_\_\_\_

Bio filters/beds

Economic/tax management

Drift reduction

Constructed wetlands

**Q12 - Please rank presented measures BY ADOPTABILITY\*. Choose only 5 most suitable for you. Rank them from 1 to 5, using a "drag & drop", meaning 1 the most ADOPTABLE method and 5 the least adoptable method for you.**

\*Adoptability of a measure is the willingness to apply such measure for keeping water resources safe. The adoptability refers to your own will of applying certain measures to your fields.

Available categories:

Ranked categories:

Vegetated filter strips

1. \_\_\_\_\_

Crop rotation improvement

2. \_\_\_\_\_

Input reduction

3. \_\_\_\_\_

Integrated pest management

4. \_\_\_\_\_

Obligatory reduced input

5. \_\_\_\_\_

Bio filters/beds

Economic/tax management

Drift reduction

Constructed wetlands

**Q13 - Now we ask you to do the same for 10 measures that can be applied in agriculture cultivation and help decrease the pollution by NITRATES (NO3) in water resources.**

**Q14 - Let us quickly explain the 10 proposed measures. Put your mouse over the term and the explanation will appear.**

**Changes in cropping system or crop rotation**

**Changes in fertilization timing**

**Changes in the application method**

**Changes in application dose**

**Cover crops**

**Reduced tillage**

**Buffer strips**

**Grassed waterways**

**Farm-scale nutrient management scale**

**Outreach and information events**

---

**Q15 - Please rank presented measures BY APPLICABILITY\*. Choose only 5 most suitable for you. Rank them from 1 to 5, using a "drag & drop", meaning 1 the most APPLICABLE method and 5 the least applicable method for you.**

\*Applicability is the appropriateness of measures for a particular task of keeping water resources safe. The applicability of a measure refers to how appropriate it is in a given situation (do you have enough knowledge to implement it, does the soil/climate/crop rotations allow the implementation of measures, do you have the necessary tools/machinery to implement it, etc.).

Available categories:

Ranked categories:

---

---

Changes in cropping system or  
crop rotation

1. \_\_\_\_\_

Changes in fertilization timing

2. \_\_\_\_\_

Changes in the application method

3. \_\_\_\_\_

Changes in application dose

4. \_\_\_\_\_

Cover crops

5. \_\_\_\_\_

Reduced tillage

Buffer strips

Grassed waterways

Farm-scale nutrient management  
scale

Outreach and information events

**Q16 - Please rank presented measures BY COST\*. Choose only 5 most suitable for you. Rank them from 1 to 5, using a "drag & drop", meaning 1 the most COSTLY method and 5 the least costly method for you.**

\*Cost refers to your estimation of price that would need to be spent in order to apply certain measure in practise.



Available categories:

---

Changes in cropping system or  
crop rotation

Changes in fertilization timing

Changes in the application method

Changes in application dose

Cover crops

Reduced tillage

Buffer strips

Grassed waterways

Farm-scale nutrient management  
scale

Outreach and information events

Ranked categories:

---

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

**Q17 - Please rank presented measures BY ADOPTABILITY\*. Choose only 5 most suitable for you. Rank them from 1 to 5, using a "drag & drop", meaning 1 the most ADOPTABLE method and 5 the least adoptable method for you.**

\*Adoptability of a measure is the willingness to apply such measure for keeping water resources safe. The adoptability refers to your own will of applying certain measures to your fields.

Available categories:

---

Changes in cropping system or  
crop rotation

Changes in fertilization timing

Changes in the application  
method

Changes in application dose

Cover crops

Reduced tillage

Buffer strips

Grassed waterways

Ranked categories:

---

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

Farm-scale nutrient  
management scale

Outreach and information events

**Q18 - If you have something to comment on measures or other relevant issue, please write here. Otherwise, skip this part.**

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