External Expert Assessment of the Agricultural Sustainability Support and Advisory Programme (ASSAP)

Report of the Independent Review Panel

12 October 2021

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High-Level Findings and Recommendations

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2.	**ASSAP should continue to focus primarily on water quality in the PAAs:** Its objectives should be simplified to focus more on supporting farmers' implementation of the right actions in the right place and demonstration of their impact on water quality.
3.	**Funding to support farmers' implementation of Actions:** Financial support, external to the ASSAP, needs to be available to enable farmers implement agreed actions recommended by ASSAP advisors.
4.	**Enhance the mainstream advisory services:** The further development of ASSAP needs be accompanied by an accelerated enhancement and refocusing of the mainstream advisory services (both public and private) with a stronger focus on sustainability (economic, social and environmental) and on-farm and action-based engagement.
5.	**Continuous diagnostic review:** the diagnostic flow-chart, designed jointly by ASSAP and LAWPRO staff, should be adopted formally as a tool for short-cycle assessment, review of progress in a PAA and identification of necessary network partners.
6.	**Spatial recording of recommendations and actions:** ASSAP, supported by its partners organisations, should complete the move towards spatial recording of recommendations and actions taken.
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8.	**Catchment-scale engagement, capacity building and planning:** work to enhance the strength and capacity of catchment-level networks, so that catchment protection and management becomes embedded.
9.	**Funding of ASSAP:** maintain the balance of funding from government and industry as ASSAP expands, keeping the relative contribution of each under review.
10.	**Demonstrating impact, informing policy and research:** ASSAP should work with partner organisations to inform policy learning and research projects that are appropriate to experimental governance, linking iterative monitoring and review to higher-order long-term validation of the cumulative results of the overall approach to water governance.

Executive Summary

1. The Rationale and Relevance of ASSAP

ASSAP has a key role in improving water quality in Irish agriculture. The variety of farm conditions and the complexity of water movement means that 'one size fits all' policies, with general recommendations and rules, may struggle to be effective. The need for contextualised action is captured in the principle: the 'right action in the right place'. This requires engagement with farmers and others. This is part of an emerging system of experimental governance in the management of water and agriculture. ASSAP should be further developed under the 3rd RBMP, expanding as additional PAAs are selected, with appropriate scientific support (Recommendation 1**).** But ASSAP must be seen as necessary, not sufficient. Much more is required to meet the goals of *Food Vision 2030* and the WFD.

2. Continue to Focus on Water quality in the Priority Areas for Action (PAA)

ASSAP should continue to focus on water quality in the PAAs. Its objectives should be simplified to focus more on supporting farmers' implementation of the right actions in the right place and demonstration of their impact on water quality (Recommendation 2).

3. Efficiency

ASSAP has been effective in building and delivering the new advisory service. Its engagement with farmers was delayed by GDPR issues, the ramping up of LAWPRO's catchment assessments and restrictions on farm visits arising from the Covid pandemic.

4. Blockages to Implementation of Agreed Mitigation Actions

There are barriers to implementation of agreed mitigation actions. A number of factors are relevant: cost, current or possible future CAP schemes, rented land and licensing requirements. Financial support, external to the ASSAP, needs to be available to enable farmers implement agreed actions recommended by ASSAP advisors.

5. Problems in Nutrient Management Planning and the GAP System

A high share of farm-level issues and mitigation actions identified by ASSAP are already a part of GAP regulations. This indicates a significant weakness across the advisory services, cross-compliance inspection and industry buy-in to the GAP provisions. It also underlines the need for scientific risk assessment and tailored advisory input, of the kind provided by ASSAP.

6. Three Central Issues

ASSAP and its partners face three central challenges in the years ahead:

- *Closing the loop by ensuring and verifying the right action in the right place*: is it being identified and implemented and how do we know? Is it having the desired impact on water quality? How is it communicated and shared?;
- *Catchment Networks*: Ensuring that the local catchment network (including farmers and their local advisors) can carry on the work once ASSAP has moved on, while maintaining high levels of trust and engagement at farm and community level;

- *Wider Advisory Services*: Transforming the wider advisory services so that they can provide farmers with tailored advice, leading to good outcomes for water quality and broader benefits for nature, climate and farm income .

7. Enhance and Refocus the Wider Advisory Services

The further development of LAWPRO and ASSAP needs be accompanied by an accelerated enhancement and refocusing of the existing mainstream advisory services (both public and private) with a stronger focus on sustainability (economic, social and environmental), and on-farm and action-based engagement. (Recommendation 4). This involves a change in *substantive* focus, from production to sustainable production. It will also require a transformation in the *method and role* of advisory services, from transmitting certified knowledge, to bringing such knowledge into greater engagement with farmers to *co-produce plans and solutions* tailored to the specific conditions of each farm and catchment.

8. Closing the Loop

Formalise Continuous Diagnostic Review

The diagnostic flow-chart, designed by ASSAP and LAWPRO staff, should be adopted formally as a tool for short-cycle assessment, review of progress in a PAA and identification of network partners (Recommendation 5).

Spatial Recording of Recommendations and Measures Taken

ASSAP, supported by its partner organisations, should complete the move towards spatial recording of recommendations and actions taken (Recommendation 6). Shared with the relevant actors, the data would allow greater monitoring, analysis of progress, review and planning. It will be necessary to work with farmers and others to achieve this transparency.

Use Selected Waterbodies to Refine Demonstration of Actions and Outcomes

Selected waterbodies can provide a safe space to explore and refine demonstration of the right actions in the right place and their impact on water quality (Recommendation 7).

Catchment-Scale Engagement, Capacity Building and Planning

ASSAP should work to strengthten and capacity of catchment-level networks, so that catchment protection and management becomes embedded (Recommendation 8).

9. The Funding of the ASSAP Service

Government should maintain the balance of funding from government and industry as ASSAP expands, keeping the relative contribution of each under review (Recommendation 9).

10. Demonstrating Impact and Contributing to Policy and Research

ASSAP should work with partner organisations to inform policy learning and research projects that are appropriate to experimental governance, linking iterative monitoring and review to higher-order long-term validation of the cumulative results of the overall approach to water governance (Recommendation 10)

Main Report

Membership of the Review Panel:

Chair: Prof Rory O'Donnell (Geary Institute, University College Dublin);

Dr Matt Crowe (former Director EPA);

Prof Phil Jordan (Professor of Catchment Science, Ulster University);

Mr Harold Kingston (dairy farmer and Munster Regional Chair of the Irish Farmers Association);

Dr Trish Murphy (Inishowen Rivers Trust); and

Ms Orlaith Tynan (Head of Sustainability, Dairygold)

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1. The Review: Focus and Process

This review of the ASSAP programme was requested by Government in the course of its revision of the Nitrates Action Programme. The Protocol for the review was drawn up by Teagasc, in consultation with a range of stakeholders. It poses four Primary Questions on ASSAP—concerning its objectives, its efficiency, effectiveness and how its experience to date should inform its future—and a range of Secondary Questions on each of these. We outline both sets of questions at the start of the relevant sections of the report.

The Protocol states that a 'critical linking question between what has happened with the ASSAP to date and its future role is to establish if ASSAP is on the right path to be able to demonstrate the impact of ASSAP on farming practices and consequently on water quality trends'.

The Protocol suggests that the assessment should pay attention to a number of issues. These include:

- How ASSAP works with, and should work with, other advisory services, auditing processes and regulatory mechanisms;
- ASSAP governance structures;
- Collaborations needed with other stakeholders in order to achieve its objectives; and
- The most appropriate funding model for the ASSAP.

It also asks that the review should pay attention to the conditions that need to be realised for the future objectives of the ASSAP, identified in the assessment, to be achieved.

The Protocol also asks that an outline high-level framework or model of the future ASSAP be developed. It suggests that this pay particular attention to the conditions that need to be realised for the future objectives of the ASSAP to be achieved. and identify the risks associated with the absence of those conditions and the appropriate outline risk mitigation strategies.

A key input to the review was a Programme Description and Self-Assessment document prepared by ASSAP. The Review Panel held a pre-assessment workshop and conducted a two-day on-site set of interviews a wide range of stakeholders, on the 13th-14th September 2021 (see Appendix A). Following this, and a number of further questions to, and discussions with Teagasc and others, the Review Panel agreed this report. As we address the primary and secondary questions, we log our emerging

recommendations briefly in a box. But all our recommendations are brought together, and discussed more fully, in Section 5, on the future of ASSAP. The Review Panel was supported in its work by Dr Kevin Heanue, of the Teagasc Evaluation Unit, and expresses its gratitude for his work.

2. The Rationale and Relevance of ASSAP

Primary Question	Secondary Questions
Q1. Is the design of the ASSAP relevant and is it an appropriate response?	To what extent are the objectives of the ASSAP in line with: The emerging requirements of national and EU policy and plans (e.g. RBMP, CAP, Nitrates Directive, Water Directive, sustainability of objectives of the dairy sector etc.)? The advice and support needs of farmers both within and outside PAA's? Other issues to be considered under this criterion include: Are the current ASSAP objectives sufficiently precise? Do the ASSAP objectives need to change for the third RBMP cycle?

2.1 Is the design of ASSAP relevant and is it an appropriate response?

The Review Panel's unambiguous answer to the Primary Question 1 is that the design of ASSAP is relevant and it is a vital element for addressing the water quality challenges in Irish agriculture. Indeed, this is the first of our High Level Findings.

ASSAP is an innovative agri-environmental science-advice framework. It exists because of scientific and policy development and can be considered a world-leading example of high-level partnership between government, public agencies, the agricultural industry and other stakeholders. As a relatively young initiative, ASSAP (with the LAWPRO science companion) should be resourced and developed in the years ahead.

The water quality and agricultural pressure policy requirements for Ireland as an EU member state are clear and based on the Water Framework Directive and Nitrates Directive. There is an urgency in ensuring all policy tools are robust as member states work towards WFD targets for 2027. There is a close link with the CAP and particularly the support mechanisms it provides, and potentially provides, to the industry.

The establishment and design of ASSAP reflects the findings of both the Agricultural Catchments Programme (ACP) and the work of EPA Catchment Science Management Unit (Deakin, 2015). Key findings were that the complexity of farming—operating on

different soil types, geologies, and under variable weather systems—means that general recommendations on water quality objectives are likely to struggle in their purpose (Shortle and Jordan, 2017, p. 17; Daly et al, 2016. P. 16). The report on Phase Two of the ACP explicitly challenged 'a "one size fits all" approach to how land and nutrient inputs are managed', and it observed that even user-friendly plans—in the sense of convenient presentation of the relevant good practices—'on their own will not meet the farmer's needs and increase their effectiveness'. In the best case, 'advisory support is required to help with implementation' (Shortle and Jordan, 2017, p. 17; Leahy and Walsh, 2015). The resulting emphasis on contextualised action to strengthen the principles of Good Agricultural Practice (GAP) is captured in the guiding principle of all work in this area: identify and take the 'Right Actions in the Right Place'. It is striking that this term is widely used by all the actors in the new water governance system. Its meaning, requirements and full implications are gradually being discovered, because they are both pervasive and profound.

In order to ensure the Right Actions in the Right Place it is necessary (a) to have fine-grained knowledge of water pressures and their sources, and (b) to design and implement context-relevant measures that can address them. This requires engagement with farmers and others whose cooperation is necessary. ASSAP advisory services are one vital link in this chain and ASSAP is one important element in the institutional architecture.

But ASSAP is only relevant, and constitutes an appropriate response, in the context of both long-standing measures to deliver the Nitrates Action Programme (NAP), via associated GAP regulations, and the overall approach to water governance designed for Ireland's Second RBMP.

Put more precisely, ASSAP was created as a small additional provider of targeted water-specific advice, to sit within, and complement, the much larger regime of agricultural advice, actions that promote compliance with GAP cross-compliance checks. Ideally, ASSAP would focus on identifying and mitigating additional pressure on water quality, in a context in which compliance with GAP regulations is largely in place. ASSAP, with its detailed local assessments and highly tailored farm plans, would be a step beyond a 'one size fits all' policy. We return to this several times in the report, as it is relevant to some of our main findings and informs some of our recommendations.

The Review Panel sees the new approach, and the three-tier governance system, as part of an emerging experimental governance regime for the management of water in Ireland. This, when combined with Origin Green certification standards, involves a move towards co-evolution of Irish agriculture and its regulatory framework. The

concept of experimental governance, and its application to Irish environmental policy in an EU context, can be found in a number of NESC reports over the past decade (see, for example, NESC, 2010). More specifically, this understanding of Ireland's emerging approach to water management and agriculture, particularly the dairy sector, was articulated in work at the National Economic and Social Council (NESC), in collaboration with Columbia University (Sabel et al., 2021). Building on this, it is the focus of ongoing work commissioned by the EPA from the Institute of Public Administration (IPA) (Boyle et al, 2021; O'Riordan et al, 2021). It is of interest that staff in ASSAP, and the many of the other organisations in the emerging system, regularly refer to it as 'experimental governance'. Indeed, they are aware of the many instances and ways in which their experimental governance collides with more traditional forms of hierarchical and siloed public administration and regulation.

The Review Panel is in no doubt that, within this evolving regime for sustainability and sectoral development, ASSAP should be further developed. The direction of development is outlined in later sections. In further developing ASSAP it is important to be cognisant of how relatively young the entity is and that it is still in the process of proving itself capable of converting science, advice and support into tangible and measurable improvements in water quality through taking the right action in the right place.

There was general agreement amongst the panel and those interviewed that the name ASSAP could be improved upon. While it is probably not the right time to change the name, we are recommending that Teagasc engage professional communications advice to review and advise on overall branding and promotion of the service.

Recommendation 1: Develop and expand ASSAP: ASSAP should be further developed under the 3rd RBMP, expanding as new PAAs are selected, with appropriate scientific support. Communications expertise should be engaged to consider naming, branding and promotional issues.

2.2 Are the objectives of the ASSAP in line with the emerging requirements of national and EU policy and plans?

ASSAP's objectives are broadly in line with existing and emerging requirements of national and EU policy for water quality protection and the WFD Programme of Measures. But ASSAP must be seen as necessary, not sufficient. EPA catchment characterisation shows that water pressures from agriculture are still increasing. Indeed, Ireland and most member states, have a long way to go to meet the objectives of the WFD. In addition, the recently-adopted *Food Vision 2030* (FV2030), commits 'to reduce nutrient losses from agriculture to water by 50 per cent by 2030' (Mission 1, p.

30, Government of Ireland, 2021). Much more is required to meet these goals and targets. Our analysis of ASSAP's work, and the evidence brought to the Review Panel, suggest some of these requirements, and these are outlined in our recommendations.

2.3 Are ASSAP objectives in line with the support needs of farmers both within and outside the PAAs?

Our answer is in two parts. First, ASSAP's objectives and services are pertinent to farmers both inside and outside of PAAs. Indeed, in the course of our hearing, the Review Panel heard of farmers from outside seeking ASSAP advisory services.

But, second, the advice and support needs of farmers are far wider than those provided by ASSAP. As noted in our High Level Findings and Executive Summary, a significant proportion of the problems identified by LAWPRO and ASSAP, and the mitigation actions proposed by ASSAP, include 'Preparation and Implementation of NMP' and 'Organic Manure Timing, Location and Method'. We discuss this further when we consider Primary Question 3 (Has ASSAP been effective in achieving its objectives?), and it informs our recommendations on the future of ASSAP, discussed in Section 5.

2.4 Are current ASSAP objectives sufficiently precise and do they need to change for the third RBMP cycle?

As outlined in the Programme Description and Self-Assessment (PDSA), there are ten ASSAP objectives (see Appendix B). Broadly speaking, these were appropriate and sufficiently precise for the set-up phase of ASSAP under the 2nd RBMP cycle and for the 190 PAAs.

ASSAP's objectives are of three types:

a) Objectives 1-5 relate to the establishment of ASSAP—which we label *building and delivering the service*;

b) Objective 6 is 'To develop and implement a structured approach to transitioning of a PAA to allow for post-ASSAP management by relevant competent authorities'—which we label *ongoing catchment protection*;

c) Objectives 7-10 refer to transmission of information, resources and findings to the broader advisory system, to policy on water quality and agricultural, and to research—which might be labelled *mainstreaming and informing*.

With the ASSAP service now established, the objectives in Group (a) become less relevant. As discussed further in Section 5, Group (a) objectives should now be

modified and simplified to focus more on performance, using for instance the SMART goals framework, and they should include a greater focus on assisting farmers' implementation of the measures recommended by ASSAP.

In Group (b), Objective 6, concerning the 'post-ASSAP' management of catchments, *ongoing catchment protection,* remains relevant. This requires ASSAP and its partner organisations to work on building the capacity of local actors within each catchment. It is addressed further when we discuss the future of ASSAP, in Section 5.

The objectives in Group (c)—concerning the mainstreaming and diffusion of ASSAP knowledge, methods and learnings—remain critical. Mainstreaming this emerging knowledge within the wider advisory services should continue to figure as an overall objective under the 3rd RBMP, but Teagasc research, knowledge transfer and advisory functions should lead this mainstreaming activity - not ASSAP. The formulation of revised objectives on mainstreaming and diffusion of ASSAP knowledge should be informed by the existing interaction between ASSAP and the wider advisory services. But, in particular, ASSAP's work in this respect should be designed in tandem with Teagasc's reform of the mainstream advisory services to embed sustainability—and provide an exemplar to other advisory services. This is discussed further in Section 4, where we consider how effective ASSAP has been in achieving its objectives, and in Section 5, where we discuss the future of ASSAP.

With regard to possible changes in the objectives of ASSAP, one view is that ASSAP's focus should now expand beyond water quality to encompass other dimensions of sustainability, such as biodiversity and GHGs. While this wide remit must, sooner rather than later, be embedded in all agricultural advisory services, the Review Panel emphasises that ASSAP is a young and small-scale service, and is still developing internally and in its engagement with other actors, including farmers. With the other actors in the three-tier water governance system, it still has a way to go in being able to provide 'proof of concept'. Therefore, the Review Panel recommends that its focus continue to be primarily on water quality in the PAAs. However, where there are multiple benefits from a corrective action—such as when addressing a water problem involves a nature-based solution which enhances biodiversity or carbon sequestration—this synergy should be promoted and exploited. It is important that any corrective actions that take place do not have a detrimental effect on factors such as biodiversity or hydromorphology. In time, of course, all agricultural advisory services will need to encompass the various dimensions of sustainability. We note this recommendation here and return to it later.

Recommendation 2: ASSAP should continue to focus primarily on water quality in the PAAs. Its objectives should be simplified to focus more on farmers' implementation of the right actions in the right place and demonstration of their impact on water quality.

3 Efficiency

Primary Question	Secondary Questions
Q2. Has the implementation of the ASSAP been efficient?	Define the inputs and outputs associated with the ASSAP and identify the level, unit cost and trends of outputs. How well is ASSAP managed and administered? How can the outputs of ASSAP be maximised in the context of repurposed state and/or private resources?

Overall, the Review Panel is satisfied that the implementation of ASSAP has been efficient. It is a well-managed programme, with able leaders and staffed by professional and highly-committed advisors. Their engagement with farmers was somewhat delayed by GDPR issues, the simultaneous ramping up of LAWPRO's PAA catchment assessments and, as those issues were being resolved, severe restrictions on farm visits arising from the Covid pandemic. It used some of this early time to work with LAWPRO to codify and operationalise a work flow process for joint LAWPRO-ASSAP actions in a PAA. This is illustrated in the impressive work flow protocol (see Appendix C), and ASSAP is now actively undertaking its central tasks (the Review Panel were impressed by evidence of the frequency and quality of interactions between LAWPRO scientists and ASSAP advisors).

The Review Panel was not provided with detailed information on the level, unit cost and trends of outputs. Analysis of such data will be more relevant in a future ASSAP and the relationship between inputs, outputs and outcomes can be better identified.

A future efficiency challenge for ASSAP, working with Teagasc and other actors, will be how quickly and efficiently the knowledge and learnings from ASSAP can be shared with the wider advisory networks, so that this knowledge can be used to drive good water quality outcomes in areas outside of ASSAP involvement.

4. Effectiveness

Primary Question	Secondary Questions
Q3. To what extent has the ASSAP been effective in achieving its intended objectives?	Does the ASSAP fulfil its stated objectives? Have the ASSAP targets been met? Are the approaches taken by collaborating organisations consistent in helping to meet targets? What attitudinal or behavioural changes have occurred among farmers Have aspects of the ASSAP over or under-performed and, if so, identify the causes of this over or underperformance?

Ultimately, the effectiveness of ASSAP—within the context of the overall governance structure and policies—will be measured by the success of actions taken in the PAAs and their impact on water quality. The questions will be 'have the right action in the right place happened?' and 'have they had the desired results in improving and protecting water quality?'. However, the ultimate goal, improved water quality, was not a part of ASSAP's initial objectives—but was included in an overarching aim. Nevertheless, it is important that early successes be demonstrated and publicised, and that the organisation and its partners build on these successes. We discuss the challenge of demonstrating impact further in Section 5, when we consider how ASSAP can best contribute to policy and research.

With regard to its existing objectives, ASSAP and Teagasc have already done an impressive amount of reflection and review, with two Interim Reports, a SWOT analysis and the formulation of ideas on operational improvements, as outlined in the PDSA document. This is good practice and fits well with the OECD Water Governance Framework.

In assessing to what extent ASSAP has been effective in achieving its objectives, we consider separately the three types of objective noted above:

- building and delivering the service;
- ongoing catchment protection; and
- mainstreaming, diffusion and informing policy and research.

4.1 Has ASSAP Achieved Objectives 1-5: Building and Delivering the ASSAP Service?

4.1.1 Building the Service and Providing Recommendations

Most of the objectives related to *building and delivering the service* (Objectives 1, 2, 3, 4) appear to have been largely achieved. The training of ASSAP advisors, and their close collaboration with LAWPRO and others, has made them effective in identifying the farm-level pressures on water quality, in engagement with farmers, in reaching agreement on a set of measures to be undertaken, and in reviewing progress in implementation. Evidence in relation to these intermediate outcomes is very strong and augers well for documenting the 'right action in the right place' and its impact on water quality.

4.1.2 Achieving Implementation of the Recommended Mitigation Measures

Objective 5 is 'To co-design with stakeholders a suite of mitigation measures'. Engagement with farmers and advice on mitigation measures has been significantly advanced in the ways just noted. But, within the spirit of experimental governance and engagement, 'co-design of mitigation measures' should, ideally, encompass *implementation* (co=production) of the actions, certainly of the 'agreed actions'. One of the claims of experimental governance is that—through contextualisation of plans, engagement, monitoring and recursive learning—it can design and achieve actions that elude arms-length advice, top-down instruction and punitive systems of inspection and enforcement.

On delivery and implementation, ASSAP is building its systems for documenting and reviewing its work (see ASSAP's internal Reviews and the PDSA document). One aspect is to record and classify its recommendations, distinguishing between four broad categories: 'P loss through overland flow', 'preparation and implementation of NMP', 'buffers' and 'organic manure timing, location and method'—each of which contains several more precise types of mitigation action. A second dimension is review of the recommended actions based on return visits to farms—recording them as either 'complete', 'ongoing', 'commenced', 'not started' or 'not proceeding' (see Figure 11 of the PDSA document). This dataset allows us to make initial judgements on the extent to which ASSAP has been effective in achieving both co-design and *implementation* of the mitigation measures. These judgements provide the basis for several of our recommendations.

First, there was an impressive overlap between those issues identified by ASSAP and those agreed by individual farmers (92 per cent). This indicates, that on the whole, the ASSAP message is on the right track and that these messages/issues are recognised by the farming community. Indeed, in our discussion with a range of stakeholders we were struck by repeated references to the fact that farmers will take action when the *reason* for mitigation measures is made clear, based on scientific evidence on the nature and cause of the observed water quality problem.

Second, it is interesting to consider the data generated by ASSAP's return visits and monitoring of farmers' progress in implementing the actions agreed and recommended. Compared with the level of 'agreed' actions, the overall share of 'completed' actions is 8 percent. The figure for 'completed' or 'commenced' is 24 per cent. In addition, 28.5 per cent of actions are recorded as 'ongoing'. Indeed, some measures are ongoing by their very nature, as they are practices or behavioural changes that need to be implemented year-in year-out. The combined percentage for 'commenced', 'complete' and 'ongoing' is 52.5 per cent. This is encouraging but, overall, the data suggest that there are some further barriers to implementation of mitigation actions. Existing knowledge suggests that a number of factors explain non-implementation of the recommended actions. These include:

- Cost can be a significant factor, especially where the mitigation actions involve capital expenditure or removing land from production;
- Related to that, the provisions of various other agricultural schemes under CAP can restrict or disincentivise action by farmers;
- There is evidence that some farmers have been reluctant to act now, in case future CAP arrangements might provide support or, indeed, even penalise actions;
- Farmers are more reluctant to undertake expensive actions on rented land;
- The age and income profile of farmers can be a factor;
- Sometimes, implementation of measures is delayed by licensing requirements and regulatory provisions and processes in public agencies.

Interim research results from the WaterMARKE project indicate that larger farms are more likely to start measures earlier than smaller farms, and that diffuse pollution mitigation measures were less likely to be started than point-source pollution issues.

Based on this evidence, the Review Panel recommends that financial support, external to the ASSAP, needs to be available to enable farmers to implement the agreed actions

recommended by ASSAP advisors. We log this recommendation here and return to it when we discuss the future of ASSAP, in Section 5.

Recommendation 3: Funding to Support Farmers' Implementation of Actions. Financial support, external to the ASSAP, needs to be available to enable farmers implement agreed actions recommended by ASSAP advisors.

There is a third aspect of the data on the problems identified by ASSAP and implementation of actions that is of great significance. In ASSAP's data of the issues and mitigation actions, a significant number are in the categories 'Preparation and implementation of NMP' and 'Organic manure timing, location and method'. Nine of the issues listed under these two categories, for example, were identified as part of GAP, amounting to 40 per cent of all issues enumerated.

This suggests that one of the assumptions underpinning ASSAP as a new and supplementary advisory service, noted in Section 2—that all compliance with regard to Good Agricultural Practice is ideally in place—is not entirely valid. First, it is clear that prior weak or non-implementation of nutrient management plans in the PAAs is a cause of many of the water quality pressures identified by LAWPRO and ASSAP. Furthermore, ASSAP's data on the level of implementation of the proposed actions suggest that inability or reluctance to achieve the suggested actions—such as 'precision application of nutrients at the correct times'—is a significant factor. It is important that the reason for these patterns be identified. They would seem to indicate a significant weakness across the wider advisory services, cross-compliance inspection and industry buy-in to the GAP regulations.

The view of the patterns of pressures on water and of difficulties of implementation identified by ASSAP in the PAAs, the Review Panel recommends that, alongside the further development of LAWPRO and ASSAP, there needs to be a major enhancement of the mainstream advisory services. Again, we log this important recommendation here, and return to it in our discussion of the future of ASSAP.

Recommendation 4 : Enhance the mainstream advisory services The further development of LAWPRO and ASSAP needs be accompanied by an accelerated enhancement and refocusing of the existing mainstream advisory services (both public and private) with a much stronger focus on sustainability (economic, social and environmental), and on-farm and action-based engagement.

4.2 Has ASSAP Achieved Objective 6: Ongoing Catchment Protection?

ASSAP's sixth Objective is 'To develop and implement a structured approach to transitioning of a PAA to allow for post ASSAP management by relevant competent authorities'. It seems likely that the scientific work and engagement with communities, organisations and individual farmers, undertaken by LAWPRO and ASSAP to date, has started to build local capacity. Beyond that, while building the service, and the inter-organisational systems necessary for this, there has probably been limited opportunity for ASSAP and LAWPRO to focus on Objective 6. As this round of LAWPRO and ASSAP work on a PAA is completed, it will be necessary to ensure that the management of a catchment, involving all the relevant actors, is able to protect water quality and address new threats as they arise. To promote this, ASSAP's ongoing work should include a focus on local capacity building. This will require enhanced catchment-scale engagement and planning to build and strengthen local water catchment networks. We outline and discuss this recommendation (number 9) further in Section 5.

4.3 Objectives 7-10: Mainstreaming to the Broader Advisory Services and Informing Policy and Research

These objectives relate to the ambition of using the ASSAP innovation and its findings to influence the broader advisory services, inform water and agricultural policy, and enhance research. Objective 7 is to 'Develop water quality focused information and resources for use by the broader advisory and education services', and Objective 8 is 'To disseminate the information and findings of the ASSAP and LAWPRO to the broader advisory and education services'.

As documented in the Programme Description and Self-Assessment Document, ASSAP has created the opportunity to provide water quality focused advice and discussion through multiple knowledge transfer methods to the wider farming community. In doing so, this has helped to increase the level of awareness on water quality and also the farming practices that have a positive or negative impact. This knowledge transfer is key to measures and actions being sustained into the long term and providing farmers and the agricultural industry with the tools to have a positive impact on waters.

Both Teagasc and the dairy processing co-ops have organised, participated in and facilitated a wide variety of extension platforms harnessing the expertise of water quality scientists and research and advisory experts to provide up-to-date knowledge

and advice to the farming community as well as to community groups and local organisations.

These measures are impressive and extremely valuable. Indeed, ASSAP staff has devoted a considerable share of their time to these dissemination, education and communication activities.

However, as noted above, the pattern of pressures on water identified by ASSAP, and the challenge of achieving implementation of the actions recommended by ASSAP advisors, indicate a wider problem with the GAP that needs to be understood and addressed. This is a direct manifestation of those ACP (Phase Two) reflections noted earlier. Consequently, the Review Panel suggests that ASSAP's valuable dissemination activities need to continue in the context of a simultaneous accelerated enhancement and refocusing of the existing mainstream advisory services, as outlined in Recommendation 4. In context of that enhancement, we suggest in Section 5.5 that Teagasc research, knowledge transfer and advisory functions should lead the mainstreaming activity, not ASSAP As We discuss ASSAP's Objectives 9 and 10 (Informing broader water quality and agricultural policy, and informing research), in Section 5, where we consider the future of ASSAP.

5. The Future of ASSAP

Primary Question	Secondary Questions
Q4. How can the experience of ASSAP to date inform the future ASSAP?	What are the areas for development and improvement in the existing ASSAP and what conditions are needed for these developments and improvements to occur? What is the future role of the ASSAP in implementing the 3rd RBMP and what conditions are needed to ensure this role can be fulfilled? What should the future objectives of the ASSAP be? Are there opportunities for ASSAP to lead the industry in providing a new KT template for upskilling and education across all areas of the AKIS in water quality agricultural advice aimed at helping to achieve national water quality targets? Is there an opportunity to establish multifunctional collaborative advisory teams that deal with all aspects of on-farm sustainability? Examine the opportunities for integrating and delivering on water policy, Climate Change, Biodiversity and broader economic, social and environmental sustainability objectives and identify the role that ASSAP might play in achieving this during the third RBMP cycle.

Here we address the question: How can the experience of ASSAP to date inform the future ASSAP? We do this by outlining further our findings and perspective, and bringing together our recommendations. We also address, to the extent possible, the request that the review pay particular attention to a number of additional issues.

5.1 ASSAP is an important innovation which should be further developed

In Section 2.1, we noted the features of ASSAP that make it an importance innovation. Its establishment and design reflects the complexity of farm conditions and the movement of water. It combines scientific analysis to identify problems at the scale of catchments, PAAs, farms and fields, and uses engagement to co-produce mitigation actions and agricultural need to identify and initiate the right actions in the right place.

ASSAP and LAWPRO have a number of new national resources to use for 'targeted advice'. These include new PIP maps for field scale assessment of the risk of diffuse pollution from P and N. These resources have been described as a 'game changer' for risk assessment and advice. They make possible augmented mitigation against diffuse pollution by identifying and taking the Right Actions in the Right Place. These enhanced resources are based on scientific partnerships between government agencies and universities and, at national scale, are a major breakthrough. For risk assessment and management, the online maps indicate to scientists where diffuse pollution is likely to be more concentrated (hotspots); and to advisors and land owners/managers they point to where advice should be focused to be most effective.

ASSAP has succeeded in establishing the personnel required for roll-out as envisioned. The Review Panel was impressed by the reallocation of permanent, experienced, staff from the wider Teagasc and industry advisory services. This is considered the best way to establish trust and continuity with farmers in PAA catchments—rather than using less experienced staff or short-term contract staff. ASSAP has also established all of the necessary networks and governance structures proposed at the outset. Communication pathways between ASSAP and LAWPRO, at both high-level and at grass-roots (advisor-scientist) level, are all clear and the communication gaps (that can be revealed during review milestones) are also clear.

5.2 ASSAP should continue to focus on water quality

For the reasons given in Section 2.4, the Review Panel recommends that ASSAP's objectives should continue to focus primarily on water quality in the PAAs (see Recommendation 2).

5.3 Expand ASSAP under the 3rd River Basin Management Plan

The Third River Basin Management Plan, which will run from 2022 to 2027, seems likely to add further PAAs. Consequently, the plan needs to provide for an incremental expansion of ASSAP, and to ensure that appropriate scientific support from LAWPRO is provided to the additional ASSAP advisors. The RBMP also needs to provide for the training and knowledge transfer mechanisms needed to transform the wider public and private advisory services. This is necessary to achieve the Right Actions in the Right Place to deliver good water quality outcomes and wider benefits for biodiversity, climate and farm income.

Ideally, ASSAP will become an innovation hub for both water quality improvement and protection functions as, in many cases, similar actions to those employed for improvement are needed to protect water quality. In a similar vein, these actions can also deliver benefits for nature and climate (e.g., tree planting, wetland establishment), if planned correctly and with these multiple benefits in mind. All elements of the advisory service (ASSAP, public sector advisors and private sector advisors) need to be providing farmers with consistent and up to date advice on water quality management and have access to the same advice and support toolkits (once tested out through ASSAP). Mechanisms for achieving this should be provided for in the 3rd cycle River Basin Management Plan.

5.4 Funding to Support Farmers' Implementation of Actions

There is evidence that cost is one of the factors limiting farmers' implementation of some necessary and agreed actions. Some actions, involving capital expenditure or reallocation of land, can involve considerable cost. Consequently, financial support, external to the ASSAP, needs to be available to enable farmers to implement the agreed actions recommended by ASSAP advisors. With the new water management regime, the science is targeted, the advice is targeted, but much of the available financial support is not. Attention needs to be given to addressing the cost barriers. At the very least, measures suggested by ASSAP analysis should not be inhibited by mainstream CAP provisions and the design of Environmental Schemes.

In addition, the Review Panel recognises that the concept for 'breaking pathways', to manage diffuse pollution from surface and sub-surface hydrological pathways, often requires nature-based solutions such as woodland, smart buffers and wetlands, or fallow areas and cover crops. These solutions offer multiple benefits to society (diffuse pollution, carbon sequestration, water regulation, biodiversity potential). There is an opportunity for high-level joined-up thinking between the existing and potential support mechanisms for farmers to link all this together. As highlighted above, the Review Panel notes that financial support, external to the ASSAP, needs to be available

to encourage farmers to mitigate some of the more pressing and larger diffuse and point-source pollution issues where physical intervention is required. It also recognises that there are several financial resource schemes already in place (e.g., TAMS, GLAS, EIP etc.), or which may become available in the future, but which are not targeted at PAA-identified issues. To help the ASSAP-LAWPRO partnership to close the gap between issues identified in PAAs and other catchments, and for those issues to be rectified to completion (notwithstanding GAP related issues), the Review Panel recommends that support mechanisms be reviewed and developed. There also needs to be reflection on whether these mechanisms would support those issues identified relating to GAP and those, related to non-GAP augmented actions. There is clearly need for a high-level conversation here, but the ASSAP data validates problems with the GAP system (encompassing advice-compliance-inspection buy-in) that identifies a further pressing need. The panel recognises a dichotomy here, but also that the overall weakness in reducing nutrient pollution from agricultural land (encompassing advice-inspection-industry) identifies a more pressing need for targeted support than for targeted enforcement.

5.5 ASSAP's Experience Shows the Need for a Major Enhancement of the Mainstream Advisory Services

Consequently, following on from the final points in Section 5.4, and as noted in Recommendation 4, the Review Panel believes that the further development of LAWPRO and ASSAP needs be accompanied by an accelerated enhancement and refocusing of the existing mainstream advisory services (both public and private) with a much stronger focus on sustainability (economic, social and environmental), and on-farm and action-based engagement. There is also a need to quickly put in place knowledge transfer systems and training, so that the wider public and private advisory services can learn from the ASSAP approach and be able to provide similar and consistent advice to farmers. We suggest that Teagasc research, knowledge transfer and advisory functions should lead this mainstreaming activity, not ASSAP The Review Panel is not suggesting that the entire national advisory service becomes the same as ASSAP. But the wider advisory services have access to the innovation and learning being developed through ASSAP, so that the widest possible spectrum of farmers can benefit from this innovation and learning. Farmers need to be at the centre of service design, as in most situations it is a farmer who is being asked to implement the Right Actions in the Right Place.

There are two related dimensions in transitioning the mainstream advisory services to the current requirements of the food system and the goals set out in *Food Vision 2030*:

- First, there is transition in *substantive* focus, from an emphasis on production, to a focus on sustainable production.

- Second, there is a transformation in the *method and role* of advisory services, from mainly transmitting certified knowledge established by scientific research, to bringing such knowledge into a greater contextual engagement with farmers and other industry actors in order to *co-produce action-based plans and solutions* tailored to the specific conditions of each farm and catchment.

Part of the development involves the provision of outcome-based and development-focused advice, with an emphasis on sustainable production, in tandem with measure/regulation based work.

The Review Panel notes that, as outlined in its recent Statement of Strategy, Teagasc has a number of measures started and planned relevant to water quality and ASSAP. One is extension of the ACP in Phase Four, by integrating gaseous emissions and water quality monitoring, and scaling up the programme o river basin level. A second is the establishment of the SignPost Farms Programme, which will develop the methodology of Farm Sustainability Plans. As well as renewing ASSAP, it intends to 'provide upskilling, support and training to over 600 Farm Advisory System accredited advisors and to 7,000 derogation farmers on new innovative solutions to protect water quality through the ConnectEd Programme' (Teagasc, 2021, p. 49).

Given the scale and urgency of the water quality challenge, and associated threat to Irish agriculture, reforms and actions to enhance and refocus the advisory services need to happen sooner rather than later, building on those strategic initiatives.

5.6 Our Understanding of 'Closing the Loop' from Catchment Characterisation to Action and Informing Policy and Research

Before outlining our further recommendations, it useful to explain our thinking on a number of related issues, including 'proof of concept'.

The evidence and argument outlined above highlights a number of challenges. Among them is the challenge of achieving a high level of implementation of the measures suggested in the farm plans agreed by ASSAP advisors and farmers, and the challenge of preparing for ongoing catchment protection. Below we outline a number of ideas and recommendations on these. These can be seen as measures aimed at 'closing the loop'—the loop that runs from catchment characterisation, through local assessment, to identification and implementation of the right actions in the right place. Such a loop, as shown in Appendix C, figured prominently in the design and presentation of the new approach to water governance and the three-tier governance structure and is widely cited by staff in EPA, LAWPRO and ASSAP.

Separately, in our discussion of how effective ASSAP has been in achieving its objectives, we postponed consideration of a number of ASSAP's objectives. Specifically, we deferred discussion of Objective 9 ('To use the information and findings of the ASSAP and LAWPRO to inform broader water quality and agricultural policy), and Objective 10 ('To use the information and findings of the ASSAP and LAWPRO to inform research'). Below we make some tentative suggestions on how these objective might be pursued.

Our introductory clarification is this:

- Demonstrating the effectiveness of experimental governance is complex, but possible, and requires careful design of a set of tests and projects;
- We believe that there needs to be a connection between ASSAP's work to close the loop, on the one hand, and its contribution to policy and research, on the other;
- This will involve a link between ASSAP's ongoing iterative review—using local review of successes and failures to frequently adjust what it does—and more encompassing research that assesses the effectiveness of the overall approach and contributes to policy;
- We believe that the 13 Proof of Concept Waterbodies (located in nine PAAs) have a role, but more as a safe space for *refining the LAWPRO-ASSAP,* including finding the way to greater transparency on the right actions in the right place, rather than as a scientific tool for *proving the concept per se*—though a part of this relates to recording actions;
- In order to assess the effectiveness of ASSAP and related processes in achieving intermediate and ultimate goals (concerning catchment-level water quality), other data and resources, are becoming available to Teagasc and others, and are these likely to be more productive than the existing proof of concept project.

With these clarifications, we now outline our views and recommendations.

5.7 ASSAP Measures to help 'Close the Loop' from Local Assessments to Implementation

An important element in 'closing the loop' is providing clear and transparent evidence that Right Actions in the Right Place have (a) been identified and (b) implemented with a measurable and recordable positive impact on water quality. Clear evidence is available from the ASSAP documentation that the steps leading up to identifying the right action in the right place are taking place and that there is also strong farmer buy-

in to the process. However, the final step of identifying and implementing the right action in the right place remains somewhat elusive.

Here we outline a number of ideas and recommendations.

5.7.1 Continuous Diagnostic Review

The Review Panel suggest that the diagnostic flow-chart, designed jointly by ASSAP and LAWPRO staff, should be adopted formally as a tool for short-cycle assessment and review (see Appendix D). Among its interesting features is that when it signals that the work in a PAA is not complete it asks, among other things, what external actors/agencies are relevant to taking measures forward. This reflects the fact that the implementation of the actions suggested by the ASSAP Advisors is sometimes inhibited by external factors, such as blockages in licensing or other administrative processes. As experimental governance regimes develop, they tend to confront and reveal long-standing features of siloed and hierarchical public administration, as well as cognate policies that need reform.

Recommendation 5: Continuous diagnostic review: the diagnostic flow-chart, designed jointly by ASSAP and LAWPRO staff, should be adopted formally as a tool for short-cycle assessment, review of progress in a PAA and identification of necessary network partners.

5.7.2 Complete the Move Towards Spatial Recording of Recommendations and Measures Taken

ASSAP, supported by LAWPRO and Teagasc, has made significant progress in recording farm assessments, farm plans and agreed measures, the review of actions and the progress on their implementation by farmer. This is creating data that will be essential in analysis of the service, the pattern of water quality problems and problems of implementation. In our discussion with a range of individuals, we were impressed by the argument that ASSAP should move towards spatial recording of recommendation and actions undertaken at farm level.

To date, ASSAP provides all farms that have been assessed with a farm plan that needs to be implemented by the farmer. The plan involves a list of actions in the form of a letter and also a map identifying the locations of where the measures are to be implemented. The ASSAP currently does not have a dedicated mapping system and the advisors resorted to using various freely available mapping solutions to overcome the problem, such as Google Maps. These maps are stored on the Teagasc DMS Cloud but are all individual files. This issue, along with the necessity to move from an Excel based database to a web based data base, has prompted Teagasc to secure funding from DAFM to develop mapping and database capabilities on the existing NMP Online

system. This new system will provide a single location for all farm plans and maps and will be possible to interrogate to get spatial data on the type and locations of measures that farmers are implementing.

The EPA PIP maps available to both ASSAP and LAWPRO personnel provide a basis for assessing action and response following the completion of ASSAP-identified measures. ASSAP should consider the mechanics of moving towards spatial recording of actions recommended and taken. This would greatly enhance the power of the PIP maps, produced by the EPA, which show the pathways and likely pressure points. Shared with the relevant actors, the data would allow greater monitoring, analysis of progress, reviews and planning. However, the transparency between ASSAP and LAWPRO required for this, needs to be carefully considered with all partners and especially industry partners. Central principles of ASSAP are confidentiality and trust with farmers and these need to be protected and enhanced. Farmer buy-in to water quality restoration and protection is likely to be more sustainable than inspection and enforcement. However, without some interface of spatial data recording and exchange between ASSAP and LAWPRO, there is no facility for farmers and others to gauge the level of effectiveness at the PAA level, and to identify and where more (or less) may need to be done.

Recommendation 6: Spatial recording of recommendations and actions: ASSAP, supported by its partner organisations, should complete the move towards spatial recording of recommendations and actions taken.

5.7.3 Using Selected Waterbodies to Refine the ASSAP Concept and its Demonstration

We suggest that selected waterbodies (for example, the 13 Proof of Concept Waterbodies in nine PAAs) can be used as a safe space to further refine the LAWPRO-ASSAP approach and, in particular, to work out how best to demonstrate and communicate that the right action in the right place has been identified and implemented. Further development of a number of aspects of the work could see the proof of catchment waterbodies as sites in which ASSAP 2.0 is designed.

One issue that can be teased out in the proof of concept areas is how best to deal with the post-ASSAP/LAWPRO issue – i.e. who continues within a PAA when ASSAP and LAWPRO move on and how will this will work in practice? Ideally, the local water management networks—involving state, private and NGO entities with a role or an interest in water quality—would be skilled up to ensure that the gains made while ASSAP and LAWPRO were in the area can be maintained and further developed once they have moved on. Again, trust is at the centre of this and all of these entities will

need to learn how to work together with a common purpose of supporting farmers and other land managers in protecting and improving water quality—this, in essence, is the local water catchment network.

As well as some of the innovations noted above, work in the selected waterbodies can contribute the move towards fuller recording of actions, greater sharing of information on this and, ultimately, demonstrating impact. (But, as noted above, this preliminary work is not the same of using these waterbodies as a comprehensive scientific proof of concept.)

This aspect of the future work in these selected 'safe spaces' arises because, well short of scientific proof, there are challenges and sensitivities to more transparently showing that the right action in the right place has (a) been identified and (b) been implemented, and sharing this information more widely than with the individual farmer. Maintaining trust is key to this. Consequently, farmers in the selected areas will need to be involved in working out information sharing arrangements. It is in everyone's interests that there be clear evidence and transparency that the right actions in the right places are taking place and are having the desired impact on water quality.

As this engagement and work progresses it will, of course, begin to overlap with other projects and processes intended to measure and demonstrate the impact of ASSAP and the experimental governance approach to water quality—something we discuss in Section 5.9 below.

Overall, the Review Group recommends that a 'safe place' be created for this exercise within the 13 'proof of concept' waterbodies.

Recommendation 7: Safe spaces to enhance transparency of the right actions in the right place and their impact: Use selected waterbodies (the 13 'proof of concept' waterbodies) as a safe space to explore and refine demonstration of the right actions in the right place and impacts on water quality .

5.7.4 Catchment-Scale Engagement and Planning

The current ASSAP model involves using state of the art catchment science tools and collaboration with LAWPRO and the EPA to work out where water quality problems exist within a PAA. Then to start an engagement with farmers in the PAA that will lead to the identification and implementation of an action or actions on a farm to improve water quality in the local catchment/PAA. This process is backed up by community meetings and farmer meetings so that there is wider community, farmer and farming organisation knowledge and awareness of why ASSAP is active in a particular area.

However, the advisor-to-farmer engagement is very much a private and confidential engagement to ensure that a trusting relationship is created and respected. The ASSAP advisor has a wider knowledge of the PAA and so is able to interpret information and possible actions in a wider catchment context.

A way needs to be found to extend this level of 'catchment awareness' and capacity building to the local catchment/PAA cultural and organisational ecosystem and networks (which includes locally active agricultural advisors, local farmers and land managers, local community groups and cultural/sporting/spiritual organisations, local authority water protection staff, local IFI staff, local NPWS staff, local river trusts and other water protection NGOs, etc.). This is to ensure that 'catchment protection and management' becomes embedded as part of the normal day to day reality in the catchment once ASSAP and LAWPRO have completed their work and involvement in the PAA. Otherwise, there is a high risk that the gains made through ASSAP/LAWPRO interventions will fail to become embedded within the catchment.

Consequently, ASSAP's work should include a focus on local capacity building

Recommendation 8: Catchment-scale engagement, capacity building and planning: ASSAP should work to enhance the strength and capacity of catchment-level networks, so that catchment protection and management becomes embedded.

5.8 The Funding of the ASSAP Service

The Review Panel saw no compelling evidence at this point in time to vary the 2:1 ratio of funding from government and industry. But, with the necessary expansion of ASSAP as more PAAs are created, both government and industry will have to provide more resources and the relative contribution of government and industry should be kept under review. These are high-level considerations and we recognise that they are inter-linked with all aspects of planning. There may be scope for industry to fund specific measures, identified as the Right Actions in the Right Place (for example, fencing off of water courses, riparian zone planting etc.), which could help speed up implementation of measures.

Recommendation 9: Funding of ASSAP: maintain the balance of funding from government and industry as ASSAP expands, keeping the relative contribution of government and industry under review.

5.9. Demonstrating Impact and ASSAP's Contribution to Policy and Research

The Review Panel recognises that proof of concept is a complex, but necessary, task. We believe that significant thought needs to be given to designing a spectrum of meaningful policy learning and research projects. Consequently, our tenth and final recommendation is that ASSAP should work with its partner organisations to devise appropriate projects to measure and demonstrate the effectiveness of the approach.

Recommendation 10: Demonstrating impact, informing policy and research: ASSAP should work with partner organisations to inform policy learning and research projects that are appropriate to experimental governance, linking iterative monitoring and review to higher-order long-term validation of the cumulative results of the overall approach to water governance.

In thinking about projects which aim to measure impact and causation it is important to keep in mind the foundations on which ASSAP is built. As noted in Section 2.1, among these are recognition of the great variety of farm conditions and the complexity of the hydrological processes. It was this recognition—deriving from the ACP, EPA work and other research—that led to acceptance that 'one size fits all 'policies, blunt rules and simple inspections would are unlikely to be effective . From this came the focus on the Right Actions in the Right Place and the creation of systems for fine-grained catchment characterisation, selection of PAAs, local assessments, farm-level examination, tailored advice and co-production of mitigation plans. This is more like a new 'regime', than a new discrete action, though it does contain discrete interventions

The reasoning behind Recommendation 10 reflects the core features of experimental governance:

1. Freedom to devise tailored actions suited to different contexts;
2. Engagement and collaboration with civil society actors and public agencies that hold critical knowledge and whose collaboration is essential to effective action;
3. Frequent monitoring and review of actions and effects, informing ongoing adjustment;
4. Pooling of emerging information from front line actors to revise programmes, goals and relevant regulatory provisions.

Combined, these features explain why this is seen as a 'recursive' approach to public policy—the outcome of one set of actions is used as a basis for revision not only of the immediate actions, but also of the policy and regulatory regime governing them.

As regards demonstration of impact, three things follow:

a) Frequent local review of actions and any observable effects is inherent in the process and has a role in both delivering the programme and assessing its effectiveness;

b) Adjustment of actions and course correction by LAWPRO and ASSAP is essential and, consequently, it does not make sense to freeze the advisory approach in order set up a controlled test of its effectiveness;

c) In the language of evaluation research and random control trials (RCTs), the ultimate 'treatment' is the experimental governance regime itself—ie the system for governing the selection, contextualistion and continuous improvement of actions.

d) In devising demonstration of effect, it is necessary to recognise that tests of impact work on different time scales.

Iterative review, serves course correction and improvement in the short and medium term. Initial evaluations of the policy should measure progress on indicators of ground-level performance in relation to particular projects or interventions. If ASSAP is working as intended, the outcome would be, for example, decreases in pollution runoff on farms which implement ASSAP recommendations, compared to earlier results for the same places or current outcomes for verifiably similar places that have not had ASSAP advice. In the medium and long term it will be possible to validate the complex treatment (the policy regime that shapes the place-by-place selection and combination of the many different, context-specific, elements that influence water quality in agriculture), perhaps using an RCT comparing early and late adopters of ASSAP. As noted above, the overall experimental governance regime is the 'treatment' and we would expect localities that apply it thoroughly for an extended period to achieve better continuing outcomes than localities just mastering the new methods.

Given the complexity of the issues, the Review Panel believes that proof of concept is a shared challenge for the full range of actors in the new water governance regime. Indeed, other resources, such as the social scientific expertise of Teagasc's Rural Economy Section can also make a significant contribution. The Water Framework Directive identifies three levels of monitoring: member state level surveillance, operational monitoring and investigative monitoring. Reflecting this, we suggest that it is necessary to design a spectrum of additional tests. These should range from short-

term local-level monitoring to identify the impact of discrete actions on water quality in specific waterbodies, though intermediate-scale reviews, to, ultimately, evaluation projects that can assess the overall effectiveness of the new water governance regime in improving water quality. In the longer term, the data generated in EPA three-yearly water quality reviews will play an important role in assessing ASSAP and the new approach to water governance.

We see definite value in limited and local monitoring to establish more quickly the effect of farm-specific or waterbody-specific mitigation actions on local water quality. This may include an 'investigative' monitoring approach, to use the WFD terminology, or more experimental approaches, which could provide more timely and targeted water quality monitoring to assess the relative impact of the actions undertaken. This could also include seasonal data, and techniques that are currently outside current WFD methods—monitoring that is also targeted (type and regime) to the issue being addressed. This would be particularly important where surface-driven diffuse pollution (e.g., P and sediment) is being mitigated and where short term gains (or otherwise) may be found in rapid, repeated, assessment of the land-water system. This may require discussion with the EPA in relation to the overall design of the national WFD monitoring programme, to ensure that the programme is flexible and agile enough to help explore whether the right actions in the right places have been implemented, and have impact.

A further implication of our analysis is that it is necessary to be wary of research proposals and processes that promise to find strong generalisable causal relationships that can simplify the policy to the extent of reducing, or even eliminating, the need for contextual advisory services and co-production of actions tailored to specific farm conditions. Research, as well as the rapidly advancing field of precision agriculture, should be seen as a complement to, rather than a replacement for, local advisory services and co-production of improvement plans.

The Review Panel recognises the importance of research in this space and notes that ASSAP as a whole (with all its constituent parts) is research, and that new learnings are vital for future planning. However, a balance needs to be struck between targeted research and future research that might divert ASSAP from its core objectives, given that its time resources are under pressure.

5.10 A Logic Model for ASSAP: Conditions, Risks and Risk Mitigation

As noted in Section 1, the Review Panel was asked to provide an outline logic model, identifying the conditions for ASSAP success, risks and risk mitigation measures. This model is provided in Table 1. It brings to the surface the connections between the

issues facing ASSAP, identified during the review, and the ten recommendations we have made.

	Conditions		Risks		Risk Mitigation
C1	• LAWPRO PAA assessments • Local assessments	**R1**	• Constrained by lack of science assessments at PAA or local level	**RM1**	• Recommendation 1
C2	• ASSAP staff time, in 190 PAAs • ASSAP staff time, new PAAs	**R2**	• Insufficient staff for scale of job • ASSAP staff time diverted to dissemination from farmer engagement in PAAS & demonstrating impact	**RM2**	• Recommendation 1 • Recommendation 2 • Recommendation 9 • And see C5, R5 & RM5
C3	• Trust with farmers • Trust/cooperation with LAWPRO • Effective LAWPRO & ASSAP community engagement	**R3**	• Lose LAWPRO trust on existing or new PAAs • Lose farmer trust • No demonstration of right actions in the right place or impact	**RM3**	• Recommendation 6 • Recommendation 7 • Recommendation 8 • Recommendations 5 & 10 • see C7, R7 and RM7
C4	• Farmer implementation of agreed actions	**R4**	• Barriers to implementation of agreed actions	**RM4**	• Recommendation 2 • Recommendation 3
C5	• Success of wider advisory services, cross-compliance & buy-in to GAP regulations	**R5**	• Weakness across advisory services, cross-compliance & buy-in to GAP generates more water pressures than ASSAP can deal with	**RM5**	• Recommendation 4
C6	• Ongoing catchment protection	**R6**	• Lack of local capacity to maintain catchment protection	**RM6**	• Recommendation 7 • Recommendation 8
C7	• Demonstration that right actions in the right place are taking place & having impact	**R7**	• Difficulty demonstrating right actions in the right place & impact	**RM7**	• Recommendation 5 • Recommendation 6 • Recommendation 7 • Recommendation 10

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Appendix A

Schedule for on-site visit

Panel members arrive Sunday September 12th 2021

Time	Item	
18.30	Welcome & dinner Talbot Hotel	Attended by Director of Research, ASSAP personnel, expert panel

Monday September 13th: Talbot Hotel, Carlow

Time	Item	Key Topics
09:00 – 09:15	Welcome	Introductions and overview of schedule
09:15 - 10:00	Panel closed discussion	Clarification of process, role of panel members, structure and format of final report.
10:00 -11:30	Overview of the ASSAP Noel Meehan, Pat Murphy, Joe Crockett	Programme description and self-assessment Evaluation questions
11:30 – 12:00	Panel deliberations	Evaluation questions and criteria
12:00 – 13:00	Overview of LAWPRO Carol McCarthy and Ruth Hennessy	Description and interlinkages with the ASSAP
13.00 – 13.45	Lunch	
13:45 – 14:15	Stakeholder Session 1 Jack Nolan, DAFM	Evaluation questions
14:15 – 15:00	LAWPRO and ASSAP collaboration /referral process Cathal Somers ASSAP and Philip Murphy LAWPRO	Presentation (25 minutes) on collaboration process Evaluation questions
15:00 - 16:00	ASSAP Advisors Ivan Kelly & Fiona Doolan, Teagasc & T.J Phelan, Glanbia	Evaluation questions (with a focus on farmer practice change and behaviour)
16:00 - 16:45	WaterMARKE Project Mary Ryan, Teagasc & Cathal O'Donoghue, NUIG	Evaluation questions (with a focus on farmer practice change and behaviour)
16:45 - 17:00	Panel deliberations	Evaluation questions and criteria
19:00	Dinner	Attended by EP, Secretariat

Tuesday September 14th: Talbot Hotel, Carlow

Time	Item	Key Topics
9.00 – 9.30 9.30 – 9.50 9.50 – 10.10 10.10 – 10.30	Stakeholder Session 2 - Industry Pat Murphy, Kerry Aine O'Connell, IFA, Denis Drennan ICMSA Eamon Farrell & Gerry Long, ICOS	Evaluation questions
10:30 - 11:00	Panel deliberations	Evaluation questions and criteria
11:00 –11:30 11.30 – 12.00	Stakeholder Session 3 – Policy & Funders David Flynn & Graham McGovern, DHLGH Jenny Deakin & Mary Gurrie, EPA	Evaluation questions
12:00 –12:30	Panel Deliberations	Evaluation questions and criteria
12:30 –13:15	Lunch	Panel only
13:15 –15:00	Panel deliberations	Preparation for exit presentation & final report
15:00 –16:00	Verbal Exit Presentation by the panel	Initial main findings and recommendations
16:00	Panel departs	

Appendix B

ASSAP's Existing Objectives

1) To seek collaboration across all stakeholders, agricultural and environmental, as a key measure in the implementation of the programme.

2) To put in place the structures and connections to ensure that the ASSAP engages with farmers and their representative organisations and the wider agricultural industry.

3) To establish a cohort of skilled advisors through the provision of training and technological resources to enable them to provide farmers with the appropriate advice and solutions to attain improvements in water quality.

4) Develop a farm assessment tool for advisors to a. identify farm issues impacting water quality 7 | P a g e b. recommend mitigation actions from a suite of possible solutions c. provide the farmer with a clear and easy to follow farm plan d. monitor implementation of mitigation actions e. report to LAWPRO, EPA and both funding departments

5) To co-design with stakeholders a suite of mitigation measures.

6) To develop and implement a structured approach to transitioning of a PAA to allow for post ASSAP management by relevant competent authorities.

7) Develop water quality focused information and resources for use by the broader advisory and education services.

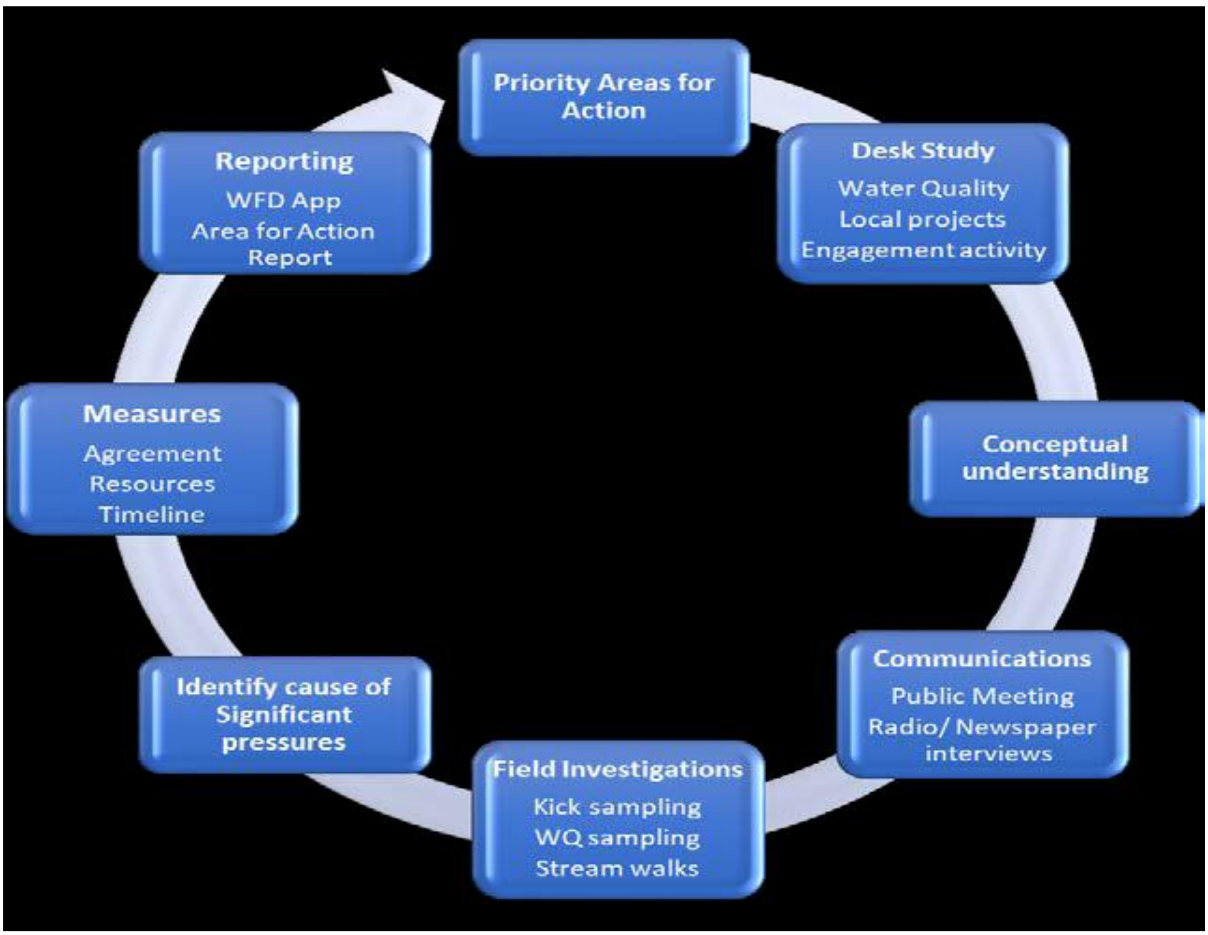
8) To disseminate the information and findings of the ASSAP and LAWPRO to the broader advisory and education services.

9) To use the information and findings of the ASSAP and LAWPRO to inform broader water quality and agricultural policy.

10) To use the information and findings of the ASSAP and LAWPRO to inform research

Appendix C

The Loop from Priority Areas for Action to Mitigation and WFD Reporting



Appendix D

ASSAP-LAWPRO PAA Review Flow Chart