Making the case for Water Stewardship

Development of Water Stewardship resources to provide the rationale for private sector engagement in the Water Framework Directive

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1 Introduction

1.1 Context of the development of Water Stewardship

Poor water quality (particularly due to excess nutrients) is the major threat to freshwater biodiversity across Northern Europe. However, the potential disruption risks to businesses – and hence motivation to engage in water stewardship activities – is low. This is because treatment costs for water supplies are generally a small fraction of overall costs; or because water is supplied through the public water supply system and therefore treatment costs are shared and diffuse.

The main risks to businesses are through the potential reputational damage of being publically identified as being responsible for, or associated with, acute water pollution events resulting from effluent discharges or poor practices, both directly and, for brands and retailers in particular, in their supply chain.

An AMEC report commissioned by WWF-UK in 2011 demonstrated that general awareness of Water Stewardship actions - and the need for it in temperate climates - amongst businesses is still low. The impact of agricultural supply chains on water quality (a particular issue across many Member States) was not fully apparent, with interviewees unsure of the evidence, the impacts or how they could intervene.

This project is being funded by an EU WaterLIFE grant, awarded to WWF-UK. WaterLIFE aims to restore rivers to good ecological health by supporting water stewardship by the private and third sectors. The three year project, led by WWF-UK with the Rivers Trust and Westcountry Rivers Trust, is funded by LIFE+ programme, the European Union's environment fund. WaterLIFE will demonstrate how communities and companies can work alongside government to protect and restore our freshwater environment. The project will showcase how companies can take stewardship action to reduce environmental impact of operations and supply chains. It will support local groups to engage in river basin planning and deliver solutions and it will support government implementation of the Water Framework Directive.

An important context for the project is an understanding of WWF's own approach to water stewardship and the water stewardship "ladder" of engagement.

WWF's Water Stewardship model

WWF-UK's concept of water stewardship serves to unite a wide set of stakeholders interested in water management. WWF defines Water Stewardship for business as:

'A progression of increased improvement of water use and a reduction in the water-related impacts of internal and value chain operations. More importantly, it is a commitment to the sustainable management of shared water resources in the public interest through collective action with other businesses, governments, NGOs and communities.'

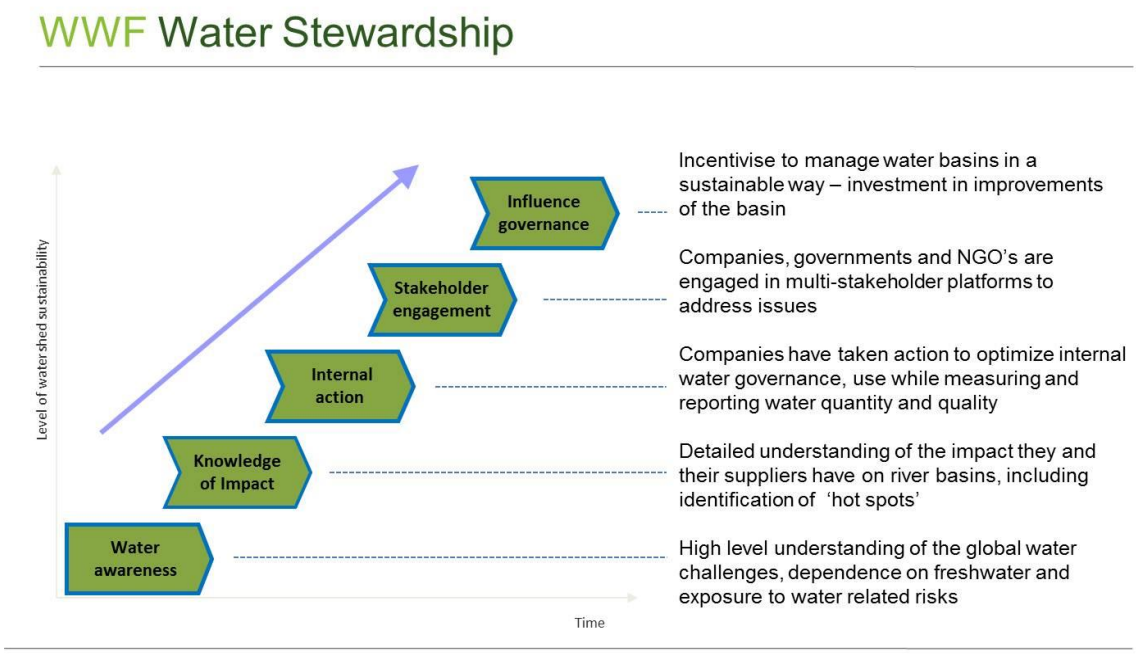
WWF-UK has been involved in water stewardship discussions since the early development of the concept, and maintains a thought leadership position both internationally and in the UK.

The organisation has set out a framework for water stewardship, set out in Figure 1. It starts with a series of internal steps that a business should undertake, including water awareness, knowledge of impact and internal action.

To help with these first steps, WWF has also developed a 'Water Risk Filter' tool to enable companies and investors to assess the risk that water poses to their business and provide guidance on how they can respond to the risks identified (www.waterriskfilter.org).

A robust water stewardship approach then moves beyond the internal steps to stakeholder engagement and influencing governance to help ensure sustainable water management policy, regulation and practice going forward.

Figure 1 WWF Water Stewardship Ladder



Source: WWF-International

1.2 Project aims

In order to transform a groundswell of corporate interest in Water Stewardship globally into practical action that results in environmental improvements in the UK and Europe, there is a clear need for businesses to be presented with a compelling case explaining why and how they should support WFD delivery.

The purpose of this project is to provide private sector stakeholders with:

1. Compelling evidence showing the impact of agricultural supply chains on the freshwater environment and how this is resulting in failure to meet WFD objectives.

2. A Rationale (e.g. business motivations, opportunities and risks) for taking action to reduce environmental impacts of operations and supply chains.

3. Practical examples and recommendations for how private sector companies can implement a Water Stewardship approach in UK / EU.

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This action will be used to produce communications materials aimed at engaging corporate stakeholders.

1.3 Structure of this report

This report is structured to respond to the three main points identified above:

- Section 2 sets the scene, describes the problems faced by our freshwater environment, and how agricultural activity has contributed to these problems.
- Section 3 describes how businesses are beginning to recognise that sustainability is fundamental to long-term business security, and how some of them are making the case and rationale for action on water stewardship.
- Section 4 describes how water stewardship is being implemented in the UK and Europe; presents a number of private sector-led case studies that demonstrate how companies could engage in water management activities, and also presents water stewardship initiatives that form an existing, viable framework for private sector engagement.

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2 Understanding the impact of food and agricultural supply chains on the water environment

2.1 Our rivers and lakes are under pressure

The UK's lakes and river systems are a hugely important resource for biodiversity, social, cultural and economic prosperity. The UK is a small and crowded island, and the pressures on the quantity and quality of our water supplies is intense from all the demands we have on using freshwater for our homes, businesses and agricultural supply to retailers. At the same time, our rivers, lakes and wetlands contain some of our county's most treasured ecological biodiversity.

These precious national freshwater resources face a number of threats, including:

- A growing population with a growing demand for the water on which these ecosystems depend; and
- An increasing intensification of agriculture to deliver more and affordable food.

Both these factors significantly increase the risks of ecologically damaging low flows in our rivers and increased volumes of pollution. In addition, the conversion of wetlands through urban and agricultural development further diminishes the value of our freshwater resources at the expense of our growing need to use more land. In the context of these pressures, climate change now presents a further critical threat to these resources.

Increasing levels of pollution and the over abstraction of freshwater provide the clearest evidence of the impact of these pressures and can take the form of what is known as "point source" or "diffuse" pollution.

Pollution is often described as *point source* or *diffuse* (or *non-point) pollution.*

Point source pollution enters a river or lake at a specific site and is generally easily identified. Potential point sources of pollution include effluent discharges from sewage treatment works and industrial sites, power stations, landfill sites, fish farms, and oil spillage via a pipeline from industrial sites. Point source pollution is generally readily prevented since it is possible to identify where it is coming from and, having done so, those responsible for causing the pollution can take preventative measures through immediate clean up action or longer-term investment in treatment facilities.

Diffuse pollution arises where substances are widely used and dispersed over an area as a result of land-use activities such as urban development (run off from roads) farming and forestry. It is often difficult to identify specific sources of such pollution and therefore take immediate action to prevent it, since prevention often requires major changes to land use and management practices. Examples of diffuse pollution include the leaching to surface water and groundwater of contaminants from manures, nutrients and pesticides used in agriculture and forestry.

It is not just what we put in to water, but also our use of water that can cause pollution; the abstraction of water from rivers and lakes reduces the ability of water bodies to tolerate the presence of potentially-polluting substances. Where the volume of receiving water is low, the relative concentration of a polluting substance entering the water will be higher and consequently its impact will be greater. Hence, the reduction of water pollution relies not only on preventing

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potentially-polluting substances entering water bodies, but also on reducing the amount of water we use.

Of particular concern is the impact of diffuse pollution of water, of which agriculture is the source of about one third of the diffuse pollution which affects 75% of rivers in England & Wales. Figure 2 comes from the Report of the European Commission to the European Parliament[1] on the UK's implementation of the Water Framework Directive, and illustrates Defra's point that diffuse pollution sources represent the most significant pressure on our rivers.

Figure 2: Graph of % of surface water bodies affected by significant pressures

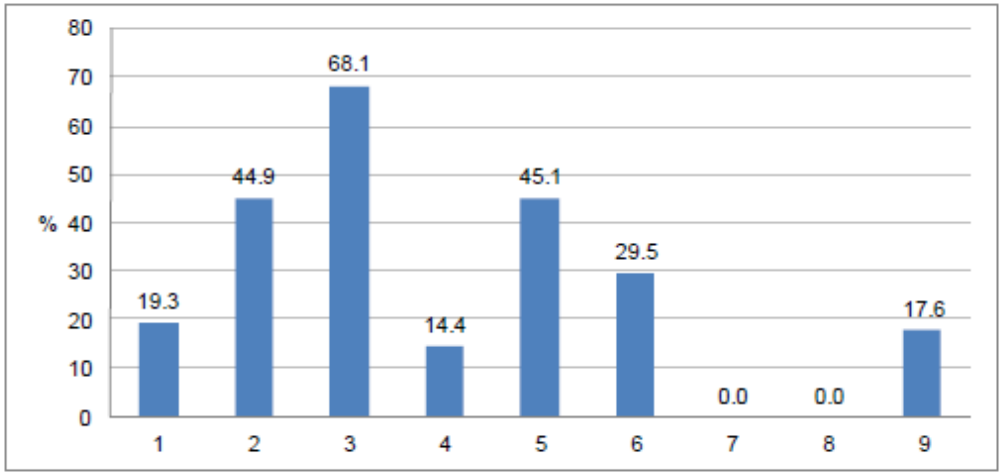

Figure 4.4.1: Graph of percentage of surface water bodies affected by significant pressures
1 = No pressures
2 = Point source
3 = Diffuse source
4 = Water abstraction
5 = Water flow regulations and morphological alterations
6 = River management
7 = Transitional and coastal water management
8 = Other morphological alterations
9 = Other pressures
Source: WISE

The two important pollutants associated with diffuse pollution are nitrogen and phosphorus. Modern agriculture creates artificially nutrient-rich soil to maintain high food productivity and to meet the quality and cost requirements of the major food and drink producers and retailers. On intensively farmed land, the soil is repeatedly compacted by the passage of heavy machinery or animals. Compacted soil is less able to absorb water, and the plants are unable to use up all the nutrients in the soil. Rain that falls on a compacted field will flow quickly and unimpeded on its way into the nearest river or lake, carrying with it the sediment, nutrients and pesticides with it.

So, some approaches to land management can increase soils and sediment being washed off the land carrying phosphorus into waters. A changing climate means that more intense rainfall is likely to occur, increasing the risk of impacts further. If a river or lake receives too much nutrient input of this

[1] Taken from page 11 of the Report from the Commission to the European Parliament and the Council on the implementation of WFD (2000/60/EC) on River Basin Management Plans {COM(2012)670/final}

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sort it can cause excessive algal growth called 'eutrophication'. Nitrate from fertilisers has built up in groundwater over decades and will take a long time to reduce.

Sedimentation from erosion, forestry practices, saturated and compacted fields, and livestock trampling of river banks can affect river ecology by smothering fish spawning grounds. Other impacts include bacteriological contaminants from animal faeces, and pesticides from farming, forestry, golf courses, parks and the inappropriate storage and application of livestock slurry to land. These contaminants pose a particular threat to bathing waters, shellfish waters and drinking water sources.

When dealing with agricultural diffuse pollution the UK Government is obliged by European Union legislation to adhere to the 'polluter pays' principle (the Water Framework Directive – WFD, requires much better control of diffuse pollution in order to improve water quality). According to the National Audit Office it has been estimated that although the majority of farms take seriously their responsibilities to protect water courses, approximately one third of farms are not entirely compliant with existing requirements[2].

Water Body Classification under the Water Framework Directive (WFD)[3]

The WFD assesses water quality using three categories:

Ecological quality is assessed via the presence or absence of various 'indicator' species, the concentration of nitrates, phosphates and specific biological toxins, and the degree of water oxygenation.

Chemical quality is assessed based on the presence of various controlled priority chemical substances in the water.

Hydrological quality describes the extent to which a river channel has been modified from its natural form.

These three criteria are each assigned one of five grades ('bad', 'poor', 'moderate', 'good' or 'high'), which are combined to provide an overall classification for the water body. The scores are combined on a 'one out, all out' basis, such that if a water body attains 'high' ecological and hydrological status, but 'poor' chemical status, the overall classification will be 'poor'. The WFD classification system is more stringent than the previous Environment Agency classification, which suggested that 79% of English rivers were in 'good' condition, as opposed to 21% of rivers under the WFD. It is also a legal requirement to meet the WFD standards for Protected Areas, which include bathing waters, shellfish waters, drinking water sources, sites designated under the Habitats Directive and nutrient sensitive areas designated under the Nitrates and Urban Waste Water Treatment Directives.

The ways by which diffuse polluting substances reach surface and groundwater are often complex. Soluble pollutants, such as nitrate, leach through the soil to the water table, eventually reaching rivers, groundwater, lakes or coastal waters. Other pollutants stay on or near the ground surface and can be washed overland or on soil particles into water. These processes are usually driven by rainfall

[2] Ibid

[3] From the website of the Foundation for Water Research http://www.euwfd.com/html/sources_of_pollution_-_diffuse_pollution.html

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but can take hours, days or years depending on local factors. So the way land is used and how it is managed is critical to the risk of diffuse water pollution.

Agricultural land is estimated to account for around 60% of nitrate source which enters surface waters in England and Wales with sewage and other discharges accounting for the rest.[4] Nitrate concentrations in rivers are linked to the proportion of arable land in the catchment upstream.[5] Intensive livestock production is also a significant source. Farming also accounts for up to 40% of the phosphate load in rivers, although this varies between catchments.[6] Phosphate inputs to both lakes and rivers in England and Wales rose over the last century mainly as a result of expansions in cereal crop production and the increasing use of artificial fertilisers. In addition with farms estimated to use 90 per cent of pesticides in England, they are likely to be the primary source of these chemicals found in water. The use of inorganic fertilisers and the spreading of animal manures to land can increase nutrient levels in water. Run-off from agricultural land depletes oxygen in the water if animal manure is present. Soil erosion caused by inappropriate cultivation, trampling of riverbanks by livestock, construction and other land disturbance can lead to sediment build-up in rivers. Agricultural sources account for most of the silt entering water in England.[7]

The effects of diffuse pollution can be very long-term, with contaminants persisting in groundwaters or sediments for decades or centuries. Nutrient-enriched lakes and acidified waters may take many years to recover. It is far better and more cost effective to deal with the problem at source rather than try to treat the water once it has been polluted.

2.2 The current regulation is not the solution – it needs local stakeholders action and improved regulation

To what extent can regulation be used as the main instrument for reducing diffuse pollution? Establishing the sources of diffuse pollution has proved difficult as these can vary from place to place. The Environment Agency has developed a better understanding of the condition of England's rivers through the compilation of River Basin Management Plans (RBMPs), but it has been found difficult to measure the full extent to which diffuse pollution is responsible for the failure to meet water quality standards[8]. Better evidence does exist to the extent that there is improved understanding of the circumstances and practices that give rise to diffuse pollution whereupon specific livestock types / cropping issues are highlighted as reasons for failure for water bodies in latest RBMPs. The RBMPS also highlight where there has been the catchment walkover data which shows detail on the sources.

[4] "the unseen threat to water quality", Diffuse water pollution in England and Wales report – May 2007

[5] ibid

[6] ibid

[7] ibid

[8] River Basin Management Plans available on https://consult.environment-agency.gov.uk/portal/ho/wfd/draft_plans/consult?pointId=3034101

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Because of this the Environment Agency's enforcement power is perhaps limited with regard to tackling diffuse pollution[9] and they use what they called "advice-led" regulation as the approach for protecting the water environment from pollution from rural areas. It identifies areas where the environmental risk is greatest, and supports local stakeholder action to find long term management solution for the activities which are potentially the most polluting. The Environment Agency's policy is that:

> *"The methods used to reduce diffuse pollution are likely to include negotiated agreements, economic instruments, educational projects and promoting more environmentally friendly practices, as well as regulation"*[10]

Across England there are 93 management catchments, including those which cross the Welsh border. The next level down comprises the operational catchments. These are sub-divisions of a management catchment and typically relate to the areas draining well-known tributaries of a larger river, or to discrete small rivers of their own. There are also "operational" catchments specific to certain larger water bodies, for example groundwaters, which, due to their size, can cross management catchment boundaries and even river basin districts. Across England there are over 360 of these operational catchments.

The Government's 2011 white papers on water and on the natural environment, together with its 2013 national adaptation programme for building resilience to climate change, provide their view on the direction for measures to tackle the major river basin management planning issues. In particular, the white paper on the Natural Environment identified the need to facilitate greater local action for water; particularly through local catchment approaches[11].

On 3 June 2013 Defra launched a Policy Framework to aid wider adoption of the Catchment Based Approach, rolling this out across England. Specifically the Environment Agency and Natural England work together with farmers to increase the number and appropriate location of schemes under the Environmental Stewardship scheme where there are diffuse pollution problems; largely working through Catchment Sensitive Farming and Campaign for the Farmed Environment[12].

The Catchment Sensitive Farming initiative provides voluntary advice to farmers and includes a capital grant scheme. It is run jointly by the Environment Agency and Natural England, and funded by Defra and the Rural Development Programme for England. Results indicate that improved management practices due to this project are achieving significant reductions across a range of pollutants[13].

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[9] National Audit Office, Tackling diffuse water pollution in England (2010) and available on http://www.nao.org.uk/report/tackling-diffuse-water-pollution-in-england/

[10] "The unseen threat to water quality", Diffuse water pollution in England and Wales report – May 2007

[11] Catchment Based Approach: Improving the quality of our water environment (May 2013); available from https://www.gov.uk/government/publications/catchment-based-approach-improving-the-quality-of-our-water-environment

[12] Ibid

[13] ibid

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Catchment partnerships, initiated through Defra's catchment based policy are regarded as the principal mechanism to facilitate local action to protect and enhance the water environment. The intention is for each catchment partnership to be committed to working collaboratively to in order share evidence, develop common priorities and deliver action on the ground in catchments. Many partnerships which include some Rivers Trusts, local farming groups, conservation groups working with the Environment Agency are producing catchment plans which will detail many local actions related to the proposed new measures for the WFD related river basin management plans[14].

The water companies are also important stakeholders in the catchment approach and are involved in more than 100 schemes which aim to work with farmers and the environment to provide improved water quality in the resources used for drinking water and to save long term costs on new treatment facilities[15]. Many of these schemes have produced other environmental benefits - for example, reduced flood risk, better soil quality, more sustainable agriculture and improved understanding of pollution risks. To quote from the Water UK policy document;

> *"Cheap food has it consequences. Not tackling agricultural pollution will result in rural land use that will not, ultimately, deliver sustainable agriculture in the long term, and the water industry (and their customers) with a heavy financial burden".*

Other stakeholder organisations have led approaches to support changes in farming practice, such as the Campaign for the Farmed Environment and the Voluntary Initiative for Pesticides, which are aimed at being adopted by farmers and land managers. Many catchment based partnership groups, including Rivers Trusts and water companies and local river conservation groups (and some with support from WWF and business partners such as HSBC and Coca Cola) have established their own catchment initiatives. These approaches have helped prevent water bodies from deterioration and there are indications of some improvements through the uptake of voluntary measures by farmers such as better nutrient planning and buffer strips.

The catchment based approach aims to generate more effective engagement to tackle environmental problems at a more local scale; where many of the problems facing the water environment are best understood and tackled at a level more local than a river basin district. Taking a catchment based approach also particularly helps in identifying local benefits of catchment management and to find strategies for dealing with issues such as pollution from diffuse sources[16].

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[14] River Basin Management Plans available on https://consult.environment-agency.gov.uk/portal/ho/wfd/draft_plans/consult?pointId=3034101

[15] Water UK policy document, "CAP Reform – A future for farming and water" March 2013

[16] WWF-UK's experience of the Rivers on the Edge programme provides a series of worthwhile examples of the effectiveness of the approach; http://www.wwf.org.uk/where_we_work/europe/rivers_in_the_uk/

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Defra, the Environment Agency and the water companies pursue catchment management because by working with others in catchments it is possible to[17]:

- understand the issues in the catchment and how they interact
- understand how the issues are affecting the current local benefits and future uses of water
- involve local people, communities, organisations and businesses in making decisions by sharing evidence
- identify the most important benefits and which issues to tackle as a priority
- promote local action to protect and improve the water environment.

However the emphasis on catchment management does not mean that there is no place for regulation. Current regulation is undertaken through a cross compliance programme with Agri-environment payments, funded through the Rural Development Programme and payments are available to land owners and farmers who make provision to achieve biodiversity and water quality improvements. The payments are designed to fund measures that go beyond good practice that otherwise would be difficult to fund, for example buffer strips, watercourse fencing and seasonal livestock exclusion.

The results from a recent WWF-UK study "Investigating Agricultural Compliance Rates" suggests that non-compliance on regulation is not an industry wide issue; rather a feature which is present on a minority of farms – the study estimates that it is around a third[18] – and recommends that it should be on these farms where any future enforcement effort should be concentrated. Farmers who claim the annual Single Farm Payment (an annual payment made to most farmers under the Common Agricultural Policy) are required to comply with good practice standards, for example measures to protect soil quality and run-off, as well as existing regulations such as the Nitrate Vulnerable Zone (NVZ) action programme. Breaches of compliance with these standards can lead to a reduction in payments, and thereby provides incentive to comply with regulatory measures. The compliance regulation and checks appear to be effective in supporting the development of good practices that will prevent occurrences of specific point source pollution events, but do not adequately deal with the wider diffuse pollution problem – which is long term and difficult to attribute to specific locations.

So given the difficulties on enforcement, long term solutions to diffuse pollution will require a combination of regulatory and voluntary measures to reduce the impact of rural land based activities on water.

[17] Catchment Based Approach: Improving the quality of our water environment (May 2013); available from https://www.gov.uk/government/publications/catchment-based-approach-improving-the-quality-of-our-water-environment

[18] Investigating Agricultural Compliance Rates, Alex Inman Consulting, June 2014

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2.3 Does business have a role in Catchment Management?

In a recent study[19] undertaken for WWF-UK the main conclusion was that:

> *"there was a lack of consistency and coherence in stakeholder views regarding water stewardship in the UK agricultural supply chain"*. The report further mentions that the main supermarkets and food producers are very much…*"focused on water scarcity and availability with no real mention of water quality"*.

Polluted and degraded water resources do have the potential to disrupt businesses that are reliant on long term needs for water. This might be from increasing costs associated with increasing water treatment investment; impacts on the availability of supply; or (perhaps most importantly for organisations with a high public profile) this could take the form of reputational damage.

So although perhaps not currently evident, there will be a long term need to improve businesses' motivation to engage in water stewardship activities and to demonstrate how communities and business can work alongside government, regulators and farmers to protect and restore the freshwater environment. To become active participants along with others in action to reduce environmental impact of operations and supply chains. This is discussed further in section 3.

The Government has also recognised the important opportunities that exist for the business community to become an active participant in the catchment management strategies and solutions;

> "*we recognise that engagement can attract other funding streams so we hope this role and catchment partnerships will become self-sustaining after the first 18-24 months of the national roll out of our approach"*[20].

To date there is no evidence that this aspiration or "challenge" has been taken up by business, but it nevertheless provides a useful context for framing future policy action to provide incentives and opportunities for national, and importantly local business to play a partnering role in the "collective action" required to improve water stewardship responses.

The Final Report of the Ecosystem Markets Task Force, "Realising nature's value" was published in March 2013[21], making a number of recommendations including suggestions for both Government and business. Both catchment management and business, and a nature based certification scheme are included.

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[19] Options for Managing Water Quality Impacts in UK Supply Chains, WWF-UK, May 2012

[20] Realising nature's value: The Final Report of the Ecosystem Markets Task Force" Task Force published its Final Report on 5th March 2013, available from https://www.gov.uk/government/publications/government-response-to-the-final-report-of-the-ecosystem-markets-task-force

[21] Realising nature's value: The Final Report of the Ecosystem Markets Task Force" Task Force published its Final Report on 5th March 2013, available from https://www.gov.uk/government/publications/government-response-to-the-final-report-of-the-ecosystem-markets-task-force

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Recommendation 5: The Task Force recommends: a) Greater incentives for water catchment management. This will enable water companies, farmers and businesses to work together on a much larger scale using well established methods to deliver water quality, biodiversity, natural environment and economic benefits. b) More encouragement and incentives for wastewater catchment management. This is an embryonic area needing both encouragement and financial incentives to enable sewerage companies, farmers and industrial businesses to work together to repair the damage done by past generations to our rivers and beaches, whilst also delivering economic benefits. High quality demonstration projects are needed to provide the necessary learning.

The Task Force also made an important recommendation that:

> *"Business should explore and exploit untapped opportunities for rigorous and innovative nature-based certification and labelling that incorporate environmental protection";* which has *"sufficient rigour to show that they do genuinely protect or enhance nature's services; enhanced consumer awareness of the linkages between products and nature"*; and "*to encompass full supply chain traceability"*

In Defra's view of the catchment pilots provide a framework for collaboration with stakeholders. Defra plan to provide some initial start-up funding to help support this role within catchment partnerships and that this engagement will be used to attract other funding sources so that catchment partnerships will become self-sustaining. The policy also envisages that the catchment management process will help facilitate measures to tackle river management in a way that generates voluntary and paid contributions from the third sector and business sectors (including Water Companies, the food and drinks industry, farmers and land owners) to deliver water quality and support resource protection.

The Task Force also highlighted the important role that business has to play in exploiting opportunities and co-ordinating efforts in order to maximise the visibility of ecosystems in labelling. These include both opportunities for UK businesses to grow as a result of certifying and labelling their products, and opportunities for UK certification and labelling businesses to grow.

This is not just a UK issue - poor water quality (particularly diffuse pollution) is the major threat to freshwater biodiversity across Northern Europe. Many of the threats facing Europe's rivers cannot be solved by one organisation alone. Communities, business and government need to work together to tackle them effectively. The National Audit Office assessment mentions that other countries have used wide-ranging mechanisms to encourage changes in farm practices. Farm certification schemes are widely used by supermarkets to encourage farmers' to change their practices and assure customers that certain standards have been maintained in the production process. The NAO suggests that membership of these schemes can help farmers obtain higher prices for their produce to compensate for the additional costs associated with better environmental management. The report cites that over 78,000 farmers and growers in the UK are members of such schemes, and that this membership accounts for between 65 and 90 per cent of output. The Ferti-Mieux scheme in France is specifically mentioned as a model of how these schemes can be used to effectively target diffuse pollution issues and help farmers obtain a price premium on their produce.

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Government believes that business has a role to play in the participation of catchment management and that this participation should be regarded as an important part of its business commitment to support the business link to the "value of nature" and enhance a long term business responsibility to remind their suppliers of legal responsibilities. It is suggested that by concentrating their support on those good practices identified measures mentioned in the WWF report[22].

The WWF-UK study[23] identified a 'top 10' of measures which, if implemented by farmers, are likely to make the greatest contribution to achieving improved water quality and GES under the Water Framework Directive.

- Manage soil exposure during winter months
- Adoption of nutrient planning and precision farming
- Take steps to address and repair soil compaction
- Introduce riparian buffer strips
- Install 5+ months slurry/manure storage facility
- Fence out livestock from watercourses
- Do not grow high risk crops on sloping ground
- Separate clean and dirty water
- Optimum maize management (early varieties, no maize stubble over winter)
- Increase Soil Organic Matter

The National Audit Office reported that through the England Catchment Sensitive Farming Delivery Initiative's grant scheme, there is around £4.9 million per year to part-fund infrastructural improvements on farms to reduce diffuse pollution. Natural England is responsible for administering the grant application process and paid out grants to 670 farms in 2009-10, with the average grant being approximately £7,300 (up to 20 capital items that can be partially funded through the scheme which have an impact on the overall catchment management, including, for example, roofing for livestock gathering areas, yard improvements and riverside fencing).

Defra provides funds via Natural England to assist farmers to take steps to encourage environment protection and better land management. Environmental Stewardship schemes are designed to compensate farmers for managing their land in ways that conserve wildlife and biodiversity, protect natural resources and maintain and enhance the quality of the landscape. These schemes have a budget of £2.1 billion between 2007 and 2013. At October 2009 there were 39,881 live stewardship agreements, covering approximately 5.3 million hectares (57 per cent) of agricultural land in England.

Despite this level of investment (which is funded through general taxation), the NAO survey of farmers found that 62% considered financial constraints as the biggest barrier to tackling diffuse pollution on their farms. There is therefore an opportunity for business to fill the financial "gap", and offer further financial support to the to the supply chain to adopt pro-environmental capital investments (such as no/low interest loans). This could be an important basis for developing strategy for business water stewardship.

[22] Investigating Agricultural Compliance Rates, Alex Inman Consulting, June 2014

[23] ibid

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There is potential for business to play an increasing role in an advisory capacity, either as a partner in catchment management processes or by working with suppliers to explore implementation of opportunities which will have both an economic and an environmental advantage, using the WWF's 'top 10' WFD measures as a basis for business engagement.

In order for businesses to implement water stewardship they will require;

- Incentives to ensure no loss of income to the supplier
- Provision of no interest or interest free loans if significant capital investment is required
- Encouraging the participation in other certification schemes
- Capacity building and disseminating lessons learnt, advice and raising awareness
- Auditable activities on farm to check compliance
- Ongoing monitoring to assess the effectiveness of the measure and the wider impact on the environment.

The private sector has much to contribute in terms of know-how, capacity, financial and business administration, networking, and the establishment of public-private partnerships.

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3 Addressing diffuse pollution and the rationale for business to take action to reduce environmental impacts of operations and supply chains.

An internet search of recent initiatives and developments in corporate sustainability reveals that a number of large and well-known companies are recognising significant change is required in order to continue delivering value to their stakeholders. These include shareholders, but also employees, customers and suppliers.

A clear feature of this new thinking is that in order to be sustainable, companies must drive change outside their own operations. So, as well as developing new business models that provide value to all their stakeholders (as listed above), they must also seek to influence the behaviour of all their stakeholders.

The business case driving water stewardship is a combination of 'doing the right thing' and a feeling of an ethical obligation of protecting the environment. In addition to this, it is often the best option available to deliver a sustainable solution whilst providing wider environmental benefits. Examples of this are included in Section 4 case studies. The business community increasingly recognises the importance of ecosystem health to the competitiveness and sustainability of business operations and this is slowly being reflected in strategies and actions.

There are four common themes that emerge from the research undertaken as part of this project.

3.1 Driving an innovative approach

Firstly, senior executives at individual companies have to recognise that sustainability is a core business requirement and not a costly add-on, required only to meet non-financial reporting requirements, or to merely reassure investors and other stakeholders of a company's green credentials. Perhaps the most well-known example of such an advocate of sustainability is Paul Polman of Unilever[24], whilst Peter Brabeck-Letmathe of Nestlé has shown a particular interest in water[25]. These individuals (and others) have clearly influenced the sustainability strategy of their companies, who are widely regarded as pioneers in sustainability in general, and particularly in their approach to water stewardship globally. A water stewardship programme will need 'mavens' like this: individuals or groups who are visionaries and passionate about the cause and committed to driving change within organisations to enable early adoption of sustainable practices.

WWF-UK has worked extensively with a range of large companies, including Nestlé, SABMiller, Coca Cola and M&S to successfully promote water stewardship across the world. Clearly there are a number of large companies around the world who appreciate the issues and say that they are willing to do something about it. It can be difficult however to see how the activities of a few visionary (albeit very big) corporations can implement extensive change given the barriers to sustainable business (discussed in the next section), especially in areas where the reputational, risk management, and financial benefits of such activity is seen as marginal (e.g. water stewardship in the UK and EU). The companies which 'talk the talk' are actually doing very little on water stewardship in the UK.

[24] For example: http://www.theguardian.com/sustainable-business/embedding-sustainability-drives-profitability-unilever-polman

[25] For example: http://www.water-challenge.com/default.aspx

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There are promising developments that show increasing convergence on the practical action needed to make business more intrinsically sustainable. For example, there is an established movement that seeks to implement this goal – **called the B Team**. The B Team is a not-for-profit initiative formed by a global group of leaders to create a future where the purpose of business is to be a driving force for social, environmental and economic benefit[26].
Amongst other things, the B Team believes that:

- The private sector can and must redefine both its responsibilities and its own terms of success;
- Those who choose to work with us will see that in the long run what's better for the planet and its people is also better for business.

The ultimate aim of the B Team is to get millions of business leaders committed to a better way of doing business. Their vision is aligned with that of leading authors on sustainable business, such as John Elkington and Andrew Winston recognise the fundamental shifts that business needs to make to deal with global megatrends such as climate change, population growth, and diminishing resource availability[27].

The remaining three sections summarise the common themes that emerge from these sources. The final section presents some observations from the authors.

3.2 Account for externalities

Put simply, the true cost of all business impacts need to be accounted for. This can be done by taking account of the value of natural capital, and by no longer regarding the impact of business on the environment as an 'externality'. Externalities include all wider impacts on the water environment which could be protected by implementing water stewardship. This includes water inputs used in growing and production, water pollution caused in same processes, impacts on soil and biodiversity.

WWF's own Living Planet Report 2014[28] states that we are already 'drawing down' natural capital by consuming 50 percent more per year than the earth can replenish, and the rate of depletion is accelerating. We are no longer living off the dividends of natural capital, but off the capital itself.

There are several ways of accounting for natural capital. Firstly, it can be done via using 'environmental profit and loss' (EP&L) accounting principles. An EP&L assesses how much a company would need to pay for the environmental impacts it causes, providing a shadow price for risk and opportunity analysis. Trucost produced the first ever EP&L for Puma, as in Figure 3.

[26] http://bteam.org/

[27] John Elkington coined the idea of the 'people, planet, profit' triple bottom line in the mid-1990s and has recently co-authored 'The Breakthrough Challenge – 10 ways to connect today's profits with tomorrow's bottom line' with Jochen Zeitz. Andrew Winston is an expert on green business strategy, who wrote 'Green to Gold' and most recently 'The Big Pivot', which explores how companies can manage the profound challenges of a hotter, scarcer, more open world.

[28] http://wwf.panda.org/about_our_earth/all_publications/living_planet_report/

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Figure 3 Environmental profit and loss account for Puma

	Water use $ million	GHGs $ million	Land use $ million	Other air pollution $ million	Waste $ million	TOTAL $ million	% of total
	33%	32%	26%	7%	2%	100%	
TOTAL	47	47	37	11	3	145	100%
PUMA operations						8	6%
Tier 1						13	9%
Tier 2						14	10%
Tier 3						27	19%
Tier 4						83	57%

The total monetary impact of PUMA's direct and supply chain operations was valued at EUR $145 million. The greatest impacts are from the use of water and the generation of greenhouse gas emissions, at $47 million each. The largest water-related costs are in the third and fourth tier of the supply chain[29].

Secondly, it can be done via Payment for Ecosystem Services (PES). Schemes such as Upstream Thinking[30] work on this principle, with water companies paying farmers to undertake catchment management activity that will reduce pollution. If the costs to farmers of reducing run-off are lower than downstream treatment costs, water companies have a legitimate business case to reduce costs by paying farmers to reduce pollution.

In summer 2012, South West Water made £360,000 available to farmers for capital investment in farm infrastructure to improve water quality. One hundred and fifty farmers in South West Water's source catchments were invited to submit sealed bids requesting up to £50,000 for on-farm capital investments that would improve water quality (e.g. improving manure/slurry storage facilities, new fencing, and livestock crossing). The auction was open for 6 weeks and had 3 rounds. After the first and second rounds, farmers were given feedback on how to make their bid more competitive. In total, 42 bids were received, requesting a total of £776,000 and 18 were funded.

The auction approach facilitated much faster implementation: the scheme was devised and implemented within 6 months. Moreover, by combining healthy competition with feedback between rounds of the auction, farmers were able to work with advisers to reduce the size of their grant requests, increasing South West Water's value for money[31].

[29] http://www.trucost.com/environmental-profit-and-loss-accounting

[30] http://upstreamthinking.org/index.cfm?articleid=8516

[31] http://www.huffingtonpost.com/matthew-agarwala/put-your-money-where-your_3_b_5767076.html?utm_hp_ref=the-b-team

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Upstream Thinking and other similar PES schemes have been delivered with the help of a 'trusted intermediary' – in this case the Westcountry Rivers Trust – who acted as the bridge between the water company and the farmers to identify and help deliver location-specific catchment management solution.

There are some potential issues with PES, as it has been implemented in the UK: for example, what happens where there isn't a water company 'customer', and more importantly perhaps, why should water stewardship be paid for via water bills, when the problems are caused (mainly) by agricultural practices in the food and drink sector supply chain?

3.3 Delivering long term value

Accounting for externalities is a critical first step as it should put an appropriate financial value on environmental goods and services that are not included in the normal corporate profit and loss account. But there is a risk that accounting for these externalities will impact on the short term performance of companies that 'do the right thing', compared to others that do not. This in turn could affect shareholder dividends and investor confidence.

Private sector companies therefore have a challenge to convince investors and shareholders that longer term (and potentially smaller) returns on investment are 'better' than the quick wins that drive much of the financial sector at the moment. Evidence from programmes such as the CDP Water Disclosure project, shows that this is possible. The CDP project which is sponsored by large international investment firms, including Norges Bank Investment Management, expects companies to demonstrate strategies for water and climate change management[32].

3.4 Collaboration

Collaboration (or collective action) is a key step on the water stewardship ladder because:

- Companies are able act with relative speed and flexibility to drive behavioural change amongst their customers and suppliers;
- Effective water stewardship must be scaled from individual companies to catchments, regions and countries to be effective;
- Companies cannot deliver water stewardship on their own – they need to work with local delivery partners who have the right technical, geographical and social knowledge to implement the right practices on the ground.
- Each individual company is responsible for a small bit of a big problem. There are therefore cost, scale and impact limitations in acting alone to achieve something big.
- There is a stronger voice in advocating policy changes when working in collaboration.

Water stewardship is often put forward as a 'pre-competitive' activity: i.e. competitors working jointly with competitors to deliver mutually beneficial outcomes. Collaboration like this – e.g. working across catchments, regions, or even countries – with local delivery partners (such as wildlife or rivers trusts in the UK) could potentially drive widespread change in water stewardship. Collaborative working is an essential part of a successful stewardship programme. Operating in this way will deliver mutual benefits and share any risk associated with it.

[32] https://www.cdp.net/CDPResults/CDP-Global-Water-Report-2014.pdf

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In the Vittel PES case study (Section 4.3) it clearly states that partners and collaborators reflect the evolution of the PES programme. As the programme became more established and extended this was reflected in a more diverse list of stakeholders all of whom were essential to the success of the scheme. The programme would not have been possible without the effort made to understand farmers, establish a permanent dialogue with them and recognise their perspectives and needs. The methodology used in this process was the key to success and not the funds injected into the programme.

3.5 Making it happen

The preceding sections have provided a top-down argument for private sector involvement in water stewardship, as part of a wider need for business to recognise that it cannot continue to deplete natural resources and remain sustainable. There are strong positive initiatives underway, and a groundswell of activity that are promising for the future. But how do these high-level corporate initiatives translate to measures implemented on the ground?

For example, the LEAF Sustainable Water guide provides a simple tool for undertaking a farm-level water audit to understand issues around water use, pollution control, managing drainage and runoff and soil erosion. (Further information about this is included in Section 4.1).

Whilst many of the measures described in the LEAF guide are simple and low or no cost, it would be useful to understand the costs involved in implementing the recommendations, across a number of farms, and compare these costs with the benefits achieved (using appropriate methods to value natural capital). This would help develop a case for the private sector to fund farm and catchment scale water stewardship, in order to;

- Reduce physical, regulatory and reputational water risks;
- Improve the resilience of their agricultural supply chain; and
- Reduce the long-term shadow price of their supply chain operations.

To summarise:

- Simple, low cost farm or catchment-level water stewardship measures can improve water quality;
- These schemes can be funded and implemented across catchments using methods of valuing natural capital that bring benefits to private companies and the environment;
- Leaders in the corporate world recognises that environmental and water risks and impacts need to be accounted for better in assessing business performance; and investors are requiring this; and
- An increasing number of companies want to make this happen.

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4 Examples and recommendations for how private sector companies can implement a Water Stewardship approach

4.1 Case Study 1: LEAF[33 34 35 36 37]

LEAF (Linking Environment And Farming) brings together farmers, consumers and food businesses to deliver a shared vision of being committed to promoting sustainable agriculture and producing good food to high environmental standards. LEAF's mission is to:

> *"...inspire and enable sustainable farming that is prosperous, enriches the environment and engages local communities…"*

LEAF helps farmers to produce good food, with care and to high environmental standards, identified in-store by the LEAF Marque logo. The Leaf Marque is an assurance system which was introduced in 2003 to provide the food chain with a standard system that would prove that farmers are producing in a more sustainable way. It gives farmers the recognition for their environmental commitment and offers consumers the opportunity to buy affordable responsibly produced food.

LEAF Marque originated in the UK, but now operated in over 30 countries. Countries include; Egypt, France, South Africa, Peru, New Zealand, Senegal and Kenya. The area of land around the world which is dedicated to growing Leaf Marque producers has increased by 31% overall in 2013 and is now 247,053 hectares. It has been adopted by a range of major supermarkets (Sainsbury's, ASDA, Waitrose and M&S), food companies (Birdseye, Kellogg's, Nestlé, Unilever, and Dairy Crest) and individual suppliers, adding significant value to their business while protecting the environment.

LEAF operates on a global scale with farmers growing to LEAF's IFM principles in some 33 countries. In 2014 LEAF signed up to 'The Declaration of Abu Dhabi' which is a global food security initiative working to identify sustainable solutions to food security and safety challenges. Other signatories include Unilever, BASF, Nestlé, SAI Platform, Syngenta, Bayer CropScience and a number of other leading global food industry organisations, certification bodies and NGOs. LEAF is working closely with such partners e.g. Unilever to help them deliver their sustainable commitments.

The LEAF Marque is concentrated in cereal and horticultural crops with five crops accounting for 58% of the UK total – wheat, potatoes, oilseed rape, lettuce and barely. As of 2014, 22% of all of the horticultural crops produced in the UK are to LEAF Marque standards.

LEAF membership brings together many of Britain's most progressive farmers with some of the most innovative and successful food retailing and processing companies as well as the farm supply and

[33] http://www.leafuk.org/leaf/home.eb
[34] http://www.leafuk.org/leaf/farmers.eb
[35] http://www.leafuk.org/resources/000/691/685/SSW.pdf
[36] http://www.leafuk.org/resources/001/025/798/annrev14_final_15_Dec_14_web.pdf
[37] http://www.leafuk.org/resources/000/935/841/Leaf_Sustainability_LOW-RES.PDF

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service sectors. LEAF's approach is built around the whole-farm principles of Integrated Farm Management (IFM), which achieves a balance between the best of modern technology and sound traditional methods, whilst enriching the environment. LEAF also works with European partners to build sustainable solutions that are practical, achievable and realistic.

All farms certified to the LEAF Marque standard care for the environment by:

- Using crop rotations to keep the soil in good health
- Carefully managing their hedgerows to provide a variety of habitats and food sources for wildlife
- Implementing a plan to create and enhance habitats to increase biodiversity
- Using pesticides and fertilisers only when absolutely necessary
- Leaving a strip of land between hedgerows and crops to act as habitat for wildlife
- Recycling on-farm waste and conserving energy
- *Improving water efficiency and quality*
- Assessing the environmental impact of their farming practices
- Continually improving their farming practices and the environment

There may be a small financial driver as by optimising use of fertilizer and minimising water use at the farm level, the farmers may save some money. In a recent survey of LEAF members, 66% of LEAF farmers agreed with the statement 'by adopting LEAF and IFM principles we have benefitted financially', on average each farm saved £14,000 (or £40.00 per hectare). It is difficult however to ascertain the exact driver for the farmers to opt for the LEAF farming accreditation but it is clear that there are environmental, financial and social benefits in addition to the feeling that it is "the right thing to do".

With particular respect to "*Improving water efficiency and quality*", LEAF has produced a guide called "Simply Sustainable Water" which describes six simple steps for managing water quality and water use.

4.1.1 A LEAF demonstration farm at Overbury [38] [39] [40]

(Following conversation with Jake Freestone, Farm Manager at Overbury Farm)

Overbury Farm is an accredited LEAF farm which guarantees the customer that the food they are buying has been produced on a farm committed to improving the environment for the benefit of wildlife and the countryside. Overbury Farm has implemented the six steps described in Simply Sustainable Water.

What was the business driver?

Overbury Farm has been a family run farm for over 300 years. They want to position themselves to be seen to be doing the best for the environment to safeguard the farm for the next 300 years. They have been going above and beyond what is required by LEAF as they see it as strengthening their position in the market place and securing their position as a 'go to' business. This is for both selling

[38] Discussion with Jake 16/02/15
[39] https://www.youtube.com/watch?v=zN61vN61C3w
[40] https://www.youtube.com/watch?v=J2dQuUVu1Ac&feature=youtu.be

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their product and for providing advice and capability to other farmers. Everyone at Overbury believe that is the right thing to do to farm in a holistic manner and making a conscious effort to improve how they work on the farm.

What is the strategy?

The high level strategy is to farm it in a sustainable manner whilst trying to enhance the biodiversity. The farm bird species include brown hairs, skylarks, lapwings and yellow hammers and there are also significant orchid and butterfly populations. The aim is to increase the number of these species and to try and attract new ones onto the farm like great partridge and turtle doves.

Which part of the stewardship ladder does it speak to?

The initiatives undertaken at Overbury Farm sits within the "internal action" (3) as the actions, targets, goals and actions hep to tackle the problem within the farm itself. Overbury Farm is also a LEAF demonstration farm, and as a result the farm host visits for a wide range of groups from farmers to politicians, teachers to WI groups, to show how integrated farm management can produce affordable food in harmony with the environment. This would then fit into the all steps 1, 2 and 3 to increase 'water awareness' and 'knowledge of impact'.

LEAF as the umbrella concept, promotes sustainable food and farming and they help farmers produce good food, with care and to high environmental standards. This could relate to step 4, collective action as it aims to bring different stakeholders together.

What are the practical actions that have been implemented?

Overbury Farm has implemented the six steps described in Simply Sustainable Water;

1. Water saving
2. Protecting water sources
3. Soil management for water quality
4. Drainage and ditching
5. Tracking water uses and monitoring
6. Water availability and sunshine hours

There are several examples of how Overbury Farm have protected and improved (anecdotally) their nearby water sources by implementing integrated farm management. In one field which has a spring fed spring, they have left a grass tussocky margin at the boundary which helps to intercept pesticides and fertilizers from the adjoining arable field before it meets the stream. A pollen and nectar rich high level stewardship margin has also provided insect feed and cover for birds as well as intercepting and protecting the water running through the valley. These strips are crop free habitats. Some of the fields also contain a 1 hectare (football pitch size) fallow plot in the middle which is aimed at providing nesting and feeding sites for farmland birds.

Sewing cover crops helps water quality by locking up nutrients within the soil structure of the field so that they cannot be washed away. Overbury Farm always plant catch cover crops, such as mustard, which helps with intercepting rainfall, reducing soil erosion and the potential silting of and nutrient and pesticide pollution of the nearby water course.

Drainage and maintaining ditches are also very important. They have created a silt trap along one of the field ditches and the purpose of which is to widen and deepen the ditch to slow the water down. As the water slows, any suspended soil particles can sink to the bottom taking any pesticide or

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fertilizer particles attached to them with it. The silt traps are then 'muddied out' periodically and the soil returned to the field (150 tons last time). Further along the ditch, after the silt trap, they have installed a reed bed. The reeds are yet to mature, but once they have, the reeds will cover the whole area and provide a habitat for birds (like reed buntings) and also a great insect habitat. In addition to providing a biodiversity habitat, the reeds will act as a natural water filter and remove nitrates, phosphates, etc. that might be in a soluble form within the water, thus improving water quality before the water continues back on the ditch line and into the stream. One of Severn Trent Water's water pipes runs through Overbury Farm and when it was rehabilitated during a security of supply scheme, the farm piggybacked on this activity and decided to try and improve the drainage in a large wet area to try and reduce run off. Whilst the farm was being dug up, the heavy clay soil was mixed up and then replaced with stones and sand to improve the drainage in areas where the soil type impedes water flow.

A final, but important part of the process is to track water use and monitor water quality. The Farm uses nitrate and phosphate water quality testing kits to see what is coming into and what is going out from the farm.

What's in it for the farmer?

They have been going above and beyond what is required as a LEAF accredited farm. They see their product as superior to others and their place in the supply chain as strong as a result of their ethos. Their five year plan is based around the implementation of the farm's new Higher Level Stewardship scheme and maximising biodiversity income. The farm is keen to *'tap into large companies' corporate and social responsibility objectives – perhaps through tree planting'.*

What has been the result / benefit in terms of reduced impact for the river?

Actual data to show any change in water quality in the local water courses is not available as their testing is very limited and sporadic. However, there is much anecdotal evidence to suggest that the practices in place have contributed to an improved environment. The reed beds are fully matured and will continue to filter and clean the water of nutrients and suspended solids. They have created fantastic habitats throughout the farm and this is reflected in a rich biodiversity.

4.2 Case Study 2: Conservation Grade

(Following conversation with Brin Hughes)

What was the business driver?

The Conservation Grade was the inception of Bill Jordan of Jordan Cereals who paid a premium for farmers to do or not do certain practices on their farms. The scheme was confounded in 2000 with the introduction of the Single Farm Payments which had a greater consideration of environmental protection.

The Conservation Grade Protocol (CGP) has been designed to deliver the highest levels of on-farm wildlife and biodiversity through habitat creation and management and is intended to become the leading farming and environment standard. It should consistently evolve over time and embrace an increasing range crop and livestock enterprises. Adopting the Conservation Grade (CG) farming practices will enhance wildlife whilst providing consumers with quality food, which is recognisable to the consumer.

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The more farmer that sign up ten percent of their farm over to the CG then this will have wider benefits for biodiversity. The remit of CG is widening to focus on other areas than just biodiversity and include specific measures for soil and water. There are now specific targets and actions for the protection of water quality.

What's the strategy?

The Conservation Grade is a unique sustainability protocol that requires farmers to create and actively manage a specified range of wildlife habitats in return for a contracted premium price for their crop. Independent scientific trials demonstrate the Conservation Grade 'Fair to Nature' approach leads to a significant increase in wildlife biodiversity compared to conventional farming systems.

To meet the requirements of the CG Protocol, farmers need to satisfy the following essential criteria:

1. Commit at least 10% of the farmed area to the specified range of managed wildlife habitats
2. Be full members of an approved Assured Food Standards farm assurance scheme (e.g. Red Tractor, GlobalGap etc.)
3. Be members of the Guild of Conservation Grade Producers
4. Complete and annually review the CG Farm Environment Plan
5. Participate in the CG training and annual update programmes provided for farmer members
6. Comply with the CG production standards
7. Pass an annual verification (Audit) of the Protocol by a CG approved verifier

The more habitats there are on a farm, the greater the wildlife diversity and numbers. The CG is aimed at creating a wider range of habitats including wetlands and ponds, hedgerows and broadleaf woodland. As well as these activities, there are now specific targets and actions for the protection of water quality. The need to protect water bodies from agricultural pollution is a high priority within the CG scheme. Introducing buffer strips in a CG farm is now a prerequisite for the accreditation. The strips must be no less than five meters wide between the top of the ditch bank and the crop, or the water's edge. The farm environment plan must include standards for water quality e.g. pesticides. At present there is not any formal water quality monitoring or measuring but this is inferred with benefit to the ecosystem seen by an increase in species such as birds, butterflies and bees.

In terms of water management specifically, farmers will need to demonstrate that they have relevant strategies in place to optimise water usage on the farm and to minimise water waste. A sample of questions included in the protocol are as follows;

- Do you have a water management plan designed to optimise water usage on farm and minimise waste?
- Is your water management plan reviewed annually?
- How do you measure the water efficiency of your enterprises and crops? e.g. record irrigation usage per tonne of crop output.
- Do you harvest, recycle and store water to minimise use of abstracted water?
- Do you ensure storage areas also provide benefits to wildlife? e.g. allowing the development of aquatic vegetation or providing nesting platforms

With each questions in the protocol, there are also recommended practice and/or requirement and/or evidence given which the farmers must adhere to. There are also strict guidelines to adhere to with respect to the application of manure and fertilizer. For example, not within 10 metres of a

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watercourse including field drains or ditches and not within 50 metres of a source of drinking water for human consumption.

Brands are realising that CSR now specifically mentions water, soil and biodiversity and not just all contained under the 'carbon' umbrella and so there is potential for them to become more engaged. The attraction to brands is that it is funded in-house by consumers and they are both the buyer and the beneficiary.

Which part of the stewardship ladder does it speak to?

Conservation Grade is included in the first three steps of the water stewardship ladder. Compliance with the CG will then lead to collective action, step 4.

What are the practical actions that have been implemented?

The CG Protocol is designed to ensure that every accredited farmer addresses the issue of declining wildlife species by creating a wide range of high quality wildlife habitats on their farm. Every CG accredited farmer has to designate a minimum of 10% of their farmed area to a range of managed wildlife habitats. The habitat types include;

- Pollen and nectar mixes (grasses, wildflowers, legumes)
- Wild bird food crops
- Tussock and fine grass mixtures
- Annually cultivated natural regeneration

The provision of these habitats is the key aspect of the Protocol. However, in addition to these there are some additional management actions which deliver wider environmental benefits and this includes the protection of water and waterside habitats.

What's in it for the farmer?

Farmers are part of the supply triangle and they will be paid a premium by the brand for the ingredients that go into the product either bread or cereal. Conservation Grade paid a fee to accredit the farmers and the farmers grow according to the protocol to supply the brand and get a premium for this.

Premiums vary from crop to crop and from brand to brand but is generally about ten percent more than the 'normal' price. Jordan's cereals pay £25 a ton which could be as much as twenty to twenty five percent more than a non CG product.

What has been the result / benefit in terms of reduced impact for the river?

As stated, there is not any formal water quality monitoring or measuring but this is inferred with benefit to the ecosystem seen by an increase in species such as birds, butterflies and bees. The biodiversity is monitored and measured and is a way of backing up the measures undertaken by the farmer with scientific proof.

4.3 Case Study 3: Vittel PES for water quality

(Following conversation with Daniele Perrot-Maitre)

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What was the business driver?

Vittel is a world leader in mineral water bottling selling over one million bottles every year in over 70 countries. France accounts for 45% of these sales with consumers believing in the natural benefits of the natural spring water. Maintaining water quality is essential to the entire water bottling business. The legislation regarding the selling of 'natural mineral water' is extremely constraining in France and unlike in other countries (such as UK or USA) prohibits any treatment. Maintaining the natural stability of the water is a high reputational risk.

In the early 1980s concerns were raised about the increasing trend of nitrates in the aquifer. At this time the farmers in the catchment were starting to switch towards an intensive maize based agricultural system which was responsible for the increasing nitrate within the water. In response to this, Nestle Waters (owners of Vittel) proposed to farmers the idea of transforming their farming practices in a Payment for Environmental Services (PES) scheme.

The objective of the PES programme was to give improved water quality, specifically nitrate rates, below 4.5 mg/l in the aquifer. To achieve this, it required maintaining a rate of 10 mg/l in the root zone of the plants which was achieved by reducing fertilizer use, animal waste and manure application and by making use of the capacity of the soil to absorb and retain nitrates.

What's the strategy?

The issue of declining water quality in the aquifer coincided with advice from the European Common Agricultural Policy to move away from the traditional hay-based cattle ranching system and replace it with a maize-based system with limited free-range grazing and increased stocking rates. The increased nitrate and pesticide levels are as a result of the leaching of pesticides and fertilizers from the maize fields, overstocking and poor management of animal waste.

In order to safeguard their water source and therefore business Vittel looked into alternatives to ensure water quality over the next fifty years.

1. **Do nothing** – too costly and risky as changes in water could result in closing the business
2. **Relocate to a new catchment where risks are lower** – this would lose the 'Vittel' label and the premium price which goes with it
3. **Purchase all lands in the aquifer catchment** – not a feasible option as French legislation does not allow the sale of agricultural land for non-agricultural purpose. This would also be likely to result in social protests if farmers lost their land.
4. **Use legal action to ensure farmers change their practices** – the legitimacy of this would be questionable as the nitrate limits are actually within permitted levels but it is just a problem for the mineral water industry. It would be hard to justify imposing this onto farmers.
5. **Provide incentives to farmers to voluntarily change their practices** – this is the only alternative left – the challenge is to make Vittel and farmers' interests coincide so that it is in the their best interest to cooperate.

The only alternative was to convince farmers to change their farming practices and develop a system of incentives attractive enough for them to want to do so.

The farmers were incentivised to improve their farm practices and a four step methodology was developed to drive this forward. The stages are;

1. To understand the farming systems and why farmers do what they do.

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2. To analyse the conditions under which farmers would consider changing farming behaviour.
3. To identify, test and validate in farmers' fields the management practices necessary to reduce the nitrate threat.
4. To provide financial and technical support to farmers willing to enter the programme.

Which part of the stewardship ladder does it speak to?

This case study speaks to step 4 and maybe step 5 of the water stewardship ladder. The success of the PES programme was dependent on engaging with stakeholders and having a concerted action plan. Partnerships were essential to being able to understand the issue (in terms of the farming and farmer) and to be able to understand how to rectify this (and deliver the required reduction in pollution).

The development of a shared vision as the basis for a set of innovative partnerships that enabled buy in, and enabled successful participation and cost sharing with a variety of stakeholders was pivotal for the success of the PES programme.

What are the practical actions that have been implemented?

The changes required were quite drastic. They implied the adoption of a land and labour intensive system and heavy investment when land, labour and capital were precisely what farmers lacked. A number of practices were identified to help improve and eventually reduce the level of nutrients and pesticides in the aquifer. These included;

- Give up maize cultivation for animal feed (land under maize production shows nitrate rates of up to 200mg/l in the root zone).
- Adopt extensive cattle ranching including pasture management (hay and alfalfa rotation so that farms produce all animal feeds themselves).
- Reduce carrying capacity to a maximum of one cattle per hectare.
- Compost animal waste and apply optimally in the fields.
- Give up agrochemicals (chemical fertilizer replaced with composted manure and without the use of pesticides).
- Balance animal rations to reach optimal milk productivity and farm profitability.
- Modernise farm buildings where required.

In turn, farmers were provided with a long term incentive package which was developed in collaboration with farmers and agreed upon. These were;

- Long term security through 18 or 30 year contracts.
- Abolition of any debt linked to land acquisition and any land acquired by Vittel is left usufruct (i.e. farmers have the right to the use and profits of the property of another without damaging it) for up to 30 years.
- A subsidy of, on average, about 200 euros per hectare over five years. This is to ensure a guaranteed income over the transition period and reimburse the debt contracted before entering the programme for the purchasing of farm equipment required. The exact amount is negotiated on a farm by farm basis.
- Up to 150,000 euros per farm to cover the cost of all new farm equipment and farm building modernisation.
- Provision of free labour to apply compost in the farmers' fields. This is to address the labour bottleneck and to ensure that optimal amounts are applied on each plot. These amounts are

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calculated for each plot for each farm for each year and the individual farm plans are developed each year.

- Free technical assistance including annual individual farm plans and an introduction to new social and professional networks. This is particularly important as giving up the intensive agricultural system alienated farmers from traditional farming networks and supportive organisations.

What's in it for the farmer?

Although it took a long time to convince the farmers to change their practices, in the end there was a clear win-win. The farmer benefits from the incentives offered as described above. Vittel have ensured no loss of income to the farmers involved.

What has been the result / benefit in terms of reduced impact for the river

Vittel was originally confronted with resistance from farmers. It took ten years to convince farmers to change practices. Partnerships with the Rhine Meuse River Basin Agency and the French National Institute of Agronomic Research and co-financing four years of research to independently identify optimal agricultural practices were critical to the success of the scheme.

By 2004, all 26 farms in the area had adopted the new farming practices resulting in 1,700 hectares of maize eliminated and 92% of the basin was protected. The performance of the programme is evaluated through a monitoring programme. Water quality from surface and groundwater is monitored daily and on farm practices are also monitored to ensure compliance with farming practices. An observation network monitors all activities in the catchment area to quickly identify pollution risks and preventative measures are taken when required. Although no qualified data was available, water quality levels have been maintained or reduced.

Although protection of biodiversity was not the objective of the initial programme the new practices employed on the farms have had a positive impact. Biodiversity is encouraged through the planting of flower rows and the establishment of bird houses and bird refuges. Ladybirds, a natural predator of crop pests, are bred and released at strategic times during the year. Farms also plant and maintain 40kms of hedgerows to keep a balanced population of foxes and birds of prey (the natural predators of field mice that ravage crops).

The Vittel experience illustrates the complexity linked to the interactions between technical, economic, social, legal and political aspects and the importance of taking all these facets into account when developing a PES programme. It also demonstrates that there can be a business case for private sector participation in PES.

4.4 Case Study 4: Molson Coors[41] [42]

Molson Coors (MC) brewery has a commitment to conserving water and ensuring it as a sustainable resource. The quality of their beer is directly affected by the quality of the water used to produce it

[41] http://www.molsoncoors.com/en/Responsibility/What%20Matters%20To%20Us/Environmental%20Stewardship/Water.aspx

[42] http://www.molsoncoors.com/en/Responsibility/Case%20Studies/Responsible%20Sourcing/Linking%20Farming%20and%20Water%20in%20the%20UK.aspx

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and therefore it is important to secure supply of high quality water. For this reason, protecting the water resources is a central part of their paper "Our Beer Print" and is a strategic objective for the Company. They have set an ambitious objective to reduce water intensity by 15% by 2020 from a 2011 baseline.

(Following conversation with Debbie Read, Molson Coors)

What was the business driver?

For them it was a pretty straightforward business driver - they have depended on a clean and secure supply of water and good quality grains for their beer throughout their history and continue to do so. This is about safeguarding the resources required for their business.

There is some relevant background to the approach of MC and this involves their relationship and participation in the programme to improve the water quality of the Clear Creek Watershed which started as a Forum of stakeholders in the catchment in 1990 but then in 1997 became a Foundation (CCWF) as a non-profit organization…"dedicated to improving the ecological, aesthetic, recreational and economic conditions in the Clear Creek Watershed through comprehensive and cooperative efforts with watershed stakeholders". (More details of the history can be found on http://www.clearcreekwater.org/organization.html)

A relevant paragraph from the history to the theme of water stewardship can be found on this website link: *"…the Forum was an informal organization which transcended the boundaries of any one agency, community, industry, or organization within the watershed. The role of the Forum has been to bring people together from throughout the watershed to share knowledge, attitudes and values and thus develop cooperative water quality improvements strategies and projects. Not an easy task given the diversity of stakeholders and interests—ranging from mountain rural to urban, from agricultural and industrial to recreational and regulatory. Through numerous gatherings, stakeholder input on projects has been obtained and incorporated to define watershed priorities and establish project partners, thus creating a watershed-wide "culture of cooperation." Once stakeholders began fixing things on the ground, sustainable improvements began to be seen—project by project".*

In the UK, Molson Coors is involved with partnership in two catchments, one in Tadcaster and the other at Alton. In June 2011, Molson Coors held the first meeting of the **Tadcaster River Wharfe Community Users Group** in partnership with the UK Environment Agency. The other is also a partnership with the EA - the River Wey runs through the MC Alton brewery site and is importance to both the brewery and the local community – it is a chalk stream running past WWF-UK's former offices in Godalming and work on the river is part of the **Hampshire Biodiversity Action Plan**.

The objectives of the Tadcaster group are "*to protect the quality and supply of water for the Tadcaster community for now and future generations";* with aims…*"to develop partnerships, share best practices, mitigate short and long-term risk, and ensure that our river can be enjoyed by all".* Recent outputs include a joint strategy with the Environment Agency. Full details available from a presentation delivered at TEDx Event in 2012. (http://www.thewaterevent.com/files/mcbc_thewaterevent.pdf)

The experience from the US has also influenced their "out-reach" to local communities within the catchments, which includes the creation of community forums. An example in the UK is the relationship with a local charity partner, the **Canal and River Trust** (CRT), for 2014 by adopting a section of the Trent & Mersey Canal. Interestingly the decision to build on this relationship comes…*"following positive employee and community feedback on work done through the partnership to date"*.

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So in some respects the drivers of "improved staff engagement" and engendering a supportive community relationship can be regarded as a by-product of the central purpose of the business related strategy to be involved in catchment (or watershed) activities.

What's the strategic context for the initiative?

They have a strategy launched in 2013 called "Our Beer Print" which lays out a 2020 Sustainability Strategy covering the management of energy, GHG emissions, water and solid waste. The cornerstone of this strategy is a commitment to waste water treatment investment that will also be able to generate clean energy.

Protecting the water resources is also central part of the Our Beer Print strategy and they set an objective to reduce water use by 15% by 2020 from a 2011 baseline.

Which part of the stewardship ladder does it speak to?

The initiatives through MC seem very much to fit within the step of "collective action" (4), though it is also clear that their involvement in the US watershed management programme of Clear Creek in step 5 with their full participatory role in governance influence and being an important player in public policy on the river management programme.

What are the practical actions that have been implemented?

Within the two UK catchments the programme has involved supporting local restoration groups to clear banks, construct and installed faggots to manage the banks and improve the river flows.

Sponsoring community events have also been an important aspect of their involvement – used as way of communicating information about the river management plans and what support from the community is required; and generally to raise awareness of water issues – a community duck race in Tadcaster was one example from last year.

What's in it for the farmer?

And these community events include farmers and landowners – along with ASDA they sponsored a LEAF Guidance document on sustainable land management – so they seem to be widely engaged in a range of activities from local river restoration activities, partnering with the EA to supporting LEAF objectives.

What has been the result / benefit in terms of reduced impact for the river

Tadcaster has increased its water by efficiency 8% reduction over 2 years and MC is now achieving efficiency of 2.9hl of water to make 1 hl of beer

They think that there has been a massive improvement in trust with local community and stakeholders – especially the EA (with no complaints about abstractions – very sensitive to this!)

4.5 Case Study 5: First Milk[43]

(Following conversation with Paul Gibson, Natural Resources Wales and Simon Matthews, First Milk)

[43] http://www.firstmilk.co.uk/userfiles/files/sustainability/FirstThingsFirst_FirstMilk_SR_2012.pdf

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First Milk (FM) is an innovative British farmer owned dairy co-operative, with over 2,000 member dairy farmers. FM have partnered with the Food Animal Initiative (FAI) to produce a First Milk Sustainability Programme which will look at sustainability issues throughout the supply chain. In addition to developing their own programme, FM are also involved with a number of pan-industry initiatives, including the Dairy Roadmap and Dairy 2020. The work they are undertaking as part of their own Sustainability Programme sits alongside these UK dairy industry initiatives. One example of this was to establish a partnership with Natural Resources Wales (formerly Environment Agency Wales) to develop better nutrient management practices to help protect local watercourses.

In Pembrokeshire, west Wales, First Milk Cheese Company has a plant in Haverfordwest and produces about 28,000 tonnes of cheese per year from the milk which is locally supplied by 350 farms across the region. As a by-product of the cheese making process is whey, which is a watery liquid which remains after the coagulation of proteins which makes the solid cheese. Traditionally this waste product was disposed of by either discharging to waterways or sprayed directly onto farmland. Disposing it like this however, either directly into a waterway or indirectly via runoff from pasture, can have significant detrimental impacts. Whey has a high biological oxygen demand which can impact fish, aquatic plants and other aquatic organisms. Growing concerns about discharging whey in this manner resulting in negative impacts on the environment has prompted governments to impose restrictions on its disposal, stipulating that the liquid requires treatment to a specific standard before the effluent can be discharged.

What was the business driver?

Currently the effluent produced by the creamery is treated at Dŵr Cymru Welsh Water (DCWW) sewage treatment works (STW) at Haverfordwest. Current capacity at the STW is close to maximum and consequently DCWW have told FM that they will no longer accept their trade effluent. This is to allow the works to accommodate the increase in demand due to new housing and retail development planned for the area. First Milk therefore needed to find an alternative means if effluent disposal.

The only viable option was for FM to build their own treatment facility. The treated effluent would then be discharged into the nearby watercourse. In 2012 First Milk proposed building their own treatment facility which would discharge via a pipe line into the Western Cleddau River. This area has been designated as a Special Area of Conservation (SAC) under the Habitat Directive and as a result has very stringent regulations in place in order to protect the environment. Nutrient enrichment is considered to be a contributing factor to the 'unfavorable' condition of the aquatic habitats within the SAC. This means that mitigation will be required before First Milk is able to obtain a new discharge effluent license.

What's the strategy?

Natural resources Wales (NRW) met with FM to discuss a way forward. The initial plan was to "offset" any increase in nutrient loading due to the effluent from FM by reducing diffuse sources of pollution at the farms within the catchment who supply milk to the creamery – effectively pollution neutrality.

FM with support from NRW would ensure that a number of dairy farms would implement measures to reduce inputs of nitrate, phosphate and suspended solids into the nearby water environment. The total amount of nutrient reduction from these interventions must equal any increase from the creamery as an absolute minimum.

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The objective is that a number of farms agree to be a part of this scheme and farms outside of the catchment will also be encouraged to participate which is aimed at delivering wider environmental improvements.

Which part of the stewardship ladder does it speak to?

This case study speaks to the 4th step of the stewardship ladder. FM needed an innovative approach which involved engaging with stakeholders, farmers in their supply chain and NGO's (NRW). It also includes step 3 as the whole initiative involves facilitating internal action at the farm level.

What are the practical actions that have been implemented?

Once a farm has been identified and they have agreed to be involved, it will need to provide FM with an evidence pack demonstrating what measures it has/will implement. NRW will carry out audits on the farms to assess compliance. The audits are a way of offering support to the farms and measuring their progress, but the compliance to the "offsetting" scheme is between the farms and FM. The close relationship between FM and their supplying farms is critical to the design and success of the mitigation scheme.

What's in it for the farmer?

FM state that, "*as a farmer-owned business we are uniquely paced to deliver sustainable practices right along our supply chain. We have an industry-leading sustainability programme in place which covers farm practices right through to our commitment – producing nutritious and great tasting food for our consumers".* They also recognised that, "*Natural Resources Wales deserve a lot of credit for working with us creatively to develop this innovative scheme that will protect the Western Cleddau River".*

It is an interesting case study in terms of trying to identify a driver. FM rely on their suppliers within the catchment to supply milk, similarly the farmers rely on FM to buy their product. In a way, this seems like an easier water stewardship example as each are mutually dependent on each other. The farmers do want to farm in a more sustainable manner and through this process FM have enabled this by providing support, advice, knowledge and the funding mechanism required. This is however only to those farms which have opted to join the scheme. It is not clear how FM will treat the participants to the scheme differently to those who have chosen not to (in terms of financial incentives price per volume supplied, or longevity of contract to supply milk).

What has been the result / benefit in terms of reduced impact for the river?

This case study is still work in progress. FM is currently developing the evidence pack that will be completed by each farm joining the scheme. To date FM have signed up 34 farms to the offset scheme. It is too soon to have any measured successes but they have calculated that in order for the effluent discharge licence to be granted they must achieve an offset of 11.2 tonnes of nitrate, 1.8 tonnes of phosphate and 26.6 tonnes of suspended solids. Based on the nutrient reduction measures to be adopted on the participating farms this will be achieved.

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4.6 Case Study 6: Sustainable Agriculture Initiative Platform[44] [45]

The Sustainable Agriculture Initiative (SAI) Platform is the main food and drink industry initiative supporting the development of sustainable agriculture worldwide. Food companies and retailers are the biggest purchasers of agricultural raw materials and in order to rely on a constant, increasing and safe supply of agricultural raw materials, these is an understanding that they must be grown in a sustainable manner.

In 2002 Nestlé, Unilever and Danone created the Sustainable Agriculture Initiative (SAI) Platform, a non-profit organisation to facilitate sharing, at precompetitive level, of knowledge and initiatives to support the development and implementation of sustainable agriculture practices involving the different stakeholders of the food chain. SAI Platform today has over 60 members which actively share the same view on sustainable agriculture defined as:

> *"the efficient production of safe, high quality agricultural products, in a way that protects and improves the natural environment, the social and economic conditions of farmers, their employees and local communities, and safeguards the health and welfare of all farmed species".*

They have also defined sets of principles and practices for the sustainable production of various agricultural products, ranging from coffee to dairy to fruit. To facilitate sustainable sourcing, the SAI Platform has benchmarked agricultural standards and published guidelines for the industry.

The SAI Platform Water Working Group have produced 'Principles and Practices for Sustainable Water Management in Agriculture at a farm level'. The document aims to address the key aspects of water and irrigation management at an environmental, economic and social level. Emphasis is given to the correct management of water in terms of both quantity and quality[46]. In addition to this, the water and agriculture working group of the SAI Platform developed a paper entitled, 'Water Stewardship in Agriculture – beyond the farm towards a catchment approach'[47].

The publication sets out the main principles of water stewardship to help industry representatives understand the issues and to explain the importance of a catchment based approach. The key concept is that water stewardship begins on the farm, but must also extend to the surrounding landscape through a catchment based approach. Stakeholder engagement with neighbours and the community is critical to success.

The main concept is that 'sustainability' should encompass production, society and the natural environment. A catchment based approach to water management provides a logical and practical way to address these components in a coordinated and locally relevant context. A catchment contains many entities: farms, farmers, landowners, industry, habitation, people, conservation areas and regulators. Sustainable management therefore requires interaction and cooperation which is best achieved through a process of stakeholder engagement.

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[44] http://www.saiplatform.org/

[45] http://www.saiplatform.org/activities/committees/water-committee

[46] http://www.saiplatform.org/uploads/Library/Principles%20and%20Practices%20for%20%20Sustainable%20Water%20Management%20_At%20a%20farm%20level.pdf

[47] http://www.saiplatform.org/uploads/Modules/Library/sai-platform-water-stewardship-report.pdf

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Stakeholder Engagement:
Stakeholders include and organisations, groups or individuals that have some interest or 'stake' in the farm's activities. Typical stakeholders include; the community, farmers and landowners, other water users such as water companies and industry, the environment and regulators and government agencies. The key stages in stakeholder engagement are:

- *Mapping of stakeholders*
- *Categorising stakeholders*
- *Knowing the water policy framework and institutions*
- *Assigning responsibility within your team*
- *Plan of action*

The most advanced stage in stakeholder engagement is to establish a programme of long term engagement combined with active promotion of improves water management policies. The ultimate aim is to influence policy as to encourage good water stewardship by all.

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Appendix A: Further information

This section contains additional information about existing schemes, initiatives and organisations which are of interest.

Catchment sensitive farming[48 49]

Catchment Sensitive Farming (CSF) is a scheme run by Natural England in partnership with the Environment Agency and The Department for Environment, Food and Rural Affairs. It raises awareness of diffuse water pollution from agriculture (DWPA) by giving free training and advice to farmers in selected areas in England.

The selected areas are called 'priority catchments' and advice is available in these catchments only. The aim of the advice is to improve the environmental performance of farms. CSF is staffed by trained, qualified and experienced advisors. The advice is confidential and not disclosed to other parties. The selected catchments targeted are to improve freshwater SSSIs where pollution from farming practices impacts significantly on water quality and habitats and where improvements in water quality will make the greatest contribution under the Water Framework Directive objectives.

CSF is funded by the Rural Development Programme for England which comes from DEFRA and the scheme is managed by Natural England. CSF complies with Article 22 of Commission Regulation (EC) EC 702/2014 on how it gives advice.

The Red Tractor scheme[50 51]

Red Tractor Assurance was established in 2000 and is the UK's leading farm and quality food assurance scheme when shoppers called for a single symbol that would stand out in a busy supermarket and provide reassurance that food had been produced to good standards. The Red Tractor Scheme is a not-for-profit, limited company set up by the UK food industry and their logo, is used by major UK retailers, many branded manufacturers and food service operators to signify farm to pack assurance.

The 'British Farm Standard', then known as the little red tractor, was developed by Assured Food Standards - a body made up of experts from farming and the food industry uniting every part of the UK food chain to provide millions of shoppers with a single stamp of approval. In 2005 the logo was redesigned, with the introduction of the Union Jack to reinforce the integrity of Red Tractor Assurance as a provider of responsible food production standards as well as origin.

The Red Tractor scheme has developed, and in 2009, demand grew for food confidence outside the supermarket. Working with some of the biggest food caterers in the UK, Red Tractor has introduced its standards to food service. Today, there are over 2000 food service companies that are involved with the scheme. In 2012, in line with London 2012 Olympic commitment to provide the most sustainable Games in history, the London 2012 'Food Vision' requested Red Tractor standards as the

[48] https://www.gov.uk/catchment-sensitive-farming-reduce-agricultural-water-pollution
[49] http://publications.naturalengland.org.uk/publication/32034
[50] http://www.redtractor.org.uk/home
[51] http://www.redtractor.org.uk/the-history-of-red-tractor

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benchmark for all food sourced for the 2012 Olympic and Paralympic Games. Most recently In February 2014 Red Tractor introduced a new set of standards and logo to give shoppers peace of mind about the ingredients in products like ready meals and pies. The new 'Made With' module and logo highlights to shoppers that the named ingredient has been produced to Red Tractor quality standards and is traceable back to farms in the UK.

In summary the Red Tractor is a well-recognised symbol of good farming practice and the scheme continues to grow as it enables consumer confidence in the choices they make. Companies which have adopted the Red Tractor include; Asda, Tesco, Morrison's, The Co-op, Aldi, John Lewis, KFC, McCain potatoes and Bidvest 3663 (major food supplier of restaurant chains).

In the absence of a water stewardship schemes already being established, or setting up a new initiative at the risk of initiative fatigue, it may be possible to use an existing reputable scheme like this, to use as an avenue to introduce water stewardship. The drivers behind the schemes do differ but it may the most effective mechanism to deliver water stewardship by piggy-backing onto existing sustainability initiatives.

Agricultural and horticultural development board[52]

The Agriculture and Horticulture Development Board (AHDB) is a statutory levy board, funded by farmers, growers and others in the supply chain and managed as an independent organisation (independent of both commercial industry and of Government).

Their purpose is to make our agriculture and horticulture industries more competitive and sustainable through factual, evidence-based advice, information and activity.

Levy payers are at the heart of their activities, and the delivery of support services to them is focused through six branded operating divisions covering about 75% of total agricultural output in the United Kingdom (UK):

- Pig meat in England - BPEX division
- Beef and lamb in England - EBLEX division
- Commercial horticulture in Great Britain - HDC division
- Milk in Great Britain - DairyCo division
- Potatoes in Great Britain - Potato Council division
- Cereals and oilseeds in the UK - HGCA division

AHDB also ensures that proper account is taken of Government priorities for agriculture and the agri-food industry, where appropriate. Specifically AHDB;

- Deliver extensive research and development programmes which are delivering scientifically-robust and commercially useful outcomes for levy payers
- Undertake efficient farm-level knowledge transfer programmes based on evidence both from third party science and their own R&D aimed at improving efficiency, productivity and sustainability
- Provide unbiased, high quality market information that helps business decision making and improves supply chain transparency
- Conduct export market development work and also domestic marketing activity to inspire and inform consumers in order to assist the economic viability of sectors which require this

[52] http://www.ahdb.org.uk/

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- Raise awareness of food and where it comes from among school children
- Help ensure the agriculture and horticulture industries are able to develop and attract workers with the skills needed to operate effectively
- Ensure that proper account is taken of Government priorities for agriculture and the agri-food industry, where appropriate.

DairyCo[53]

DairyCo provides independent, evidence-based information and resources for dairy farming business. From world class research to effective improvement programmes, they provide information to support dairy farmers. Many dairy farmers are already managing their land in an environmentally beneficial way. However, all will face some considerable environmental challenges in the future, whether this is NVZs and slurry use, greenhouse gases or water use and pollution control. DairyCo has produced a range of tools and information to assist dairy farmers understand how environmental legislation may affect their businesses and also how to comply.

With regards to water, DairyCo helps farmers to optimise their water use at the farm level. The provision of a clean and adequate supply of water is vital on any dairy farm, but the cost of achieving this varies widely. The average farm spends £31/cow/year on water but data shows that this can be over three times higher than this on some farms. DairyCo enables farmers to conduct a simple assessment of water supply and usage which will indicate if it is worth addressing its management. They have produced a booklet '*Effective use of water on dairy farms'* [54] which will help to highlight where to start and how best to assess farm usage. As well as general water use the booklet looks at detecting leaks, rainwater harvesting options and alternative water sources available to some such as abstraction for rivers or canals. There is also a full water audit pack[55] available from DairyCo for those wanting to analyse water usage further.

Although focused on water quantity rather than quality, DairyCo may be a good avenue to explore to promote water stewardship within the whole catchment rather than water focus being within the farm only. With established links to dairy farmers it would be an effective way to reach out to farmers.

The Prince's Countryside Fund[56]

The Prince's Countryside Fund, which provides vital assistance to Britain's rural areas and the people who live within them. The programme - which sees us work in collaboration with other like-minded businesses - has three objectives:

1. To improve the sustainability of British farming and rural communities, targeting the areas of greatest need
2. To reconnect consumers with countryside issues
3. To support farming and rural crisis charities through a dedicated emergency funding stream

[53] http://www.dairyco.org.uk/

[54] http://www.dairyco.org.uk/resources-library/technical-information/environment/effective-use-of-water-on-dairy-farms-(1)/#.VJimwl4ihA

[55] http://www.dairyco.org.uk/media/105314/diy%20full%20water%20audit%20pack.pdf

[56] http://www.princescountrysidefund.org.uk/

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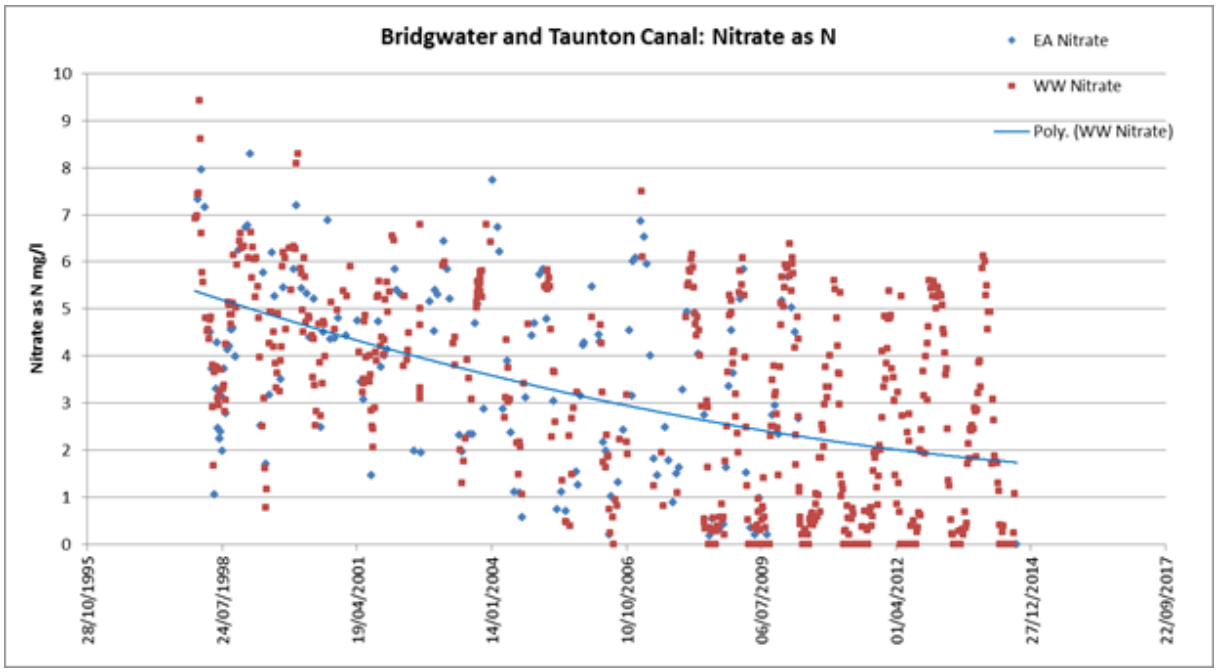
Since 2010 the Fund has given grants of £2.1 million helping 40,000 people. Projects supported include 113 rural transportation schemes, 1,700 farms have been given business support and 1,447 young people have been offered training and apprenticeships.

Water Quality in Wessex Water's reservoirs

Evidence from Wessex Water suggests that already implemented initiatives in place to target water quality in catchments have started to show results. Source protection zones and nitrate vulnerable zones and other enterprises maybe have had an effect at reducing diffuse pollution. This is based on minimal evidence but further investigation of other water quality in water companies may signal that a catchment based 'stewardship' approach may be effective.

The graph below is for a canal which feeds a key reservoir and it shows a steady decline in nitrate, but still with a strong seasonal signal. These characteristics are geologically dependent, as the clay hard rock nature of the catchment acts differently as there is no buffering for the nitrate unlike in chalk unsaturated zones. It is a signal that concentrated water stewardship has the potential to yield results.



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