



Agricultural Water Pollution: Why the Problem Has Been So Challenging, and
What Legal Steps Can Be Taken to Control It.

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Abbreviations

CAP	Common Agricultural Policy
CJEU	Court of Justice of the EU
CSF	Catchment Sensitive Farming
DEFRA (Defra)	Department of Environment, Food and Rural Affairs
EA	Environment Agency
EFRA	House of Commons Environment, Food and Rural Affairs Committee
EU	European Union
EU15	15 Members of European Union before 1 May 2004
GAEC	Good Agricultural and Environmental Condition
GPA	Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities
IGR	Intergovernmental Review
LBMP	Land-Based Marine Pollution
MFD	Marine Framework Directive
NAO	National Audit Office
NFU	National Farmers Union
NGO	Non-Governmental Organisation
NVZ	Nitrate Vulnerable Zones
OECD	Organisation for Economic Co-operation and Development
OSPAR Atlantic	Convention for the Protection of the Marine Environment of the North-East Atlantic
RBMP	River Basin Management Plans
RSP	Regional Seas Programme
SMR	Statutory Management Requirements
UK	United Kingdom of Great Britain and Northern Ireland
UN	United Nations
UNCLOS	UN Convention on the Law of the Sea
UNEP	UN Environment Programme
WFD	Water Framework Directive
WPZ	Water Protection Zone

Introduction

1 Background: emergence of the issue

Industrial pollution of rivers was one of the first and most recognisable instances of environmental pollution. Following the industrial revolution, many waterways suffered dramatic impacts of factory discharges, and beginning in the 19th century, governments made serious attempts to regulate and reduce them. Although this process was long and difficult, relative success has been achieved, highlighted by conspicuous improvements in river quality. Cleveland's Cuyahoga River, for example, no longer catches fire,¹ and the Thames is experiencing the return of fish species, having previously been home to debilitating pollution.² However, over time, awareness has developed of a different, yet also highly damaging, source of water pollution: agriculture. In fact, the successes in dealing with industrial pollution have highlighted the impacts of diffuse water pollution, of which agriculture is the predominate source.³

Modern farming practices involve the application of large amounts of pesticides, fertiliser and animal manure to farm land. Through run-off and soil leaching, these pollutants can enter waterways, having damaging impacts on riverine, and ultimately, marine ecology.⁴ In particular, excess amounts of nitrate and phosphorus, components of fertiliser and manure, can have a harmful effect on water life forms. Large amounts of these substances in water can stimulate excessive growth of algae and other microorganisms, which in turn deprives the water of oxygen, making less habitable for other species.⁵ This process is known as eutrophication, and it is the environmental effect of agricultural water pollution that has the largest impact. Despite recognition and a growing understanding of the problem, this form of pollution continues to be a major concern. In fact, currently, agriculture is the largest single

¹ Water Science and Technology Board, *River Science at the U.S. Geological Survey* (The National Academies Press, 2007).

² MJ Atrill (ed) *A rehabilitated Estuarine Ecosystem* (Kluwer Academic Publishers 1998).

³ Environment Agency, 'The Unseen Threat to Water Quality' at <http://www.environment-agency.gov.uk/static/documents/Research/geho0207bzlvee_1773088.pdf> accessed 14 August 2012.

⁴ For a full description of the environmental impacts of farming see Strosser et al, note 6.

⁵ D Harper, *Eutrophication of Freshwaters: Principles, Problems and Restoration* (Chapman & Hall 1992) chapter 1.

source of water pollution in many industrialised areas, including large parts of Europe⁶ and the United States of America.⁷

1.1 Existing strategies ineffective

Clearly, agricultural water pollution is a significant environmental problem. For a number of reasons, it is also a particularly difficult problem for environmental law and policy. The regulation of diffuse pollution is described as a 'second generation' environmental issue,⁸ compared to the so called 'first generation' issues of industrial point source pollution.⁹ Unfortunately, the methods that were used to tackle the first generation problems are 'inappropriate and unavailable' for agricultural pollution.¹⁰ Regulation of industrial pollution involved responsible agencies mandating certain technology and setting emission standards against which individual factory emissions could be measured.¹¹ Agricultural water pollution, on the other hand, cannot be measured as it leaves a particular farm, and the environmental effects of increased application of fertiliser may not be felt for many years.¹² Moreover, instances of agricultural pollution are highly unpredictable, as they are mediated by weather conditions. As a result, legal responsibility for this kind of pollution is difficult to ascribe, and thus the entire framework of the first generation pollution laws is largely inapplicable.¹³

1.2 Agricultural sector resistant to regulation

As well as issues particular to the nature of the pollution, the nature of the industry itself has been the source of problems for environmental policy. It has been argued that in general, governments are less willing to place environmental controls on farmers due to a perception

⁶ P Strosser, M Pau Vall, and E Plotscher, 'Water and agriculture: contribution to an analysis of a critical but difficult relationship' (1999) at <http://europa.eu.int/comm/agriculture/envir/report/en/eau_en/report.htm> accessed 12 August 2012.

⁷ Agricultural pollution contributes an estimated 50% of all national water pollution: M Ribaldo, D Horan and M Smith, *Economics of Water Quality Protection from Non-Point Sources*, USDA, *Agricultural Economic Report 782* (Washington DC, 1999).

⁸ DR Williams, 'When Voluntary Incentive-Based Controls Fail: Structuring a Regulatory Response to Agricultural Non-Point Source Water Pollution' (2002) 9 *Washington University Journal of Law and Policy* 2.

⁹ See N Gunningham, D Thornton and R Kagan, *Shades of Green: Business, Regulation and Environment* (Stanford University Press, 2003) 45-50.

¹⁰ S Seymour, G Cox and P Lowe [1992] *Sociologia Ruralis* 82.

¹¹ D Hughes at al, *Environmental Law* (4th edn, Butterworths 2002) chapter 16.

¹² Ribaldo et al, note 7 at 32.

¹³ N Gunningham and D Sinclair, 'Policy Instrument Choice and Diffuse Source Pollution' (2005) 17 *J. Env. Law* 51.

that farming is a naturally conserving land use.¹⁴ Whether or not that is true, farmers have had a substantial influence on the political process, and one theme of their advocacy has been a resistance to environmental regulation. Farmer groups, like the National Farmers Union in the UK, have presented opposition to what is seen in the industry as excessive restrictions on the use of their land.¹⁵ This resistance can be explained by a desire to avoid additional costs, however there is also an issue of the importance farmers place on environmental protection. Elworthy makes the comparison between the clear environmental problems caused by industrial pollution, and the less visible effects of nutrients and pesticides, which means it is harder to convince farmers that action is needed.¹⁶

1.3 Effects of regulation uncertain

Finally, agricultural water pollution is a particular problem for policy makers in that it is very difficult for them to predict, or even to measure, the effect of their policies. As noted, this kind of pollution is affected by random weather events, making linkages between policy cause and effect difficult to establish. Also, the significant time lag between application and pollution means that it might be many years before the results of a policy will be known. However, there is a fundamental assumption in environmental law that the lawmakers will have some understanding of the linkages between the policies they implement and the resulting environmental impact. Yet, in this area, such an understanding has not always been present. In a recent study, it was found that the agency responsible for implementing pollution regulations in the England did not know what the effect of its complex and costly regulation of agricultural nitrate pollution had been.¹⁷

2 Nature of study

Thus, there is a clear scope for research into the legal means by which this problem could be addressed. The purpose of this dissertation is to critique the current law, with a view to making suggestions as to what laws and policies might be used in the future. A key source for this dissertation is Gunningham and Sinclair's 2005 article on the problem of diffuse water

¹⁴ Seymore et al, note 10.

¹⁵ See chapter 3 section 1.

¹⁶ S Elworthy, *Farming for Drinking Water* (Avebury 1994).

¹⁷ National Audit Office, 'Tackling Diffuse Water Pollution in England' (HC 186 Session 2010–2011).

pollution.¹⁸ Their study did not have a particular geographic focus, and although it discusses many examples of instruments used in particular countries, it does not discuss the regulatory history or real prospects for future regulation of any particular jurisdiction. This dissertation, in contrast, will explore the development, impacts and future prospects of law in specific geographic areas; commencing with general international law, moving to the European Union, and finally focussing on the UK. Throughout this discussion, Gunningham and Sinclair's classification of regulation into three types, performance standards, specification standards, and process standards,¹⁹ will be used.

This dissertation proposes that law of the European Union is a promising area of regulation in this area, and that the United Kingdom is a useful example of implementation of European Union law. This is true, however it also must be acknowledged that an impetus for that particular geographical focus arises from my location of study at the University of Kent, United Kingdom. A further impetus comes from the availability of information in English on regulation and environmental outcomes within states. European Union reports are available in English, however the most prominent sources of information within states are academic works and government reports, both of which tend to be in the language of the relevant state. It is possible that with more accessible information on the law and policy within other Member States, some conclusions could have been affected. Much of this dissertation focuses on explaining why particular rules have not worked, or should not be expected to work. Therefore, evidence of successful measures undertaken by states may have altered some of these conclusions.

It must also be acknowledged that the task of pointing out the failures and weaknesses of environmental law and policy is far easier than providing an outline for success. One main reason for this is that without conducting scientific field research, it is not possible to demonstrate that a particular policy will be successful. Nevertheless, the tone of this dissertation may appear to be excessively negative. The entirety of chapter 4, for example is

¹⁸ Gunningham and Sinclair, note 15.

¹⁹ Performance standards are those which mandate a particular environmental outcome, leaving the duty holder free to employ any means to achieve it. Specification standards mandate a 'design or physical change' which is expected to bring about environmental improvement, but does not mandate an environmental outcome. Process standards mandate a certain decision making process which is expected to bring about environmental improvement, but does not mandate improvement, nor the designs of physical changes that might be employed. Gunningham and Sinclair, note .. 55.

devoted to an explanation of why a particular principle, the Polluter Pays Principle, should not be applied to this problem. However, it is submitted that the nature of the problem under analysis necessitates a negative view. One positive message that could have been brought to a dissertation such as this would be to highlight jurisdictions where success has been had in dealing with the issue. However, a striking aspect of agricultural water pollution is that, notwithstanding the acknowledged lack of access to foreign language sources, there is very little in the way of such examples throughout the world. This fact simply highlights the importance of increasing understanding of agricultural water pollution, and at very least it is hoped this dissertation will achieve that goal.

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Chapter 1: International Law

Introduction

Agricultural water pollution can be regulated at various administrative levels, from the individual farm right up to the regime of international law applicable to all countries. The first level under consideration in this study is that of international law. Although farm pollution can be very localised, it falls within a category of pollution that has global significance; that which affects the oceans. Run-off from farms will, unless removed, generally be carried to the sea, joining other land-based pollution to cause environmental problems there. Although the impacts of spills from vessels or drilling platforms are more well-known, the largest source of marine pollution is in fact land-based pollution.¹ The focus of this dissertation is agricultural water pollution, a very important subset of land-based marine pollution (LBMP), and in other chapters, that specific type of pollution will be analysed. However, at the international level, instruments are generally not differentiated by sources of land-based pollution. Therefore, the discussion in this chapter will be limited to an assessment of the legal situation regarding LBMP generally. However, where specific issues arise that pertain to agricultural pollution, these will be identified.

The protection of the marine environment has been one of the most important goals of international environmental law, with agreements covering dumping,² oil pollution from vessels³ and preservation of fisheries,⁴ amongst other areas. It is therefore surprising that no legally binding international agreement on LBMP has yet been formulated. Various regional agreements exist, however very few have had more than a minimal impact. Further, the customary rules on trans-boundary harm do not appear to have played any role in addressing this type of pollution.

¹ GESAMP, *Protecting the Oceans from Land-based Activities* (Reports and Studies No 71, 2001).

² 1972 Convention on the Prevention of Marine Pollution by the Dumping of Wastes and other Matter (London Convention).

³ 1973/78 Convention for the Prevention of Pollution from Ships (MARPOL Convention).

⁴ 1995 Agreement on Straddling and Highly Migratory Fish Stocks (UN Fish Stocks Convention).

It is not just at the level of international agreement that this issue has had little attention. The legal literature on LBMP has been described as 'relatively sparse'⁵.

Hassan, in the most significant recent contribution in the area, notes that books on the environmental law of the sea will only devote a few pages to LBMP.⁶

The purpose of this chapter is to analyse this apparent lacunae within the field of international environmental law. It will be demonstrated that despite international recognition of the problem, there is not a legal framework capable of effecting real improvement. Moreover, the nature of the problem, and the nature of the possible solutions, means that international law, as it currently exists, is largely incapable of creating solutions in the future.

1.1 International instruments on land-based marine pollution

At an international level, the importance of LBMP has been understood for some time, and was under consideration in 1972, when the United Nations Environment Programme (UNEP) was formed. Yet despite forty years of consideration at an international level, when policy makers face this issue today, instead of a single, binding instrument, they face a 'fragmented array of international agreements and instruments'⁷ of varying normative value. At a global level, the only instrument specifically focussed on LBMP is a non-binding Global Programme of Action, signed in 1995. However, as this chapter will show, there have been significant limitations to its effectiveness.

As well as environmentally focussed agreements, LBMP is within the purview of international law of the sea. The UN Convention on the Law of the Sea (UNCLOS)⁸ concluded in 1982 and entered into force in 1994, is the centrepiece of international

⁵ D Ong 'Protecting the Marine Environment from Land-Based Sources of Pollution: Book review' (2007) 22(2) IJMCL 340.

⁶ D Hassan, *Protecting the Marine Environment from Land-Based Sources of Pollution: Towards Effective International Cooperation* (2006, Ashgate) 6.

⁷ D VanderZwaag and A Powers, 'The Protection of the Marine Environment from Land-Based Pollution and Activities: Gauging the Tides of Global and Regional Governance, (2008) 23 IJMCL 423, 424.

⁸ A Yankov, 'The Law of the Sea Convention and Agenda 21: Marine Environmental Implications' in A Boyle and D Freestone (eds) *International Law and Sustainable Development* (1999 OUP) 280.

law pertaining to the oceans. Unlike the Geneva Law of the Sea Conventions it replaced, UNCLOS does include provisions on LBMP, however they take the form of ‘declarations of general principles of international law’⁹ regarding pollution. Article 207 requires states to “adopt laws and regulations to prevent, reduce and control pollution of the marine environment from land-based sources.” The means by which this will be done is set out in paragraph 4:

States, acting especially through competent international organizations or diplomatic conference, shall *endeavour to establish global and regional rules, standards and recommended practices and procedures* to prevent, reduce and control pollution of the marine environment from land-based sources, taking into account characteristic regional features, the economic capacity of developing States and their need for economic development. [emphasis added]

This Article establishes an obligation to set rules and standards, but it does not establish specific substantive obligations.¹⁰ UNCLOS has been criticised for this failure to create ‘a comprehensive management system of international control’ for LBMP.¹¹ Nevertheless, the assumption behind Article 207 is that other treaties or agreements, including regional agreements, would be created to provide an appropriate and enforceable set of standards.¹² The environmental obligations under UNCLOS are developed and broadened by Agenda 21 of the 1992 Rio Conference Report, Chapter 17 of which links sustainable development of coastal areas with protection of the marine environment. Although Agenda 21 is not binding, it is an important complement to UNCLOS,¹³ designed to assist the achievement of Article 207. It presents guidance regarding processes to be followed and areas of priority action. For

⁹ TA Mensah, ‘The International Legal Regime for the Protection and Preservation of the Marine Environment from Land-based Sources of Pollution’ in A Boyle and D Freestone (eds) *International Law and Sustainable Development* (1999 OUP).

¹⁰ Yankov, note 8.

¹¹ Hassan, note 6.

¹² Birnie et al, *International Law and the Environment* (2009 OUP) 391.

¹³ A Yankov, ‘The Law of the Sea Convention and Agenda 21: Marine Environmental Implications’ in A Boyle and D Freestone (eds) *International Law and Sustainable Development* (1999 OUP).

example, with regards to the reduction of land-based sources of pollution, it states that priority actions may include (inter alia):

Cooperating in the development and implementation of environmentally sound land-use techniques and practices to reduce run-off to water-courses and estuaries which would cause pollution or degradation of the marine environment.¹⁴

However, despite this progress, the regime lacked focus, and a need for a specific instrument dealing with land-based sources of pollution was recognised.¹⁵ Work on the development of an international instrument specifically controlling LBMP continued throughout the 1980s and early 1990s, and in 1995 the Washington Declaration on the Protection of the Marine Environment from Land-based Activities and the Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities¹⁶ (GPA) were signed.

Like Agenda 21, the GPA can be seen as complementary to Article 207 UNCLOS, in that it provides courses of action by which LBMP can be reduced. States are asked to identify the major hazards, and implement measures to reduce these hazards. The GPA also sets out mechanisms for cooperation between states to achieve marine pollution reduction. However, like Agenda 21 and Article 207 UNCLOS, GPA does not provide measurable substantive obligations for states in this regard. For example, the goals behind measures to reduce nutrient pollution are to:

- identify, in broad terms, marine areas where nutrient inputs are causing or are likely to cause pollution, directly or indirectly;
- reduce nutrient inputs into the areas identified;
- reduce the number of marine areas where eutrophication is evident;¹⁷

The activities required to achieve this goal include:

¹⁴ UN Department of Economic and Social Affairs, Division of Sustainable Development, *Agenda 21*, 17.28(h)

¹⁵ A Yankov, 'The Law of the Sea Convention and Agenda 21: Marine Environmental Implications' in A Boyle and D Freestone (eds) *International Law and Sustainable Development* (1999 OUP) 285.

¹⁶ UNEP (UNEP(OCA)/LBA/IG.2/7 1995).

¹⁷ GPA Section 129.

- Minimization of the release of nutrients by the use of best environmental practice (BEP) in agriculture.¹⁸
- Strengthening the capacities of local authorities to take account of likely impacts of inputs of nutrients from agriculture and urban development in carrying out their functions of planning and controlling land-use and development.¹⁹

Further elucidation is therefore required before the measurable, legal obligations would arise. Moreover, although the preparatory committee behind the Washington conference did assume that a legally binding instrument would be concluded,²⁰ the GPA is not binding, and can at most be considered soft law.²¹ Also, although providing a much clearer path to pollution reduction than that presented in Article 207 UNCLOS, the GPA did not create the aforementioned 'management system of international control' that Hassan²² thought was necessary.

Given the seriousness of the problem of LBMP, it may be a matter of concern that no binding instrument was agreed to at the Washington conference. However, the then President of the International Tribunal of the Law of the Sea, Mensah, in 1999 wrote that he believed a binding agreement was unnecessary, and that in fact, the GPA was a 'watershed' because it accepted this.²³ This sentiment was expressed in the GPA agreement, which states that adequate protection and sustainable development can be provided using the existing framework of international law.²⁴

It is not possible to determine whether the GPA proclamation is genuine, or simply an expression of pragmatism on behalf of the Conference. However, after 17 years of operation, despite the confidence expressed in the existing international system, the non-binding nature of the GPA has been associated with a lack of urgency in full

¹⁸ 130(d)(ii).

¹⁹ 130(d)(iv).

²⁰ UNEP, 'Review of Development and Activities since 1985 – Note by the Secretariat' UN Doc UNEP/MG/IG/1/2 of 29, para 35, cited in Mensah note 9.

²¹ D Rothwell, *The International Law of the Sea* (2010, Hart).

²² Hassan, note 6.

²³ Mensah, note 9, 310

²⁴ GPA para 272.

implementation of the agreement. The different sources and scales of LBMP, and the number of different national and international programmes addressing it mean that assessing the impact of the GPA is difficult.²⁵ However, reports prepared for the GPA's Intergovernmental Review (IGR) show that even at an institutional level, GPA implementation has not been thorough,²⁶ and at the environmental level, major concerns exist. Conditions are worsening with regards to sewage, marine litter and destruction of habitats.²⁷ Further, despite specific coverage within the GPA, nutrient over-enrichment is a major and *increasing* problem throughout the world, with eutrophication an issue in the Baltic, North Adriatic, and Black Seas, the Gulf of Mexico, the South China Sea, and the Mississippi River, amongst many other bodies of water.²⁸

The tremendous challenges that these issues pose for the international community should not be underestimated, and the issue of nutrient over-enrichment is characteristic. A key cause of the continued worsening of this problem is the fact that food production from agriculture is increasing to meet the needs of a growing population.²⁹ The challenges faced in this area are highlighted by the fact that much of Africa suffers from a *lack* of sufficient nutrient inputs, resulting in degradation of farmland.³⁰ The GPA has taken specific steps to confront the problem, by establishing the Global Partnership on Nutrient Management; a UNEP/GPA coordinated effort to face the problems of understanding and monitoring that the issue requires. However, the GPA provides no funding for the Partnership, and nations and regions are left to themselves to allocate appropriate funding to the initiative. Unsurprisingly, greater assessment activity has occurred in Europe and North America, whereas in Latin

²⁵ VanderZwaag and Powers, note 7, 437.

²⁶ VanderZwaag and Powers, note 7.

²⁷ UNEP/GPA, *The State of the Marine Environment: Trends and Processes* (UNEP/GPA, 2006).

²⁸ UNEP/GPA, *The State of the Marine Environment: Trends and Processes* (UNEP/GPA, 2006).

²⁹ UNEP/GPA *Progress in the implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities at the international, regional and national levels from 2007-2011* (UNEP(DEPI)/GPA/IGR.3/2, 2011).

³⁰ UNEP, *Addressing the nutrient challenge: What we need to know and what we need to do* (UNEP/GPA/IGR3/INF/7, 2011).

America, Africa and Asia, the Partnership has recognised more funds are needed for those regions to conduct adequate assessments.³¹

This uneven effort, mirroring unequal financial capacity and political will are, in fact, symptomatic of the entire GPA system.³² For this and other reasons, the non-binding nature of the GPA has been identified by some writers as a cause of its lack of effective implementation.³³ Since its inception in 1995, there have been many meetings and reports issued, most significantly the GPA's Intergovernmental Review (IGR), which has been held three times, most recently in Manila. In 2006, IGR 2 produced the 'Beijing Declaration' calling for the mainstreaming of goals of the GPA into wider public policy. The UN General Assembly has made resolutions welcoming these outcomes and calling upon states to fulfill their GPA commitments, and welcoming the work on implementation done so far.³⁴ However, none of these declarations or resolutions counters the fact that a majority of states have simply failed to produce the degree of compliance necessary for the GPA's goals to be met.³⁵ It is not possible to be precise over to what extent this non-compliance is associated with the non-binding nature of the agreement, however in its report to the IGR2, Canada acknowledged the lack of a compliance mechanism contributed to less urgency given to its implementation.³⁶ Given the size of the challenge faced by states in bringing various sources of land pollution under control, it would not be surprising if many of them used the GPA's non-binding nature as an excuse for inaction.

³¹ Global Partnership on Nutrient Management, *Building the Foundations for Sustainable Nutrient Management* (UNEP 2010).

³² UN Commission on Sustainable Development, E/CN.17/1999 (27 January 1999) at par. 37.

³³ VanderZwaag and Powers, note 7.

³⁴ UN General Assembly Resolutions 61/222 and 62/215

³⁵ UNEP, *Summary report on voluntary national reporting on the implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities* (UNEP/GPA/IGR.2/INF/2, 2006) cited in VanderZwaag and Powers, note 7.

³⁶ VanderZwaag and Powers, note 7, 127.

1.2 Why didn't states agree to a binding instrument?

There is, therefore, enough evidence to prompt suspicion of Mensah's claim that the non-binding agreement represented recognition of the adequacy of existing international principles. Indeed, there are a number of more plausible explanations. A principal reason is that LBMP, while acknowledged as a problem in all parts of the globe, might not be considered a global problem, as such. The majority of the effects of land-based pollution occurs within the country of origin; either in the national rivers, lakes or territorial sea.³⁷ The international effects of LBMP are most prominent in areas where several states share enclosed or semi-enclosed seas.³⁸ The fact that the pollution is largely non-transboundary means that it is seen as a national, or possibly regional, not but an international problem.³⁹

A second reason, presented by Schumacher et al,⁴⁰ is that states may be unwilling to take the difficult action necessary due to the lack of value they place on having healthy marine ecosystems. Environmental concerns are strong in many developed countries, and the health of the coastal waters is considered a significant issue by a wide section of the population.⁴¹ However, Schumacher et al argue that many developing states do not place significance on the health of coastal ecosystems, and in fact may even place value on the ocean's use as a sink for pollutants.⁴²

A third reason for state unwillingness is the lack of consensus and certainty over the causes of and possible solutions to LBMP. An understanding of the mechanisms for this pollution, and the means by which it might be addressed, is currently evolving,

³⁷ GESAMP, note 1; DA Ross, *Introduction to Oceanography*, (1977, Prentice Hall) 346.

³⁸ Ibid.

³⁹ Mensah, note 9, 312.

⁴⁰ M Schumacher, P Hoagland and A Gaines, 'Land-based marine pollution in the Caribbean Incentives and prospects for an effective regional protocol' (1996) 20(2) *Marine Policy* 99.

⁴¹ DR Williams, 'When Voluntary Incentive-Based Controls Fail: Structuring a Regulatory Response to Agricultural Non-Point Source Water Pollution', (2002) 9 *Washington University Journal of Law and Policy* 21.

⁴² M Schumacher, P Hoagland and A Gaines, 'Land-based marine pollution in the Caribbean Incentives and prospects for an effective regional protocol' (1996) 20(2) *Marine Policy* 99

however many uncertainties remain.⁴³ This is even more pronounced in the case of diffuse LBMP, where regulation of pollution with multiple sources has proven very challenging for policy makers.⁴⁴ This lack of certainty complicates the creation of specific obligations, and gives states more reasons not to comply with those that exist.⁴⁵

While all of these reasons help explain unwillingness of states to sign a binding treaty, there is one fact which writers agree is more important. That is, the sources of LBMP, industry, transport, and agriculture, are seen by states as central to their economies, and moreover their *sovereignty*. It has been noted that states consider the significant restrictions on these sectors that a binding agreement would entail to be too intrusive.⁴⁶ States, as Miles noted, generally ‘do not like to be told what they may do or not do in their own territory’.⁴⁷ When those instructions relate to key areas of national development and economic health, the feeling is stronger.⁴⁸

Therefore, there are many explanations available as to why the international agreement covering LBMP was non-binding. Having considered these issues, it is unlikely that the main reason is that states simply recognised that a binding agreement was not necessary. It is more likely that, in fact, states are unwilling to give up sovereignty over a matter which has uncertain causes, may not greatly affect other states, and may not be considered a significant concern. Given all these views, it is not surprising that moving to a binding agreement is not on the current GPA agenda.

⁴³ GESAMP, note 1.

⁴⁴ See discussion in Chapter 4.

⁴⁵ D Brubaker, *Marine Pollution and International Law* (1993, Belhaven) 108.

⁴⁶ E.g. Hassan, note 6; Mensah, note 9.

⁴⁷ EL Miles, ‘The Approaches of UNCLOS III and Agenda 21 – A Synthesis’ in M Kusuma-Atmadja, TA Mensah, and B Oxman (eds.) *Sustainable Development and Preservation of the Oceans: The Challenges of UNCLOS and Agenda 21*, (1997, Law of the Sea Institute), 37

⁴⁸ O Young, *The effectiveness of international environmental regimes causal connections and behavioural mechanisms* (1999 MIT Press).

1.3 Should a binding agreement be sought?

Despite the apparent lack of movement in establishing legally binding obligations, in academic writings, there have been calls for a global agreement on land-based marine pollution and activities.⁴⁹ VanderZwaag and Peters, on finding the current regime inadequate, concluded that such an instrument should be considered.⁵⁰ In his comprehensive review, Hassan⁵¹ makes a strong case for its creation, stating that this would be the way to overcome the large limitations in implementation and enforcement faced by the current regime.

However, although such calls are understandable given the importance of the issue and the lack of progress under the GPA, it is not clear that a binding regime would significantly change the situation. In the first place, there must be a question over whether a binding international agreement could have both global application and sufficient specificity to have a meaningful impact. The nature of the threat to the marine environment varies considerably throughout the world, due to differences in geography and in polluting activities.⁵² Barnes believes that in order to have a practical impact, a global standard would have to be quite detailed and context specific.⁵³ However, Barnes also contends that any standard attracting international agreement would inevitably be highly generalised.⁵⁴ The truth of this view is reflected in the fact that the GPA, despite its focus on land-based marine pollution, actually lacks specific targets or processes.⁵⁴

Secondly, despite the high level of focus often enjoyed by international agreements, their record in effecting real environmental change is highly uneven. The Convention on Biological Diversity, for example, which enjoys binding status, has not significantly

⁴⁹ Hassan, note 6.

⁵⁰ VanderZwaag and Peters, note 7.

⁵¹ Note 6.

⁵² Hassan, note 6.

⁵³ R Barnes, 'Protecting the Marine Environment from Land-Based Sources of Pollution: Towards Effective International Cooperation: Publication Review' (2008) 10(3) ELR 245.

⁵⁴ See section 1.1

slowed the loss of biodiversity throughout the world.⁵⁵ It has been argued that states only honour their commitments to the extent that they accord with what they would have done anyway.⁵⁶ When the action required by an instrument exceeds this threshold, states simply avoid their responsibilities, and rarely, if ever, face consequences for doing so. Johnston and VanderZwaag agree, stating that many world leaders believe that signature or 'occasional ratification' of international environmental law is all the participation necessary.⁵⁷ Therefore, whether a binding agreement would significantly improve compliance with the international regime is a matter of speculation.

2 LBMP under customary international law

As well as international treaties, a relevant source of international law potentially affecting LBMP is that pertaining to transboundary harm. Principle 21 of the Stockholm declaration, resting on the jurisprudence developed from the *Trail Smelter*⁵⁸ case in 1941 declares:

States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.

The principle that states have the responsibility to avoid activities which cause transboundary harm has a controversial status in customary international law. On one hand, it is regarded by some commentators as a 'cornerstone' of international law whose

⁵⁵ Secretariat of the CBD, *Global Biodiversity Outlook 3* (CBD 2010).

⁵⁶ K Danish, 'International Relations Theory' in D Bodansky, J Brunnée and E Hey, *Oxford Handbook of International Environmental Law* (OUP 2007).

⁵⁷ VanderZwaag and Peters, note 7.

⁵⁸ *Trail Smelter Arbitration* 33 AJIL (1939) 182 & 35 AJIL (1941) 684.

impact on state responsibility cannot be ignored.⁵⁹ On the other hand, some writers believe that its status as customary international law is actually illusory. It has been pointed out that despite Principle 21, and its reiteration as Principle 2 of the Rio Declaration, there has been no international judicial proceedings confirming its presence since *Trail Smelter*. This is so, even though trans-boundary harm occurs throughout the world on a daily basis.⁶⁰ Thus, with no cases on which to rest, responsibility for transboundary harm remains, at best, an uncertain principle of international law.

Notwithstanding this drawback, it is not clear that this principle could be of use regarding LBMP. Firstly, as noted,⁶¹ the majority of harm created by land-based pollution occurs within the rivers, lakes and territorial seas of the source state, meaning rules on transboundary harm would only be applicable to a fraction of the pollution. Secondly, there is a great difficulty in ascribing provenance in LBMP, making the proof of responsibility quite difficult; this is especially so with diffuse pollution.⁶² The recent *MOx Plant*⁶³ and *Pulp Mills on the River Uruguay*⁶⁴ cases show that there is potentially scope for international law to intervene where a particular facility is the source of trans-boundary harm. However, bringing litigation based on, say, run-off of hundreds of different farms, possibly from more than one country, is far less likely to succeed.⁶⁵ Finally, there is no agreed definition on the threshold level of marine pollution which incurs state responsibility. In his review of the series of potentially applicable threshold measures, Hassan concludes that none has sufficient support to be confidently identified as that which operates for LBMP.⁶⁶

⁵⁹ G Handl, 'Transboundary Impacts' in D Bodansky, J Brunnée and E Hey, *Oxford Handbook of International Environmental Law* (OUP 2007).

⁶⁰ D Bodansky, *The Art and Craft of International Environmental Law* (HUP 2010) 198.

⁶¹ Section 1.2.

⁶² See chapter 4.

⁶³ *MOX Plant Case* ITLOS No. 10. (2001)

⁶⁴ *Pulp Mills on the River Uruguay Case (Argentina v Uruguay)* ICJ Reports (2006)

⁶⁵ See chapter 4.

⁶⁶ Hassan, note 6.

Therefore, it is difficult to see how laws of transboundary harm could be used to address any but a small fraction of the instances of LBMP. The usefulness of laws in addressing *diffuse* LBMP, with its high level of uncertainty regarding source, is even more tenuous.

3 Regional agreements

Throughout the negotiations on LBMP, starting with the commencement of UNEP and continuing to the present, there has been a view that the issue is best tackled at a regional level, rather than with a mechanism of global operation. This is a view held by environmental law writers,⁶⁷ states,⁶⁸ and international organisations.⁶⁹ The belief is that the proximity of the states, their use of a 'shared resource' and the fact that they will usually be of comparable development status, help them to create stronger, more environmentally appropriate and more enforceable targets.⁷⁰ Moreover, they are in a better position to create integrated ecosystem and coastal zone management, as called for by Chapter 17 of Agenda 21.⁷¹ Finally, semi-enclosed seas are at a far higher threat of pollution than the open ocean.⁷²

Thus, the Regional Seas Programme (RSP) was launched by UNEP in 1974, and is proclaimed as one of that organisation's most significant achievements.⁷³ Under the RSP, thirteen regional programmes have been established, and a further five, including the Northeast Atlantic and Baltic agreements, have independent partnership status. At the centre of the regional programmes are action plans, developed by the regional

⁶⁷ Barnes, note 53.

⁶⁸ DL VanderZwaag, PG Wells and J Karau, 'The Global Programmes of Action for the Protection of the Marine Environment from Land-based Activities: A Myriad of Sounds, Will the World Listen?' (1998) 13 Ocean Yearbook 183, 208.

⁶⁹ UNEP, 'Review of Development and Activities since 1985 – Note by the Secretariat' UN Doc. UNEP/MG/IG/1/2 of 29 cited in Mensah, note 9, 515.

⁷⁰ LW Alexander, 'Regional Arrangements in the Oceans' (1977) 71 AJIL 84.

⁷¹ Birnie et al, Note 13.

⁷² T Melvasalo, 'Regional marine environmental management and the GPA-LBA: perspectives and the need for scientific support' (2000) 43(8-9) Ocean & Coastal Management Volume 713.

⁷³ UNEP, 'Regional Seas Programme' <<http://www.unep.org/regionalseas/About/default.asp>> accessed 2/07/2012.

programmes to address the specific conditions of those areas. The action plans include measures to research and monitor the environmental conditions in the relevant areas of sea. Most programmes involve a framework convention, under which specific protocols for specific issues can be developed. Specific protocols for LBMP are found in many regional agreements,⁷⁴ and all contain general obligations to prevent and reduce pollution from land-based sources.

Amongst the various regional agreements, there is a large variety in the scope of application, the environmental standards set, and the compliance requirements. Unsurprisingly then, the impact of the regional agreements has been mixed. UNEP itself said that a 'great deal of concentrated work' was required for their 'finalization'.⁷⁵ Boyle⁷⁶ believes that some agreements, including those covering the Mediterranean, North, Baltic and Black seas 'have gone a long way towards meeting the goals and objectives set for them', although 'in practice much remains to be done'. Evidence shows that agreements comprising developing nations have had difficulties in establishing well-functioning regimes.⁷⁷ The GPA's Regional Implementation Report concluded in 2006 that the central issue for facing all agreements was that the environmental standards they set tended to be general and weak, despite the fact that the regional nature of the agreements should allow them to have sufficient specificity.⁷⁸ Other problems which have been identified include the use of very 'malleable pollution control concepts',⁷⁹ a lack of dispute settlement mechanisms, and

⁷⁴ E.g. 1980 Athens Protocol to the 74 Barcelona Convention for the Protection of the Mediterranean Sea against pollution.

⁷⁵ UNEP, *Environmental Law: An In-Depth Review*, Nairobi, (UNEP Report, No. 2, 1996) 51, cited in Mensah, note 9, 317.

⁷⁶ A Boyle, 'Protecting the Marine Environment: Some Problems and Developments in the Law of the Sea' (1992) 16 *Marine Policy* 83.

⁷⁷ UNEP/GPA, *Implementation of the GPA at regional level: The role of regional seas conventions and their protocols* (2006 UNEP/GPA) [Regional Implementation Report].

⁷⁸ UNEP/GPA, *Implementation of the GPA at regional level: The role of regional seas conventions and their protocols* (2006 UNEP/GPA) [Regional Implementation Report] 12.

⁷⁹ DL VanderZwaag, Overview of Regional Cooperation in Coastal and Ocean Governance in C Thia-Eng, G Kullenberg and D Bonga (eds.), *Securing the Oceans: Essays on Ocean Governance- Global and Regional Perspectives*, (2008 GEF/UNDP/IMO) at 215

a tendency to focus on cooperation at a formal level, without accompanying implementation and enforcement.⁸⁰ VanderZwaag and Powers argue that the cause of these shortcomings is a lack of political priority, which is associated with a lack of financial resources allocated to the task. Hassan broadly agrees, stating that the economic infeasibility of proper implementation of regional programmes has been the cause of the slow implementation.

Therefore, even though regional agreements may be the best means through which LBMP can be dealt, the problems holding back the general international regime appear to be replicated on the lower level. Although the framework for possible effective change has been established, a lack of specific legal obligations, and sufficient funding, prevents the regime from having a major impact. Given the weakness of the global regime, this conclusion about the regional programmes means that the effectiveness of international law as a whole is quite limited.

4 OSPAR

It has been seen that the international law addressing LBMP is characterised by weak, non-specific, and unenforceable obligations. However, there are some regional agreements which have had greater success than most, namely those concerning the Northeast Atlantic, and the Baltic and Mediterranean Seas.⁸¹ One reason for this may be that they comprise developed nations – the former two solely – which have more economic capacity and political will to address environmental problems. However, there are also significant legal differences between these agreements and most other RSPs. Firstly, rather than obliging states to simply *reduce* marine pollution, these agreements set specific, measurable targets. Secondly, their connection to European Law means these statal obligations are under scrutiny from bodies capable of commanding compliance.

⁸⁰ G Kutting, 'Mediterranean Pollution: International Cooperation and the Control of Pollution from Land-Based Sources' (1994) 18 *Marine Policy* 233.

⁸¹ Birnie et al, note 13, 393.

These characteristics can be seen in the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention), which entered into force in 1998, updating two earlier conventions. Its parties include the 12 European Union states with either coastlines on or watersheds connected to the European Atlantic coast, as well as Iceland, Norway and Switzerland. OSPAR obliges its members to 'take the necessary measures' to protect and conserve the marine environment. However, unlike the GPA, OSPAR gives detail to that general obligation through specific OSPAR Commission recommendations and agreements.⁸²

To illustrate, OSPAR has developed a eutrophication strategy aimed at reducing that threat within target waters. This strategy does not contain process or specification standards,⁸³ and states may choose to implement the strategy in different ways. For example, in order to effect reduction in nutrient application from manure, two options are provided; limiting the livestock density on farms, or alternatively, requiring excess manure to be transported to neighbouring farms or processing plants.⁸⁴ However, underlying these flexible standards is a performance standard; the commitment to reduce sources of phosphorus and nitrogen pollution in the order of 50% compared with 1985.⁸⁵

OSPAR states have recorded some success in moving towards this goal, achieving a reversal in worsening trends, helped by the addressing of significant sources of pollution.⁸⁶ However, the success has not been consistent across all forms of pollution. For instance, although all states, except Ireland, Sweden and the UK, had achieved the goal of a 50% reduction in Phosphorus pollution by 2010, only Denmark had achieved the same goal for Nitrogen. Notably, throughout the Member States, agriculture has

⁸² A Trouwborst and HM Dotinga, 'Comparing European Instruments for Marine Nature Conservation: The OSPAR Convention, the Bern Convention, the Birds and Habitats Directives, and the Added Value of the Marine Strategy Framework Directive' (2011) 20(4) *EEELR* 129.

⁸³ Per definition used by Gunningham and Sinclair. See discussion in Chapters 3 and 4.

⁸⁴ PARCOM Recommendation 92/7 on the reduction of nutrient inputs from agriculture into areas where these inputs are likely, directly or indirectly, to cause pollution, Appendix I(1).

⁸⁵ PARCOM Recommendation 88/2 on the reduction in inputs of nutrients to the Paris Convention Area.

⁸⁶ OSPAR Commission, *Quality Status Report* (London, 2010) 27.

been the source of nutrient pollution that has been most challenging to reduce. Significant reductions have been achieved in nutrient pollution from sewerage and industry, the two other largest sources, but these successes have not been matched in the agricultural sector.⁸⁷

Nevertheless, the fact that OSPAR includes measurable, specific goals represents an improvement on the general nature of the GPA, and many other Regional Seas Programmes. Another improvement within OSPAR compared to other LBMP programmes is in its enforceability. Under the terms of the convention, specific decisions of the OSPAR Commission have always been proclaimed to be legally binding on the parties.⁸⁸ As such, according to Hassan, the OSPAR treaty 'set in place a mechanism to render the Parties' implementation transparent and publicly accountable'. It must be noted that despite this proclamation, the Convention does not include a compliance mechanism.⁸⁹ However, with the introduction of the 2008 European Union Marine Framework Directive,⁹⁰ the nature of the legal obligations for the 12 members of OSPAR also in the EU has significantly changed.

The Marine Framework Directive and OSPAR have a complex relationship, wherein they both implement and are implemented by each other.⁹¹ The EU Member States that are contracting parties to the OSPAR Convention have agreed that the OSPAR Commission should be the main platform through which they coordinate their work to implement the Marine Framework Directive in the region. Therefore, the relevant measures, binding and non-binding, adopted by the OSPAR Commission, are brought within the direct scrutiny of the European Commission and the Court of Justice of the

⁸⁷ OSPAR Commission, *Quality Status Report* (London, 2010) 27.

⁸⁸ OSPAR Convention, Article 13(2).

⁸⁹ M Pallaemerts 'The North Sea and Baltic Sea Land-based Sources Regimes: Reducing Toxics or Rehashing Rhetoric?' (1998) 13(3) *IJMCL* 421.

⁹⁰ Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy. See discussion of this instrument in Chapter 3.

⁹¹ A Trouwborst and HM Dottinga, 'Comparing European Instruments for Marine Nature Conservation: The OSPAR Convention, the Bern Convention, the Birds and Habitats Directives, and the Added Value of the Marine Strategy Framework Directive' (2011) 20(4) *EEELR* 129.

European Union.⁹² This means that measures such as the eutrophication strategy, may now act as obligations with the legal force of EU instruments.

It must be noted that this particular power is yet to be exercised by those European Union institutions, and it may be the case that their oversight on OSPAR obligations will, in fact, be limited. If those European Union institutions choose not to pursue enforcement, there is no enforcement mechanism within OSPAR in reserve, despite the fact that OSPAR Commission decisions are declared to be legally binding. Moreover, with the implementation of comprehensive EU Directives tackling water pollution, it may be the case that the role of OSPAR will be less prominent. To illustrate, the OSPAR commission notes that the 'main action' available to EU states with regards to reduction of nutrient inputs is 'the adequate implementation of the EU Water Framework Directive, the Nitrates Directive and the Urban Waste Water Treatment Directive.'⁹³ Therefore, although OSPAR does represent a high point in the international law dealing with LBMP, evidence shows that the action at the European Union level will have the most bearing on resolution of the issue.

Conclusion

The preceding discussion has raised large questions as to the utility of international law in the struggle to deal with LBMP. Although many meetings have been held and many agreements produced, the international efforts to address this type of pollution have been worryingly ineffective. It is the reluctance of states to give up control of sensitive areas that has largely held these efforts back, and it does not appear that international law has any means by which to resolve this impasse. Instruments dealing with LBMP do face a unique set of obstacles to state compliance, however it must also be noted that these problems betray fundamental weaknesses within international environmental law. That the ability of the international community to take action could be determined

⁹² Ibid.

⁹³ OSPAR Commission, *Nutrients in the Convention Area: Assessment of Implementation of PARCOM Recommendations 88/2, 89/4 and 92/7*, (2006 OSPAR Commission) 13.

not by the size of the problem, but the willingness of the participants to do what they sign up to do, is troubling. Further, the fact that the so-called cornerstone of international law, the rules of transboundary harm, can be so simply side-lined, raises questions as to its practical role in addressing major environmental problems.

It may be possible for international environmental law to be reformed, so that its ability to deal with issues such as this is increased. The amount of environmental law scholarship addressing international instruments, and the number of international summits on environmental matters, demonstrates that there is certainly a willingness to attempt to develop a regime that can be more effective. However, at this point, it has to be acknowledged that if the problem of LBMP is going to be addressed, different paths will have to be taken. One of the high points of international law in this area, OSPAR, is arguably subordinate to European Union law with regards to addressing the sources of land-based pollution. Therefore, EU law may be a more promising area of legal development addressing this difficult and important issue.

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Chapter 2: European Union

Introduction

It was seen in chapter 1 that there are profound limitations to the effectiveness of international instruments in dealing with agricultural water pollution. It was also seen that EU law represented a more promising field of effective regulation of land-based marine pollution than other forms of international law. There are two explanations for this. Firstly, Europe represents the largest collection of geographically connected developed countries in the world, and it is in developed countries where the most meaningful environmental controls have been set and enforced by governments. Secondly, environmental protection has been one of the more important tasks the EU has set itself. Article 2 of the Treaty on European Union lists ‘a high level of protection and improvement of the quality of the environment’ as a goal of the EU, and it has had decades of legislative activity in this area. It is suggested that there is further reason to believe that the EU may be in a comparatively good position to address the problem of *agricultural* pollution in particular. Support and regulation of agriculture has been another, arguably more central activity of the EU since its inception. Single farm payments under the EU’s Common Agricultural Policy (CAP) account for approximately one third of the total EU budget, at 43 billion Euros in 2010.¹ Although environmental controls over agriculture have been a more recent expansion, the fact that agriculture has been such a central part of European Union activity means that there is significant institutional scope for its regulation.²

Agricultural water pollution has been recognised as a problem within Europe for decades, and the breadth of current environmentally focussed water regulation reflects this. By the early 1990s, the use of chemical fertilisers in Western Europe

¹ European Commission, cited in BBC News, ‘Q&A: Reform of EU farm policy’ (2011) at <<http://www.bbc.co.uk/news/world-europe-11216061>> accessed 19/08/2012.

² B Jack, *Agriculture and EU Environmental Law* (2009 Ashgate)

exceeded that in any other part of the world.³ Nitrates, the principal active component of such fertilisers, became the subject of specific legislative attention in the 1991 Nitrates Directive.⁴ Since then, the Water Framework Directive (WFD),⁵ and more recently, the Marine Framework Directive (MFD) have added to controls over water pollution. These directives represent an intelligent and comprehensive regime, which has had some success in attacking the problem. Nevertheless, it is also apparent that despite this, there are significant ongoing issues regarding agricultural water pollution, for which thorough solutions are yet to be found.

1 Nitrates Directive

Excessive agricultural nitrates entering water and leading to eutrophication has become a substantial problem within the internal waters of Europe.⁶ The Nitrates Directive, introduced in 1991, aims to control this issue through a two stage process. Firstly, Member States are required to establish which of its internal waters suffer from, or are at risk from excessive nitrate pollution, defined as water with a concentration of nitrates exceeding 50mg/l. The catchments of these waters are to be designated as 'Nitrate Vulnerable Zones' (NVZs), although Member States have the option of simply declaring its whole territory to be an NVZ.⁷ Within these zones, states are to establish action programmes, which set a series of what Gunningham and Sinclair describe as specification and process standards, covering matters such as the storage capacity for livestock manure, periods of the year when fertiliser application is not allowed, and application restrictions on land near waters and on slopes. Significantly, the Nitrates Directive limits livestock manure application to 170 kg N/ha

³ Agra Europe, *Agriculture and the Environment: How will the EC resolve the conflict* (1999 Special Report No 60) 9.

⁴ Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources.

⁵ Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 Establishing a Framework for Community Action in the Field of Water Policy.

⁶ Jack, note 2.

⁷ Article 3(5).

per year within NVZs.⁸ In the areas of the territory outside the NVZs there is a general obligation for a 'good code of agricultural practice', although this is voluntary in nature.⁹ These measures are all designed to ultimately decrease the level of nitrates in waters, however it is noted that they do not prescribe any particular performance standards.

Reports to the European Commission show that there has been some apparent impact of the Directive, with the total amount of mineral nitrogen fertiliser consumption decreasing from a high in the early 1990s of around 12 million tons p/a within the EU 15, to a now relatively stable amount of around 9 million tons p/a.¹⁰ The amount of nitrogen from manure spread on farms annually has continued to decrease since the 1990s, with a reduction between 2003 and 2007 of approximately 4% for the EU15.¹¹ However, with regards to the environmental outcomes, reporting has shown that the picture is rather mixed. Across the EU 15, 4% of recording points are over the 50mg/l limit, with problems concentrating in certain trouble spots, particularly in Western Europe.¹² Worryingly, a greater number of reporting sites are getting worse than are getting better, and 33% of all measured waters are either eutrophic or hypertrophic.¹³

An important question for environmental law is whether these ongoing problems are due to deficiencies within the Directive, or deficiencies in *implementation* of the Directive. It is certainly true that implementation of the Directive has not been universally thorough. The UK's full implementation, for example, was delayed by

⁸ Annex III (2).

⁹ Article 4(a).

¹⁰ European Commission, 'Report On implementation of Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources based on Member State reports for the period 2004 – 2007' (COM(2010)47 final).

¹¹ Ibid.

¹² European Commission, 'Accompanying document to the Report On implementation of Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources based on Member State reports for the period 2004 – 2007' (SEC(2010)118 final).

¹³ Ibid.

several years.¹⁴ Infringement procedures have been brought against Member States, with three open at time of writing, against France and Poland for failing to properly designate NVZs, and against Greece, for deficiencies in action plans.¹⁵ However, despite these deficiencies, most Member States have now implemented the Directive. Considering the size of the problem, it would be highly unlikely that successful Commission action against the three offending states will cause the problem to cease. Indeed, France, one of the targets of infringement procedures, already has the highest proportion of waters which are improving.¹⁶

Therefore, it appears that there is an underlying deficiency in the Directive itself, meaning that additional requirements of some source will be necessary to achieve an adequate reduction in nitrate pollution. It has been speculated that the lack of performance standards within the Directive is the cause of the problem.¹⁷ In some ways, the introduction of the Water Framework Directive in 2000 is an acknowledgement of the deficiencies with the Nitrates Directive,¹⁸ as the later Directive does incorporate environmental quality standards into its provisions, meaning that implementation will only be successful if the environmental outcomes desired are actually achieved.

2 Water Framework Directive

The Water Framework Directive, while leaving the Nitrates Directive in place, took over from a number of earlier directives addressing water pollution. Unlike the Nitrates Directive, the WFD is not addressed to any particular source or type of pollution; it is a holistic attempt to regulate all forms of water pollution,¹⁹ and as such can affect all sources, including agriculture. Under the WFD, Member States are required to bring

¹⁴ See chapter 3.

¹⁵ J Sellick, 'Strategic Issues – European Union' (2012) 22(1) *Journal of Water Law* 36, 38.

¹⁶ European Commission, note 12.

¹⁷ W Howarth, 'Diffuse water pollution and diffuse environmental laws' (2011) 23(1), *J. Env. L.* 129

¹⁸ *Ibid.*

¹⁹ M Lee, 'Law and Governance of Water Protection Policy', in J Scott (ed) *Environmental Protection* (2009) OUP.

their internal surface and ground waters to 'good' status, which for surface waters involves a chemical and ecological component. This is to be brought about via the implementation of programmes of measures in each River Basin District within a Member State, or between Member States if the basin is international. The programmes of measures are required, at a base level, to include the necessary elements of other water protection legislation, like the Nitrates Directive.²⁰ However, they are also required to include whatever else is considered necessary for the water to meet the requirement of 'good' chemical and ecological status. In fact, the achievement of these goals may mean the implementation of stricter standards for nitrates than found in the Nitrates Directive.²¹ States are required to monitor environmental conditions, and where the necessary status is not met, determine the reason for this failure.²²

By having good status as the central goal, all of the elements of agricultural water pollution are brought into the scope of the WFD. For example, a major pollutant associated with agriculture is phosphorus, for which there is no specific European pollution control instrument. However, as an excessive amount of phosphorus in water may cause that water to fail to meet chemical or ecological standards,²³ when this is found to be the case, the programme of measures is required to address it. The same is true for all major agricultural pollutants, and the three main types; nutrients, sediment and pesticides, are listed in Annex VIII as 'main pollutants' requiring control under the WFD.

The WFD provides a list of measures which Member States may undertake in order to achieve the goal of good status.²⁴ These measures are wide ranging, encompassing many types of process and specification standards, as well as economic instruments,

²⁰ Also The Birds Directive (79/409/EEC); The Habitats Directive (92/43/EEC); and The Sewage Sludge Directive (86/278/EEC).

²¹ Annex VI Part B WFD.

²² Article 11(5).

²³ One of the criteria for good ecological status is the absence of eutrophication: Annex V, table 1.2.

²⁴ Article 11.

public participation, research programmes, rehabilitation projects, and efficiency measures. It is expected that Member States will utilise such measures as necessary, differentiated by the nature of the pollution and its source. Although the WFD prescribes overarching process standards of the production of RBMPs, monitoring, and intercalibration of status criteria, there are no prescribed process or specification standards applicable to forms of pollution or types of polluters. Therefore, in their programmes of measures, Member States are able to regulate individual sources of pollution, like agriculture, as they feel is appropriate.

3 Marine Strategy Framework Directive

Although the WFD is the European instrument central to addressing agricultural water pollution, it is possible that the 2008 Marine Framework Directive²⁵ may have a role to play. Pollution in rivers which flow to the sea, if not dealt with earlier, is likely to cause problems there. Nitrates in the salt water cause algal blooms, which in turn lead to eutrophication in ocean waters, damaging the ocean ecology.²⁶ At a broad level, the Marine Framework Directive reproduces the methodology behind the WFD, establishing 'good environmental status' – analogous to the WFD's 'good' status – as its central goal.

States are required to create a programme of measures (in cooperation with other states when necessary) in order to ensure those waters reach target status by 2020 at the latest. As with the WFD, by placing the emphasis of the environmental quality of the oceans, any source and any pollutant which causes waters to fail to reach the target is brought within the scope of Marine Framework Directive.²⁷ With regards to agricultural water pollution, there is a question as to whether the Marine Framework Directive places obligations on its reduction over what is already necessary under the

²⁵ Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy.

²⁶ J Lovelock, *The Ages of Gaia*, (1998 OUP) 144.

²⁷ A Trouwborst and HM Dotinga 'Comparing European Instruments for Marine Nature Conservation: The OSPAR Convention, the Bern Convention, the Birds and Habitats Directives, and the Added Value of the Marine Strategy Framework Directive' 20(4) *EEELR* 129 2011.

WFD. Whether or not more stringent controls result will become apparent when the programmes of measures are developed, and they are due by 2015. However, it is possible that pollution within rivers which may be at acceptable levels under the WFD will, in combination with that of other sources, become a problem in the ocean waters. This is more likely in mainly-enclosed seas like the Mediterranean and Baltic, but could also be possible in areas of the North Sea.

4 Agricultural pollution a prime reason for WFD failure

Despite the comprehensive system of management introduced by the WFD, and more recently supported by the MFD, agricultural pollution is still a major problem within the European Union.²⁸ There is expected to be widespread failure to meet the goal of good status for surface waters by the WFD's first target date of 2015, and a majority of reporting Member States have indicated that agricultural pollution is one the main reasons, for some *the* main reason, why these goals will not be met.²⁹

For example, in the Netherlands, even assuming maximum effectiveness of the measures currently in place, only 40 to 60% of all water types are expected to reach their targets by 2027, the third target date of the WFD.³⁰ The main reason for this failure will be nutrients, and the source of approximately 75% of those nutrients is agriculture. Although the Netherlands, with its intensive farming and highly modified watercourses, faces particular stress from this form of pollution, across the EU agriculture is responsible for 50-80% of all nitrate inputs in water.³¹ A study by the European Environment Bureau found that in most Member States, nutrient pollution

²⁸ V Mohaupt, G Crosnier, R Todd, P Petersen, and T Dworak 'WFD and agriculture activity of the EU: first linkages between the CAP and the WFD at EU Level' (2007) 56(1) *Water Science & Technology* 163.

²⁹ European Commission, Accompanying document to 'Towards Sustainable Water Management in the European Union: First stage in the implementation of the Water Framework Directive 2000/60/EC', (COM(2007) 128 final).

³⁰ Netherlands Environmental Assessment Agency, 'Evaluation of the Water Framework Directive in the Netherlands; costs and benefits' (2008) at

<<http://www.pbl.nl/sites/default/files/cms/publicaties/500140004.pdf>> accessed 8 August 2012.

³¹ European Commission, Implementation of Directive 91/676, COM (2010) 47.

accounted for over 50% of expected failures to achieve good status.³² More worryingly, across the EU very few plans contain a plausible description of how required targets on nutrients are to be reached. The measures to address agricultural water pollution have been characterised as ‘superficial and weak’, and entirely lacking in the major action that the difficult problem clearly requires.³³

If waters within a Member State do not achieve the required status by 2015, the WFD allows the application of exceptions, allowing the delay in goal achievement by two RBMP six-year cycles, i.e. until 2027. One of the possible applications of this exception is where ‘completing the improvements within the timescale would be disproportionately expensive’.³⁴ With regards to waters failing due to agricultural pollution, it appears this is the exception that most Member States plan to claim.³⁵ Added to Member State reluctance to make the large expenditures on abatement measures is the fact that there is a high level of uncertainty as to the effects any particular measure would have. In a detailed cost/benefit analysis of possible WFD measures in the Netherlands, out of a series of possible options, on the available data, it was found that only two represented value for money: wet buffer strips and helophyte filters. However, the Netherlands Environmental Assessment Agency concluded that even these options represented a significant input cost, and there was a very high level of uncertainty as to what impact they would actually have if deployed on a wide scale, making them unattractive as policy options.³⁶

It is certainly true that the task of lowering agricultural pollution is a very challenging task. However, this is the task that Member States have been set, and at present, there is little evidence of an ability to meet the challenge.

³² European Environment Bureau, ‘10 years of the Water Framework Directive: A Toothless Tiger? A snapshot assessment of EU environmental ambitions’ (2010) at <<http://www.eeb.org/?LinkServID=B1E256EB-DBC1-AA1C-DBA46F91C9118E7D&showMeta=0>> accessed 16 August 2012.

³³ Ibid.

³⁴ Article 4(4).

³⁵ European Environment Bureau, note 32.

³⁶ Netherlands Environmental Assessment Agency, note 30.

5 Possible solutions

5.1 Remove Member State discretion

Given the lack of success Member States have had in developing and implementing plans to reduce farm-based water pollution, a possible way forward would be to start setting standards centrally. The European Commission could issue specific directives or regulations implementing those specification and process standards seen to be most likely to effect the necessary reduction in pollution. Such a solution may be attractive to those frustrated by Member State inaction in this area, however it is highly unlikely that such a process will occur. In this regard, it is useful to recall the reason why performance standards, as opposed to process and specification standards, are to be preferred. Coglianese and Lazar³⁷ showed that performance standards work because the individual duty holders are in a much better position than regulators to determine how a particular result might be best achieved. Therefore, the polluter is able to reach the necessary performance standard more cost-effectively than any regulator attempting to manage all polluters. Although performance standards are not possible at a farm level, what the WFD effectively implements is performance standards at a catchment level. The same argument used to favour placing performance standards on individual polluters can also be applied when the duty holder is a state. That is, when only the result, not the method, is prescribed, the duty holder, in this case the Member State, is free to pursue the most cost-effective methods, tailored to the specific circumstances of the catchment, which can achieve the necessary target. With regards to the regulation of agricultural pollution, it is clear that the challenges to effective management will vary greatly between and within Member States. There is a high level of variation in the type and intensity of the farming, as well as topographical and hydrological landscape features, throughout Europe.³⁸ Moreover, the type of regulation may need to vary, so regulation which is appropriate in some states may not

³⁷ C Coglianese and D Lazar, 'Management Based Regulatory Strategies' (Regulatory Policy Program Working Paper RPP-2001-09) (2001) at <<http://www.hks.harvard.edu/m-rcbg/research/rpp/RPP-2001-09.pdf>> accessed 12 August 2012.

³⁸ Jack note 2.

be in others. Therefore, although they have not been very successful so far, Member States are still arguably in a better position than the European Commission to determine the most efficient and effective way of achieving an appropriate level of environmental quality for waters in their territory.

Also, the political implications of more prescriptive rules coming from Europe cannot be ignored. The rule of subsidiarity is a reflection of the reality that, although European states have chosen to give some rule-making power to a pooled political authority, they do not wish the exercise of that authority to be more intrusive than it needs to be. It is likely that this consideration will inform future European action, meaning that the primary rule-makers with regards to agricultural water pollution will continue to be the Member States.

5.2 Enforcement by the European Commission

The next question to be answered is whether European institutions can compel Member States to meet their targets. The WFD obligations of measurement, monitoring, River Basin Management Plan adoption, and inter-calibration, have had reasonable compliance, despite initial delay and some ongoing enforcement action.³⁹ However, failing to achieve good water status is not a derogation which can be overcome by Commission enforcement, in the way the non-transposition of a directive can. Nevertheless, if the Commission does not accept Member States' application of the exception of Article 4(4) WFD, it does have the power to issue fines to the offending states. Such a move would be controversial, and would likely involve a number of Member States facing significant penalties. It is not clear whether the Commission would be willing to take such action, especially where those Member States had formally complied with all other aspects of the Directive, and registered an exception under Article 4(4). Lee argues that decisions over disproportionate cost are

³⁹ European Commission, note 29.

open to Member State judgement 'in all but perhaps the most extreme cases'.⁴⁰ Moreover, there is a question as to what legal weight those water quality targets have; one argument suggests that given the wording of the obligation, it is in fact legally irrelevant.⁴¹ The Commission will certainly face a difficult decision in 2015, and it is likely that it will face significant pressure not to impose large penalties on those Member States who found themselves unable and unwilling to tackle this problem. Until this time, Member States are left to make their own attempts at reaching good status in their waters, no matter how ineffective those may be.

5.3 Cross compliance under the Common Agricultural Policy

It has been noted that one of the reasons Member States have been unwilling or unable to provide a plan as to the adequate reduction of agricultural pollution is the significant expense this entails. Considering this, it may be that the Common Agricultural Policy (CAP) represents an opportunity for overcoming this hurdle. The CAP is one of the centrepieces of European Union action, accounting for one third of the entire EU budget. Expenditure under CAP is divided into two main types: Regional Development,⁴² and Single Farm Payments, which are made directly to farmers across Europe. For many years, environmental performance standards were not attached to EU farm payments. However, following recent reforms, since 2005,⁴³ under 'cross compliance' measures, Member States have been able to reduce payments to farmers if they fail to meet 'good agricultural and environmental condition' (GAEC) on their farms, or fail to comply with any of 19 statutory management requirements (SMRs).^{It is} this ability to *reduce* payments already given to farmers if conditions are not met, as opposed to making new funds available, which makes cross compliance an attractive tool to address environmental problems associated with agriculture.

⁴⁰ Lee note 19, 39.

⁴¹ W Howarth 'Aspirations and Realities under the Water Framework Directive: Proceduralisation, Participation and Practicalities' (2009) 21 J. Env. L 391, 413

⁴² Funds available for rural development projects, administered by Member States.

⁴³ Council Regulation No 1782/2003 and Commission Regulation No 796/2004.

The 19 SMRs are instruments addressing various aspects of environmental protection, and include some specific directives having direct impact on water protection, in particular the Nitrate Directive and Groundwater Directive. Although their connection to Single Farm Payments through cross compliance does not add any legal weight to the obligations they contain, it is believed that the penalty of withdrawing payments should provide a very potent tool to Member States when attempting to ensure farmer compliance with those Directives.⁴⁴ The requirement of GAEC, on the other hand, does represent an opportunity for Member States to place requirements of farmers over and above those required under pre-existing EU legislation. At a base level GAEC is to establish soil protection measures, but Member States may develop further standards as they feel necessary. These additional measures can include those specifically targeted at protection of water, and most Member States include some provisions in that regard.⁴⁵ However, despite their potential to positively influence water quality outcomes, no explicit connection has been made between Single Farm Payments and the Water Framework Directive.⁴⁶ Regional Development funds may be provided to compensate for costs and lost income arising from implementation of the WFD, but Member States are under no obligation to tie Single Farm Payments to the outcomes the WFD requires. As a result, the WFD and the CAP operate independently, with different planning cycles, and little consideration given for the other.⁴⁷

This lack of attachment to firm environmental goals means that the GAECs developed have been generally weak, and unlikely to make significant improvements to agricultural water pollution. A report by *Alliance Environnement* found that implementation of Single Farm Payment cross compliance standards had been variable, but only three states, Germany, Italy and the UK had actually established obligations

⁴⁴ R Muessner, Z Karaczun, T Dworak, and K Marsden 'WFD and Agriculture: Linkages at the EU Level Final Report about Cross Compliance and the WFD' (2006) at <http://circa.europa.eu/Public/irc/env/wfd/library?l=/framework_directive/thematic_documents/wfd_agriculture/approved-080606pdf/_EN_1.0_&a=d> accessed 12 June 2012.

⁴⁵ Ibid.

⁴⁶ Ibid.

⁴⁷ Ibid.

for farmers covering all of the necessary standards required by the CAP-reforming regulation.⁴⁸ This finding was supported in a report from the Court of Auditors, which was highly critical of the implementation of the cross compliance measures across Member States. It concluded that the GAEC standards were weak, and failed to implement measures expected to have significant impact on environmental problems. It further found that monitoring of these deficient standards by Member States was not thorough.⁴⁹

Reasons given for the lack of realisation of the full potential for linkages between WFD and CAP are those which permeate the entire issue, measurement and funding difficulties. The Mohaupt report notes that the European Commission has conceded that many elements of farmer contribution to water pollution are very difficult to check, and/or require long detailed inspections which are costly to the regulator and inconvenient to the farmer.⁵⁰ Indeed, farmer groups across Europe have been very resistant to the linkage of Single Farm Payments to compulsory environmental conditions.⁵¹ Also, there has previously been reluctance among Member States to impose stricter conditions upon Single Farm Payment recipients for fear of losing competitiveness in the agricultural sector to other Member States.⁵²

Nevertheless, it is clear that in the operation of cross compliance measures, there is significant unmet potential to make real reductions in agricultural pollution. This unmet potential has been recognised,⁵³ and the European Commission's Environment Directorate-General⁵⁴ commissioned a study to investigate possible linkages. They

⁴⁸ V Swales, K Arblaster, J Bartley, and M Farmer (2007) *Evaluation of Cross Compliance as Foreseen under Regulation 1782/2003*, Alliance Environnement at

<http://www.ieep.eu/assets/372/cc_descriptive.pdf> accessed 5 September 2012.

⁴⁹ Court of Auditors, *Is Cross Compliance and Effective Policy?* (2008) Special Report 8/2008.

⁵⁰ Mohaupt et al, note 28.

⁵¹ Jack, note 2, 72.

⁵² D Baldock and K Mitchell, *Cross Compliance within the Common Agricultural Policy: A Review of Options for Landscape and Nature Conservation* (Institute for European Environmental Policy 1999) 24.

⁵³ European Commission, note 12.

⁵⁴ Mohaupt et al, note 28.

recommended the recalibrating of cycles of timing of the CAP and those of the RBMPs so that greater linkages can be utilised. The Court of Auditors also concluded that significant potential for positive change from cross compliance existed, provided standards were strengthened and better enforced.⁵⁵ Jack⁵⁶ argues that using CAP to promote positive environmental management goes against the European Commission's philosophy, which is that while basic environmental standards should be provided by farmers without payment, the provision of further environmental services ought to be compensated.⁵⁷ However, given the striking lack of success in dealing with agricultural water pollution under the WFD, it is surely necessary to make greater use of the large potential held within cross compliance measures.⁵⁸ To date, Member States have been free to develop their own standards for GAEC, and many have taken that opportunity to set weak requirements. If Member States were made to account for the impact of CAP payments on WFD goals, the standards of GAEC would necessarily improve. With three years before Member States are required to account for their failure to achieve good status, such a measure ought to be considered promptly.

Conclusion

Given the EU's great potential to be a world leader in environmental law, it is disappointing that its efforts in the area of agricultural pollution have been seemingly so ineffective. The development of the Water Framework Directive, with its holistic coverage and undoubted advancement in sophistication as a legal regime, is apparently well designed to deliver positive outcomes in all areas of water pollution, including that from agriculture. Its ongoing failure to do so raises questions as to the limitations of what European Environmental law can actually achieve. There is a

⁵⁵ Court of Auditors, note 49.

⁵⁶ Jack, note 2, 164.

⁵⁷ European Commission, *Directions Towards Sustainable Agriculture* (Com (1999) 22 Final) 20.

⁵⁸ It must be noted that CAP does not apply to all forms of agriculture; pig and poultry farming receive no Single Farm Payments, therefore unless those farms are participating in less favoured area or environmentally sensitive area schemes, they are beyond this form of control.

political element to the operation and enforcement of European Union legislation, meaning that what are sometimes clear legal provisions are not treated with the level of seriousness that those concerned with the environment would like. With regards to reducing agricultural pollution to a necessary level, it seems that considerations of cost, and perhaps political acceptability, have tended to override those obligations provided by the Water Framework Directive. One conclusion is that if full implementation is to be reached, an analysis of why individual Member States fail to achieve their targets. Ultimately, despite the breadth and strength of EU environmental legislation, it is the action of the Member States that ultimately determines whether goals such as the reduction of agricultural water pollution can be achieved.

European Instruments

Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources.

Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 Establishing a Framework for Community Action in the Field of Water Policy.

Council Regulation No 1782/2003.

Commission Regulation No 796/2004.

Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy.

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Chapter 3: United Kingdom (England)

Introduction

As the first nation to industrialise, the United Kingdom was also the first to experience industrial pollution, and British laws addressing it began with the first Alkali Act of 1863. Over the decades, efforts to improve the water quality of UK rivers have eventually had some success. The Thames, for example, which has in the past suffered from debilitating pollution levels, has been rehabilitated to the extent that fish species are returning.¹ However, as elsewhere, the relative success in dealing with industrial, point source pollution has made apparent the lack of success in dealing with diffuse sources, in particular, agricultural pollution.²

In current times, although there is significant indigenous impetus to address environmental issues, the driving force behind UK environmental law is European legislation.³ The issue of agricultural water pollution is no exception; as we have seen, the UK is obliged to implement a number of directives which impact on this area. However, as with many areas of environmental regulation, there is a significant gap between the targets set by the relevant EU directives and the situation on the ground. A significant percentage of UK waters are expected to fail to reach the targets required under the Water Framework Directive (WFD) by the first due date, 2015, and agricultural pollution is one of the main reasons behind this predicted failure.

In this chapter, the implementation within the UK of two central European Instruments, the Nitrates Directive and the Water Framework Directive, will be assessed, and the reasons for the impending failure of the UK to reach its WFD targets will be analysed. This will be followed by a discussion on the possible directions for policy if those goals are to be successfully achieved. Although the United Kingdom is

¹ MJ Atrill (ed) *A rehabilitated Estuarine Ecosystem* (Kluwer Academic Publishers 1998).

² BJ D'Arcy, F Usman, D Griffiths and P Chatfield, 'Initiatives to tackle diffuse pollution in the UK' (1998) 38(10) *Water Science and Technology* 131.

³ A Jordan, *The Europeanization of British Environmental Policy: A Departmental Perspective* (Palgrave 2002).

the formal Member State of the EU, responsibility for implementation of EU directives is differentiated between the constituent entities of the United Kingdom. The focus of this study will, for simplicity, be confined to implementation within England.

1 Implementing the Nitrates Directive

The history of the Nitrates Directive in England provides an example of some of the central impediments to environmental regulation of agriculture. Although the problem has been acknowledged by successive UK governments,⁴ implementation of the Directive in the UK has been slow. Despite its entering into force in 1991, the UK has only in recent years come into full compliance with the Directive. In England, the initial implementing Regulations⁵ were not brought in until 1996, and only covered 8% of the land area.⁶ The object of these regulations was for the 'protection of drinking water sources', and thus many areas which were at risk of nitrate pollution as defined by the Directive were not included, as they were not part of drinking water catchments.⁷ This designation was successfully challenged by the Commission,⁸ and the government was forced to widen the object to the broader environmental goal, increasing the coverage to 55% of land area. However, even this increased application was not in conformity with the Directive, as it allowed a nitrogen application limit of 250 kg N/ha on grasslands (the Directive's limit is 170 kg N/ha), despite the fact that no derogation had been sought.⁹ Since the introduction of the tighter 2008 Nitrate Regulations, and a derogation granted for the 250 kg/ha limit to apply in more limited circumstances,¹⁰

⁴ Ibid.

⁵ The Protection of Water against Agricultural Nitrate Pollution (England and Wales) Regulations 1996.

⁶ House of Commons Environment, Food and Rural Affairs Committee, 'Implementation of the Nitrates Directive in England (HC 412, 2008).

⁷ Defra, 'The Protection of Waters Against Pollution from Agriculture: Consultation on the Implementation of Nitrates Directive in England' (2007) 11.

⁸ Case C-69/99 *Commission v United Kingdom*, [2000] ECR I-10979.

⁹ House of Commons, note 6, 11.

¹⁰ Commission Decision 2009/431/EC: Derogation granted to England, Scotland and Wales to apply 'up to 250 kg N/ha from grazing livestock manure on grassland farms where 80% or more of the agricultural land is grassland'.

England is no longer facing the threat of Commission action; albeit many years after the Directive's commencement.

It is difficult to precisely explain the reasons for the UK's delay in properly implementing the Nitrates Directive, however, two interacting influences can be observed; a scepticism over the validity of the measures, and strong resistance by the agricultural sector. In 2008, the Environment, Food and Rural Affairs Committee (EFRAC) conducted an investigation into the implementation of the Nitrates Directive. In its report, the Committee criticised the levels of nitrate application and nitrate concentration set in the Directive for being arbitrary, and for lacking scientific justification.¹¹ The Committee stated that the fixed 50mg/l concentration measure, and the 170kg/ha nitrate application limit compared unfavourably to the flexible concept of 'good' status under the WFD. It is true that the European Commission did not provide comprehensive justification of these two figures, and the 50mg/l figure appears to have been brought over from the level set by the Drinking Water Directives of 1980 as a measure to protect human health, not the environment. However, given the scientific uncertainty over the sources and rate of nitrate pollution, and the uncertainty over what control measures will have the necessary effect,¹² it is not surprising that comprehensive justification was not given for the precise limits set. It is doubtful that such proof could ever be provided. Nevertheless, the perceived lack of certainty behind the science can lend support to political forces opposed to the implementation of difficult environmental restrictions.

Another form of opposition comes from the agricultural sector. In the EFRAC investigation, the National Farmers Union (NFU) argued in submissions that the restrictions the Directive placed on farmers were too onerous.¹³ These submissions continue a pattern of resistance to the Nitrates Directive by the agricultural sector. The

¹¹ House of Commons, note 6, 8.

¹² See discussion in chapter 2, section 4.

¹³ House of Commons Environment, Food and Rural Affairs Committee, 'Implementation of the Nitrates Directive in England (HC 412, 2008).

1996 Regulations were subject to a legal challenge from the NFU, who claimed that they should not be penalised for waters not meeting the 50mg/l target, given that it could not be shown that agriculture was solely responsible.¹⁴ Although the challenge was dismissed by the Court of Justice of the European Union (CJEU), it demonstrated the strong resistance in that sector to controls placed on nitrates.

These two sources of resistance to the Directive may be related. Writing the year after the introduction of the Nitrates Directive, Seymour et al argued that ‘government scepticism over the rationale of the EC nitrate pollution definition’ had been communicated to farmers, compromising its legitimacy.¹⁵ The EFRAC Report demonstrates that government scepticism still exists, and is perhaps still being communicated to farmers, to similar effect. Certainly a perception problem continues to exist in the agricultural sector. In its report on diffuse pollution in England, the National Audit office found that 85% of farmers surveyed believed that diffuse pollution was not a significant problem, and 72% thought that agriculture made either minor or no contribution. This is despite significant public expenditure towards awareness raising campaigns by Defra and the Environment Agency. Unfortunately, such farmer scepticism, in turn, undermines the prospects of their cooperating with the Directive.¹⁶

2 Implementing the Water Framework Directive

The WFD provided the UK government with both a large challenge and a large opportunity. The requirement to bring its internal waters to ‘good’ status meant that it had the legal justification, and the obligation, to take further steps to control pollution from agriculture. This meant the possibility of tighter restrictions on nitrates than those given by the Nitrates Directive, but also restrictions on all other forms of agricultural

¹⁴ Case C-293/97 *R v Secretary of State for the Environment and the Ministry of Agriculture, Fisheries and Food, ex parte Standley and Others and Metson and Others and National Farmers Union (Intervener)* [1999] ECR I-2603. Interestingly, one of the arguments presented was that by only controlling agriculture, the regulations offended the polluter pays principle (see discussion in Chapter 4)

¹⁵ S Seymour, G Cox and P Lowe [1992] *Sociologia Ruralis* 82.

¹⁶ *ibid.*

water pollution. However, despite this opportunity (and obligation), there has not been the necessary improvement in regulation of this kind of pollution. Although the UK has complied with the procedural aspects of the Directive, along with many other Member States, it is set to fail to meet its first targets for 2015,¹⁷ and diffuse pollution is one of the main reasons for this. Agriculture is a known cause of failure in 2835 different water bodies across England and Wales, second only to the water industry, and far ahead of industry on 404 water bodies.¹⁸ The UK is planning to argue for the 'disproportionate cost' exception under WFD Article 4(4),¹⁹ but if the Commission does not accept this application of the exception, the UK could face significant fines. However, despite this worrying prospect, there has not been the regulatory activity such a possibility might be expected to trigger.

The River Basin Management Plans (RBMPs), created in compliance with the WFD, did not contain and were not accompanied by additional legal or regulatory power aimed at reducing any particular type of pollution. With regards to agricultural pollution, the RBMPs contain programmes of awareness raising, and efforts to increase understanding of agricultural pollution, as well support for voluntary schemes like Catchment Sensitive Farming.²⁰ Many RBMPs discuss the introduction of mandatory controls if the voluntary schemes fail,²¹ and others specifically refer to the development of Water Protection Zones.²² However, it is recognised that the legislative powers this additional regulation would entail necessitates their being developed centrally. In its 2007 report on diffuse water pollution, the Environment Agency stated that if it were to be able to adequately address the problem, it required 'new or

¹⁷ Defra, 'Water for Life' (Water White Paper, Cm 8230, 2011).

¹⁸ Environment Agency, compiled and cited in White Paper, note 17, 30.

¹⁹ See chapter 2, section 4.

²⁰ See for e.g. Environment Agency, 'River Basin Management Plan: South West River Basin District' (2009) at <<http://publications.environment-agency.gov.uk/PDF/GESW0910BSTP-E-E.pdf>> accessed 7 August 2012.

²¹ See e.g. Environment Agency, 'River Basin Management Plan: Anglian River Basin District' (2009) <<http://publications.environment-agency.gov.uk/PDF/GEAN0910BSPM-E-E.pdf>> accessed 7 August 2012.

²² See discussion below at 2.1

improved legislative powers' to do so.²³ However, despite this opinion, and despite similar opinions expressed in RBPMs, no such powers have been provided. The controls under the Nitrates Regulations remain the strongest tool for that kind of pollution. Other controls on water pollution do exist,²⁴ however Environment Agency staff interviewed by the National Audit Office in 2010 believed these mechanisms were inadequate.

2.1 Water Protection Zones

One promising potential increase in the Environment Agency's powers is the extension of use of Water Protection Zones, a designation predating the Water Framework Directive, but one seen as a possible legal mechanism for the tighter control of diffuse pollution. This designation was established under the Water Resources Act 1991, however as yet it has only been used in the Dee River catchment. The Environment Agency had originally perceived these as being useful for point source pollution – the Dee's pressing problem was industrial pollution – however its possible utility in dealing with diffuse pollution was subsequently recognised.²⁵ Under the Act, designation by the Secretary of State of a particular area as a Water Protection Zone gives him or her the power to restrict *any activity* contributing to pollution of that water. Although the current Act explicitly rules out its applicability to agricultural pollution,²⁶ a Defra consultation on its expansion considered the amendment of this provision to allow its use in that area.²⁷ In response to the consultation, the EA welcomed the proposed changes, recognising that this was the type of regulatory power that was required. As

²³ Environment Agency, 'The Unseen Threat to Water Quality: Diffuse water pollution in England and Wales report' (2007) <http://www.environment-agency.gov.uk/static/documents/Research/geho0207bzlvee_1773088.pdf> accessed 14 July 2012.

²⁴ Direct prosecution for water pollution; anti-pollution works notices; and enforcement through the environmental permitting regime.

²⁵ Environment Agency, 'Response to Defra and WAG consultation', (2009) at <http://www.environment-agency.gov.uk/static/documents/Research/2018_Water_Protection_Zones.pdf> accessed 14 July 2012.

²⁶ Article 93(3)

²⁷ Defra report cited, but has subsequently been removed from website. This point discussed in Environment Agency, note 25.

such, it urged ‘prompt implementation of the changes to support measures in the final first cycle River Basin Management Plans.’

However, despite the support from the Environment Agency, and despite the apparent necessity to increase the regulatory options in dealing with diffuse pollution, the move towards expanding the use of WPZs has seemingly been discontinued. Although the EA website indicates that implementation of the WPZs is still going ahead, there has not been any update on the activity since the EA’s response to Defra’s consultation in May 2009, and in the Water White Paper produced in 2011, Water Protection Zones were not mentioned.²⁸ Since the WPZ consultation, there has been a change of government in the UK, and a funding cut to Defra of 30%.²⁹ Given budgetary constraints, one possible explanation for the postponement of the WPZ extension is the administrative cost they entail. The EA acknowledges that designing and operating an effective WPZ is a very intensive administrative and regulatory procedure, and this is one of the reasons for their very limited use to date.³⁰ Thus, the EA’s response to the Defra consultation included a call for indication of the additional funding necessary for their deployment.³¹ Whatever the reason for the lack of pursuing WPZs, it seems a cause for concern that the type of regulation called for in RBMPs, and by the EA, is apparently no longer a viable option.

2.2 Catchment Management and Catchment Sensitive Farming

Policy in the area of diffuse water pollution has shifted away from the potential mandatory provisions of WPZs to more voluntary measures. In the recent Water White Paper,³² the major means for diffuse pollution control discussed was ‘catchment management’, a programme established in 2009. In this programme, individual catchments are managed, either by the Environment Agency, or a local organisation, in

²⁸ Defra, note 17.

²⁹ E Kirk and A Reeves ‘Regulatory agencies and regulatory change: breaking out of the routing’ (2011) 13 *Environmental Law Review* 155.

³⁰ Environment Agency, note 25.

³¹ *Ibid.*

³² Defra, note 17.

order to tackle local sources of pollution, including agriculture. This programme is currently being trialled in 25 catchments around the UK, and according to the White Paper, will be monitored for effectiveness with view to its expansion and continuation. However, the individual catchment management plans do not have legal status,³³ and are not empowered to make any mandatory regulation.³⁴ In addition to this programme, the EA, along with Defra and Natural England, operate a voluntary 'Catchment Sensitive Farming' (CSF) programme, promoting farming practices which are less harmful to the connected waterways.

It is hoped that the voluntary schemes currently being pursued will have a positive impact on agricultural pollution. Given the lag between policy deployment and environmental effect, it will be some time before the effect of these programmes can be measured and attributed. However, it is clear that these programmes do not provide the increase in regulatory power that the Environment Agency believes is necessary if it is to properly control diffuse water pollution. Given that only three years remain before the first assessment year under the WFD, this lack of regulatory power represents a concern.

3 Policy options for the UK government

Given the apparent lack of a coherent plan for bringing agricultural water pollution to an acceptable level, it is necessary to consider the options available to the UK government. There are a number of key policy decisions facing regulators in this area, which must be considered if a rational policy direction is to be found.

3.1 Voluntary vs. mandatory measures

The key distinction between the use of the now un-favoured Water Protection Zones and the catchment management and Catchment Sensitive Farming programmes, is that

³³ Environment Agency, 'Guidance for Hosts: Extending the catchment-based approach' (2011) at <http://www.environment-agency.gov.uk/static/documents/Research/Guidance_for_hosts_v2.pdf> accessed 20 August 2012.

³⁴ Environment Agency, 'Pilot Catchment FAQs' (2011) at <http://www.environment-agency.gov.uk/static/documents/Research/Pilot_catchment_FAQs.pdf> accessed 24 August 2012.

the former involved mandatory action on behalf of those regulated, whereas the latter is purely voluntary. The question of which mode to employ is a live issue across many areas of environmental regulation. Voluntary measures to alleviate any form of pollution are often preferred by lawmakers, as they are politically easier, and do not have the difficulty and expense of enforcement. Gunningham and Sinclair recognised this, and in their plan to tackle diffuse water pollution called for a phased approach, with the first phase characterised by more voluntary, incentivised standards.³⁵ It was argued that those standards would be more acceptable, but could lay the groundwork for more mandatory measures in a future second phase. Given the strong resistance to regulation within agricultural sector, it is natural that voluntary measures are under close consideration by the UK authorities. However, there are serious concerns about the utility of voluntary measures in addressing agricultural pollution.

In a detailed study, Williams³⁶ demonstrated that such measures are simply unlikely to work in an agricultural context. Other studies show that when farmers are asked to voluntarily undertake action, unless a 100% subsidy is provided, there will be little uptake of the measure. This has been shown in Ireland, Scotland and other European countries.³⁷ This is not surprising; farmers need to make money to survive, and are sensitive to the introduction of additional costs. The NAO report found that financial constraints were a major reason behind farmers' unwillingness to take action against diffuse pollution.³⁸ Therefore, unless UK Government is able to fully subsidise any pollution reduction measures, it can be expected that only measures with very little or no input costs will attract much compliance.

³⁵ N Gunningham and D Sinclair, 'Policy Instrument Choice and Diffuse Source Pollution' (2005) 17 *Journal of Environmental Law* 51.

³⁶ DR Williams, 'When Voluntary Incentive-Based Controls Fail: Structuring a Regulatory Response to Agricultural Non-Point Source Water Pollution', 9 *Washington University Journal of Law and Policy* (2002).

³⁷ M Ribaud, D Horan and M Smith, *Economics of Water Quality Protection from Non-Point Sources*, USDA, *Agricultural Economic Report 782* (Washington DC, 1999) 48.

³⁸ National Audit Office, 'Tackling Diffuse Water Pollution in England' (HC 186 Session 2010–2011).

However, the fact that voluntary standards tend not to work is not the only problem associated with their use. Williams argues that when measures are voluntary, whether or not they are compensated, there is an implicit message that those measures are not strictly necessary, otherwise they would be mandatory.³⁹ Given that in the attempts to control farm pollution, one of the biggest problems faced by authorities is reluctance on behalf of farmers to accept the need for regulation, this perception given by voluntary measures is a significant problem.

Therefore, the move away from Water Protection Zones to voluntary measures is a matter of concern. As Howarth points out,⁴⁰ the move represents a significant contrast with the legal obligations under the WFD to attain good status in its waters. It could be argued that the catchment management and CSF measures cohere with Gunningham and Sinclair's call for an initial voluntary phase. The authorities have indicated that mandatory measures will be considered if the voluntary measures do not work.⁴¹ The problem is that the voluntary measures have already been in place for a long time, as a voluntary code of good agricultural practice was established as prescribed by the Nitrates Directive in the 1996 Regulations. With only three years before waters are required to meet good status, it would appear that the time for voluntary measures has passed.

3.2 Economic instruments

Another policy divide present in many debates over pollution control is the use of economic instruments. Over the last decades, such instruments have become attractive to policy-makers in comparison to so-called 'command and control' measures. Economists argue that economic instruments are the most efficient way to effect behaviour, and should be favoured for this reason. Further, these instruments

³⁹ Williams, note 36.

⁴⁰ W Howarth, 'Editorial: The Water White Paper and the Legislative Horizon', 22(1) *Journal of Water Law* 3.

⁴¹ Defra, note 17.

are simpler to apply, and do not require government agencies to design complex schemes aimed at affecting polluters' behaviour.⁴²

However, an analysis of the economic instruments available to the control of farm pollution shows that they are of doubtful efficacy. The first option, and that which has the most widespread use internationally, is the application of taxes on purchased farm inputs, namely fertilisers and pesticides.⁴³ The idea is that an increased cost of the input will reduce its use, and therefore, its appearance in the water environment. As such, it is an attractively simple mechanism, and a number of European countries have employed it. However, practice shows that such taxes have not been very successful at achieving this goal.⁴⁴ The reason for this is that demand for pesticides and fertilisers are rather inelastic, and not easily affected by a price differential.⁴⁵ In order to make an impact on usage, the level of tax must be very high; in fact, a European Community study showed that in order to reduce nitrogen inputs by just 10%, the necessary price rise would have to be 50-100%.⁴⁶ Unsurprisingly, those European governments who have implemented taxes have been unwilling to set the tax at a sufficient level to make a difference large enough to be significant at the environmental level.⁴⁷ Given this evidence, to date, Defra has rejected the idea of input taxes as not cost effective, which appears to be a sensible position.

Another economic mechanism aimed at farm pollution is to levy farmers for the costs of removing those pollutants for which they are responsible. This issue of liability is considered in detail in Chapter 4, which demonstrates a number of problems with this concept, including that recognised by Seymour et al, which is that it would necessarily

⁴² See e.g. C Sunstein, *After the Rights Revolution: Reconceiving the Regulatory State* (Harvard University Press, 1990) and T Swanson, 'Economic Instruments and Environmental Regulation: A Critical Introduction' (1995) 4(4) RECIEL 287.

⁴³ D'Arcy et al note 2.

⁴⁴ Gunningham and Sinclair, note 35.

⁴⁵ D'Arcy et al note 2.

⁴⁶ Seymour et al note 15.

⁴⁷ P Dampney, G Goodlass and J Hillman, 'Methods and Measures to Minimise the Diffuse Pollution of Water from Agriculture: A Critical Appraisal' (DEFRA, 2002)

entail present actors having to pay for pollution caused by their predecessors.⁴⁸ Other economic instruments, such as the auctioning of grants for environmental improvement,⁴⁹ and the issuing of tradable pollution permits,⁵⁰ have not been successfully deployed elsewhere, and are thus of doubtful utility in a situation such as this, where time and efficacy are of the essence.

3.3 What form should regulation take?

Therefore, despite its unpopularity in some quarters, it appears that increased regulation is the only viable option available to policy makers, if meaningful change is to be delivered. Therefore, the question facing authorities is what form of regulation is best applied. In addressing any kind of pollution, performance standards are particularly attractive, as they allow the duty holders to determine the best means of achieving an agreed end.⁵¹ However, unfortunately, it is not possible to measure the amount of pollution leaving one particular farm, which means that while performance standards at the catchment level are possible, and desirable, they are simply inapplicable at the farm level.⁵² Therefore, process and specification standards are the only viable options available to authorities.

Although we have seen that implementation of meaningful controls has been difficult, regulatory options are available. The Nitrates Directive, with its restrictions on storage capacity and application rates, demonstrate how specification standards can work on individual farms. Tighter regulations on nitrates, and similar standards for other agricultural pollution, could be set. Landscape specification standards also have demonstrated utility; for example, fencing, buffer strips along waterways, and

⁴⁸ Seymour et al note 15.

⁴⁹ S Gordon, *Regulatory Design for Water Quality Management in Perth, Western Australia: Economic Instruments Series: Paper 2--Innovative Economic Instruments for Non-Point Source Water Pollution in the Swan-Canning River System* (School of Resources, Environment and Society, Australian National University, 2003).

⁵⁰ English Nature, 'The Role of Economic Instruments in Managing Diffuse Nutrient Pollution: A Focus on Phosphorus' (No 462 English Nature Reports, 2002).

⁵¹ See chapter 2 section 5.1.

⁵² Gunningham and Sinclair, note 35.

revegetation can all reduce the amount of pollutants entering waterways from farms.⁵³ However, given the variation in types of farm and sources of pollution, it is likely that these standards will have to be somewhat tailored to the individual polluters. Setting of differentiated standards does add considerable cost to the administration of these schemes, as the Environment Agency noted with regards to Water Protection Zones.⁵⁴ Therefore, it might be tempting to set uniform standards applicable across all farm types. However, as Ribaudó et al demonstrate, the losses in efficiency and effectiveness associated with uniform standards will far outweigh the benefits of simplicity when applied to agricultural pollution.⁵⁵ This is because even where the standards do not vary, the differences in individual farms mean that determining compliance with standards requires individual attention to each farm.

The other main category of instrument available is process standards, whereby the undertaking of particular processes is mandated. The most common example of this is the requirement for farmers to produce management plans for the application of nutrients on their farms.⁵⁶ These plans can be coupled with a requirement to reduce the amount of applied substances, and can vary in the depth of information required. The Netherlands, which has a very high level of agricultural pollution, requires its farmers to calculate the total amount of nutrients applied on their farms, so that they can keep within set limits, which are tightened every year.⁵⁷ Gunningham and Sinclair argue that this is possible in the Netherlands due to the fact that the practice of farm management is well established in that country, meaning that there is little additional administrative burden placed on farmers.⁵⁸ They also note that such practice requires a very well-trained, well-funded regulator, to ensure its proper operation. Nevertheless,

⁵³ Ibid.

⁵⁴ See above section 2.1

⁵⁵ Ribaudó et al, note 35, 61-2.

⁵⁶ Gunningham and Sinclair, note 35.

⁵⁷ J Beghin and M Metcalfe, *Environmental Regulation and Competitiveness in the Hog Industry: An International Comparison* (Iowa State University, 1998) 3-5.

⁵⁸ Note 35.

there is no particular reason why this type of operation could not be extended to other countries, including the UK, if it was deemed necessary.

3.4 Potential of cross compliance under Common Agricultural Policy

With the apparent abandonment of an extension of WPZs, there is currently limited legal capacity for the introduction of the types of standards described above. However, the government already has at its disposal a means by which restrictions on individual farms can be placed, without the need for further legislative powers. Under the CAP cross-compliance measures,⁵⁹ the UK government is to set a standard of ‘good agricultural and environmental conditions’ (GAEC), which farms must attain as a condition of their continuing to receive single farm payments. As is the case in most EU Member States, the GAECs currently applied by the UK are weak considering the power they endow to set high environmental standards. The GAEC standards⁶⁰ for England farms do include restrictions on how close application of fertiliser may be to waterways, differentiated between organic and manufactured. Farmers are obliged to keep maps of the water bodies on their property, and they are also required to comply with the SMRs like the Nitrates Directive. However, apart from these limited measures, the only specification standard presented is that farmers are ‘strongly encouraged’ to ‘consider placing 6-metre buffer strips’ next to watercourses vulnerable to nitrate pollution. Unfortunately, no requirements for any other aspect of farm pollution: pesticides, other nutrients, or soil erosion, is made, despite these being vital to UK targets.

It appears that despite the clear potential of better GAEC standards to meet WFD targets, there is a reluctance to use them to that end. A 2004 report commissioned by Defra noted that there was ‘pressure to keep cross-compliance conditions to a minimum’, and as such the use of these measures as a means of lowering agricultural

⁵⁹ See discussion in chapter 2, section 5.3.

⁶⁰ Rural Payments Agency, ‘Guide to Cross Compliance in England’ at <<http://rpa.defra.gov.uk/rpa/index.nsf/293a8949ec0ba26d80256f65003bc4f7/6eb355ea8482ea61802573b1003d2469!OpenDocument>> accessed 4 September 2012.

water pollution 'must be viewed with some degree of caution'.⁶¹ This reluctance has continued with the recent change of government in 2010. The recent Water White Paper stated that CAP reforms will be used to 'provide clearer guidance for farmers on the basic measures required to safeguard water courses'.⁶² However, no plans to tighten the GAEC standards are apparent. This appears to be a significant lost opportunity to make progress in an area which is seemingly so difficult for the government to make progress on.

Conclusion and ongoing challenges

The above discussion has demonstrated that the adequate regulation of agricultural pollution is not easy, as improvement in this area faces a number of challenges. Farmers are an important constituency in the UK, and they have been strongly resistant to the regulations many feel are necessary to properly control water pollution. Secondly, when governments attempt to use agricultural regulation, they do so facing a high level of uncertainty as to whether their plans will have the desired effect. This lack of certainty makes what is already a difficult political task even harder. Finally, the regulation likely to have the most impact is complex and costly. At a time where budgets across all government departments are constrained, expensive plans like this are politically unpopular.

Nevertheless, it has also been seen that there are ways forward available that can be expected to positively influence the amount of agricultural pollution entering UK waters. Although these may be expensive, and untested on a large scale, the necessity of the task means that action must be taken. It might be that certain specification standards are more or less effective than others, however this can only be determined if they are attempted. Of course, there will continue to be resistance from within the

⁶¹ DEFRA, 'Impacts of CAP reform agreement on diffuse water pollution from agriculture, executive summary' (2004, Rep.GRP-P-175)

⁶² Defra, note 17.

agricultural sector, but it is surely possible to improve communication so that a greater understanding of the problem can be provided to farmers.

One area where improvements are needed is in the scientific understanding of the impacts of measures already undertaken, and undertaken in the future. It is a matter of great concern that the Environment Agency reported that it was unaware as to whether recorded reductions in nitrates in water were as a result of the Nitrates Regulations.⁶³ As Howarth acknowledges, there is an assumption in environmental law that the regulatory agency understands the relationship between measures it implements and environmental outcomes.⁶⁴ In the area of diffuse water pollution, it is likely that there will always be some uncertainty as to the precise effect of any one restriction. However, if political support is to be found for greater restriction on agriculture, it is necessary for the agencies proposing change to be able to demonstrate the expected effects of new measures.

Ultimately, meaningful action is constrained by the budget allocated for environmental protection. All measures suggested here; tailored specification standards, farm management plans, tighter GAEC rules, and more research into the effect of regulation, are expensive. However, if the UK wishes to meaningfully address agricultural pollution, the evidence suggests that expense is unavoidable.

⁶³ NAO, note 38.

⁶⁴ W Howarth, 'Diffuse water pollution and diffuse environmental laws', (2011) 23(1) J. Env. L 129.

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Chapter 4: Cost Recovery under the Water Framework Directive

Introduction

The previous chapters have discussed legal attempts to control the very substantial transference of harmful substances from farms to waterways. The focus of this discussion has been the environmental impacts of this pollution, and how different tools might be used to ameliorate the negative impacts it has on ecological systems. However, there is another significant type of impact caused by agricultural water pollution. It has been known for some time that the extraction of agricultural pollutants, chiefly fertilisers and pesticides, places a substantial financial burden on companies that supply drinking water in the UK.¹ In order to meet quality standards for drinking water, those organisations who supply it are obliged to spend large amounts of money removing those agricultural pollutants. Despite the size of these costs, at the present time, farmers are not obliged to make any financial contribution to this task, despite the clear linkage between the pollution and their activities. This appears to be in contravention of the polluter pays principle (PPP), a key concept within the Water Framework Directive (WFD) and EU environmental law generally. Article 9 of the WFD requires that Member States ‘take account of the principle of recovery of costs of water services, including environmental and resource costs’,² and by 2010 they are to ensure ‘an adequate contribution of the different water uses, disaggregated into at least industry, households and agriculture, to the recovery of the costs of water services [...] taking account of the polluter pays principle’.³

However, 12 years after the introduction of the WFD, no significant movement towards requiring payment from farmers has been instituted in the UK, and the financial burden of removing the pollution, running to hundreds of millions of pounds per annum, is born solely by those companies providing the drinking water. This chapter

¹ S Elworthy, *Farming for Drinking Water* (Avebury 1994).

² Article 9(1).

³ Article 9 second indent.

will assess this situation, and attempt to explain why the apparent breach of the PPP has been allowed to continue. There are great impediments to the full application of the PPP in this situation, and it is hard to see these being overcome. Unfortunately, central to the difficulties in applying the PPP here is a problem which permeates much of the preceding discussion: measuring individual contributions to diffuse pollution is not possible. This and other factors make it unlikely that farmers will be made to pay for their contributions to this costly form of pollution.

1 Costs of agricultural pollution to water companies

1.1 Cost calculation

Although the costs involved in removing agricultural pollution from drinking water are known to be high, there has not been a precise measurement made for these costs. Petty et al's study, based on figures from 1992-1997, put the figure at £220 million per annum within the UK, although the authors acknowledged a large role for estimation in this calculation. More recently, the Environment Agency's 4th Periodic Review of the Water Industry put the costs to water companies between £127 and £148 million per year in 2004-05 prices in England and Wales.⁴ The writers of the latter report noted that more needs to be done to develop methods of evaluating these costs, particularly for agriculture.⁵ Despite this call, the 5th Periodic Review of the Water Industry, created in 2009, was not able to accurately state the amount of money spent by water companies on agricultural pollution. The 5th Review did make an estimate of the amount spent on treating those pollutants most associated with agriculture, placing it at £189 million per annum for nitrates and £92 million per annum for pesticides, but

⁴ Environment Agency (2007) 'The Total External Environmental Costs and Benefits of Agriculture in the UK' at <http://www.environment-agency.gov.uk/static/documents/Research/costs_benefitapr07_1749472.pdf> accessed 30 July 2012.

⁵ Environment Agency. 'The 4th Periodic Review of the Water Industry: A Large-scale Application of Environmental Cost-benefit Analysis' (2004) <http://www.bath.ac.uk/management/crj/pubpdf/Occasional_Papers/22_Fisher_Horton.pdf> accessed 30 July 2012.

could not say what proportion arose from agriculture.⁶ It is clear from these varying figures that determining the actual amount of money spent on removing agriculturally sourced pollutants is difficult.

1.2 Cost recovery obligation

Whatever the precise figures, a significant cost is being borne by the water companies as a result of agricultural pollution. To date, no action has been taken by the UK to recover the costs of removing agricultural contaminants. It should be noted that the UK is not alone in this; the 2007 WFD implementation report showed that only 5 of the 27 Member States had even provided complete information regarding the costs of agriculture,⁷ let alone made provision for cost recovery. Nonetheless, the lack of action within the UK appears to be in contravention of Article 9 of the WFD.

The obligation in Article 9 is quite weakly worded,⁸ and it may be that the UK would not face penalty for failing to fully implement it in this way, as contravention is difficult to establish.⁹ However, an application of the polluter pays principle would appear to necessitate action to recover costs from the agricultural sector, whether or not a precise EU legal obligation can be established. Further, there are calls from the environmental movement for the principle to be applied in this situation. When the first UK River Basin Management Plans (RBMPs) were produced, they were criticised by environmental NGOs, including the Royal Society for the Protection of Birds and World Wildlife Fund for failing to 'lay the cost of cleaning up' on those causing the pollution, i.e. urban development, and agriculture.¹⁰

⁶ Environment Agency, 'Periodic Review 2009' (2009) at <<http://www.environment-agency.gov.uk/business/sectors/33065.aspx>> accessed 10 July 2012.

⁷ European Commission, 'Accompanying document to 'Towards Sustainable Water Management in the European Union: First stage in the implementation of the Water Framework Directive 2000/60/EC' (2007) (COM(2007) 128 final. http://ec.europa.eu/environment/water/water-framework/implrep2007/pdf/sec_2007_0362_en.pdf

⁸ W Howarth, 'Cost recovery for water services and the polluter pays principle' (2009) 10 ERA Forum 565.

⁹ Ibid.

¹⁰ -- -- 'Little improvement in river water quality, shows latest WFD report' (2010) 444 Ends Report 22.

Although there are two sources of impetus to implement cost recovery, given the obvious difficulties involved in shifting such a large cost from one industry to another, it is incumbent on policy makers to properly consider whether such a move is worthwhile. Such consideration ought to involve a critical evaluation of the polluter pays principle itself.

2 The Polluter Pays Principle

The polluter pays principle was first set out in OECD Council recommendations in 1974.¹¹ Since then, it has gained widespread recognition as an important principle in the area of environmental protection, and is incorporated in EU law in the Article 191(1) of the Treaty on the Functioning of the European Union (formerly EC Treaty). Moreover, it is now incorporated into many specific environmental instruments, including the Water Framework Directive. Despite its place in environmentally focussed directives, the PPP is originally an economic principle.¹² The idea is simple: polluters ought to pay for the environmental harm they produce. If they do not, environmentally damaging industries will be able to produce goods which do not reflect the true total cost of their production.¹³ These goods will be cheaper than they otherwise should be. Therefore, to avoid distortions in the market, the cost of the pollution caused should be internalised by the polluters. If this is done, the correct price signal will be given to consumers, one which reflects the full cost of the product.¹⁴ Therefore, the money spent on dealing with the pollution (cleaning it up, or ideally, preventing it in the first place) should be paid by the polluter.

As the principle has developed in law and policy over time, other environmentally focussed aims of the PPP's application have emerged, including preventative and

¹¹ OECD Council, 'Environment and Economics Guiding Principles Concerning International Economic Aspects of Environmental Policies' (223 (final) 1974).

¹² N de Sadeleer, *Environmental Principles: From Political Slogans to Legal Rules* (OUP 2002), chapter 1.

¹³ OECD Council, note 11.

¹⁴ SE Gaines, 'The Polluter Pays Principle: From Economic Equity to Environmental Ethos' (1991) 26 *Texas International Law Journal* 463 at 472-473: 'The polluter pays principle arguably works most effectively where the costs of pollution prevention associated with certain goods are passed on to the consumer in order to create market-driven incentives to change shopping patterns which harm the environment'.

curative functions.¹⁵ However, the original, central function of the PPP is to prevent externalities from distorting the market.¹⁶ This principle's economic focus, what Pedersen describes as its 'free market spirit',¹⁷ means that the principle can be used to oppose government subsidy of environmental protection, a function that arguably can lead to un-environmental outcomes.¹⁸ This interpretation of the principle is evident in advice from Defra in its consultation on the Nitrates Directive implementation. In the document, the Department states that, 'in line with the PPP, there should be no expectation that funding will be provided to directly support meeting the new Action Programme measures'.¹⁹ There is dispute over whether this policy position is in fact coherent with the PPP as originally conceived,²⁰ but it is the interpretation of the principle that has generally held sway in its implementation.²¹

2.1 Applying the polluter pays principle to agriculture

However, whether such an application of the principle should be implemented with regards to agriculture is a matter of contention. In their comprehensive study on the issue of diffuse pollution, Gunningham and Sinclair considered two paradigms for funding of environmental improvements in this area; 'community pays', i.e. actions funded by pooled funds, normally through the government, and 'polluter pays'. They argued that it was for 'the community, through the political process' to decide whether 'polluter pays' or 'community pays' should operate in relation to dealing with diffuse pollution. In other words, governments ought to be able to subsidise the move to less polluting practices if they consider it to be good policy.

¹⁵ de Sadeleer, note 12.

¹⁶ O Pedersen, 'Environmental principles and environmental justice' (2010) 12(1) Environmental Law Review 26

¹⁷ Ibid.

¹⁸ de Sadeleer, note 12.

¹⁹ Defra, 'The Protection of Waters Against Pollution from Agriculture: Consultation on implementation of the Nitrates Directive in England' (2007)
<<http://www.defra.gov.uk/corporate/consult/waterpollution-nitrates/index.htm>> accessed 24 June 2012.

²⁰ de Sadeleer, note 12.

²¹ Ibid.

In practice, despite the Defra advice, governments have generally tended to avoid the strict interpretation of the PPP in the area of agriculture.²² The OECD noted this fact and stated that there were 'particular reasons for expecting it to be a policy sphere in which political processes will continue to dominate'.²³ Agriculture has a unique place in the culture and politics of modern societies, such that Governments worldwide have found it very difficult to find the political will to enforce change on the industry that results in un-subsided higher costs.²⁴

The extent to which the anti-subsidy application of the PPP will apply with regards to agriculture is a matter of ongoing policy interest, and the manner in which directives such as the WFD are implemented will be central to that determination. The foregoing conclusion on the PPP does not determine whether or not cost recovery should be implemented in regards to water companies' extraction costs. However, it does raise doubts as to whether the underlying theory behind Article 9 of the WFD could or should be applied to agriculture.

3 Problems with application of Polluter Pays Principle

3.1 Calculating costs

In consideration of how the PPP might apply to agriculture over water pollution, one of the central questions regarding the principle is raised; which costs should be recovered, and how should they be calculated? In the originally conceived function of the PPP, these questions are reasonably simply resolved: if a financial cost is incurred dealing with pollution, that cost should be borne by the polluter. However, when the idea of 'cost' is broadened to include environmental damage, difficulties arise, as placing a monetary value on something which is inherently unquantifiable is one of the

²² G Cox, P Lowe and M Winder 'Private rights and public responsibilities: the prospects for agricultural and environmental controls' (1988) 4(4) *Journal of Rural Studies* 323.

²³ OECD 'Agricultural and Environmental Policies: Opportunities for Integration' (1990) 75(1) *International Review of Hydrobiology* 114, 115.

²⁴ J Tobey and H Smets, 'The Polluter-Pays Principle in the Context of Agriculture and the Environment' (1996) 19(1) *The World Economy* Volume 63 1996.

most challenging tasks set in environmental law. Gaines describes this wider concept of PPP, which incorporates environmental cost, as the 'legal' interpretation of PPP as opposed to the original 'economic' interpretation.²⁵ He argues that although such a broadening can be economically justified, it goes 'far beyond' the original conception of the PPP. It has been argued that this expansion from a purely economic instrument has meant that there is some confusion and inconsistency in its application.²⁶ However, if the PPP is to act as a genuine environmental principle, it would appear to be absolutely necessary to consider environmental costs when assessing damage caused by pollution. With this in mind, under the WFD, Member States are required to identify, not just the financial costs, but the environmental and resource costs, when making provisions for cost recovery.²⁷

A guidance document for the WFD implementation²⁸ provides two methods of calculation; the 'costs-based' and 'benefits-based' approaches. The cost-based approach relies on determining the amount of expenditure required to either maintain or restore the environment to an agreed standard. This standard will be determined, for example, by levels of environmental status as established by the WFD. The benefits-based approach relies on making a determination of the economic value of natural resources. However, despite logic behind both of these methods, they both have major problems.²⁹ With regards to the costs-based approach, calculation of the cost required to reduce pollution to the level where those environmental standards can be met is extremely difficult. This is because there will normally be multiple sources for the pollution, and the cost of preventing the pollution or restoring the environment is unknown or unknowable.³⁰ Yet even greater problems beset the benefits based

²⁵ Gaines, note 14.

²⁶ de Sadeleer, note 12.

²⁷ Article 9(1).

²⁸ European Drafting Group ECO2, 'Assessment of Environmental and Resource Costs under the Water Framework Directive' (2004) at http://circa.europa.eu/Public/irc/env/wfd/library?l=/framework_directive/thematic_documents/economic_issues/environmental_resource/version_05-07-04pdf/_EN_1.0_&a=d accessed 12 July 2012.

²⁹ Howarth, note 8.

³⁰ See chapter 2 section 4.

approach. Despite valiant attempts to set values for ecosystem services, providing meaningful monetary figures for the value of the natural environment is very difficult, if not impossible.³¹ Indeed, there have been scathing attacks on the use of economic valuation of the environment at all. Sagoff makes a convincing argument to say that because environmental goals and economic value have completely different philosophical bases, a conversion between the two is actually irrational.³²

Considering these problems, it should not be surprising that Member States have found it very difficult to provide data for the environmental costs of pollution, despite this being a requirement under the WFD. The international River Based Management Plan for the Danube notes that due a lack of both ‘methodology and information’, environmental and resource costs were simply not included in the management plan.³³ WFD implementation documents state that England and Wales have a ‘tradition’ of measuring these costs, however this document also acknowledges that ‘their exact estimation is subject to a *high degree of uncertainty on both scientific and economic grounds*’ [emphasis added].³⁴ We have seen³⁵ that calculating the financial cost of agricultural pollution is difficult, and it appears that calculating the environmental costs is even harder.

With regards to the issue of water companies’ costs resulting from agricultural pollution, the determination under the costs-based approach should be comparatively straightforward. Although attribution must still be determined,³⁶ water companies will be aware of the amount they are expending to bring the water to the necessary standard for its use as public drinking water. It should be noted, however, that this

³¹ R Brouwer, (2000), ‘Environmental Value Transfer: State of the Art and Future Prospects, (2000) 32 Ecological Economics 137, 138.

³² M Sagoff, *The Economy of the Earth* (CUP 1998).

³³ International Commission for the Protection of the Danube River, *Danube River Basin District Management Plan* (IC 191 2009).

³⁴ European Drafting Group ECO2, ‘Assessment of Environmental and Resource Costs under the Water Framework Directive’ (2004) at http://circa.europa.eu/Public/irc/env/wfd/library?l=/framework_directive/thematic_documents/economic_issues/environmental_resource/version_05-07-04pdf/_EN_1.0_&a=d accessed 12 July 2012.

³⁵ See above section 1.1.

³⁶ See below section 3.2.

calculation is purely economic, focussed on the costs a group of companies incurred in their creation of a product of a saleable standard, as compared to the costs involved in bringing UK waters to an appropriate environmental status under the WFD. Moreover, it does not include any consideration as to the environmental harm caused by agricultural pollution. Therefore, if cost recovery were to be implemented in this area, it must be acknowledged that it would be a narrow application of the PPP, one which would only indirectly go towards achieving the goal of the WFD.

3.2 Attributing costs

As well as a determination of costs, a proper implementation of the PPP requires that those polluters creating the costs be identified for recovery. The problem is that assigning responsibility for the damage of nitrate pollution is notoriously difficult.³⁷ It is known that a significant amount of the nitrate and pesticide pollution comes from agriculture, however there are other sources of these pollutants, and calculating the precise origins of the pollution would require an enormous scientific effort. Despite research by Defra and the Environment Agency, those agencies do not have strong evidence demonstrating pollution causation with regards to different agricultural activities.³⁸ The WFD requires Member States to identify the sources of the pollution, differentiated at least into households, industry and agriculture.³⁹ However, they are not required to determine individual contributions, and the immense difficulty in determining the farmers specifically responsible for the pollution is a major stumbling block with regards to an implementation of cost recovery.

The problem of establishing causation is common to all types of diffuse pollution. How can individual liability be discerned when pollution has come from a number of sources over a period of time? This difficult question has been a topic of consideration in environmental law for some time. Uebnow makes the argument that what is required

³⁷ S Seymour, G Cox and P Lowe [1992] *Sociologia Ruralis* 82.

³⁸ National Audit Office, 'Tackling Diffuse Water Pollution in England' (HC 186 Session 2010–2011).

³⁹ Article 9(1) 2nd indent.

is a system of collective liability for cumulative damages.⁴⁰ Van Dunne⁴¹ suggests that the solution from the Dutch thalidomide case, in which all firms who commercialised the drug were held jointly and severally liable for the damage it caused, could be transposed to water pollution. However, although this issue has been widely considered at an academic level, in practice there has been little progress in assigning legal responsibility for diffuse pollution. For example, the Environmental Liability Directive, the EU instrument designed to ensure that legal responsibility is given for environmentally damaging activities, only applies to diffuse pollution 'where it is possible to establish a causal link between the damage and the activities of individual operators'.⁴² The suggestions of Uebnow and Van Dunne may merit consideration, yet they would still require the allocation of responsibility to individuals who may not have actually caused the specific pollution for which they are liable, in a prima facie contravention of the polluter pays principle itself. Unsurprisingly, the National Farmers Union have argued that due to the 'impossibility' of tracing leached nutrients back to individuals, the PPP should 'definitely not' be applied to farmers.⁴³ It can be expected that farmers will continue to oppose financial liability being imposed for pollution that cannot be shown to have originated from their farms. Until a politically and legally acceptable method of attributing costs for diffuse pollution can be developed, this will continue to be a stumbling block to the full implementation of the PPP to agricultural water pollution.

3.3 Who pays final costs?

Despite the aforementioned unanswered questions, there is perhaps a more compelling reason as to why cost recovery may not be pursued with regards to water companies' expenditure treating agricultural pollution. This is the fact that although

⁴⁰ G Uebnew 'The Invisible Cupola: from Causal to Collective Attribution in Ecological Liability' in G Uebnew, L Farmer and D Murphy (eds) *Environmental Law and Ecological Responsibility* (Kluwer 1994).

⁴¹ JM van Dunne, 'Legal aspects of non-point source pollution of the River Meuse: a comparative analysis of issues of liability in tort and multiple causation' in JM van Dunne (ed) *Non-point source river pollution: the case of the river Meuse: technical, legal, economic, and political aspects* (Kluwer 1996).

⁴² *Directive 2004/35/CE of the European Parliament and of the Council*, Article 4(5)

⁴³ National Farmers Union (1987) 'The Nitrate in Water Debate' *Insight* December 1, cited in Seymour et al, note 35.

full implementation of the PPP would entail a massive reallocation of costs, and would be legally and organisationally very challenging, those who ultimately pay for the pollution would simply shift from water buyers to food buyers.⁴⁴ Although the original expenditure in dealing with this pollution is made by the water companies, as private, profit-seeking corporations, they pass these costs onto water consumers through pricing. If these costs were instead incurred by agriculture, it can be presumed that the increase in costs to the farmers would be passed on to food buyers. There is nothing inherent in the PPP which prevents the costs being passed to the final buyer, in fact it is necessary if the principle is to have the price signalling function.⁴⁵ Former Environment Minister, Nicholas Ridley, affirmed that the polluter pays principle meant, in effect, the polluter's customers pay.⁴⁶ Therefore, if cost recovery were to be fully implemented, the final payers for this pollution would be largely the same people who currently pay for it, as food consumers and water consumers are largely overlapping groups. Such an outcome does not appear to be a satisfactory reward for what would be an enormous effort.

Conclusion

The clear conclusion of the foregoing discussion is that the obstacles to successful implementation of the PPP with regards to water companies' extraction costs far outweigh the limited benefits it would provide. This conclusion may appear to be frustrating, especially to the water companies of the UK, for whom dealing with agricultural pollution is such a significant part of their budget. Environmental campaigners might also feel frustrated by this conclusion, as there appears to be a substantial injustice in the fact that one of the biggest polluters is able to continue polluting without having to account for the costs its activities necessitate. However, it must be remembered that if the PPP were to be applied in this situation so that water

⁴⁴ Howarth, note 8.

⁴⁵ Seymour et al, note 37.

⁴⁶ Centre for Policy Studies, *Policies against pollution: the conservative record – and principles* (1989), 26, cited in Seymour et al, note 37.

companies' extraction costs were shifted to the agricultural sector, it would only be in a limited application of the principle. The environmental costs of agricultural water pollution are arguably more significant than the financial costs, and these would continue to be unaddressed. Further, environmental campaigners ought to also be aware that if the application of the PPP were extended so that environmental costs were also met, this would necessitate the financial valuation of ecosystem services, something that many believe to be antithetical to environmental protection.⁴⁷

Finally, it must be noted that this issue again highlights the importance of improved scientific knowledge of the process of agricultural water pollution. If individual contributions to water pollution were able to be measured, or at least estimated with some accuracy, this would remove one of the central impediments to movement forward in this area.

If full cost recovery is implemented, food consumers will be presented with a more accurate representation of the full cost of their food production. However, given the overwhelming obstacles to the implementation of the PPP in this case, it is unlikely to happen in the foreseeable future.

⁴⁷ See for e.g. G Monbiot, 'Putting a price on the rivers and rain diminishes us all' *The Guardian*, (London, 6 August 2012) at <<http://www.guardian.co.uk/commentisfree/2012/aug/06/price-rivers-rain-greatest-privatisation>> accessed 9 August 2012.

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Conclusion and the Limits of Law

The preceding discussion has shown that this so-called second generation environmental issue is one which policy makers are yet to come to grips with. Throughout this dissertation, many existing measures have been identified which, despite good intentions, will not make a significant difference to the problem of agricultural water pollution. The entire system of international law appears to have little prospect of compelling states to improve the water quality of rivers entering the ocean, and even less of compelling action on agricultural pollution in particular. Even the most advanced international regimes, such as OSPAR, have not been able to make an impact on this area. Further, national, voluntary schemes to reduce the pollution output of farms were seen to have only minor value, unless measures were fully subsidised. Finally, economic instruments, in particular the polluter pays principle, were seen to be of highly doubtful utility.

The impotence of these measures might be frustrating to those who wish to use law to address agricultural pollution. However, it must be recognised that there are important limits to what law can do generally, and these limits are particularly striking in the topic under discussion. Throughout the dissertation, certain aspects of agricultural water pollution have been identified that make it particularly difficult to regulate. Significantly, the ability of law to overcome these impediments is often very limited. One key theme to which this applies is that of scientific knowledge. We saw that one of the most promising legal means of controlling agricultural pollution was the mandating of specification standards on individual farms. However, which standards would be most effective can only be determined with scientific field research. How to best apply nutrients to insure maximum plant take-up, what application limits should be set, what forms of pesticides and fertilisers are least harmful, and what physical barriers can best reduce farm run-off, are all examples of questions which could feed into better regulation, but need to be answered by scientists, not lawyers. Further, if techniques were developed which could trace pollution back to individual farms, many of the legal problems facing this issue would be resolved. Although scientific research can be encouraged by legislation, the types of investigations listed above cannot be mandated.

Scientific research requires funding, which leads to the next major limitation of law. The most promising legal methods identified in this dissertation; Water Protection Zones (or equivalent

measures), farm management plans, and environmental standards under cross-compliance measures, all have in common that they are expensive for the controlling agency to operate. Again, European Union legislation can encourage increased funding, but the political processes which ultimately determine funding for environmental protection is largely above the influence of any particular law. Finally, a recurring theme of the discussion has been the resistance from the agricultural sector to environmental regulation. It was speculated that this resistance is linked to a lack of appreciation among farmers of the importance of the issue. Whether or how such an appreciation could be imparted is another issue on which law is silent.

Given the limitations of the efficacy of legislation, the importance of those measures which can make a difference is increased. On a national level, specification standards, like those set under the Nitrates Directive, have been shown to make some difference, and could be expanded in pursuit of Water Framework Directive quality goals. At a European level, the substantial potential of CAP cross-compliance should be realised by forcing states to link these measures to Water Framework Directive goals.

Ultimately, the most salient feature of this problem is its intractability. The measures identified as having the greatest potential, as well as being expensive, are also administratively and scientifically difficult. This conclusion may not be popular when budgets are limited and economic troubles are more to the political fore. Nevertheless, it is pointless to pretend that the situation is otherwise. Real progress in reducing agricultural water pollution will only be made when the size of the challenge is acknowledged, and a thorough, concerted effort is made to address it.