THE ROLE OF THE EU NITRATES, WATER FRAMEWORK AND PROPOSED MARINE STRATEGY DIRECTIVES IN REDUCING NUTRIENT POLLUTION FROM AGRICULTURE TO THE BALTIC SEA

Report

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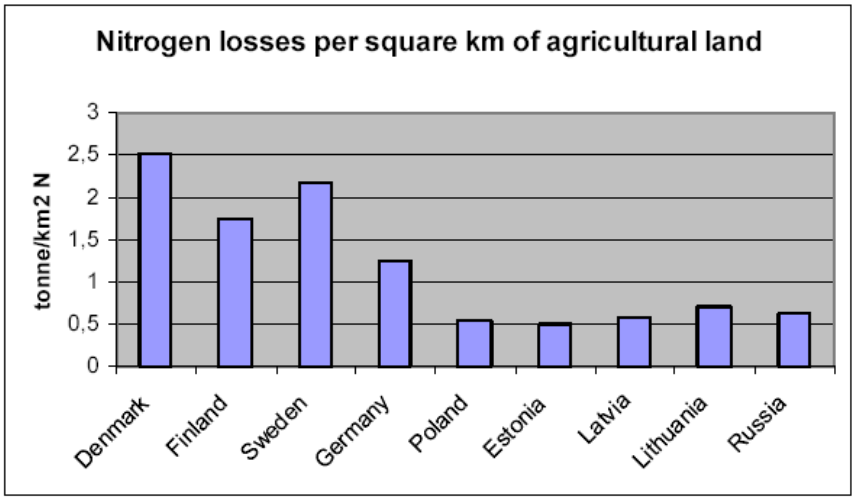
CONTENTS

1 INTRODUCTION

The Baltic Sea is subject to significant problems in relation to its nutrient status. Some areas are considered eutrophic, with disruption to the marine ecosystems. About 75 % of the nitrogen enters the Baltic Sea via water (58% as diffuse sources) and 25 % is atmospheric. Agriculture and managed forestry contribute almost 60 % of the waterborne nitrogen and 49% of waterborne phosphorus inputs to the sea. In 2000, the total inputs amounted to 1,009,700 tonnes of nitrogen and 34,500 tonnes of phosphorus[1]. These figures, including the changing inputs over time and contributions from different littoral states are outline further in Figures 1, 2 and 3. Agriculture is, therefore, a major source of nutrients and agricultural production is expected to increase after the EU enlargement, which will probably lead to increased discharges from this sector. It should also be noted that forestry can be an important contributor and this could become of further importance if the sector is expanded to meet the demand for biomass as a fuel/energy source (an issue that also applies to the agriculture sector).

Figure 1. Nitrogen losses per unit area for Baltic littoral states. Source: Hagebro 2004[2].



[1] HELCOM 2005. Nutrient pollution to the Baltic Sea in 200. Baltic Sea Environment Proceedings No. 100.

[2] Hagebro, C. 2004. Agricultural impact on the water environment. HELCOM Presentation.

Figure 2. Nitrogen losses for point and diffuse sources between 1985 and 2000 for the Baltic littoral states. Source: Hagebro 2004.

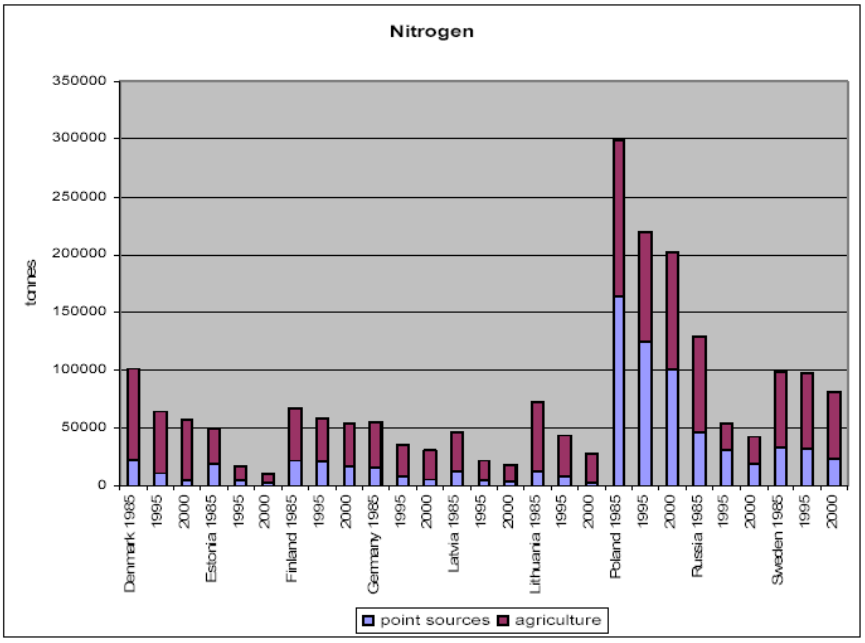
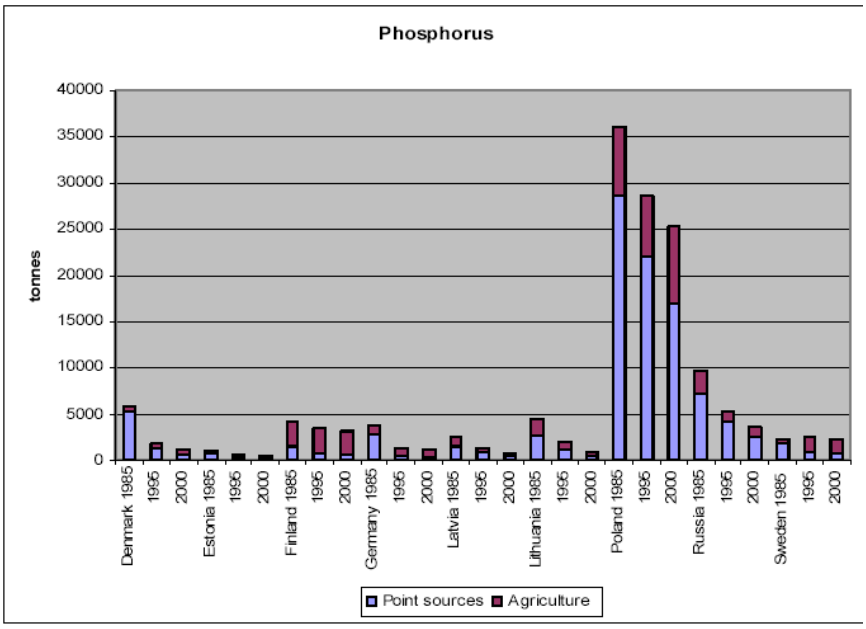


Figure 2. Phosphorus losses for point and diffuse sources between 1985 and 2000 for the Baltic littoral states. Source: Hagebro 2004.



HELCOM has adopted a system of vision, strategic goals and ecological objectives. The overall vision is for 'a healthy Baltic Sea environment, with diverse components functioning in balance resulting in a good ecological status and supporting a wide range of sustainable human economic and sustainable activities' One of the

supporting goals is the ‘Baltic Sea unaffected by eutrophication’. Within this the objectives are:

- Concentrations of nutrients close to natural levels.
- Clear water.
- Natural level of algal blooms.
- Natural distribution and occurrence of plans and animals.
- Natural oxygen levels.

Action, therefore, needs to be taken to reduce agricultural diffuse nutrient pollution in order to deliver the HELCOM objectives. However, reducing nutrient loads from agriculture is more complicated than cutting loads from point sources. The implementation of agri-environmental measures is expected to promote reductions in nutrient loads from agriculture, but there is evidently a considerable time lag between the implementation of agricultural water protection measures and any visible effects in water bodies. HELCOM’s MARE project has examined a number of scenarios which have demonstrated that there can be significant reductions in nutrient inputs to the Baltic in the new EU Member States, Belarus and Russia through improved collection and treatment of municipal waste water and wider use of phosphate free detergents. However, agriculture in the new Member States is expected to grow, which will result in increasing diffuse nutrient pollution if further measures are not taken.

Measures to tackle diffuse nutrient pollution from agriculture include legislation adopted by the European Union. Such legislation is obligatory on all of the countries within the Baltic catchment except Belarus and Russia. The purpose of this paper is, therefore, to examine the obligations, opportunities and limits for EU Member States of the nitrates Directive, the water framework Directive and the proposed marine strategy Directive with respect to control of diffuse nutrient pollution from agriculture. It will then conclude by a consideration of the potential role and opportunities for HELCOM arising from the implementation of this legislation.

2 NITRATES DIRECTIVE (91/676/EEC)

2.1 Introduction

The nitrates Directive was adopted in 1991 following concern by Denmark over the levels of nitrates in surface and groundwaters. The Directive requires Member States to:

- Designate areas where nitrogen pollution is a problem (or their whole territory).
- Develop codes of good agricultural practice.
- Develop and implement Action Programmes in all designated areas, with some specific actions prescribed in the Directive.
- Monitor and review the effectiveness of implementation.

While the Directive's aim is to reduce nitrogen pollution from agriculture, it does not have a legally binding objective for the level of nitrogen in surface or ground waters. Rather, it prescribes action to be taken. The implementation of Action Programmes was required by 19 December 1999. The Directive has, therefore, applied to the EU-15 for a number of years, but has also since been introduced to the new Member States. It has, and will, be an important element the suit of instruments available for reducing the input of agricultural nitrogen into the Baltic Sea.

2.2 Summary of legal obligations

Designation of areas subject to nitrogen pollution

Article 3 requires that Member States designate as vulnerable zones all known areas of land in their territories which drain into waters identified as waters affected by nitrogen pollution and waters which could be affected by pollution if action pursuant to Article 5 (implementing Action Programmes – see below) is not taken. This designation shall be identified by the Member States in accordance with the criteria set out in Annex I of the Directive, summarised in the following box.

When any waters identified by a Member State are affected by pollution from waters from another Member State draining directly or indirectly in to them, the Member States whose waters are affected may notify the other Member States and the Commission of the relevant facts. Member States shall review if necessary revise or add to the designation of vulnerable zones as appropriate, and at last every four years, to take into account changes and factors unforeseen at the time of the previous designation. Member States shall be exempt from the obligation to identify specific vulnerable zones, if they establish and apply action programmes referred to in Article 5 throughout their national territory.

Criteria for identifying waters for designation under the nitrates Directive (Annex I)

Waters shall be identified making use, inter alia, of the following criteria:

1. whether surface freshwaters, in particular those used or intended for the abstraction of drinking water, contain or could contain, if action pursuant to Article 5 is not taken, more than the concentration of nitrates laid down in accordance with Directive 75/440/EEC;
2. whether groundwaters contain more than 50 mg/l nitrates or could contain more than 50 mg/l nitrates if action pursuant to Article 5 is not taken;
3. whether natural freshwater lakes, other freshwater bodies, estuaries, coastal waters and marine waters are found to be eutrophic or in the near future may become euthrophic if action pursuant to Article 5 is not taken.

In applying these criteria, Member States shall also take account of:

1. the physical and environmental characteristics of the waters and land;
2. the current understanding of the behaviour of nitrogen compounds in the environment (water and soil);
3. the current understanding of the impact of the action taken in implementing the action programmes.

Codes of good agricultural practice

Article 4 requires that Member States shall, within two years:

- establish a code or codes of good agricultural practice, to be implemented by farmers on a voluntary basis, which should contain provisions covering at least the items mentioned in Annex II A of the Directive (summarised in the following box);
- set up where necessary a programme, including the provision of training and information for farmers, promoting the application of the code(s) of good agricultural practice.

Codes of Good Agricultural Practice (Annex II)

The codes of good agricultural practice should have the objective of reducing pollution by nitrates and take account of conditions in different regions. They should contain provisions covering the following items, in so far as they are relevant:

- periods when the land application of fertilizer is inappropriate;
- the land application of fertilizer to steeply sloping ground;
- the land application of fertilizer to water-saturated, flooded, frozen or snow-covered ground;
- the conditions for land application of fertilizer near water courses;
- the capacity and construction of storage vessels for livestock manures, including measures to prevent water pollution by run-off and seepage into the groundwater and surface water of liquids containing livestock manures and effluents from stored plant materials such as silage;
- procedures for the land application, including rate and uniformity of spreading, of both chemical fertilizer and livestock manure, that will maintain nutrient losses to water at an acceptable level.

Member States may also include the following items:

- land use management, including the use of crop rotation systems and the proportion of the land area devoted to permanent crops relative to annual tillage crops;
- the maintenance of a minimum quantity of vegetation cover during (rainy) periods that will take up the nitrogen from the soil that could otherwise cause nitrate pollution of water;
- the establishment of fertilizer plans on a farm-by-farm basis and the keeping of records on fertilizer use;
- the prevention of water pollution from run-off and the downward water movement beyond the reach of crop roots in irrigation systems.

Action programmes

Article 5 requires that Member States establish action programmes within two years of NVZ designation (or one year after additional designation) and implemented within four years of their establishment (December 1999). A Member States can establish an action programme for all vulnerable zones in its territory or different programmes for different vulnerable zones or parts of zones. Action programmes shall take into account of:

- available scientific and technical data, mainly with reference to respective nitrogen contributions originating from agricultural and other sources;
- environmental conditions in the relevant regions of the Member State concerned.

Action programmes shall consist of the following mandatory measures:

- the measures in Annex III (summarised in the following box);
- those measures which Member State has prescribed in the code(s) of good agricultural practice (Article 4) (unless superseded by the measures in Annex III).

Member States shall also take such additional measures as they consider necessary if it is apparent that the measures will not be sufficient for achieving the objectives of the Directive. In selecting these measures or actions, Member States shall take into account their effectiveness and their cost relative to other possible preventive measures. Member States are also required to develop suitable monitoring programmes and review and revise their action programmes.

Measures to be Included in Action Programmes (Annex III)

The measures shall include rules relating to:

- periods when the land application of certain types of fertilizer is prohibited;
- the capacity of storage vessels for livestock manure, which must exceed that required for storage throughout the longest period during which land application in the NVZ is prohibited (unless demonstrated manure in excess of the actual storage capacity will be disposed of in a manner which will not cause harm to the environment);
- limitation of the land application of fertilizers, consistent with good agricultural practice and taking into account the characteristics of the NVZ, in particular:
    - soil conditions, soil type and slope;
    - climatic conditions, rainfall and irrigation;
    - land use and agricultural practices, including crop rotation systems; and to be based on a balance between:
    - the foreseeable nitrogen requirements of the crops,
    - the nitrogen supply to the crops from the soil and from fertilization corresponding to:
        - the amount of nitrogen present in the soil at the moment when the crop starts to use it to a significant degree (outstanding amounts at the end of winter),
        - the supply of nitrogen through the net mineralization of the reserves of organic nitrogen in the soil,
        - additions of nitrogen compounds from livestock manure,

- additions of nitrogen compounds from chemical and other fertilizers.

These measures will ensure that, for each farm or livestock unit, the amount of livestock manure applied to the land each year, including by the animals themselves, shall not exceed a specified amount per hectare, i.e. 170 kg N. However, for the first four year action programme, Member States may allow an amount of manure containing up to 210 kg N. Also during and after the first four-year action programme, Member States may fix different amounts from those referred to above, but these must not prejudice the achievement of the environmental objectives and must be justified on the basis of objectives criteria, for example:

- long growing seasons,
- crops with high nitrogen uptake,
- high net precipitation in the vulnerable zone,
- soils with exceptionally high denitrification capacity.

If a Member State applies a different amount, it shall inform the Commission of the fact, including how the value was arrived at.

In relation to the maximum nitrogen application rate of 170 kg/ha from livestock manure, the nitrates Directive allows for the possibility of a derogation, provided the objectives are still achieved. Derogation requires a Commission Decision following the positive advice of the nitrates regulatory Committee, which assists the Commission in implementation. For example, Commission Decisions of November 2002 (2002/915/EC) and 13 April 2005 (2005/294/EC) allow a derogation for Denmark of 230 kg N per year, subject to specific conditions.

The timetable for the implementation of the above obligations is given below, although all dates have now passed.

Table 3.1. Timetable for implementation of the nitrates Directive

Action	Date due
Transposition	20-Dec-93
Designations	20-Jun-94
Codes of Practice	20-Dec-93
Action Programmes drawn up	20-Dec-93
Implementation of Action Programmes	20-Dec-97

2.3 Relevant case law

There have been a number of cases before the European Court of Justice (ECJ) against Member States for failure to implement sufficiently the Directive (particularly extent of NVZ designation and implementation of action programmes). Two cases (both involving the UK) have resulted in interpretation of the provisions of the Directive.

In April 1999 the ECJ (Case C-293/97) issued its first significant interpretation of the Directive. This followed a challenge by a group of farmers against the designation of NVZs under UK legislation. A principle challenge concerned the designation of waters where nitrate pollution was not predominately caused by agricultural sources. The Court ruled that the Directive required designation if the 50mg/l threshold listed in Annex I would be exceeded if no action was taken under the Directive. The Court stated 'it does not follow from the wording of the provision that Member States are required to determine precisely what proportion of the pollution is attributable to nitrates of agricultural origin or that the cause of such pollution must be exclusively agricultural'. The farmers also argued that the Directive infringed the principle of proportionality, in that they alone would bear the costs of improving water quality. The Court considered that the Directive allows a flexible approach to the application of measures and that it was for national courts to ensure that the principle of proportionality was observed at that stage.

In December 2000 the ECJ (Case C-69/99) issued a judgement against the UK stating that it had interpreted the Directive too narrowly. The Directive requires that Member

States have to identify all surface or ground waters polluted, or at risk of being polluted, by nitrates. The UK had only designated such waters where they were used as drinking water sources. In October 2001 the Commission sent a 'letter of formal notice' to the UK seeking details of how the UK will comply with the ECJ judgement.

2.4 Implementation

The Directive has been in force through two enlargements of the Community affecting countries in the Baltic region, although it is best to consider implementation for the EU-15 and EU-25 as the most relevant division. The European Commission has produced a number of implementation reports, most recently in March 2007[3], although it is also worth considering some results from its 2002 report[4] alongside this.

The 2007 report contains information on the monitoring of nitrate levels in ground and surface waters based on data submitted by the EU-15 for the period between 2000 and 2003. The Commission's overall analysis is that significant progress has been made on the implementation of the nitrates Directive, particularly compared to earlier reports. However, the report concludes that further work in improving designations and the quality of action programmes will be required in order fully to achieve the objectives of the Directive with regard to water quality. In surface waters stable or decreasing nitrate concentrations were observed in 86 per cent of monitoring sites, confirming trends already seen in several Member States in the previous report. Nitrate concentrations were reported to have increased at 14 per cent of monitoring sites mainly in non-Baltic Member States.

The Commission is currently conducting infringement proceedings with seven Member States mainly for insufficient designation of nitrate vulnerable zones and non conformity of action programmes. There is currently no action being taken against any Baltic countries.

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[3] COM(2007)120. Report on implementation of Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources for the period 2000-2003.

[4] COM(2002)407 Report on the Implementation of Council Directive 91/676/EEC concerning the Protection of Waters against Pollution caused by Nitrates from Agricultural Sources.

Extent of designation

The extent of designation of NVZs in the Baltic countries has varied significantly, with the countries showing two approaches:

- Whole territory designation: Denmark, Finland, Germany, Lithuania (91% designated, but Action Programme for whole territory).
- Selected catchment designation: Estonia, Latvia, Poland, Sweden.

It is interesting to compare this level of designation with the relative contribution each Member State makes to diffuse nitrogen pollution in the Baltic. From Figure 2 (see Introduction) it is possible to identify three country groupings:

- Larger nitrogen inputs: Poland and Sweden;
- Medium nitrogen inputs: Denmark, Finland, Germany, Lithuania;
- Small nitrogen inputs: Estonia and Latvia.

Although overall inputs do need to take account of the size of the country, the mis-match with NVZ designation is interesting. Detailed assessment of the level of compliance with the Directive determined by the Commission for the new Member States is still to be undertaken. However, it should be noted, in its 2002 assessment, the Commission argued that Sweden should designate an additional 10% of its territory above the 9% already designated, which has since been done and noted in the 2007 assessment. This level of designation is, therefore, considered to be in compliance with the Directive. Poland also, for example, designated 21 NVZs in 2004 with an area of about 6263 km^2 (i.e. round 2 % of Polish territory)[5] and Estonia has designated two NVZs, representing 7.7% of the land area of the country[6].

[5] Fotyma, M & Duer, I. 2006. Implementation of Nitrates Directive to Poland. *Acta Agriculturae Slovenica*, 87: 51-58

[6] Government of Estonia. 2005. *Report of Estonia on the Implementation of the Nitrates Directive*. Tallinn.

Is the extent of designation sufficient? Annex I sets out the criteria for designation and this includes the criterion 'whether natural freshwater lakes, other freshwater bodies, estuaries, coastal waters and marine waters are found to be eutrophic or in the near future may become euthrophic' (see above). Note the inclusion of marine waters and not simply coastal waters. The Baltic Sea is clearly in this category. This could raise the question of designation across the Baltic catchment. Clearly in its earlier assessment, the Commission did not consider this as necessary in its assessment of Swedish designation. However, it does remain an interesting point of interpretation of the Directive in relation to its wider protection of marine waters (note that this is in contrast to implementation of the urban waste water treatment Directive, for which all Baltic littoral Member States have designated their entire territories or Baltic catchment as 'sensitive areas').

Action programmes

Article 5 of the Nitrate Directive requires the establishment of action programmes within designated vulnerable zones. The nature of these action programmes has varied across the Member States. For example, in its 2002 report, the Commission noted that Germany set limits for application of manure in kg N/ha/yr, while Denmark and Sweden opted to use livestock units corresponding to these amounts. The action programme adopted by Denmark consists of the following main elements:

- Provisions for the abatement of discharges from farm waste (mandatory standards for manure storage facilities, farmyards, milking parlours and effluent outlets);
- Provisions for the land application of manure (time periods when application of manure should not occur, time periods within which the manure should be ploughed into the soil);
- Mandatory crop rotation, fertiliser planning and fertiliser account;
- Storage capacity for manure.

In Germany measures for the action programmes are established in the Fertiliser Order. These measures include periods when application of fertiliser is prohibited

(when not required by plants), prescribes maximum limit of application of manure per hectare, specifies that direct inputs or run-off of fertilisers to surface waters should be avoided during land application and lays down procedures for land application. Fertiliser Order also provides for keeping of records on nutrient supply and removal with the harvested products thus enabling to establish nutrient balance.

The 2007 implementation report provides little detail on the detailed status of action programmes, although the 2002 report did, with details provided in the following table.

Table 3.2. Overview of the level of compliance of Action Programmes (1999-2000) under the nitrates Directive for selected Member States (source: COM(2002) 407, 17.07.2002).

Measure	**Denmark**	**Finland**	**Germany**	**Sweden**
Period of prohibition of fertiliser application	Moderate/ good	Good	Moderate/ insufficient	Moderate/ good
Restrictions for application on steeply sloping ground	Moderate/ good	Moderate	Moderate/ insufficient	Insufficient
Restrictions for application on soaked, frozen or snow-covered soils	Moderate/ good	Good	Moderate/ insufficient	Moderate/ good
Restrictions for application near water courses (buffer strips)	Moderate/ good	Moderate/ good	Moderate/ insufficient	Insufficient
Effluent storage works (safety)	Insufficient	Good	Insufficient	Insufficient
Capacity of manure storage	Good	Good	Moderate/ insufficient	Moderate/ good
Rational fertilization (e.g. splitting	Good	Good	Good	Moderate

fertilization, limitations)				
Crop rotation, permanent crop maintenance	Insufficient	Insufficient	Moderate/ insufficient	Insufficient
Vegetation cover in rainy periods, winter	Good	Moderate	Insufficient	Moderate
Fertilization plans, spreading records	Good	Good	Moderate/ good	Insufficient
Other measures	Moderate/ good	Good	Moderate/ good	Good
Date for application limits 210/170 kg/ha/yr	Good	Good	Moderate/ insufficient	Insufficient

Implementation of the Nitrates Directive is still ongoing in new Member States. According to the commitments taken in the negotiation for accession, new Member States fulfilled their obligation by ensuring transposition, water monitoring network in place, designation of nitrates vulnerable zones. Action programmes are now established in all new Member States. For example, in Poland an action programme has been prepared for each NVZ after consultation with local authorities and farmers organisations. From April 2004 on these programmes became obligatory and the process of its implementation will continue until 2008 (Fotyma and Duer, 2006).

Action programmes are the 'heart' of the Directive – it is their implementation which delivers environmental outcomes. There is a need for further work on examining individual action programmes in more detail and assessing what they are likely to deliver in relation to nitrogen inputs to surface and ground waters.

2.5 Cross compliance

The nitrates Directive has been included in cross compliance under the Common Agricultural Policy in the EU-15 (plus Malta and Slovenia) as a Statutory Management Requirement since 2005. As a result if farmers, who are located within an NVZ, fail to comply with the nitrates Directive then cross compliance sanctions, usually a deduction from their Single Payment, will be applied. These are in addition to possible legal sanctions.

In the 17 EU Member States which currently apply full cross compliance, breaches of the nitrates Directive accounted for 10 per cent of all breaches in 2005, after breaches of cattle identification and registration (71 per cent) and all Good Agricultural and Environmental Condition (GAEC) standards combined (13 per cent). These figures are contained within a Commission report on cross compliance which was officially published on 29 March[7].

Cross compliance is, therefore, an important mechanism to help deliver the requirements of the nitrates Directive.

2.6 Conclusions on the Nitrates Directive

The nitrates Directive is an important instrument whereby Member States can control the amount of nitrogen applied to land and, thereby, reduce inputs to surface and ground waters. The Directive does not set a legal goal for water quality, but obliges action to be taken with regard to agricultural activity.

The Baltic countries have adopted different approaches to implementing the Directive. Currently, the Commission has not identified any implementation problems with these approaches, although further assessment will continue. The extent of NVZ designation suggests that reductions in pollution are most likely from Denmark, Germany, Finland and Lithuania. This is interested as Figure 2 (see Introduction above) demonstrates that Poland and Sweden contribute more to diffuse nitrogen inputs than do Denmark, Germany, Finland and Lithuania. It is not appropriate to

[7] COM(2007)147 final. Report on the application of the system of cross-compliance.

suggest any failure of implementation in Poland and Sweden, rather that the nitrates Directive is clearly likely to be an ineffective instrument in tackling nitrogen pollution from these two largest contributors.

Implementation of the nitrates Directives requires taking a number of measures. While assessing full implementation can be problematic, it is possible to model implementation to examine likely environmental consequences. For example, a scenario under HELCOM examined improved manure handling and its consequences[8]. However, it found little impact on run-off to the Sea, with a 6% reduction in nitrogen run-off to the Baltic proper, 2% reduction to the Gulf of Riga and 1% reduction to the Gulf of Finland. Reductions in phosphorus run-off and of nitrogen to other basins are 'negligible'. However, work undertaken under the MARE project scenarios for HELCOM (see below) has indicated that wider introduction of best practice in agriculture could reduce nutrient inputs further, although these scenarios have focused more on agricultural point sources[9].

The Directive, therefore, is an important tool, but with limitations. However, it does impose a series of obligations upon Member States which can be judged and compliance determined. To take a more comprehensive approach to tackling diffuse agricultural pollution requires an instrument that is broader in its vision and broader in the issues that it addresses. This is found with the water framework Directive.

3 WATER FRAMEWORK DIRECTIVE (2000/60/EC)

3.1 Introduction

The EU Directive establishing a framework for Community action in the field of water policy[10], commonly known as the water framework Directive, was adopted in December 2000. As will be seen, the Directive has a long timetable for

[8] See HELCOM 2006. *Eutrophication in the Baltic Sea*. March 2006. HELCOM, Helsinki

[9] Wulff, F., Humborg, C., Mörth, M., Savchuk, O. and Sokolov, A. 2007. Management options and effects on a marine ecosystem: assessing the future of the Baltic. *Ambio*, 36.

[10] (2000/60/EC, OJ L327 22.12.2000)

implementation, so, unlike the nitrates Directive, implementation is still at a relatively early stage. There has, for example, yet to be any case law interpreting the provisions of the Directive.

The Directive arose out of a long debate on the nature of EU water law and the recognition of the need for a comprehensive ecosystem-based approach that delivered integrated catchment management. Thus the Directive requires Member States to identify ecological objectives, adopt integrated administrative arrangements and is broad in the types of instruments that can be used to deliver its objectives. Importantly, the Directive recognises the inter-relation of surface fresh waters, ground waters and marine waters.

The Directive does, therefore, provide a more comprehensive instrument for addressing the issue of agricultural nutrient pollution in the Baltic Sea.

3.2 Summary of legal obligations

Purpose

The purpose of the water framework Directive (Article 1) is to establish a framework for the protection of surface and ground waters which, inter alia:

- prevents further deterioration and protects and enhances the status of aquatic ecosystems;
- aims at enhanced protection and improvement of the aquatic environment, inter alia, through specific measures for the progressive reduction of discharges; and
- ensures the progressive reduction of pollution of groundwater and prevents its further pollution.

This is further elaborated in Article 4, which requires Member States to prevent deterioration of ecological quality and pollution of surface waters and restore polluted waters, in order to achieve good ecological status in all surface waters by 31

December 2015. Good ecological status is defined according to detailed criteria which will considered below.

The Directive applies to surface freshwaters, groundwaters and coastal marine waters. The two relevant maritime definitions are:

- 'Transitional waters' - bodies of surface water in the vicinity of river mouths which are partly saline in character as a result of their proximity to coastal waters but which are substantially influenced by freshwater flows.
- 'Coastal waters' - surface water on the landward side of a line, every point of which is at a distance of one nautical mile on the seaward side from the nearest point of the baseline from which the breadth of territorial waters is measured, extending where appropriate up to the outer limit of transitional waters.

With respect to agricultural nutrient pollution, the Directive applies to those parts of the Baltic Sea which can be classified as coastal or transitional waters.

River Basin management

Article 3 requires Member States to identify individual river basins and establish the appropriate administrative arrangements to apply the rules of the Directive in that river basin. For international river basin districts the Member States concerned shall together ensure this coordination and may, for this purpose, use existing structures stemming from international agreements. River basins include surface fresh waters, ground waters and relevant coastal waters.

Environmental objectives

Article 4 sets out the key environmental objectives, which, for surface waters are that Member States shall implement the necessary measures to prevent deterioration of the status of all surface water bodies, taking account of the necessary timescales, natural conditions, technical feasibility, etc. The Directive allows for less strict objectives to

be met under certain conditions and/or for deadlines to be extended. The reasons for derogations from meeting the environmental objectives include:

- heavily modified water bodies;
- technical feasibility to achieve objectives requires an extension to the deadline;
- cost implications to achieve objectives requires an extension to the deadline;
- natural conditions require additional time to meet the objectives;

Member States are also allowed to fail to meet the requirements of the Directive when this is due to new modifications of the physical characteristics of a surface water body or alterations to the levels of groundwater or where water status declines from high to good due to 'new sustainable human development activities'. In such cases the following conditions must be met:

- to take all practical mitigating steps;
- the reasons for the changes are of over-riding public interest and/or the benefits to the environment and society are outweighed by the benefits to the new modifications to human health, safety or to 'sustainable development'.
- the benefits cannot be achieved by other means due to technical or cost issues.

These exemptions are far from clear. For example, there is no definition of a 'sustainable human development activity'. This is a limitation in implementing the Directive and, ultimately, interpretation may require the involvement of the ECJ.

Characterisation

Member States are required (Article 5) to analyse the characteristics of each river basin district with reference to ‘type specific conditions’, review the environmental impact of human activity and assess the economic analysis of water use, according to criteria set out in Annexes II and III. They are also required to establish a register of protected areas (Article 6), which includes nitrate vulnerable zones designated under the nitrates Directive. Member States are required to establish monitoring

programmes to assess surface water status (Article 8), with specifications set out in Annex V.

Eutrophication can result in a significant deviation from type specific conditions. Thus, for example, Annex V requires that 'good ecological status' of macrophytes and phytobenthos requires that 'changes do not indicate any accelerated growth of phytobenthos or higher forms of plant life resulting in undesirable disturbance to the water balance of organisms present in the water or to the physico-chemical quality of the water'. Nutrient enrichment can lead to such adverse effects and the WFD makes explicit reference to tackling eutrophication in that when estimating significant point and non-point pollution sources authorities should include 'substances that contribute to eutrophication (in particular nitrates and phosphates)' (Annex II and Annex VIII).

Tackling pollution and programmes of measures

In tackling pollution, Member States are required to adopt the combined approach (Article 10). This can include emission limit values, etc, though the Directive stresses the use of 'best environmental practices' for diffuse sources, including those set out in the nitrates Directive. Importantly, the Directive stresses that where a quality objective or quality standard requires stricter conditions than those which would result from the application of existing Community law, more stringent emission controls shall be set accordingly. Thus, if appropriate, it may be appropriate to take action on agricultural nitrates beyond that required by the nitrates Directive. For example, if it can be demonstrated that reducing fertiliser applications below the limits allowed in the nitrates Directive would deliver good ecological status, then this might be a measure that should be adopted by a Member State. This type of measure would be set out in the programme of measures and implemented through appropriate means. HELCOM could play a role in this regard in analysing the gap between the effects of the implementation of the nitrates Directive and the requirements for the achievement of good ecological status and, thereby, provide an impetus for taking additional measures where necessary. Consideration could, for example, be given to what additional measures need to be taken on diffuse nitrogen pollution from Poland and Sweden given their importance to the Baltic Sea and the limited impact that the nitrates Directive will have in these countries.

Within each River Basin Management Plan Member States are required to establish programmes of measures (Article 11) to meet the environmental objectives of the water bodies. The Directive divides such measures into 'basic' and 'supplementary'. Basic measures include, inter alia, those that are required already under Community law (such as the requirement of the nitrates Directive. For diffuse pollution sources, this also includes measures to prevent or control the input of pollutants. 'Controls may take the form of a requirement for prior regulation, such as a prohibition on the entry of pollutants into water, prior authorisation or registration based on general binding rules where such a requirement is not otherwise provided for under Community legislation. These controls shall be periodically reviewed and, where necessary, updated'. 'Supplementary' measures are those measures designed and implemented in addition to the basic measures, with the aim of achieving the objectives. The Directive provides a non-exhaustive list of such measures (see the following box). Many of these measures could be used in one or another to tackle nutrient pollution from agriculture and, indeed, a number of these have been used in the Member States (such as taxation and education).

Compulsory measures for water bodies which do not meet the environmental objectives of Article 4 include:

- monitoring to be reviewed and adjusted as appropriate;
- establishment of stricter environmental quality standards for pollutants if necessary;
- investigation of sources of pollution
- review of all relevant authorisations and discharge permits.

A non-exclusive list of supplementary measures (Annex VI, Part B):

- legislative instruments
- administrative instruments
- economic or fiscal instruments
- negotiated environmental agreements

- emission controls
- codes of good practice
- recreation and restoration of wetlands areas
- abstraction controls
- demand management measures, inter alia, promotion of adapted agricultural production such as low water requiring crops in areas affected by drought
- efficiency and reuse measures, inter alia, promotion of water-efficient technologies in industry and water-saving irrigation techniques
- construction projects
- desalination plants
- rehabilitation projects
- artificial recharge of aquifers
- educational projects
- research, development and demonstration projects
- other relevant measures

Where monitoring or other data indicate that the objectives set under Article 4 for the body of water are unlikely to be achieved, the Member State shall ensure that:

- the causes of the possible failure are investigated,
- relevant permits and authorisations are examined and reviewed as appropriate,
- the monitoring programmes are reviewed and adjusted as appropriate, and
- additional measures as may be necessary in order to achieve those objectives are established, including, as appropriate, the establishment of stricter environmental quality standards following the procedures laid down in Annex V.

The development of guidance under the Common Implementation Strategy (CIS) of the Directive has not elaborated the detailed measures that might be adopted. However, work under the CIS on the relationship between agriculture and the Directive has developed draft lists of what might be included. These are indicated in the Table below in the form of basic and supplementary measures. Basic measures are

those linked to the implementation of EU Directives, most usually the Nitrates Directive, though measures were also linked to the Birds and Habitats Directives, the Sewage Sludge Directive and in a few cases the Bathing Water and IPPC Directives. Supplementary measures are those undertaken for to achieve nationally derived objectives. It is not possible to rank the measures in relation to effectiveness for nutrient run-off. Such effectiveness varies significantly according to individual circumstances as well as the degree of application (e.g. the 'severity' of a tax).

Table 4.1. Basic and supplementary measures relating to the control of agricultural pollution. Source: Grosnier and Petersen (2006)[11].

Basic measures

- Manure storage (e.g. supplying non-leaking storage)
- Manure spreading (e.g. ban in winter months / on saturated soils; supply of transportation and spreading equipment)
- Reduction in nitrate leaching
- Placing plant protection products on the market
- Pesticides use
- Reduction of excess phosphorus
- Reduction of discharge of phosphorus
- Fertiliser spreading (e.g. prohibition of application to steep slopes)
- Buffer zones for fields
- Buffer zones around groundwater inlets
- Limit for sewage sludge use
- Cultivation restrictions on land liable to erosion
- Technical soil conservation measures
- Organisation soil conservation measures
- Drainage system measures
- Grassing and afforestation

[11] Grosnier, G. & Petersen, P. 2006. *WFD and Agriculture. Progress report.* Water Directors' Meeting. June 2006.

- Change of structure of forestry
- Initiatives for organic farming
- Management of Natura 2000 sites
- Buffer zones around protected areas (Natura 2000)
- Streamside vegetation management
- Dykes
- Increase of storage of a flood plain
- Local abolition of adjustment of flood defences to benefit agriculture.
- Reestablishment of natural rivers and river valleys
- Licensing irrigation
- Set aside for wetlands and other natural areas
- Environmental permits (IPPC) needed for large scale agricultural polluters
- Advice to farmers
- Natural resources tax payments

Supplementary measures

- Rules for land under vegetative cover
- Buffer strips
- Catch crops and spring tillage
- Wetland and ponds
- Taxes on nitrogen content in fertilisers
- Taxes on pesticides
- Training and education for farmers
- Testing of sprayers
- Regional plant protection centres
- Water abstraction rules
- Water taxes
- Waste water and waste taxes
- Environmental licensing
- Authorisation needed for certain substances
- Waste water treatment plants
- Training for farmers

- Awareness campaign
- Flood plain rehabilitation
- Implementation of eco-efficiency technologies for the agricultural and food sector.
- General binding rules to farmers on diffuse pollution

River Basin Management Plans

The principle administrative tool of the Directive is the River Basin Management Plan which Member States are required to produce for each river basin district lying entirely within their territory (Article 13). For international river basin district falling entirely within the Community, Member States shall ensure coordination with the aim of producing a single international river basin management plan. Where such an international river basin management plan is not produced, Member States shall produce river basin management plans covering at least those parts of the international river basin district falling within their territory to achieve the objectives of this Directive. The plans must be published by December 2009 and contain, inter alia, the elements listed in the following Box.

River Basin Management Plans must be reviewed by competent authorities on a regular cycle. Importantly, authorities are required to monitor the status of water bodies and the effects of the programmes of measures on the changing status. This, therefore, provides an assessment of effectiveness which should inform the review and revision of the plan. The draft plan, monitoring results and drafts of revised plans must be made public, so stakeholders will have an active role in the review process. The River Basin Management Plans are also a key reporting mechanism to the European Commission, so it can also comment on effectiveness issues and influence plan revision if it does so in a timely manner.

Elements of River Basin Management Plans relevant to the control of diffuse pollution:

- a general description of the characteristics of the river basin district required under Article 5 and Annex II. This shall include, for surface waters:
    - mapping of the location and boundaries of water bodies,
    - mapping of the ecoregions and surface water body types within the river basin,
    - identification of reference conditions for the surface water body types;
- a summary of significant pressures and impact of human activity on the status of surface water and groundwater, including:
    - estimation of point source pollution,
    - estimation of diffuse source pollution, including a summary of land use,
    - estimation of pressures on the quantitative status of water including abstractions,
    - analysis of other impacts of human activity on the status of water;
- identification and mapping of protected areas as required by Article 6;
- a map of the monitoring networks established for the purposes of Article 8 and Annex V, and a presentation in map form of the results
- a list of the environmental objectives established under Article 4.
- a summary of the economic analysis of water use as required by Article 5 and Annex III;
- a summary of the programme or programmes of measures adopted under Article 11, including the ways in which the objectives established under Article 4 are to be achieved.
- a summary of the measures required to implement Community legislation for the protection of water;
- a summary of the measures taken under Article 11(5) for bodies of water which are unlikely to achieve the objectives set out under Article 4;
- details of the supplementary measures identified as necessary in order to meet the environmental objectives established;

- details of the measures taken to avoid increase in pollution of marine waters in accordance with Article 11;
- a register of any more detailed programmes and management plans for the river basin district dealing with particular sub-basins, sectors, issues or water types, together with a summary of their contents;
- a summary of the public information and consultation measures taken, their results and the changes to the plan made as a consequence;

Upon updating the plan, the revision should include information on changes and updates, an assessment of progress towards meeting objectives, analysis of failure to undertake measures and summary of additional measures adopted.

3.3 Implementation

Implementation of the Directive has been supported by the development of a range of guidance documents under through the Common Implementation Strategy. These expand upon the individual requirements of the Directive. However, in the context of the obligations with respect to diffuse agricultural pollution, they provide limited additional detail.

Although many of the requirements of the Directive have yet to be implemented in the Member States (such as programmes of measures, let alone meeting good ecological status), the first steps in implementation are already required and Member States have reported on progress. Article 5 of the Directive requires Member States to produce an environmental and economic analysis of water bodies by 2004 and report on this to the Commission. The 2007 Commission implementation report is based on these reports. A key question that Member States had to address was ‘what is the risk of failing to meet Directive environmental objectives based on current data?’. The results show a varying picture across the Baltic littoral states. Finland and Sweden are not included in the Commission report, although their reports have since been submitted.

The results show a varying picture across the Baltic countries. Thus in Denmark and Germany the majority of water bodies are 'at risk', while this is much lower in Estonia and Poland. It is important to note that this overview covers all surface and groundwater bodies and, therefore, the specific coastal picture is likely to be different. Also note that the Baltic States and Poland are still implementing investment-heavy Directives, such as urban waste water treatment, so that some of the 'at risk' water bodies are likely to be so due to pollution that is already programmed to be tackled.

Transposition of the Directive by the EU15 (December 2003 deadline) was poorly met, although the new MS had progressed well by the date of accession in 2004. The Commission comments on the quality of the administration, being more positive about this in Denmark, Germany and Lithuania than for Finland, Latvia and Sweden. However, it must be noted that such comments do not specifically refer to the coastal zone nor are further elaborated and, therefore, are difficult to interpret.

The Article 5 Report[12] of Latvia (2005) identifies six coastal water bodies. The report highlights the importance of diffuse pollution from a variety of sources, including agriculture. It assesses pollution load using the methodology developed by the HELCOM Pollution Load Compilation. Modelling was applied to assessing diffuse agricultural pollution. Combined with monitoring information this found a correlation between the concentration of nitrogen and phosphorus compounds in water and the area of arable lands and fertilizer balance. Latvia reports that 74% of nitrogen and 72% of phosphorus originate from diffuse sources. However, 23% and 18% respectively is derived from forests, rather than agriculture.

The Article 5 Report[13] of Lithuania (2005) noted that 170 water bodies in three of the four River Basin Districts were at risk from diffuse source pollution, representing 22% of the total water bodies in the country. The report stress that nitrogen is more significant than phosphorus.

[12] Ministry of the Environment of the Republic of Latvia 2005. Characteristics of the Latvian River Basin Districts. A Review of the Impact of Human Activity on the Status of Surface Waters and on Groundwater. Economic Analysis of Water Use. (Article 5 Report).

[13] Environmental Protection Agency of Lithuania 2005. Report on Articles 5 and 6 of the 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.

The Article 5 Report[14] of Estonia (2005) noted that the country has identified 15, coastal water bodies in two of its three River Basin Districts. Estonia has calculated diffuse pollution loads following HELCOM practices and concludes that, overall, there are 77 threatened water bodies, roughly 10% of the total (without indication of whether any are coastal).

These Article 5 reports highlight the problems that diffuse nutrient pollution is causing in meeting the requirements of the Directive. The situation varies across the three countries, although the issue is clearly a challenge. The results are, however, based on the use of some modelling and some monitoring information and will, therefore, be refined as further data are collected as the Directive is implemented.

The Commission, in its report, makes a number of recommendations to tackle the problems identified, including the following relevant to the current discussion:

- Overcoming current shortcomings, including:
  - Implementation of other relevant EU law, including the nitrates Directive.
  - Putting in place economic instruments, including implementation of the polluter pays principle.
  - Putting in place a comprehensive ecological classification system.
  - Improving the methodologies for assessment and enhancing comparability.
- Integrating sustainable water management into other policy areas, such as ensuring allocation of appropriate funding within the CAP, although the Commission notes 'the national allocations so far of these funds for improvements in the water field are insufficient to tackle all the problems identified in implementing the WFD'. The Commission noted that there 'is a window of opportunity' in the forthcoming discussions on the CAP.
- Improving public participation.

[14] Ministry of Environment. 2005. Compliance with the Requirements of Article 5 of the Water Framework Directive in Estonia. Summary Report of River Basin Districts.

These are important recommendations and HELCOM can contribute to taking these forward. There is a need for common approaches to the Baltic coastal region as well as a better understanding of the consequences of the interactions between policies. Many of these issues are already familiar to the work of HELCOM and, therefore, could be readily built upon in targeting effective implementation of the Driective.

In 2006 a survey[15] was undertaken in the Member States of existing measures to tackle diffuse pollution from agriculture. It is important to note that the measures identified had not been introduced to implement the Directive, rather the survey sought to describe the range of measures that Member States currently use, from which lessons might be learnt for Directive implementation. The study found many measures linked to implementation of other EU legislation, principally the nitrates, sewage sludge, bathing water and IPPC Directives. Most measures were technical in nature, such as the use of buffer strips or zones. Other instruments were more rarely used, such as fertiliser taxes. Member States also reported on supplementary measures adopted, including educational initiatives and that further interest exists in the use of taxes and charges. However, the study reported that no Member States had completed studies on the total costs and benefits of implementing a programme of measures.

The study also found in the survey that about 50% of the Member States would, or probably would, apply for extension of deadlines and a similar proportion would use less stringent objectives (apply to between 5 and 50% of water bodies). Only one Member State reported that it would definitely not apply for an exemption.

It should be noted that another study[16] undertaken for the Water Directors (representing ministerial officials from the Member States) noted a variety of pressures from diffuse pollution on surface waters (see Table 3.1). However, there are still a number of problems in understanding agricultural diffuse pollution impacts in relation to achieving the objectives of the water framework Directive, including:

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[15] Marsden, K., Dworak, T. & Herbke, N. 2006. *The Development of WFD Programme of Measures under the Light of Agriculture. Results of a Questionnaire addressed to the Water Directors and the Pilot River Basins*. Ecologic, Berlin.

[16] Herbke, N., Dworak, T. and Karaczun, Z.M. 2006. *WFD and Agriculture – Analysis of the Pressures and Impacts Broaden the Problem's Scope*. Interim Report. 18.10.2006. Ecologic, Berlin.

- Lack of data at farm level.
- Good models for predicting inputs as part of risk assessments.
- Problems with particular soil types, e.g. peat.
- Lack of monitoring data for some water bodies.

This is an important limitation in implementation the Directive and efforts need to be made to overcome this information gap.

Table 3.1 Summary of risk assessments from diffuse agricultural pollution for surface water bodies for Baltic EU Member States or specified river basin. Extracted from Herbke et al, (2006), derived from Member State Article 5 reports.

Country or basin	**Comment**
Denmark	Coastal waters: Diffuse N and P losses from agriculture are major reasons for non-compliance for almost all coastal waters.
Estonia	45.6% of surface waters at risk from diffuse pressures (assumed to be mostly from agriculture)
Germany	No specific information, but nutrient input is likely to be relatively high as diffuse agricultural sources are listed as the second major cause of failure to achieve good ecological status.
Latvia	9.2 % of surface water bodies are at risk of diffuse pollution and 31.9% are probably at risk.
Lithuania	22 % of surface water bodies are at risk of diffuse pollution
Odra Basin	CZ: agricultural nitrogen has an important impact. DE: diffuse sources cause high nutrient loading. PL: 24.9% at risk from diffuse pressures.
Wisla Basin	15.9% at risk from different diffuse pressures.

In a separate development, the Water Directors have also continued to stress their concern over the impact of pollution from agriculture. At their last meeting, they issued a Declaration (November 2006) which stated, inter alia, that:

‘despite the efforts of the part, agriculture, among other activities, still places great pressure on water in most European regions through diffuse pollution…Therefore, agriculture remains one of the major economical sectors where significant changes are still needed for sustainable water management.’

The Water Directors’ declaration stressed the need for dialogue with farmers and use of mechanisms under the CAP. They concluded that they:

‘in principle favour voluntary approaches but if they are unable to deliver on WFD targets, then new mandatory measures might also be necessary as part of the river (sub) basin management plans (RBMP). Because the Cross Compliance mechanism has shown its usefulness in enforcing the implementation of existing legislation, the 2007 review of the cross-compliance standards should include the possibility of adding new standards for some RBMP’s mandatory measures’.

3.4 Conclusions on the water framework Directive

The water framework Directive is a major opportunity and challenge for the Member States. It provides the foundation for a comprehensive approach to the assessment of surface and ground waters, setting ecosystem-based targets and developing programmes of measures to achieve these within an integrated planning system.

This ecosystem-based approach is common to the analytical and policy context of the work of HELCOM and, therefore, there is considerable opportunity for the work of HELCOM and the implementation of the Directive to be implemented. It has to be stressed, however, that the Directive does not apply (with respect to nutrient pollution) to the wider Baltic, so such integration has its limitations. However, it is worth noting that Recital 21 of the Directive states:

‘The Community and Member States are party to various international agreements containing important obligations on the protection of marine waters from pollution, in particular the Convention on the Protection of the Marine Environment of the Baltic Sea Area, signed in Helsinki on 9 April 1992 and approved by Council Decision

94/157/EC, ……. This Directive is to make a contribution towards enabling the Community and Member States to meet those obligations.'

Thus the purpose of the Directive includes the protection of the marine environment, as the Directive, according to its Article 1, aims to 'contribute' to 'the protection of territorial and marine waters', and, more specifically, to 'achieving the objectives of relevant international agreements, including those which aim to prevent and eliminate pollution of the marine environment'. However, while progress being made currently on priority substances makes a clearer contribution to specific objectives of regional seas conventions, it is unlikely that the contribution of the Directive in relation to diffuse agricultural nutrient pollution will be more than a benefit that accrues from taking measures to protect inland and coastal waters.

The Directive does not prescribe particular measures to be implemented to control diffuse pollution, other than those already in EU law. This, therefore, provides the foundation for examining the effectiveness of the nitrates Directive measures and for the development of further measures as required. The discussion above has indicated what some of these might consist of and some are used already within the Baltic littoral states. However, work by HELCOM on best environmental practice in agriculture can contribute to this.

It is also important to note that the Common Agricultural Policy, through the use of agri-environment schemes under Pillar II, supports actions by farmers to adopt practices that protect the environment, including reducing the impact of diffuse nutrient pollution. There is considerable discussion at present (such as by the Water Directors) on the future role of the CAP in helping to implement the Directive. It is important that HELCOM contributes to this through a consideration of the effectiveness of current and potential measures that can be adopted under the CAP to the delivery of nutrient objectives in the Baltic Sea in order to ensure that the actions are targeted at those measures which deliver the greatest benefit.

4 PROPOSED MARINE STRATEGY DIRECTIVE

On 24 October 2005 the Commission adopted the Thematic Strategy on the Protection and Conservation of the Marine Environment (COM(2005)504). The main instrument of the Strategy is a proposal for a Directive – a Marine Strategy Directive (COM(2005)505) – with the aim of achieving 'good environmental status' in the marine environment by 2021, at the latest. The proposal is currently in the early stages of the adoption process of the EU institutions. It has yet, for example, to reach the first formal stage of co-decision (Parliamentary Opinion), although the views of both Council and Parliament have, at least partially, become known. As this proposal has yet to be adopted and the text yet to be finalised, it will be considered in less detail than the two Directives that are in force discussed above.

The proposed Directive applies to the territorial waters of the Member States or those which they otherwise have jurisdiction over. It takes a regional approach to Europe's seas, identifying the Baltic Sea as one region. The proposed Directive would require Member States to develop strategies for their respective waters within each Marine Region, aiming to reach the Directive's objective of achieving good environmental status in the marine environment by 2021. The Council also follows this proposed timetable, although it also states that Member States should adopt an earlier 'operationalisation' of a programme of measures where 'urgent action' is needed (new Article 2a). However, MEPs have stated that it was 'concerned at the extended timetable' and argued for harmonisation with the timetable of the water framework Directive.

The definition of 'good environmental status' would be formulated by Member States for each Marine Region, based on generic criteria and standards. The proposed Directive establishes a process to be undertaken by Member States in working towards good environmental status. This comprises a preparation stage to be completed within six years of its entry into force, and a programme of measures to be developed by 2016 and in operation by 2018. This would include:

- conducting an initial assessment;
- determination of good environmental status

- establishing environmental targets; and
- drawing up a monitoring programme.

Under the proposal, national programmes of measures would have to be approved by the Commission, which would publish a first implementation report by 2021 at the latest. However, the Council would reduce this Commission role to that of merely giving advice (Article 15). Unlike the water framework Directive the proposal would require Member States to undertake a cost-benefit analysis of any new proposed measure that it would introduce in its programme of measures.

The proposal recognises that it may not be possible to meet good environmental status within the stated timetable. This is expanded by the Council to include natural causes, *force majeure* and action by other countries. The exclusions also include modifications to waters from action taken 'for reasons of overriding public interest that outweighed the negative impact on the environment, including any transboundary impact'. It is not clear how judgements will be made on what constitutes overriding public interest, particularly if the impact is transboundary in nature.

It can be seen that these basic elements mirror similar requirements under the water framework Directive. The proposal has less detail than the water framework Directive on what these elements would require. However, developing a programme of measures would require similar analysis to that discussed in Section 3, although directed towards wider marine protection.

Member States would be encouraged to collaborate within their Marine Region or Sub-Region, and be encouraged as far as possible to build upon existing programmes, structures and international agreements. The proposed Directive stresses the benefit of building on existing international structures. It contains a reference to the regional seas Conventions (recital 11), as well as to the obligations of the Community and the Member States under the United Nations Convention on the Law of the Seas (recital 9) and its preamble further states that 'this Directive should enhance the effectiveness of the Community's contribution under international agreements' (recital 8). However, in contrast with the water framework Directive, the provisions of the

proposed Directive do not explicitly refer to the objectives of the regional seas Conventions as regards prevention and elimination of marine pollution. The draft Directive contains a provision that would require Member States to 'as far as possible, build upon existing programmes and activities developed in the framework of structures stemming from international agreements' (Article 5(2)), but omits any explicit reference to the substantive obligations resulting from those agreements. Article 9(1) would merely require Member States to 'take into account the continuing application of existing environmental targets set out at … international level in respect of the same waters.'

The proposed Directive, once adopted, will provide a firmer legal basis for action by the Baltic Member States. Critical within this will be the integration of the planning and measures adopted under the water framework Directive with those required for the wider marine environment. However, the precise extent of the opportunities it will afford and how its limitations will differ from the water framework will only become apparent after adoption.

5 CONCLUSIONS: THE ROLE OF HELCOM IN CONTRIBUTING TO IMPLEMENTATION OF EU OBLIGATIONS

5.1 Introduction

It is firstly important to stress that HELCOM has no official role in the implementation of the nitrates and water framework Directives. Member States are required to implement the Directives and the Commission is required to check on the level of compliance. However, outside of this formal framework, there are a number of opportunities for HELCOM to contribute to the implementation process and to help deliver its objectives in achieving nutrient reductions to the Baltic Sea.

5.2 Nitrates Directive

The nitrates Directive is an important instrument in helping to achieve the HELCOM objectives in relation to Baltic Sea eutrophication. There is a link between the

measures that Member States can adopt within NVZ action programmes and the measures within Recommendation 24/3 under the Convention. HELCOM can contribute to assisting in the implementation of the Directive.

HELCOM has undertaken a range of analyses of the impacts of the implementation of changed agricultural practices on the nutrient loading of the Baltic Sea. This provides an analytical framework to assess the likely efficacy of the current designations and action programmes. This can help steer future refined policy development within HELCOM, the individual Member States and the EU as a whole.

The Directive states (Article 5) that Member State shall also take such additional measures as they consider necessary if it is apparent that the measures will not be sufficient for achieving the objectives of the Directive. It is not clear what these measures might be, etc. However, the analysis undertaken within HELCOM of the efficacy of existing measures could indicate if additional measures could be beneficial. They might also form 'supplementary measures' to tackle nitrogen pollution within the context of the water framework Directive. HELCOM could also subsequently assessed the cumulative effectiveness of the programmes of measures as developed by the Member States in their River Basin Management Plans and indicate any limitations.

Annex III of the Convention and Recommendation 24/3 address pressures from agriculture to the Baltic Sea, such as the use of Best Environmental Practice and Best Available Technology and measures such as buffer zones, nutrient reduction zones (wetlands), etc. Annex III of the Convention concerning agriculture and the requirements in Recommendation 24/3 have been almost fully implemented in the older EU Member States[17]. While many countries have adopted measures, the practical implementation at farm level has been difficult to assess and any assessment of effectiveness is problematic due to time lags in the system[18]. Scenarios of the impacts of selected measures have been made by HELCOM. This work contributes to an understanding of the effectiveness of the implementation of the Directive and it is

[17] Percy-Smith, A., Bromand, B. & Jorgensen, V. 2003. Assessment of the status of implementation of environmental regulations of agriculture in the Baltic and partly the North Sea areas, 2003. Report to the Nordic Council of Ministers.
[18] HELCOM 2006. *Eutrophication in the Baltic Sea*. March 2006. HELCOM, Helsinki.

important to examine such results in more detail in the light of the specific measures that are contained in the action programmes.

5.3 Water framework Directive

The HELCOM Ministerial Declaration of 25 June 2003 agreed, inter alia, to:

- Stress the need for integration of environmental issues into the CAP.
- To implement relevant EU Directives.
- To improve agricultural practices based on Annex III of the Convention.

It invited HELCOM to develop and apply:

- Ecological quality objectives linked to good ecological status under the water framework Directive.
- Tools to assess the implication of policy scenarios on inputs of nutrients.
- Means to produce topical assessments, including rapid information exchange.

HELCOM has, therefore, stressed the importance of water framework Directive to its work and for the implementation of the Parties.

The water framework Directive applies to coastal waters up to 1 nm from the coast. There are clearly important eutrophication problems in such waters, such as coastal lagoons, and it is to be expected that Member States will need to take action to tackle these within their programmes of measures. However, analysis should be undertaken to examine the relationship between coastal eutrophication problems and those of the Baltic Sea (and sub-units) more widely. For example, the relative importance of nutrient inputs compared to nutrients derived from re-suspended sediments is likely to be different for coastal waters and the Baltic proper. Thus it is important to determine what benefits tackling coastal eutrophication would have on the wider Baltic and, therefore, what more may need to be done. This is the type of analysis that HELCOM could usefully support.

In order to ensure that adequate measures are taken to combat eutrophication, HELCOM has specifically pointed to the use of tools to assess the implications of different policy scenarios on nutrient inputs, and the resulting eutrophication status of the Baltic Sea and specific sub-regions. HELCOM has established a project on assessment of the implications of different policy scenarios on nutrient inputs where modelling is used to simulate the impact of the implementation of the EU Common Agriculture Policy and other policies in the Baltic Sea area. Based on the existing regulations, and the extent to which they have been implemented, HELCOM may consider the need for additional measures, and examine where these measures could be implemented most cost-effectively. HELCOM's has already concluded[19] that 'after current legislation has been fully implemented additional nutrient reductions are necessary to bring the Baltic Sea to a good environmental status'. Importantly, HELCOM concludes that implementation of the water framework Directive alone is insufficient as 'more drastic measures' are needed to tackle problems beyond 1 nm. Indeed, the actions in the action plan are 'estimated' to comply with the nutrient reduction aims in the proposed marine strategy Directive'.

In other words, the nitrates and water framework Directives, useful as they are, are considered to be insufficient instruments in delivering the overall objectives of HELCOM with regard to reducing nutrient inputs and reducing eutrophication of the Baltic Sea. Only taking the broader analytical approach advocated in the proposed marine strategy Directive combined with effective development of measures to tackle pressures will deliver sufficient nutrient reduction.

Assessing compliance with the water framework Directive will be a challenge for the European Commission. Beyond basic issues such as transposition, Member States' primary reporting tool is the River Basin Management Plan. There will be a large number of these, in different formats, languages, etc, with varying degrees of supporting analysis. The two fundamental questions to ask of these plans are:

- Has the Member State adequately characterised the status of its water bodies?

[19] HELCOM 2007. Towards a Baltic Sea Unaffected by Eutrophication. Draft HELCOM Overview 2007. 6 March 2007.

- Has the Member State adequately identified sufficient measures to tackle the pressures the water bodies face?

Answering these questions could be far from simple. All of the Baltic littoral states have an interest in the successful implementation of the Directive in each Member State. It could, therefore, be useful for HELCOM to support implementation by examining some aspects of the nature of characterisation and the programmes of measures. This should be focused on coastal waters. HELCOM can ask whether the littoral states are going to deliver good ecological status of coastal waters and if not, why not. This would not be a formal role, rather an analytical process designed to support HELCOM's own objectives and support communication and understanding between the littoral countries.

It is possible for HELCOM to consider the development of additional measures to assist in tackling diffuse agricultural pollution. However, at least one Party in the past has expressed a view that this is inappropriate[20]. However, HELCOM can continue to analyse the effectiveness of existing measures and potential measures to support the Member States in their implementation processes and identify where implementation gaps might occur. However, the Action Plan envisages targets levels for indicators in countries, sub-regions and the Baltic as a whole, including reduction targets for different sectors, such as agriculture. There is also discussion of a nutrient reduction quota system whereby each contracting party would have a nutrient quota (Tonnes N and P) which it will be required to reduce its inputs to the Sea by a fixed year. There is even the possibility of a simple trading system between parties. The Action Plan would also encourage elaboration of bilateral and/or multi-lateral projects and programmes to reduce nutrient inputs using the most cost-effective measures. Such an approach would provide an additional layer of 'measures' beyond those adopted at river basin level.

5.4 Proposed marine strategy Directive

[20] HELCOM 2003. *Comments from Sweden on discussion paper on non-point source nutrient losses from agriculture*. Working Group on Agriculture, Seventh Meeting, Vilnius. 28-29 April 2003.

In November 2006 the European Parliament Environment Committee own initiative report stated that 'the committee calls on the Commission to study the possibility of making the Baltic Sea into a pilot area, in view of the fact that it is an especially sensitive sea area and the Member States surrounding it are likely to agree on faster implementation of the plans and actions through the work within HELCOM and other bodies. The committee notes that the forthcoming Baltic Sea Action Plan from the Helsinki Convention (HELCOM) could act as a pilot programme to implement the Strategy objectives in the Baltic Sea Marine Region.'

HELCOM should clearly have an important role to play if/when the proposed marine strategy Directive is adopted. The suggestion that the Baltic should form a pilot area would indicate that the littoral states would need to give urgent attention to implementation and, therefore, building upon existing collaborative structures will be even more necessary.

HELCOM has already been involved in a number of activities of the type that would be required under a marine strategy Directive, such as assessing the state of ecosystems, analysing pressures, recommending measures and assessing their effectiveness. Of course, the difference with a Directive is the nature of the legal obligation applying to the Member States.

Although the requirements in the proposal as it stands for international co-operation are not extensive, it could be appropriate for HELCOM to demonstrate how important co-operation is. In particular, only collaborative analysis of the state and pressures on the Baltic will demonstrate what should be done and where to tackle problems. This would result in a more equitable focus on measures targeted at the causes of the problems. HELCOM has considerable experience in this area.

The Environment Committee of the Parliament also stated 'in order to avoid a double bureaucratic burden on the effective delivery of the Marine Strategy Directive, MEPs in the committee ask the Commission and Member States to ensure either that the regional marine conventions have the relevant legal and administrative capacities or that mechanisms for joint implementation of the Strategy are developed between the different regional bodies operating within the same marine region. In either case this

must include the widest possible cross-sectoral and stakeholder involvement.' While this statement is not primarily addressed to HELCOM, it will be important for HELCOM to assess its own capacity needs in relation to its role in contributing the implementation of the proposed Directive.

5.5 Further work required to identify opportunities for regulatory action

The EU Directives discussed in this report present many opportunities for the Baltic countries to deliver objectives to reduce eutrophication of the Baltic Sea. However, to do so requires effective implementation through robust analysis of the problems and solutions and firm implementation of effective measures.

Baltic Sea 2020, HELCOM and others can undertake further work to support this process. This can be undertaken in various ways as indicated below.

HELCOM can contribute to assessment of the variability and efficiency of the action programmes adopted under the nitrates Directive. The work already undertaken by HELCOM already identifies the importance of different nitrogen sources and the consequences of different actions that might be taken to control them. It is, therefore, important that the consequences of the different approaches to implementing the Directive are assessed for their effect on the Baltic Sea.

Developing this work further, HELCOM can assist in determining where measures adopted under the nitrates Directive are insufficient to deliver the objectives of reducing marine eutrophication, such as where greater reductions in nitrogen application are needed, etc. This is important in understanding the limits of the effectiveness of the Directive as well as providing a link to the measures that could be adopted within the River Basin Management Plans to be developed under the water framework Directive.

HELCOM could undertake further research on the relationship between achieving good ecological status in coastal waters and the pressures that remain for the wider marine environment in the Baltic. This would compliment the work undertaken by the

Member States in developing their analyses of pressures, etc, by examining the transboundary dimension in detail. It would also build on work already undertaking on linking ecological classification with eutrophication assessment[21]. It could also undertake such work outside of the strict implementation framework of the water framework Directive by looking forward to the implementation of the marine strategy Directive by considering pressures beyond the one nautical mile limit.

HELCOM should examine its working methods of HELCOM and how these could be adapted to serve the needs of implementation of the proposed marine strategy Directive. The implementation of the Directive will pose challenges to HELCOM and the Member States and it is, therefore, important that the working processes are geared to meeting these, particularly in the Baltic Sea is taken forward as a pilot case.

HELCOM can also assist the Member States in developing criteria for cost-benefit analysis of measures for the water framework and proposed marine strategy Directives. This will be important where costs and, especially, benefits are transboundary in nature and some agreed methodology would be beneficial in ensuring that results from one Member State's analysis is acceptable to its neighbours.

Taking this further forward HELCOM will need to examine how regulatory requirements can be equitably distributed between Member States in controlling eutrophication pressures in implementing the proposed marine strategy Directive. This is, of course, politically sensitive, but HELCOM is the only forum in which this can be achieved.

Taking these actions forward will assist in implementing the various instruments available to tackle diffuse agricultural pollution and, thereby, contribute to achieving HELCOM's vision for the Baltic Sea. This will require considerable efforts on the part of the Secretariat and commitment by the Parties.

[21] HELCOM 2006. Development of tools for assessment of eutrophication in the Baltic Sea. Baltic Sea Environment Proceedings No. 104.