

# Implementability of agro-environmental targets in Denmark

## Project Reporting

*Baltic COMPASS (Comprehensive Policy Actions and Investments in Sustainable Solutions in Agriculture in the Baltic Sea Region)*

*Work Package 6: Policy Adaptation and Governance*

Public Version 2011-02-01



Part-financed by the European Union (European Regional Development Fund and European Neighbourhood and Partnership Instrument)



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## Summary

### Aim and method

This report examines the challenges faced in implementing agro-environmental targets in Denmark. The aim is to offer a situation analysis on lessons learned on the implementability of agro-environmental targets for Denmark as one of the riparian countries in the Baltic Sea Region (BSR). The report comprises one of a series of national reports for the riparian countries in the Baltic Sea under Task 1 in Work Package 6 in the project Baltic COMPASS (Comprehensive Policy Actions and Investments in Sustainable Solutions in Agriculture in the Baltic Sea Region). It is based on a qualitative analysis, which has drawn on consultations with 30 professionals from 19 and a review of key documents. Consultations were held in Copenhagen March and April 2010 with actors who in different ways have 'implementing responsibility', i.e. from the public, private as well as civil society sectors.

### National agro-environmental targets and measures

The concern regarding eutrophication in Denmark dates back to the 1980s when a general public and political awareness emerged of the problem regarding oxygen depletion in shallow near-shore waters and pollution of groundwater. A number of aquatic action plans have been implemented and the evolution of the management regime reflects a gradual strengthening of regulatory measures, including on storage and application of manure and slurry, and an increasing demand on reporting the nutrient inputs through fertilizer plans and accounts. A major revision took place with the introduction of crop specific nitrogen norms, which today are set at 85 % of the economic optimum. This, together with statutory norms for the amount of effective nitrogen in animal manure has been the measures with the most significant impact. Employed measures are commonly distinguished according to whether they consist of nutrient/manure-based regulation or are directed at area-related management.

The most recent large-scale governmental agro-environmental initiative is the Government's plan for Green Growth (*Grøn Vækst*) from 2009. It aims at establishing a green growth economy in which the agro-food sector improves its innovative and competitive potential and regains international market shares, and at the same time leads to a significant further reduction in the discharge of nitrogen and phosphorus. The Green Growth initiative replaces the Action Plan for the Aquatic Environment III of 2004 and is the Government's follow-up on the Pesticide Action Plan 2004-2009. The strategy combines the Danish commitments under the Water Framework Directive and Nitrates Directive and provides the strategy under which the agro-environmental legislative framework will be revised and Parliament currently legislates. The strategy is intended part-financed by the Rural Development Program 2010-2013 and new subsidy schemes have been initiated.

With regards to the discharge of nutrients, the Green Growth Strategy first specified a reduction of 19,000 tons N and 210 tons P discharge to the aquatic environment by 2015. These targets were politically agreed in June 2009 for the draft river basin management plans, but following discussions led to a second political agreement (Green Growth 2.0) in April 2010. In the 2.0 agreement, the goal is still to reach 19,000 tons N reduction in discharge, but the reduction of 10,000 tons N has been postponed to 2027.

Unlike previous action plans, where targets for N reductions were based on leaching from the root zone (c. 1 m below soil surface), the targets in Green Growth are based on the discharge of N to the aquatic environment, which has introduced a significant uncertainty in the figures. Another set of uncertainties arises as the setting of targets to large extent depended on the use of the distribution of eel grass as a quantitative indicator species for nutrient richness. The credibility of this indicator has been questioned especially from agricultural organizations.

Altogether, the Green Growth Strategy has presented a number of measures to achieve the reduction targets– these are discussed in the report together with other central measures and targets prior to 2009.

### **Synthesis of challenges as perceived by implementing actors**

#### *1. Track record: Delays in reaching set targets*

Environmental targets are by most actors considered rather ambitious compared to other riparian states and it is often appreciated that significant reductions (c. 50%) have taken place over the past decades. However, it is a cause of concern for many actors that there has frequently been delay in reaching agreed targets in politically endorsed action plans. There is a wide appreciation that the instruments applied during the first aquatic action plans were insufficient, and dissatisfaction exists with the so-called voluntary measures due to a lacking rate of implementation. There is a low confidence from most actors in new proposed measures which rely on so-called voluntary agreements.

#### *2. Disconnect between policy processes*

There is a challenge in ensuring national coherence between different bundles of policy processes, avoiding goal conflicts, and promoting general value adding between policies. This includes perceptions of a disconnect between the Water Framework Directive and Nitrates Directive implementation, the link between terrestrial policy initiatives and how these contribute in satisfying marine requirements, and reconciling ecological sustainability targets with aspects of social sustainability, such as employment, work condition standards and labour rights.

#### *3. Estimating costs and benefits*

A variety of cost-efficiency analyses exist to comparing and selecting the most desirable policy measures, often with different assumptions regarding the value of natural resources. Identification of synergies between policy goals depends on measurement of multiple benefits, and calculations typically rely on a qualitative assessment of the effect nutrient reduction measures have on other targets. However, the final selection is often in relation to only one parameter, such as N reduction. This is suggested to be partly because there is a political preference for clear deliverables on single targets as they are easier to communicate. Cost-efficiency models cannot acknowledge the monetary value of multiple benefits, and several instruments are only qualitatively outlined without quantitative indices associated with them. A lack of data and/or accepted models and the short time lines on evaluation of measures mean that actors often rely on expert judgments of their relative efficacy. It is widely acknowledged that there is a lack of methods for estimating efficiency of progress regarding targets for recreation and other less tangible deliverables.

#### *4. Balancing central steering with stakeholder participation*

Whilst the inter-sectoral collaboration in preparing the Green Growth Strategy in the public sector

has been commended, many argue that there has been little inclusion of non-state actors and stakeholders in general. It is suggested that this is partly due to lack of manpower and financial resources, and partly due to EU requirements having spurred a concern in the national government to 'get it right' from the outset, where a more control-based closed process has been chosen. Public agencies raise concern regarding the recent heated discussions with interest groups, as measures are not effective when there is insufficient buy in to the respective programmes. Some state that closed policy processes from the state may weaken these relationships and complicate the implementation.

#### *5. State regulation vis-à-vis private ownership*

It is fraught with some difficulties to reconcile the increasing state regulation of agricultural practices with the underlying principles in Danish legislation where there is a heavy obligation to voluntary measures in respect for private ownership, supported by a broad political base. Shaped by the political history of the agricultural movement, the liberal ideal of free market meets deep rooted values of private ownership and citizen autonomy. This is contributing also to the debate regarding different definitions of the 'public good' or 'public burden' of agriculture.

#### *6. Sub-national adaptation of measures*

The relationship between national agencies and municipalities is at times shaped by a struggle for the allocation of resources and mandates, which is suggested as one of the reasons for the delay in the water management planning. The state is by many non-state actors seen to exercise great detailed steering in projects and implementation of targets, which inhibits the ability of local administrations to use instruments across legislative domains. Local adaptation of measures is by many non-state actors seen to be disabled by a 'blanket' approach under Green Growth, in which generic measures do not consider the different properties of local contexts. However, measures such as the fertilizer account system are often considered efficient exactly because of the high degree of control.

#### *7. Transboundary cooperation*

Whilst actors exhibit a general interest in experiences in other BSR states, most organizations do not have the capacity to engage in activities which focus on the BSR or internationally. The main axis of orientation is towards the EU and its compulsory requirements placed on member states. The major emphasis in Denmark is on the Water Framework Directive and Nitrates Directive implementation, and it is suggested by some actors that a successful implementation of the WFD will ensure a simultaneous implementation of the nutrient related targets under the BSAP and Marine Strategy Framework Directive. HELCOM is by many actors considered as a useful platform for dialogue between EU environmental legislation and policy developments in Russia, but not efficient in steering progress in the collaboration between BSR states. What is perceived as a lacking implementation of EU directives and the BSAP in other MSs is seen to inhibit the motivation amongst Danish agencies and farmer organizations. Further, public agencies have recently felt excluded from negotiations ongoing amongst EU member states. This is commonly seen to be owing to the Danish government position regarding the revision of the CAP post-2013, which faces resistance from other riparians and EU member states. Finally, it is suggested that there are a number of shared problems which are not currently captured by EU policy frameworks.

#### **Next steps**

Any reader with an interest to monitor or participate in the upcoming policy analyses regarding these

challenges, are warmly invited to contact Stockholm Environment Institute (Rasmus K. Larsen, Tel: +46 73 707 8564, Email: [rasmus.klocker.larsen@sei.se](mailto:rasmus.klocker.larsen@sei.se)).

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## List of acronyms

Acronym/ Abbreviation	Danish activation	English activation
AaU	Aarhus Universitet	University of Aarhus
AE	Arbejderbevægelsens Erhvervsråd	Economic Council of the Labour Movement
BLST	By- og Landskabsstyrelsen	Agency for Spatial and Environmental Planning
DF	Dansk Folkeparti	Danish People's Party
DJF	Det Jordbrugsvidenskabelige Fakultet	Faculty of Agricultural Sciences
DL	Dansk Landbrug (now Landbrug og Fødevarer)	Danish Agriculture (now Danish Agriculture & Food Council)
DLBR	Dansk Landbrugsrådgivning	Danish Agricultural Advisory Service
DMU	Danmarks Miljøundersøgelser	National Environmental Research Institute
DN	Danmarks Naturfredningsforening	Danish Society for Nature Conservation
DR	Danske Regioner	Danish Regions
ES	Energistyrelsen	Danish Energy Agency
FFF	Fagligt Fælles Fagbund	United Federation of Danish Workers
FOI	Fødevarøkonomisk Institut	Institute of Food and Resource Economics
FVE	FødevarerErhverv	Danish Food Industry Agency
FVM	Fødevarerministeriet	Ministry of Food, Agriculture and Fisheries
FVS	Fødevarerstyrelsen	Danish Veterinary and Food Administration
GoD	Regeringen	Government of Denmark
IFUL	Institut for Udvikling og Landbrug?	Danish Institute of Rural Research and Development
KEMIN	Klima og Energiministeriet	Ministry of Climate and Energy
KL	Kommunernes Landsforening	Local Government Denmark
LOK	Landbrugets Oplysnings- og Kursusvirksomhed	Author's translation: Information and Training Service of the Agricultural Sector
LF	Landbrug og Fødevarer	Danish Agriculture and Food Council
MIM	Miljøministeriet	Ministry of Environment
MST	Miljøstyrelsen	Environmental Protection Agency
PDIR	Plantedirektoratet	Danish Plant Directorate
SNS	Skov- og Naturstyrelsen	Forest and Nature Agency
SUM	Indenrigs- og Sundhedsministeriet	The Ministry of the Interior and Health
VFM	Velfærdministeriet	Ministry of Welfare
ØR	De Økonomiske Råd	Danish Councils for Environmental Economics

## 1. Introduction: Danish agriculture 2010

Cultivated land in Denmark comprises close to 60 % of the total land area and this vast coverage and the intensive forms of production means that agriculture makes a significant imprint in most parts of the country. Not surprisingly this guarantees that agriculture often ranks high on the agenda in discussions concerning the environment (see also Wilhjemsudvalget, 2001a). The sector is experiencing an ongoing 'structural development', driven by technological industrialization and effectivisation, with a trend towards larger and fewer full time farms (from 200,000 to 43,000 farms between 1959 and 2008) (ØR, 2010). The work force employed in agricultural production alone declined from 120,000 people in 1993 to 62,000 in 2004 (Mikkelsen et al., 2007). Whilst there is an opportunity for those who manage to harness the increasing specialisation to benefit from economy of scale, increasing environmental restrictions and reporting requirements lead to mounting administrative burdens on farmers (Landbrugsrådet, 2008).

The Danish Government's Green Growth Strategy, which will be discussed in detail below, stipulated in 2009 new ambitious reduction target for discharges of nitrogen (N) and phosphorous (P) to the sea by 2015 of 19,000 tons and 210 tons, respectively. The public, scientific and political discussions which have revolved around these reduction targets and their implementation illustrates how the policy processes associated with questions at the interface of agricultural and environmental sectors are located at junctures of concerns regarding, for instance, ecological sustainability, economic recession, and employment and welfare.

This report examines the challenges faced in implementing agro-environmental targets in Denmark. As such, the central theme is the efficacy of various policy instruments/measures (in Danish: virkemidler) in meeting expected targets. The aim is to offer a situation analysis on lessons learned on the implementability of agro-environmental targets for Denmark as one of the riparian countries in the Baltic Sea Region. The report comprises one of a series of national reports for the riparian countries in the Baltic Sea under task 1.2 in Work Package 6 in the project Baltic COMPASS (Comprehensive Policy Actions and Investments in Sustainable Solutions in Agriculture in the Baltic Sea Region) (See map of riparians in Fig. 1).



**Fig. 1: Denmark and the Baltic Sea Region.** Source: <http://www.geographicguide.net>.

### Baltic COMPASS project

The COMPASS project aims to contribute in reducing eutrophication (nutrient over-enrichment) of the Baltic Sea through fostering win-win solutions for agriculture and environmental sectors, based on problem definitions which are relevant for stakeholders within the whole drainage area. It is funded as a project under the Baltic Sea Region Programme and implemented through a consortium of ministries, agencies, research institutes, farmers’ organizations and environmental NGOs in all nine riparian countries. The project is led by the Swedish University of Agricultural Sciences (SLU) and consists of six work packages (see [www.balticcompass.org](http://www.balticcompass.org) for more information). The Policy Adaptation and Governance Work Package (WP6) specifically aims to support and increase the legitimacy of adaptive governance processes in integrated agricultural-environmental policy development in the region. The purpose is to add value to the work of institutions who are implementing agro-environmental policies, measures and programmes in the Baltic Sea Region.

It is intended that this analysis will contribute to the planning of a number of policy analyses on relevant challenges as a means to foster a critical process of policy adaptation, implementation and development into meeting agro-environmental targets. Thus, the point of departure for the report is the Danish national implementation of relevant agro-environmental targets, but with a view to their relationships to the respective European Union Directives, and the connections to other Baltic Sea riparian countries.

## 2. Methodology

This report is based on a qualitative analysis, which has drawn on a series of stakeholder consultations and a review of key documents. The literature reviewed was retrieved through web searches and browsing of organizations' repositories and is listed in the end of the report. It comprises mainly official strategy or policy documents, research reports, and program evaluations. Consultations were held during two visits to Copenhagen in March and April 2010 with 30 people from 19 organizations, who in different ways have 'implementing responsibility' (see table 1 for the list of the actors consulted). A large number of organizations were contacted by email with a request for a meeting, which was organized with those who responded positively.

The consultations aimed at 1) identifying what comprises the most important agro-environmental policy processes, 2) eliciting the nature of the implementation process and surfacing the major implementability challenges faced, 3) identifying how the Baltic COMPASS project, specifically WP6, may add value to the ongoing work, incl. aligning the project road map with those of implementing actors. In the consultations, the problem of eutrophication was tabled but it was explained that the project worked with problem definitions relevant for national actors. The consultations took the form of one-to-one conversations, focus groups, or telephone interviews. In the consultations, it was agreed to touch base again once the national report was finalized and starting points for national policy analyses under the Baltic COMPASS could be proposed. Concrete avenues for involvement of respective contributors were anticipated and a list of opportunities prepared for internal use in the project. The present report has been circulated to the contributors and other interested parties for comments between 5 and 27 November 2010 and subsequently discussed in a workshop held in cooperation with Local Government Denmark in Copenhagen 6 December 2010. Minor technical corrections and revisions of arguments have been undertaken on this basis to bring the report to its present form.

The identification of implementing actors acknowledged that the national contexts in each of the nine BSR riparian countries vary and that the drivers of change are not limited to the public sector, but equally in the private and civil society sectors. Thus, for the purpose of this report, the notion of 'implementing actor' refers to all organizations and people engaged in policy adaptation, i.e. public, private, and civil society sectors, including research institutes.

In the presentation of findings, data from documented sources are referenced accordingly. When no literature sources are provided, the argument derives from one or several consultations. No direct attributions are made to the informants, but the general type of informant is indicated where relevant. Whilst the text invariably represents a degree of interpretation of the information by the author, the emphasis is on conveying the information from the literature and the views from implementing actors. Throughout the report, acronyms are explained when first encountered, and a list of acronyms is provided above. Danish titles and terms are translated into English according to the general usage or in some instances by the author's own approximation – the corresponding Danish equivalent is provided in italics when introducing the term.

**Table 1: Contributing actors and organizations.**

Danish title	English title
<b>Public sector</b>	
Departementet, Ministeriet for Fødevarer, Landbrug og Fiskeri	Ministry of Food, Agriculture and Fisheries
Plantedirektoratet	Danish Plant Directorate
FødevarerErhverv	Danish Food Industry Agency
By- og Landskabsstyrelsen	Agency for Spatial and Environmental Planning
Skov- og Naturstyrelsen	Forest and Nature Agency
Miljøstyrelsen	Environmental Protection Agency
Danske Regioner	Danish Regions
Kommunernes Landsforening	Local Government Denmark
<b>Civil society</b>	
Fødevarerforbundet	The Trade Union NNF
Fagligt Fælles Forbund (3F)	United Federation of Danish Workers
Det Økologiske Råd	The Ecological Council
Danmarks Naturfredningsforening	Danish Society for Nature Conservation
Friluftsrådet	Danish Outdoor Council
Forbrugerrådet	Danish Consumer Council
<b>Private sector</b>	
Landmand, Sjælland	Farmer, Zealand
Landbrug og Fødevarer	Danish Agriculture and Food Council
Dansk Landbrugsrådgivning	Danish Agricultural Advisory Service
Rambøll Danmark A/S	Rambøll Denmark Ltd.
Innovationsnetværk for Biomasse	Agro Business Park

### Limitations of the study

Contrary to the situation in the other riparian countries, WP6 did not from the outset have a national convening partner for Denmark. Thus, during the project preparation it was agreed that SEI would take responsibility for the implementation of the first activities in Denmark until a national partner would be identified to take the lead. SEI Stockholm therefore took responsibility for the assessment underlying this report. The report does not aim to provide a comprehensive overview of all possibly relevant agro-environmental measures and targets. Rather, the aim is to identify main policy processes as perceived by the implementing actors consulted, surface key challenges faced, and to provide the necessary detail regarding targets and relevant legislation in order to understand these challenges. Many actors and other stakeholders who play central roles in relation to the implementability issues raised were identified but due to the time constraints it has not been possible to contact these people and organizations yet.

### 3. National agro-environmental targets and measures

This section begins with a brief description of the way European Commission (EC) Directives are transposed in Denmark and then moves on to a discussion of the legacy of the management regime. This includes sketching out past targets and how measures and requirements, many of which are still in use or underlie the current legislation, have emerged. The section concludes with a presentation

of the current framework for the management of nutrients from agriculture, namely the government's Green Growth Strategy and its underlying mechanisms.

### Danish transposition of EU Directives

Whilst the Statutory Orders of the EU are directly applicable in Denmark, as in other Member States (MS), EC Directives are transposed into national legislation by the Parliament (*Folketing*), which delineates the general purpose and objectives of the laws and mandates of the implementing agencies. The transposition and subsequent acts undertakes to interpret the obligations placed by the Directives. Laws are processed in three rounds in the Parliament, and the third and final treatment is often in June before the closure of the legislative year. The laws grant mandates to the relevant minister to pass rules and regulations and convey the implementing responsibility to agencies under the ministry, but do not directly specify responsible agencies for implementation. The laws include authorisations of relevant ministers to administratively determine detailed standards and implementation routes. The mandate is thus located with the relevant minister to pass necessary statutory orders (*bekendtgørelser*), which includes the more specific implementation targets. The formulation of these acts is frequently delegated from the minister to civil servants in the respective ministries, and represents a freer form of regulation, which can respond to shifting conditions and new knowledge or priorities, yet remain within the manoeuvring space provided by the original law. A law and its statutory orders can subsequently be merged into a consolidated act (*lovbekendtgørelse*), also compiled administratively by the relevant ministry.

### Legacy of the management regime for reducing eutrophication

#### Action plans on water and agriculture

In Denmark, it is frequently acknowledged that the concern regarding eutrophication dates back to the 1980s when a general public and political awareness emerged of the problem regarding oxygen depletion in shallow near-shore waters. This has since stimulated a widespread emphasis on nitrogen and phosphorous leaching in the country. Further, contrary to many other riparian countries, Denmark is highly dependent on groundwater as drinking water resource. It is generally perceived as received wisdom that N is the main limiting factor for primary productivity in coastal and marine waters in Denmark, and that agriculture is the major contributor. Reduction targets for agriculture are specified for the measurable input of N and phosphorus (P) by farmers using a conversion from the total desired reduction in discharge to the water bodies to the resulting required reduction in the leaching of nutrients from agricultural soils.

The first action plan to reduce leaching of N, P and organic pollution was launched in 1985, and the first aquatic action plan, Action Plan for the Aquatic Environment (APAE), in 1987 (Table 2). Due to a delay in reaching the agreed targets, the subsequent Action Plan for Sustainable Agriculture (*Handlingsplanen for Bæredygtigt landbrug*) and the APAE II aimed to provide further means to alleviate the problem. The political agreement behind APAE II also stipulated the need to prepare an action plan specifically for ammonium, which was agreed in 2001. This was in acknowledgement that no targets existed for ammonium emissions, and that 98 % of the emissions derived from agriculture (Tybirk and Jørgensen, 1999). The plan introduced a set of more targeted instruments on agricultural 'point sources' (Wilhelmudvalget, 2001b) to reduce emissions of ammonium as other measures mainly had focused on leaching and discharges (FVM and SNS, 2001). The most recent action plan,

APAE III, covering the period 2004-2015, represents a continuation of these plans, with a strengthening of the targets and provision of new and revised measures.

**Table 2: Overview of major national action plans on water and agriculture.** Reproduced from Mikkelsen et al., 2005, with additional information from Jørgensen et al., 2009, Grant and Waagepetersen, 2003; Waagepetersen et al, 2008; Primdahl and Bojesen, 2009.

Year	Policy actions	Purpose	Targets	Main measures
2005-2015	<b>Action Plan for the Aquatic Environment III</b>	To further reduce the nutrient pollution from the agricultural sector, initially parallel to, and to be merged with, the implementation of the WFD	<ul style="list-style-type: none"> <li>Nitrogen leaching reduced by 13 % compared to 2003 levels</li> <li>P leaching halved by 2015 compared to the 32,700 tons P in 2001/2002</li> </ul>	<ul style="list-style-type: none"> <li>Agro-environmental subsidies to establish 50,000 ha buffer strips (voluntary transfers of fallow land along lakes and rivers), establish 4,000 ha wetlands, and cover 85,000 ha with catch crops)</li> <li>Tax on mineral P of 4 DKK per kg mineral P in fodder until 2009 (aimed to reduce by 25 %)</li> <li>300m protective zones to be observed around sensitive habitats (such as raised bogs, lobelia lakes, heaths).</li> <li>Improve the use of N and P in feed</li> <li>Strengthening of organic farming as instrument</li> <li>The structural development, including setting aside of land, improved feed utilization, and the implementation of the new EU agricultural reform are expected to lead to a reduction in nitrogen leaching from agriculture of approx. 11,200 tons N before 2015.</li> <li>Afforestation in the range of 20,000-25,000 hectares will contribute to reducing nitrogen leaching by approx. 900 tons N.</li> </ul>
2001-2004	<b>Ammonia Action Plan</b>	The political agreement behind APAE II acknowledged that ammonium comprises up to one	<ul style="list-style-type: none"> <li>Reduction in ammonium use of 9,400-9,600 tons</li> </ul>	<ul style="list-style-type: none"> <li>Subsidies to encourage good manure handling in animal housing and improved design</li> <li>Mandatory covering of all dung heaps</li> <li>Ban on slurry spreading by broadcast spreader</li> <li>Slurry spread on bare soil must be</li> </ul>

		third of the N lost from agriculture. This action plan was designed to specifically address this problem.		<p>incorporated within 6 hours</p> <ul style="list-style-type: none"> <li>• Ban of the treatment of straw with ammonia to improve its feed quality</li> <li>• Optional restrictions by planning authorities to restrict agricultural expansion near sensitive ecosystems</li> </ul>
1998-2003	<b>Action Plan for the Aquatic Environment II</b>	Extension of the deadline for reduction targets from APAE I and provision of new measures	No further targets	<ul style="list-style-type: none"> <li>• Economic incentives to establish wetlands: 8,000-12,500 ha</li> <li>• Further restrictions on the N content in manure/slurry</li> <li>• Reduction of stock density to 1,7 livestock unit per ha for cattle and 1,4 for other species</li> <li>• Subsidies to encourage conversion to organic agriculture</li> <li>• Revision of the norm regulation system: maximum 90 % of economic optimum for crops can be applied.</li> <li>• Mandatory requirement to cover minimum of 6 % of area with cereals, legumes and oil crops with catch crops.</li> <li>• 18,000 ha reforested</li> </ul> <p><b>Mid-term further regulations (2000)</b></p> <ul style="list-style-type: none"> <li>• Further economic incentives to establish wetlands</li> <li>• Specification of the fertilizer budgets: N assumed retained in the catch crops shall be included</li> <li>• Further restrictions on the N content in manure/slurry</li> <li>• Reduced N norms for grassland and restrictions for application to bread wheat</li> </ul>

1991-2000	<b>Action Plan for Sustainable Agriculture</b>	Extension of the deadline for reduction targets from APAE I and provision of new measures	No further targets	<ul style="list-style-type: none"> <li>• Ban on spreading of slurry from harvest until 1 February, except for grass and winter rape</li> <li>• N fertilizer norms per crop, equal to economic optimum</li> <li>• Statutory norms for the utilization of manure N (pig slurry: 60 %, cattle slurry: 55 %, deep litter: 25 %, other types: 50 %)</li> <li>• Environmentally sensitive areas identified in Regional Plans</li> <li>• Compulsory fertilizer budgets</li> </ul>
1987-1992	<b>Action Plan for the Aquatic Environment I</b>		<ul style="list-style-type: none"> <li>• Reduction of N leaching with 49 % (145,000 tons)</li> <li>• Reduction of P leaching with 80 % (15,000 tons)</li> </ul>	<ul style="list-style-type: none"> <li>• Minimum of 9 months slurry storage capacity</li> <li>• Ban on slurry spreading from harvest to 1 November on soil destined for spring crops</li> <li>• Mandatory fertilizer and crop rotation plans</li> <li>• Minimum 65 % winter green fields</li> <li>• Mandatory incorporation of manure in soil 12 hours after spreading</li> </ul>
1985	<b>NPO Action Plan (Nitrogen, Phosphor, Organic)</b>	Agriculture is defined as the most significant polluter of N and P. The plan aims to alleviate this pollution	Reduction of N and P – no specific targets	<ul style="list-style-type: none"> <li>• Harmony demands on the relationship between animal des units and area (livestock density maximum of 1 livestock unit per ha; one LU = one dairy cow)</li> <li>• Prohibition of direct discharge of effluents from farms</li> <li>• Minimum 6 months storage capacity for manure,</li> <li>• Ban on slurry spreading between harvest and 15 October on soils destined for spring crops</li> <li>• Various measures to reduce runoff from silage clamps and manure heaps</li> </ul>

The evolution of the management regime reflects a gradual strengthening of the requirements, including storage and application of manure and slurry, and an increasing demand on reporting the nutrient inputs through fertilizer and crop budgets and accounts. A major revision took place with the introduction of crop specific N norms, which today are set at 85 % of the economic optimum. Further, the following comprise important measures in the regulation:

- *National ceiling for mineral fertilizer use*: The total use of mineral fertilizers on national scale must not exceed the level as of 2003/04.
- *Harmony area*: Maximum application rates of manure must for cattle manure correspond to 1.7 LSU/ha, and for other types to 1.4 LSU/ha. (1 LSU corresponds to 100 kg total N in the manure).
- *Utilization of N in manure*: Statutory minimum norms for utilization of N in the manure. For example, for pig slurry 75 % of total N has to be included in the fertilizer accounts, and for cattle slurry 70 %.

The employed measures are commonly distinguished according to whether they consist of nutrient/manure-based regulation or are directed at area-related management (Mikkelsen et al., 2007; Grant and Waagepetersen, 2003) (see Table 3).

**Table 3: Classification of the most common measures in combating eutrophication.** Translated from Jørgensen et al., 2009.

	Administrative regulation	Economic regulation
General regulation	<ul style="list-style-type: none"> <li>• N norms and fertilizer accounts</li> <li>• Harmony requirements</li> <li>• N balance accounts</li> <li>• Technological innovations</li> <li>• Fodder use efficiency requirements</li> </ul>	<ul style="list-style-type: none"> <li>• Tariffs</li> <li>• Environmental payments (area based subsidies, buffer strips, green accounts, technology subsidies, etc.)</li> </ul>
Area-specific regulation	<ul style="list-style-type: none"> <li>• Fallow of land</li> <li>• Reforestation</li> <li>• Construction of wetlands</li> <li>• Catch crops</li> <li>• Buffer strips</li> </ul>	<ul style="list-style-type: none"> <li>• Environment payments (buffer strips, reforestation, wetlands etc.)</li> </ul>

The national plans are also shaped by the need to respond to legislative changes from the EU. For instance, following the abolishment of the EU scheme for fallow during the growing season, a number of compensatory measures were temporarily effectuated in order to neutralise the change. These included an increase in the fraction of catch crops from 6-10 % to 10-14 %; an increase in N quota provided commitment to a voluntary program to establish and maintain buffer strips (this was combined with required use of catch crops to ensure unchanged leaching); and an information campaign and guidance to protect the environment and cut pesticide use (FVM and MIM, 2008).

Many measures under the aquatic action plans are connected to the implementation of other EU Directives and national policy objectives. For instance, the implementation of wetlands and buffer strips contained in the Law on Rivers (*Vandløbsloven*) (Lovbekendtgørelse nr. 1043 af 20. 10 2008 om

vandløb)<sup>1</sup> is significantly shaped by the Consolidated Act on Nature Protection (LBK 1042 of August 2008, *Naturbeskyttelsesloven*). Under this legislation, a number of nature management initiatives are implemented, including management and reconstruction (40 % of the funding), state reforestation (40 % of the funding), and initiatives for outdoor activities/recreation (20 % of the funding) (SNS, 1999). Of the available instruments, nature reconstruction (*naturgenopretning*) is arguably the most radical measure available in that it expropriates the area in question and extracts it permanently from agricultural activity. The protection (*Fredningsager*) is however a relatively static instrument in which is difficult to forecast the changing conditions and needs. Reevaluation of a protection status often takes several years to pass through the extensive system of judges (*fredningsdommere*) and committees (*nævn*). Yet, the management plans (*plejeplaner*) serve as a more dynamic management tool. Other important projects have been implemented under the strategic financing mechanism known as the 'Environmental Billion' (*Miljømilliarden*). The first round funded a number of water projects in river valleys, which by some was seen to have an 'unofficial goal' of N reduction. The new round with a billion DKK dedicated 2010-2013 will be allocated under both current and new guidelines to initiatives for nature and environment (GoD, 2007).

The initiatives to reduce nutrient pollution have bearing on the expectations to reduce pesticide, and vice versa, most notably through the area-based measures such as wetlands and buffer strips. Thus, the Pesticide Action Plan 2004-2009, which aimed at halting the leaching into the groundwater of approved pesticides above maximum residue limits, was only part financed with a specific budget under the plan, and several instruments were funded and implemented under the aquatic action plans (Thomsen, 2009). Recently, (under the Green Growth Strategy, see below) the government has proposed a new pesticide tax which differentiates according to the harmful effect of each pesticide (GoD, 2010a). However, some argue that there is a lack of knowledge regarding these effects and thus limited basis for the differentiated tax system (ØR, 2010).

Other important pieces of legislation were surfaced during the study but are not mentioned here. They include, amongst others, the Law on Environmental Protection (*Miljøbeskyttelsesloven*, LBK nr 753 af 25/08/2001)<sup>2</sup>, the legislation on organic agriculture, the national response to EC Directive on bathing water quality (2006/7/EC of 15 February 2006 concerning the management of bathing water quality and repealing Directive 76/160/EEC), and the National Park legislation (the first National Park was established in 2009, and others are expected to follow).

### Reductions in nutrient leaching from the action plans on water and agriculture

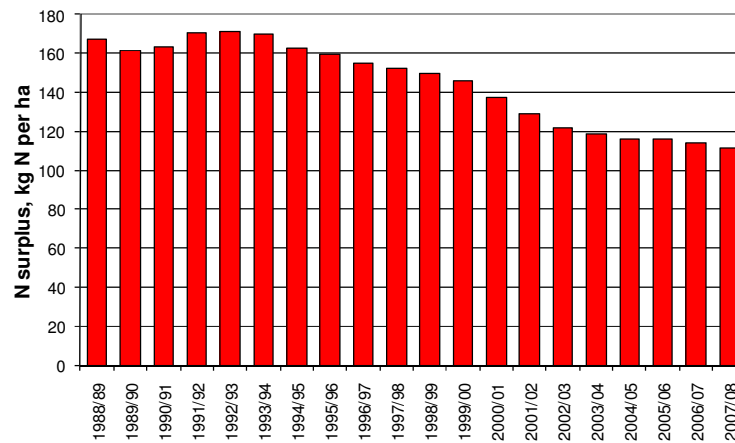
Since the introduction of the action plans, N discharges from point sources have on national level been reduced by 75 %. N and P surplus have been reduced by 35 % and 55 %, respectively (Figs. 1 and 2). Model calculations estimate the reduction of nitrogen leaching from the root zone on agricultural land to be close to 47 % (national average) (Figure 3). Further, a trend analysis of total nitrogen concentrations in five agricultural catchments shows an average reduction in catchments dominated by loamy and sandy soils of, respectively, 28 % and 53 % (Fig. 5) (Grant et al., 2010).

The impacts of the regulations are, however, not equally high in all geo-regions. It has been suggested that this is partly due to delays in nutrient travel time in groundwater. Until now, the

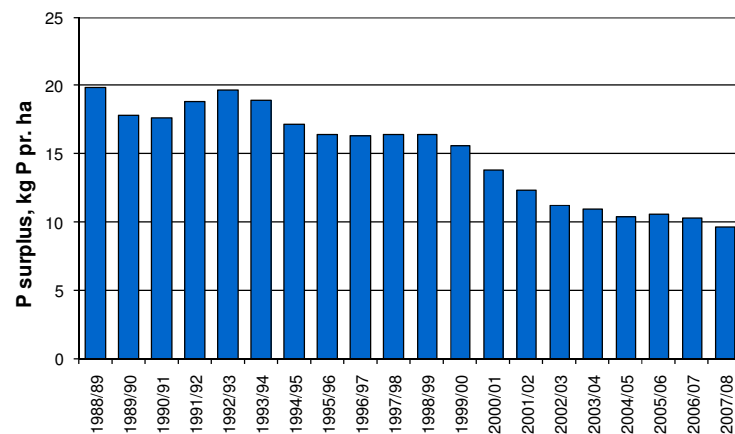
<sup>1</sup> <http://www.blst.dk/Lovomraader/Vandloebesloven.htm>

<sup>2</sup> <https://www.retsinformation.dk/Forms/R0710.aspx?id=12503>

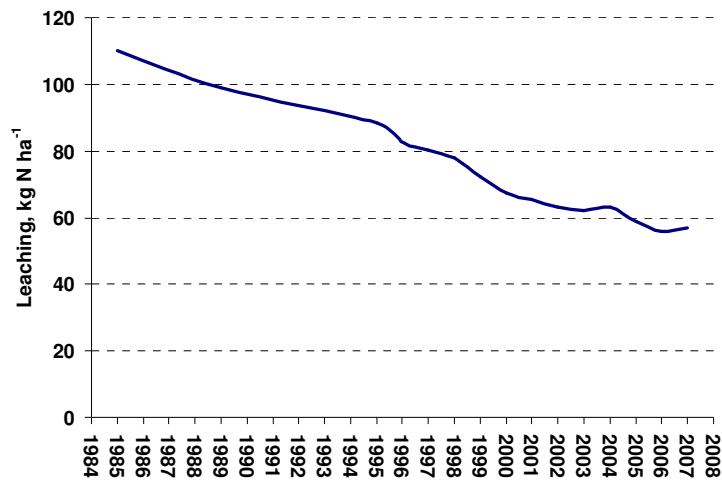
regulation has primarily been performed on a national scale using general measures. The Green Growth Strategy is intended to offer a more regional or local approach with more focused measures.



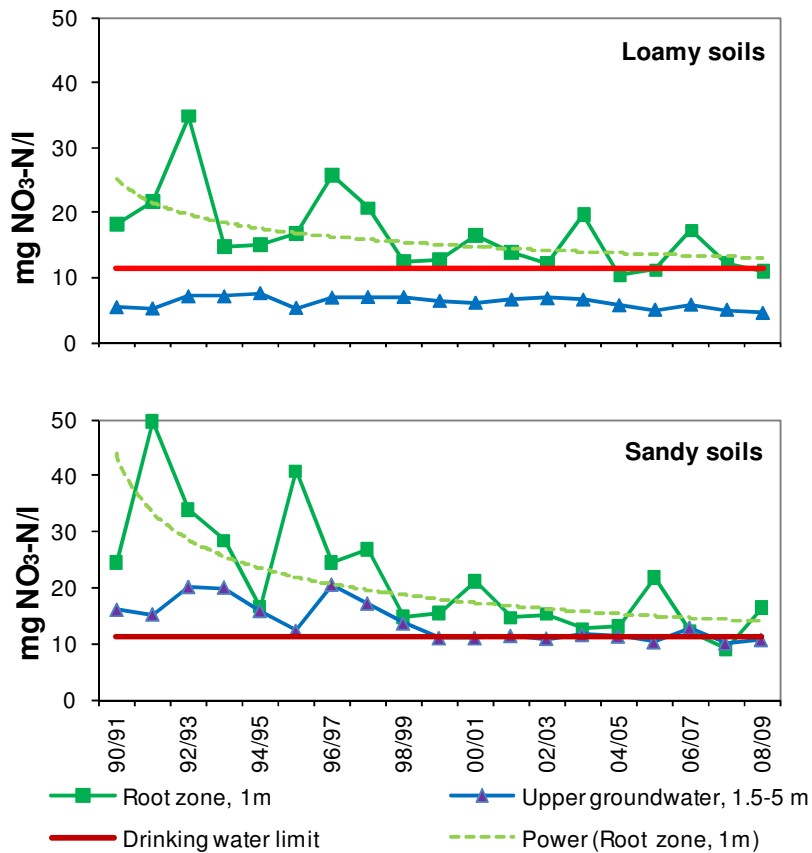
**Figure 2: Average N surplus (kg N ha<sup>-1</sup>).** Estimated from national farm gate balance of the agricultural sector using statistical data from Statistics Denmark (Vinther and Olsen, 2010).



**Figure 3: Average P surplus (kg P ha<sup>-1</sup>).** Estimated from national farm gate balance of the agricultural sector using statistical data from Statistics Denmark (Vinther and Olsen, 2010).



**Figure 4: Average nitrate leaching from the root zone (kg N ha<sup>-1</sup>).** As modelled by three different models and based on registered data for land use (General Agricultural Register) and fertiliser use (fertiliser accounts from the Plant Directorate), and on statistical data from Statistics Denmark. From Waagepetersen et al. (2008).



**Fig. 5: Development in measured nitrate contents in the period 1990/91 to 2008/09 in root zone water and upper groundwater.** From Grant et al. (2010).



### Regulation for livestock, fertilizer plans and accounts

A central element of the current legislation is the compulsory planning and reporting at farm level, manifest through the mandatory fertilizer accounts and crop rotation plans and the application of standard norms which apply for the use of fertilizer and manure N as well as crops. These measures are enacted under the consolidated act LBK 1757 of December 22 2006 (*Bekendtgørelse af lov om miljøbeskyttelse*)<sup>3</sup>, statutory order BEK 751 of 2009 (*bekendtgørelse om jordbruges anvendelse af gødning og om plantedække 09/10*)<sup>4</sup> and the consolidated act 1528 of 2009 (*lov om anvendelse af gødning og plantedække*) (commonly known as *gødskningsloven*, 'Law on Manure')<sup>5</sup> and its subsequent revisions. Farmers are responsible for preparing a fertilizer plan (including on rotation of crops, which defines which N-norm applies) and a fertilizer status account for each growing year. The permissible fertilizer load is calculated based on standards ('norms') for each crop. This yields a quota per farm/agro-enterprise, measured in mineral fertilizer equivalents per livestock unit (i.e. animal manure is converted to mineral fertilizer equivalents). By 31 March each year the farmer must submit the fertilizer status account for the previous year to the Danish Plant Directorate (PDIR). Today, 94 % of submissions from farmers are completed electronically which has reduced the error rate. The norms for manure are revised each year, based on data from analyses of mineral fertilizer quality. Fertilizer plans must be developed and signed by the respective farmer (see also Primdahl and Bojesen, 2009). The N norm figures which underlie the calculations are updated annually. The updating of the norm figures for crops is based on the changes in area coverage recorded in the monitoring system and thus is delayed with two years (Waagepetersen et al, 2008). An annual statutory order is passed which includes norm standards updated based on scientific inputs and field trials and also acknowledging the variation in feed to animals. This system is generally considered quite efficient, and evaluations have shown that the largest contributors to the reduction of N leaching during APAE II were the improved use efficiency for animal manure and fodder (Grant and Waagepetersen, 2003; Mikkelsen et al., 2007). In the 2007 physical control conducted by PDIR, only 8 % of the reported catch crop areas did not fulfill the necessary coverage of 40 % (Waagepetersen et al, 2008), which implies a relatively high degree of compliance on this measure.

The requirements for livestock holdings of more than three livestock units are enshrined in the Law 1572 of December 20 2006 (*Lov om miljøgodkendelse m.v. af husdyrbrug*) and the statutory order 1695 of 2006 and its three subsequent revisions (*Bekendtgørelse om husdyrbrug og dyrehold for mere end 3 dyreenheder, husdyrgødning, ensilage m.v.*)<sup>6</sup>. It comprises a general reform of the regulation of animal production to distribute the gains from improved environmental technology between environmental protection and farmers and institute a single administrative process for issuing of permits. The new law was also passed in response to the continued growth in the size of production units and the need for a more integrated assessment (GoD and DF, 2006). Further, it represents the translation of Environmental Impact Assessment (EIA) requirements into the agricultural sector, which otherwise is covered through the Planning Law and the Law on Environment Assessment of Plans and Programmes (*Lov om miljøvurdering af planer og programmer*)<sup>7</sup>. In effect, the new requirements mean that a new assessment and permit is required

<sup>3</sup> <https://www.retsinformation.dk/Forms/R0710.aspx?id=13072>

<sup>4</sup> <https://www.retsinformation.dk/Forms/R0710.aspx?id=125666>

<sup>5</sup> <https://www.retsinformation.dk/Forms/R0710.aspx?id=129547>

<sup>6</sup> <https://www.retsinformation.dk/Forms/R0710.aspx?id=13063>

<sup>7</sup> <http://www.vvm.dk/husdyrbrug.htm>

for most enlargements/restructuring at farm level. Further, the Consolidated Act 1202 of October 9 2007 (*Bekendtgørelse af lov om landbrugsejendomme*)<sup>8</sup> makes it compulsory for owners of an agricultural estate larger than 30 ha to achieve a “Green Certificate”, requiring in turn one of several educational backgrounds within agriculture (e.g. agriculture, horticulture, forestry) (Primdahl and Bojesen, 2009). A parallel example from the business sector is the Green Accounts system (*grønne regnskaber*), which is a voluntary assessment (prior to 2008 supported through the payments under the RD Program) aimed to both inform farm level planning and communicate to consumers regarding the sustainability of the production (Kjærgaard and Hall, 2007). In addition, the Livestock statutory order (*Husdyrbekendtgørelsen*, BEK 1695)<sup>9</sup> implements part of the Nitrates Directive and stipulates harmony demands on the relation between livestock units and area size.

## The Green Growth Strategy

The most recent large-scale governmental agro-environmental initiative is the plan for Green Growth (*Grøn Vækst*) from 2009, which aims at establishing a green growth economy in which the agro-food sector improves its innovative and competitive potential and regains international market shares. The Green Growth initiative replaces the APAE III of 2004 and is the Government’s follow-up on the Pesticide Action Plan 2004-2009. The aim is to promote coherence between environment and production through a mergence of sectoral concerns enabled by technological innovation and modernizing of the agricultural legislation. The strategy thus combines the Danish commitments under the Water Framework Directive (WFD) and Nitrates Directive and provides the strategy under which the agro-environmental legislative framework will be revised and Parliament currently legislates. The strategy is intended part-financed by the RD Program 2010-2013 and new subsidy schemes have been initiated<sup>10</sup>.

With regards to the discharge of nutrients, the Green Growth Strategy, under the two composite plans for 1) environment and nature and 2) a green agriculture, first specified a reduction of 19,000 tons N and 210 tons P discharge to the aquatic environment by 2015 (Table 4). These targets were politically agreed in June 2009 for the draft river basin management plans, but following discussions, especially with the agricultural organisations about the financially strained situation for farmers and the risk of not being able to farm in parts of the country if these goals should be reached by 2015, led to a second political agreement (Green Growth 2.0) in April 2010<sup>11</sup>. In the 2.0 agreement the goal is still to reach 19.000 tons N reduction in discharge to the aquatic environment, but the reduction of “deficit” 10.000 tons N (Table 4) have, after analysis in four inter-ministerial working groups, been postponed to 2027<sup>12</sup>.

Unlike previous action plans, where targets for N reductions were based on leaching from the root zone (c. 1 m below soil surface), the targets in Green Growth are based on the discharge of N to the “aquatic environment”, which has introduced a significant uncertainty in the figures in Table 4. The retention is very much depending on where the measures are implemented, with a low retention if

<sup>8</sup> <https://www.retsinformation.dk/Forms/R0710.aspx?id=8750>

<sup>9</sup> <https://www.retsinformation.dk/Forms/R0710.aspx?id=13063>

<sup>10</sup> [http://ferv.fvm.dk/Gr%C3%B8n\\_V%C3%A6kst\\_-\\_ordninger.aspx?ID=54086](http://ferv.fvm.dk/Gr%C3%B8n_V%C3%A6kst_-_ordninger.aspx?ID=54086)

<sup>11</sup> [http://www.mim.dk/Nyheder/Temaer/Groen\\_vaekst/Groen\\_Vaekst\\_2009.htm](http://www.mim.dk/Nyheder/Temaer/Groen_vaekst/Groen_Vaekst_2009.htm)

<sup>12</sup> <http://www.landbrugsavisen.dk/Nyheder/Netnyheder/2011/2/9/Kvaelstofreduktionudsættes12aar.htm?Fag=N>

the measure is implemented close to the surface water and a high retention when implemented far from the water.

Another uncertainty related to the reduction targets is that the setting of reduction targets to large extent depended on the use of the distribution of eel grass as a quantitative indicator species for nutrient richness. The credibility of this indicator has been questioned especially from agricultural organizations, among other based on a recent report from DHI (2010). Therefore the use of this indicator will be further analysed in a working group.

**Table 4: Measures under Green Growth to reduce nutrient discharge to the aquatic environment.**

Reproduced from ØR, 2010 with updates from DJF and BSLT. The impact of buffer strips on P reduction is a very rough estimate based on the calculations by DMU and DJF per 25 January (DMU and DJF, 2011). The efficacy of measures is still being evaluated and figures are thus subject to change. The reduction of “deficit” 10,000 tons N has been postponed to 2027.

Measure	Area covered (ha)	N reduction (tons)	P reduction (tons)
Buffer strips <sup>13</sup>	50,000	2,561	40
Extensification of river valleys	3,000	0	30
Wetlands	10,000	1,132	0
Catch crops replacing winter green fields	50,000	690	0
Increased catch crops	140,000	1,950	0
Revision of N norm rules		1,008	0
Ban on soil manipulation during autumn	110,000	739	<1
Periodic ban on tilling of grass fields	15,000	230	
Synergy from nature plans.		700	
<b>TOTAL REDUCTION</b>	<b>288,000</b>	<b>9,000</b>	<b>70</b>
<b>TARGET</b>		<b>19,000</b>	<b>210</b>
<b>CURRENT DEFICIT</b>		<b>10,000</b>	<b>140</b>

The deficit in the reduction in N leaching reflects that the current reduction target is defined from present knowledge base from estimates from registered areas and an extra package of measures will be launched later. This most notably involves the expectation of a system of tradable N quotas. A committee has been established, which convenes representatives from relevant ministries and authorities and other stakeholders, aimed to yield on one year a proposal for how to trade N quotas between farmers. The system of tradable nitrogen permits was also put forward in the 2009 report from the Environmental Economic Council (ØR, 2009). Further, a range of legislative changes are in progress, including the legislation on spraying, agricultural subsidies, fertiliser, buffer strips, etc.

<sup>13</sup> The Green Growth Strategy distinguishes between 2m (“bræmmer”) and 10m (“randzoner”) buffer strips.

### Modernising legislation and harnessing the structural development

Over and above the specific measures mentioned above, the structural development in the sector is considered as a significant driving force determining the environmental impacts from farms and similarly affecting the relative efficacy of various measures. It has been suggested that the current economic crisis for Danish agriculture is a combined result of the decline in agricultural product price levels and exchange ratio (due to global economic recession and increase in production surplus 2008-09) and the loss of capital through variable rent loans in foreign currency. The declining property prices on farms has led to an increase in the relative debt for many farmers with incurred loans on their properties and leads to a 'technical insolvency' on many recently established farms (FOI, 2009). The rising land prices and capital accruments for those farmers with existing property are partly triggered by the increase in decoupled EU subsidies (ØR, 2010). This is considered the first time that EU regulations have affected the structural conditions through closing of part-time agricultural businesses and mergence to larger farms (FVM, 2003). For indebted farmers, it is even more complicated to shift production and cropping systems, at least if this requires large scale reconstructions of infrastructure such as stables.

With the Green Growth strategy, legislative changes have now been passed which for the first time permit farmers to form shareholding corporations for the ownership of land for farming purposes. The previous legislation required individual ownership and management, and a maximum of four farms owned per farmer, or a maximum of 400 ha. The legislative changes have dissolved this upper limit for ownership of land and the maximum limits for livestock holdings, which enables the productive/industry sector to invest in larger farm units, and thus paves the way for further upscaling/concentration/streamlining of production. This reflects a liberalisation aiming to provide the conditions for farmers to manage agricultural holdings in line with other business sectors. The ambition is to improve the flexibility for running the large existing farms, through economy of scale, and improve the financial viability and competitiveness. This forms a response to the challenges encountered in securing sufficient capital, transfers of large farms between generations of farmers, and the ability to cope with market fluctuations in future absence of EU direct subsidies, as well as a view that the environmental and animal welfare requirements only can be upheld by large farms (Rasmussen, 2009). It is also expected that this will reduce the competition for land and thereby halt the 'leakage' of land and profit out of the sector when farmers compete and bid up land and property prices. One further argument for the revision of the agricultural legislation is the expectation that larger and more corporately managed farms have a better awareness regarding environmental regulations and can better implement agro-environmental targets (Ramböll Management, 2005). In some way, this seems to be aligned with the vision of the agricultural organisations, where progress is seen to reflect a market based competition and selection of the most competitive farms, which will expand the national competitive position (DL, 2009).

Over and above the legislative changes to improve the policy environment for a more desired structural development, with the April 2010 compensation package for 2011-2012 for the agricultural sector the new targets are implemented under a reduction in land taxes to benefit the primary productive sectors as well as export credits to the private sector. As suggested in new government Instruction of 2009, this is estimated to total 500 M DKK in compensation, for the costs incurred under new pesticide tax and increased regulation of N-leaching under the Green Growth Strategy. The stated motivation was to avoid that expected one quarter of the 13,000 farmers in Denmark would be forced to close within 5 years (GoD, 2010a). Indeed, compared to the

Government Instruction of 2007, the new instruction of February 2010 devoted considerable more attention to the agricultural sector, motivated by the economic crises experienced by this sector in 2009/10. This has been criticised as a general support even to unviable agri-businesses, which are not economically sound. Some have also advised against tax cuts on land for farmers as this will provide a capital gain on land to subsidize economically unviable production decisions whilst disadvantaging new farmers (ØR, 2010).

### Renewable energy targets

A central element in the Green Growth Strategy is the emphasis on the development of renewable energy in the agricultural sector. 'Green energy' is proposed as a key opportunity for synergies between sectors, enabled through the provision of new green technologies. The new government Instruction from 2009<sup>14</sup> highlights the role of agriculture as provider of green energy. It stipulates that up to 50 % of animal manure in 2020 shall be used for green energy via 100 M DKK fund 2010-2012 to expand biogas plant construction (GoD, 2010a). It is expected that this in combination with burning of the solid fraction will reduce the discharge to the sea with about 470 tons N. However, the technology is yet not fully developed and the establishment of biogas plants is a time consuming process. According to some estimates it will require the building 40 large scale community biogas plants in Denmark in order to achieve the goal of anaerobic digestion of 50 % of the livestock manure. The degassing of manure in biogas plants is also expected to benefit organic farming which generally has a problem with accessing accepted fertilizer. Underlying the political attention to green technology is also the argument of the 'Danish example', i.e. that despite the economic growth of 78 % since 1980, the energy consumption has been almost constant due to an increasing energy and CO<sub>2</sub> efficiency (ES, 2009). However, some environmental NGOs are criticising the Danish government for green-washing in the area of energy policy, seeking to hide a lack of progress in recent years.

The subsidizing of biogas plants under the Green Growth strategy is partly a response to the absence of constructions of biogas plants in recent years due to unfavorable economic conditions, which make the investment unviable (Mikkelsen et al., 2007). However, it has been suggested that the private sector does not believe the provided incentives will kick-start the establishing of biogas plants. This is explained by the estimate that the government subsidy will only cover 7,5 % of the total investments required, and that whilst Denmark has some of the highest goals concerning biogas in the EU, it also offers the smallest financial incentives. Already, it is stated, government subsidized biogas-produced electricity is lacking far behind most other EU countries. Such an interpretation may be partly explained by a lack of political majority favoring green technology/renewable energy solutions, which means Denmark has lost grounds in international competition (FFF, 2009).

Rooted in the EU Renewable Energy directive, the Minister for Climate and Energy tabled in February 2010 the Proposition on Climate Security, which highlights opportunities for reducing the reliance on oil in the agricultural sector (KEMIN, 2010). It suggests that 15 % of the arable land could be used for energy crops, which corresponds to a 16-fold increase in production of energy from agriculture. The total estimated increase in biofuels from the primary sectors (forestry, agriculture) would be close to 100 %. According to the Danish Energy Agency, 130 biogas plants would have to be constructed by 2020 (FFF, 2009). Altogether, these targets also build on the Strategy for Sustainable Development from 2007 (MIM, 2007). The Action Plan for Promotion of Environmental Technology 2010-2011

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<sup>14</sup> Associated with the change of Prime Minister, when Anders Fogh Rasmussen became the chair of NATO

(*Handlingsplan for fremme af miljøeffektiv teknologi 2010 – 2011*) (GoD, 2010b) includes 225 M DKK to agricultural green technologies. Green growth includes the Programme for Green Development and Demonstrations Programme (*Grønt Udviklings- og Demonstrationsprogram, GUDP*), which aims to increase the coordination between research, innovation and demonstration in agro- and aquaculture and food sectors. It is also expected that measures to address the long-term goal of a complete independence of fossil fuels will soon depart from the Climate Commission's report to be presented ultimo 2010 (GoD, 2010a). Further, the role of agriculture as a non-quota sector under the climate negotiations is currently discussed, and it has been suggested that all greenhouse gas emissions from agriculture shall be taxed with an amount corresponding to the quota trading equivalents in order to contribute to an international trade in the quota sectors (ØR, 2010).

### Water Basin Management Planning under the WFD

The Strategy for Sustainable Development (*Grønt Ansvar – Regeringens debatoplæg om en strategi for bæredygtig udvikling, SSD*) was presented to initiate a dialogue process in 2007. It built on the first national sustainable development strategy prepared for the 2002 WSSD ("Fælles fremtid – udvikling i balance") (GoD, 2002), but placed additional emphasis on the cross-sectoral responsibility for environmental sustainability and the role of private sector and civil society. The emphasis on the multifunctional role of agriculture, including an international competitive domestic food industry, was included also in the 2002 SSD. It anticipated the hosting of COP15 in 2009 and other international commitments, including the Government's Globalisation Strategy (*Fremgang, Fornyelse og tryghed*) and emphasised the links with global development, including agricultural trade. It also stipulated the need for establishing Nature Plans (Naturplaner) as part of the Natura 2000 EU Habitat Directive (MIM, 2007a). - The first SSD was based on the outputs from the Wilhjelmsudvalget (*Wilhjelmudvalget*), a working group established by the previous Government with 35 representatives from agro-food sector, public authorities, civil society etc. The Committee established a sub-working group on agriculture and the final report was delivered to the Government in 2001 (Wilhjelmudvalget, 2001a).

The Habitats Directive and the Water Framework Directive are jointly implemented under the Environmental Goals Law (*Miljømålsloven*) which is aimed to enable a synergetic effect between the development of Natura 2000 plans and Water Basin Management Plans (WBMPs). However, owing to the legacy of the aquatic action plans, in relation to agriculture, the implementation of the WFD appears to be receiving relatively greater attention currently. The Environmental Goals Law, passed in Parliament 2003, divided in 2007 the country in four Water Districts, for which a District Water Management Plans (*Vandplan*) is being prepared by the seven decentralised centers of MIM by the end of 2009 for implementation until 2015 by the municipalities through Municipal Action Plans (*kommunale handleplaner*). The Municipal Action Plans must be launched one year after the presentation of the District Water Management Plans. Background analyses informing the WMPs were concluded in 2005 and 2006 by the Counties (the old administrative level, see section 4), assisted by the Forest and Nature Agency (SNS, 2005). Regions, Municipalities, and interest groups were invited into the planning process through an 'Ideas Phase' lasting through the second half of 2007 (MIM and Counties, 2007). This phase saw the submission of 2500 contributions from the civil society and private sectors, of these more than 1000 were from environmental interest groups and 36 from agro-business representatives (MIM, 2008).

The responses from the pre-hearing on WBMPs have now been submitted to the decentralised centers of MIM. The pre-hearing of the proposed plans was initiated 14 January 2010 where all state and regional agencies and municipalities (five ministries and their agencies, KL and DR, and 22 interest groups and research institutions) received the material for 23 WMPs and 246 Natura-2000 plans, including draft acts and regulations<sup>15</sup>. The subsequent public hearing will last half a year and the revisions made by Agency for Spatial and Environmental Planning (BLST). The first Natura 2000 draft plans were in public review in 2008, and the hearing for Natura 2000 plans is simultaneous with WMPs. When BLST has finalized the plans after the public hearing, municipalities will have one year to develop and approve local action plans (also MIM, 2007b; MIM and Counties, 2007).

In parallel with the preparing of the WBMPs is the development of management plans for groundwater under the consolidated act 1028 of 20 October 2008 (*Lov om vandsektorens organisering og økonomiske forhold*). The mapping of groundwater resources was initially scheduled for completion by 2009 but has now been extended to 2014. Intensive work is ongoing to decide on the legal aspects of public corporations, with a resulting delay of establishing the environmental measures. A technology development fund and environmental steering system is expected to be financed by the tax on drinking water (Danva, 2010).

### **Agro-environmental measures under the Rural Development Program**

The European Rural Development (RD) Directive (1698/2005EC) has been translated into the national Law on Rural Development (*Landdistriktsloven*), passed by Parliament in 2007. Sanctioned by this legislation, the Rural Development Strategy was revised in 2009 following the amendments at EU level during the CAP Health Check, including additional funds from compulsory modulation and EU's crises support package (FVM, 2009a). The RD Program 2006-2009 was formed on the basis of a series of public hearings and debates with interest groups, but the 2009 revision mainly guided by the CAP Health Check and compulsory modulation and the Green Growth Strategy. Axes 3 and 4 were not reformed (FVM, 2009b) (see table 5 for the current allocation between axes).

Economic incentives in the aquatic and agricultural action plans under Green Growth are part-funded through the agro-environmental subsidies under the RD Program. The aquatic action plans APAE I and II were fully funded from national sources, but APAE III received EU co-financing from the RD Program. The payments were handled under the agro-environmental schemes (*Miljøvenlige jordbrugsforanstaltninger*) until 2008 (GoD, 2004). The recent 2003 revision of CAP and the Health Check, which was completed 2008, has provided further options for funding the payment measures under the action plans, and in 2007, the government aimed to devote 75 % of the funding to nature and environmental initiatives (GoD, 2007). The RD Program is now expected to co-finance the implementation of the WFD via the WBMPs, embedded in the revision of the national RD Program in 2009 (FVM, 2009c).

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<sup>15</sup> <http://www.blst.dk/Hoering/vandogaurplaner.htm>

**Table 5. Funding allocation in the Danish RD Program 2007-2013.** Source: FVM, 2009c.

%	Total public expenditures	EU financing
Axis 1	21	20
Axis 2	63	65
Axis 3	6	5
Axis 4	10	10
<b>Total</b>	<u>100</u>	<u>100</u>

## 4. Actors and responsibilities

This section undertakes a synthesis of the roles and responsibilities of implementing actors in the public, private and civil society sectors. In so doing, it takes a broad view on implementation as comprising the joint responsibility of all three sectors. The section concludes with a discussion of the procedures for setting of targets and selection of measures, as this forms a background against which to understand the challenges identified by the implementing actors in section 5.

### The public sector

Danish ministries are organised in two divisions, which deal with policy development and management/control, respectively: the Department (*Departement*) and Management (*Forvaltning*). The Management division organises a number of agencies (*Styrelser* and *Direktorater*). Ministry for Food, Agriculture and Fisheries (FVM) was established in 1996, but the first agricultural ministry was established already in 1896. Ministry for Environment was formed in 1971 and eutrophication was one of the main issues on the agenda in the first years of the ministry due to widespread appearance and awareness of ‘ecosystem deaths’ in aquatic systems (Hertel, 2009). Other important ministries include the Ministries of Finance, Economic and Business Affairs, Climate and Energy etc. but their responsibilities, whilst in many cases very central to agro-environmental concerns, will not be discussed specifically here (see a brief outline of the agencies under MIM and FVM in tables 6 and 7).

In general, one piece of legislation is owned by one ministry to ensure clarity in operations, however the implementing responsibility can be delegated to authorities who form part of other ministries. This requires a high degree of coordination between agencies and ministries which typically is enabled via official working groups and committees on relevant subject matters, as well as informal daily communication between civil servants. Most legislation grants the respective minister the privilege to establish an inter-ministerial guiding committee. For instance, for the Law of Rural Development a national Monitoring Commission has been established with representatives from a number of public authorities and interest groups. Another example of inter-ministerial collaboration is the response to the Baltic Sea Action Plan (BSAP). The implementation is owned by Ministry of Environment with BLST as lead agency and responsible for HELCOM questions. Inputs from the Ministry of Food, Agriculture and Fisheries are coordinated from the Office for Sustainability and Agriculture/Environment, with liaising also from the Office of Fisheries Policy. For the statutory orders regarding livestock, the overall responsibility for implementation lies with the Environmental Protection Agency (MST) under the Ministry of Environment, whilst action plans are monitored and implemented jointly by FVM and MIM.

It is frequently described how there is a close dialogue between Departments and agencies. In a double sense, this means that agencies have a great deal of ownership in sectoral policies, and that there often is a very direct involvement of the political electives in larger questions pertaining to day to day administration. Involvement of agency staff in policy formulation is also dependent on personal interest and engagement. The institutional changes under the Green Growth Strategy have shifted some funding allocation between agencies and research organisations.

**Tables 6 and 7: Implementing agencies under Ministry of Food, Agriculture and Fisheries and Ministry of Environment.** Source: Reproduced from agency websites and information from consultations and literature. A few examples of specific responsibilities are provided to illustrate key roles.

Ministry of Food, Agriculture and Fisheries	
<b>Danish Veterinary and Food Administration</b>	<ul style="list-style-type: none"> <li>Regulations and control in the areas of veterinary health and food safety (incl. export and import of live animals and non-food products within the EU and in third countries) (FVS, 2009)</li> </ul>
<b>Danish Plant Directorate</b>	<ul style="list-style-type: none"> <li>Crop production, vegetables in the agro-food chain and control and monitoring of most EU subsidy schemes, including area related subsidies, green budgets, labelling of cattle, planting, dry fodder, and grain.</li> <li>In the new strategy 2008-2011 the directorate has been given increased mandate to support environmental sustainability in a decentralised administration (e.g. PDIR, 2008).</li> <li>Exercises controls of the livestock system based on Control Instructions, through its six sub-national districts (incl. sampling at farm level)</li> </ul>
<b>Danish Food Industry Agency</b>	<ul style="list-style-type: none"> <li>Responsible for responding to the economic interests of the agricultural sector.</li> <li>Manages the payments under the RD Program (other agencies monitor technical content)</li> </ul>
<b>Danish Directorate of Fisheries</b>	<ul style="list-style-type: none"> <li>Administration, regulation, monitoring and inspection of fisheries activities in Denmark. Works for an appropriate use of the fish resources, including inspections and hygiene and sanitary conditions in order to safeguard the consumers against food products that do not comply with set quality standards.</li> </ul>

Ministry of Environment	
<b>The Forest and Nature Agency</b>	<ul style="list-style-type: none"> <li>Ensures opportunities for nature recreation, and to develop, establish and restore nature and to undertake practical management measures for wild flora and fauna. 19 decentralised units.</li> <li>Implements nature management regulations under the Nature Protection Act</li> </ul>
<b>The Environmental Protection Agency</b>	<ul style="list-style-type: none"> <li>Contributes to setting targets and preparing strategies and action plans as the basis for government work. Includes strategies for waste, environmental factors and health, and action plans on chemicals and eco-technology.</li> <li>Responsible for implementation of the EC Nitrate Directive.</li> <li>Oversees the livestock regulations (except monitoring)</li> </ul>

<b>The Agency for Spatial and Environmental Planning</b>	<ul style="list-style-type: none"> <li>• Manages the interest of the state in relation to nature, water, environment, and planning and supports the municipal implementation for nature protection, water management and municipal planning. Seven decentralized centers.</li> <li>• Supervising responsibility for the Nature Protection Act</li> </ul>
<b>The National Survey and Cadastre</b>	<ul style="list-style-type: none"> <li>• Prepares maps and geo-data for the public sector, private sector and citizens.</li> </ul>

### Sub-national responsibilities: Municipalities and Regions

The nationwide Public Sector Reform was implemented in 2007 after a policy negotiation and formulation process starting in 2002 and resulted in 98 municipalities and five regions. The Structural Reform Policy, agreed between the Danish Government and Dansk Folkeparti, replaced the agreement from 1970 and aimed to maintain and improve the democratic procedures in the public sector, including a significant devolution of responsibilities to municipality level (SUM, 2007; VFM and FVM, 2009). Prior to the reform, the counties played a key role in implementing agro-environmental measures, part-financed by the state budget (Wilhelmudvalget, 2001b). During the reform, Local Government Denmark (KL), the national interest organization for municipalities, has been working to enable municipalities to use the reform as an opportunity to engage in the national water and nature planning to ensure that national goals correspond to municipality realities (KL, 2007). The reform process placed the dominant responsibility for implementing agro-environmental measures with the municipality administration. However, management actions are frequently characterised by the involvement of multiple public authorities as well as non-government stakeholders. The centralised government system in Denmark means that, despite the public structural reform, for the WFD implementation, municipalities remain ‘project owners’ with an independent fiscal system and are not officially part of the administration. The Municipal Plans comprise a central coordinating instrument across sectors in the identification of potential wind farm plots and support of demonstration projects to purchase policy for municipal consumption, environmental campaigns etc. It is expected to balance different local interests and is established every fourth year when a new committee is formed after election. However, amendments in the plan can be made during the interim period as well. KL safeguards the interests of the municipalities at national level and is currently preparing guidance for municipalities in the upcoming development of Municipal Action Plans (*Kommunale Handlingsplaner*) once the WBPMs have been approved. Already, Municipal Contact Councils (*Kommune Kontaktråd*) have been established as voluntary platforms between some municipalities to address transboundary issues, including those which match the Region’s sphere of interest.

The reform also established the Regional Development Plan (*Regional Udviklingsplan*, RDP) as a new central planning tool, including the Enterprise Development Strategies (*Erhvervsudviklingsstrategi*). The RDP is a tool under the government’s Globalisation Strategy in response to the Lisbon Strategy 2020 and guides the national allocation of public and EU co-financing received under EU’s structural development funds (Regional Development Fund and Social Fund) in the areas of recreational use of nature, climate and energy priorities, including green technologies and biofuels. The plans contain a business strategy, a sustainable development strategy, and an employment strategy and strives to arrive at common prioritisations in which growth and employment has to be integral to all activities, but with synergies to other areas such as environmental sustainability. The plans are approved by

Regional Councils composed of elected political representatives. The first set of RDPs was approved in 2008, often building on the strategies developed by the Regional Growth Fora, which are multistakeholder platforms for regional interest groups. The Growth Fora are mandated to support developments in marginal areas, and food initiatives broadly support the agro-food sector and convene representatives from region, municipalities, private sector, labour unions and employer organisations, and research institutions to prioritise enterprise development and allocation of national and EU structural funds (KL, 2005; DR, 2008). The RDPs represent strategies rather than concrete action plans. However, the current plans are the first generation and it is suggested that clearer commitments and responsibilities may be incorporated in the next generation when routines have been formed for how to use this planning tool. It was also expected that the RDPs would inform the National Planning Process (*Landsplanredegørelse*) for 2009, led by BLST, which is presented from the government as a novel initiative to promote sustainable development and include regions and municipalities in national steering of sub-national development (MIM, 2009). Already, growth fora have taken a number of initiatives to support the development of green technologies, including energy saving and promoting the understanding of climate impacts on groundwater (DR, 2009a).

### Research and monitoring

The evaluation of progress in the implementation of aquatic actions plans and the relative success of the instruments employed are based on an estimation of the impact on the N-balance. This is calculated as the difference between imported mineral fertiliser and fodder, deposition, and N-fixation; and the sale of agricultural products. It also includes modelled nitrogen leaching from the root zone using three different model calculations where input data are based on registered data for land use (GLR register), fertiliser use (fertiliser accounts from the Plant Directorate), and on statistical data from Statistics Denmark (Grant and Waagepetersen, 2003). Four national indicators have been defined for these measurements: nitrogen discharges from point sources, nutrient surplus in agriculture, nitrogen leaching from agricultural land and nitrogen concentrations and loads in surface waters.

The national monitoring of nature and environment was implemented 2004-2009 under the NOVANA programme (*Det Nationale Program for Overvågning af Vand miljøet og Naturen*), including the identification of pollution sources and effects of action plans. NOVANA has been led by DMU and implemented in collaboration with Geological Survey of Denmark and Greenland (GEUS), the Forest and Nature Agency (SNS), MST and regional authorities (DMU, 2004). Monitoring results are reported to national parliamentarians and further to the EU and international conventions, staff involved in implementation of environmental legislation, and to NGOs and wider interest groups (DMU, 2006a). In addition, DEVANO (Decentral Vand- og Naturovervågning) is a decentralised monitoring system implemented under the Environmental Goals Law by the sub-national centers of MIM, assessing the environment status of lakes, streams, coastal waters, ground water, and terrestrial habitats (Bijl et al., 2009). The programs monitor progress measured against the quantitative targets for N, P, pesticides and heavy metals (DMU, 2006a). Measurements are conducted in selected localities and extrapolations enable estimates for the national and catchment/basin scale. The monitoring programs have been continuously revised as the interpretation of the monitoring obligations change over time (DMU, 2004), and a new monitoring system is being implemented in 2010, to replace NOVANA and DEVANA, with improved

technologies<sup>16</sup>. Amongst other major research programmes, previously, the programme Sea90 (*Hav90*) was funded for 5 yrs 1988-1992 with 85 MDKK under APAE I of 1987 to assess the effects of the first water management plan, particularly on nitrogen and phosphorous leaching (MIM, 1994). The ACDEP model developed during the programme was in the subsequent decade extensively applied to modelling assessments also in other European countries to estimate the atmospheric nitrogen deposition to the Baltic Sea (Hertel, 2009).

2007 also saw the implementation of the government decision to integrate sector research institutions with universities. The aim of the research reform was to strengthen Danish research and tertiary education, improve the capacity of universities to engage in collaboration with private sector and innovation, increase the attraction of international competence, and to improve the provision of services to public authorities. Danish Agricultural Research, the then sector research institutions (including for instance the National Environmental Research Institute (DMU), and other agricultural research laboratories), was integrated into Aarhus University (AaU). The agreement between FVM and AaU include a specific support to the implementation of APAE III, the WFD, the Pesticide Action Plan, and the Green Growth Strategies (FVM and AaU, 2008). The support from research institutes (*myndighedsbetjening*) is generally undertaken when ministries or agencies request specific services, and TORs are negotiated in dialogue with the relevant research institute. The Law on Innovation (*Innovationsloven*) was passed in 2005 to improve the link between the agro-food sector and Danish research. In 2006 140 projects were funded with 134 MDKK corresponding to 40 % of the total allocated budget (FVE, 2008).

## The private sector

Most of Denmark's farmers are members of a local agricultural association and purchase advisory support from one or several farm advisory services. One estimate suggests that the advisory system supports over 80 % of the farmers (Mikkelsen et al., 2007). The largest service provider is Danish Agricultural Advisory Service (*Dansk Landbrugsrådgivning*, DAAS), which is owned by the farmer organizations comprising 90 % of Danish farmers. DAAS consists of a national center (*Landscentret*) and 40 local advisory centers, a total of 3500 employees. The aim is to find environmentally sustainable solutions in intensive agriculture, often in collaboration with public agencies, e.g. through joint visits to farms, and always with a local anchoring through demonstrations or case studies. DAAS also advises public agencies on implementation of policies, drawing on the insights from in-depth projects in localities, and much emphasis is on the interaction with municipalities, which are main implementing actors. Also more specialized organizations provide advisory services, for instance the National Association for Organic Farming (*Økologisk Landsforening*), which organises producers, consumers and industry in a joint interest group.

The most recent large scale reorganisation in Danish agriculture took place in 2009, when the largest interest organisations in the private agro-food sector combined forces and formed the Agriculture and Food Council (*Landbrug og Fødevarer*, LF). The fusion includes Danish Agriculture (*Dansk Landbrug*), Danish Bacon and Meat Council (*Danske Slagterier*), Danish Agricultural Council (*Landbrugsraadet*), Danish Dairy Board (*Mejeriforeningen*) and Danish Pig Production (*Dansk Svineproduktion*). This combined interest organisation aims to exert influence on political decisions for the benefit of the agro-food industry and improve the services to members through more cost-

<sup>16</sup> [http://www.blst.dk/Overvaagning/Revision\\_overvaagning/](http://www.blst.dk/Overvaagning/Revision_overvaagning/)

efficient administration<sup>17</sup>. The 40 sub-national organizations of LF are currently coordinating 'regional groups' to provide shared inputs to the WBMP process.

The agro-food sector points to the increasing power of consumer choices in directing the development of the agricultural trade (*detailhandel*). Recently, this includes an increasing popularity of discount super markets, catering and restaurant business and preferences of cheaper imported products over domestic quality produce (Landbrugsrådet, 2006). In this regard, the sector highlights that the international markets will increasingly play a more decisive role than domestic public policy in determining the developments of Danish agriculture. Public-private partnerships and privatisation of public services in food provision has been put forward as a strategic steering instrument (Landbrugsrådet, 2007a). It is argued that Danish competitive advantage is threatened when environmental standards marginalise domestic producers and industry compared to those of developing countries (Landbrugsrådet, 2007b). However, in 2006 the agricultural export increased with 10 % from 2005 to 61,7 MDKK while the import reached 24,6 MDKK. The export was directed towards EU and Russia and the import mainly from the European market (Landbrugsrådet, 2007c).

Over and above the strictly agricultural sector businesses, consultancy companies in wider sense play an important role in the support to policy implementation, including for instance environmental impact assessments, development of actions plans etc. The financial sector, including banks and credit lenders, also play a central role in determining the management of the debts of many farms.

**Box 1: Brief history of the agricultural movement.** Source: LOK, 2005

The private agro-food sector has over the past decades undergone significant changes, many of which reflect an attempt to reconcile the ideological heritage from the cooperative (*andelsforeninger*) movement with the market based demands. The current landscape of agricultural organisations bears the imprint from the agricultural reforms (*landboreformerne*) in the 1700s which released peasants from feudal bonds (*hoveri og stavnsbånd*) and established private ownership of land. The 1915 Constitution sanctioned the right of association and the first cooperatives were formed in the 1880s. The struggle between agricultural labourers and the nobility was manifest in the institution of the two first political parties, Left (*Venstre*) and Right (*Højre*). Through the subsequent introduction of parliamentary democracy also the new proletarian labour forces achieved representation with the Social Democratic Party (*Socialdemokratiet*), whereas the world wars and the accession to the EU in 1973 motivated widespread reforms of the forms of collaboration between agricultural organisations. Today, the main forms of organisation distinguished are cooperatives, branch organisations, rural economic organisations (*landøkonomiske organisationer*), and producer and specialised associations (*producent- og specialforeninger*).

## The civil society sector

Denmark is commonly known for a relatively high degree of association in the civil society sector and environmental NGOs play a number of different roles in the implementation of agro-environmental

<sup>17</sup> [http://www.lf.dk/Om\\_os.aspx](http://www.lf.dk/Om_os.aspx)

targets. The main tasks surfaced in this study include organising environmental management activities, monitoring and control of measures, advisory functions to decision makers in public sector agencies and ministries, and drafting of strategies as inputs to policy making (see e.g. the strategies presented in DN, 2009 and Ecocouncil, 2009). Such visions can also serve as guidelines for national and local efforts within organizations and their networks, particularly those with extensive membership structures.

The monitoring functions are frequently implemented through field observations and filing of legal complaints to the authorities (*klagenævn*) (e.g. *Naturklagenævn*, and *Miljøklagenævn*). In the 2007 Instruction, the Government stipulated the intention to merge the two complaints councils in order to create a more effective and modern system (GoD, 2007). For higher level cases, the Ombudsman (*Folketingets Ombudsmand*) is appointed by Parliament and is responsible for monitoring and keeping accountable authorities and state, regional and municipal levels, for instance regarding the treatment of cases and citizens by authorities.

Further, as other interest groups, NGOs seek to influence political decisions through lobbying and issuing of statements through the media. However, it is experienced by some organizations that the interest from Members of Parliament depends greatly on their respective political affiliations. Organizations can be registered as official Hearing Partners, just as private sector interest groups, to give comments in advance of decisions on new measure. This is a way to enhance the inclusion of perspectives early in the process to seek to avoid stall-mates between interest groups later in the implementation process. Larger NGOs can serve as umbrella organizations for smaller organizations, and coordinate their inputs to national processes. Several environmental NGOs are organised in the regional network coordinated by European Environment Bureau (EEB), who has last year put forward a vision statement post-2013 for the Common Agricultural Policy (CAP) (Birdlife International et al., 2009). NGOs also lead the implementation of agro-environmental projects in other riparian states, funded by Danish public funds, e.g. with emphasis on capacity building, nature conservation, labour rights, public health and/or organic farming.

Under the RD Program, 55 local action groups have been formed to carry out the continuation of the LEADER+ programme. The Local Action Groups, which sometimes are trans-municipal also in order to match decision making at regional level, are under the RD Program responsible for implementation of local action plans (IFUL and USD, 2008).

## Procedures for setting of targets and selection of measures

### Deliberation on targets and measures

Actors generally acknowledge that the setting of targets and implementation of measures best can be conceived as a trial and error process, where some plans may not reach targets, and a number of uncertainties beyond the control of the actors influence the success of chosen measures. Consequently, a number of meeting fora and regular communication mechanisms exist to deliberate on targets and negotiate implementing measures (some examples are listed in table 8).

**Table 8: Examples of mechanisms intended for actors and other stakeholders to engage in the setting of targets and selection of measures.** Source: Synthesis from websites, documents, and consultations.

Mechanism	Content/Procedure
<b>The Organic Council</b> ( <i>Økologisk Råd</i> )	Body established under FVE, board with representatives from organizations in private and civil society sectors, which can contribute to defining research priorities. Also the national organic label (state regulation) is adapted when required, e.g. regarding the requirements on character of feed for animals.
<b>Environmental Economic Council</b> ( <i>Miljøøkonomisk Råd</i> )	The Economic Council, a national advisory function, consists of two councils, of which one is focusing on environmental economics. The council is led by four economists and consists of 20 members, appointed by the minister of finance. An annual report is prepared under leadership of the chairmen, and the members provide comments on an annual meeting.
<b>Analysis Group on Sewage Water</b> ( <i>Spildevandsgruppen</i> )	In the implementation of the Water Sector Law, an analysis group has been formed to examine what constitutes acceptable costs for houses which need to install sewage treatment.
<b>National Green Growth Forum</b>	Forum with representatives from key organizations in different sectors, located under the State Ministry.
<b>Enquiry process on Danish Agriculture 2020</b> ( <i>Dansk Landbrug 2022</i> )	Launched by FVM in 2008 where stakeholders until autumn 2009 could comment on the visions prepared by the Government. The aim is to decide how Danish agriculture can retain its competitive advantage and dynamic private sector whilst promoting climate, nature and environmental measures. An advisory group (“Følgegruppe”) has been established with representatives from different sectors <sup>18</sup> . No public outcome yet.
<b>The Climate Commission</b>	National expert group which will next year present the report suggesting how Denmark can be completely independent of fossil fuels (GoD, 2008).
<b>Nature Management Committee</b> ( <i>Naturforvaltningsudvalget</i> )	Composed of representatives from interest groups to advise SNS in preparing of project proposals when the sum exceeds 3 M DKK (SNS, 1999).
<b>Advisory Committees under FVM</b>	On topics such as Simplification of Land Management Legislation (Udvalget vdr. forenklinger i jordlovgivningen), Private Sector Contact Group (Erhvervskontaktgruppen) responsible for advising the authority on the interests of the agro-food sector, the Rural Development Group (Udvalget for et Levende Land – Landdistriktsudvalget) <sup>19</sup> .
<b>The ‘14-Day Committee’</b>	Temporary meeting platform for MIM, KL, LF, and green organizations to negotiate the Law on Livestock Holdings
<b>Committee on Policy Instruments</b> ( <i>Virkemiddeludvalget</i> )	Drew on the outputs from the enquiries of 2005 where a previous inter-ministerial committee had been established by the Government to assess the options for a long-term strategy for improved water conditions (“Langsigtet indsats for bedre vandmiljø”) (DMU, 2006b). One of the chief outputs from this work was an analysis of cost-efficient policy instruments for phosphorous and nitrogen reduction (DMU et al., 2009).
<b>Workshops and Committees on Green Growth</b>	FVM convened the first workshop on Green Growth in June 2009, and the GUDP (“Programme for Green Development and Demonstrations Programme”) Steering Committee now replaces the Innovation

<sup>18</sup> [http://www.fvm.dk/Dansk\\_Landbrug\\_2022.aspx?ID=24981](http://www.fvm.dk/Dansk_Landbrug_2022.aspx?ID=24981)

<sup>19</sup> [http://ferv.fvm.dk/Råd\\_og\\_udvalg.aspx?ID=4468](http://ferv.fvm.dk/Råd_og_udvalg.aspx?ID=4468)

	Committee (Innovationsudvalget) and the Advisory Committee for Food Research (Det Rådgivende Udvalg for Fødevarerforskning (RUFF)). The Programme distributes research funds.
<b>Contact Committee under PDIR</b>	Committee established with representatives from PDIR, farmer organizations and experts, which review lessons from the implementation of regulations, including the Law on Manure, Livestock Holdings, and N budgets and accounts. Meets several times per year.
<b>Green Contact Committee (Grønne Kontakt Udvalg)</b>	Forum for green NGOs to coordinate, share information, and at times launch joint activities and actions

### Estimating cost-efficiency of measures

Implementing measures are generally compared and selected based on their estimated cost-efficiency. The relative cost-efficiency of policy instruments is typically estimated through the use of cost-benefit analysis, which quantifies the consequences of a measure in monetary units to assess the net present value of costs and benefits. The can aim to incorporate market as well as non-market costs and benefits and can include 1) the expenses incurred under agricultural production, 2) the income incurred from production, and 3) the change in property value and land rent (ØR, 2010). Under the transposition and implementation of the WFD, the effect is primarily measured against the targets of reducing N and P loss (agro-environmental instruments) or specific toxins or pesticides. The calculations are based on known potentials for each policy instrument, but with a partial deduction for voluntary measures (including those under the direct payments scheme) as full impact cannot be expected (BLST, 2010). The development of WBMPs drew on the outcomes from the previously established Committee on Policy Instrument (*Virkemiddeludvalget*). The Committee evaluated measures against their intervention in the agricultural impact on water bodies (DMU et al., 2009). However, for the many instruments which were not analysed by this Committee, the 2006 data from the MST registry was used, in conjunction with expert judgements by BLST (MST, 2006).

For the implementation of the RD Program, a new effect-based steering system is being developed for evaluation of the respective regulations and measures supported under the Program. This includes a monitoring through national and EU determined indicators (incl. effect, result, and output indicators). This effort also aims to develop a goal hierarchy for each measure, including a change theory, which requires a detailed understanding of the expected outputs and the probability to achieve expected outputs. This is considered as a more academic approach and there is a need for a comprehensive data and IT management system to share and process knowledge between sectors.

## 5. Challenges through the eyes of eyes of implementing actors

This section spells out the key challenges identified through the consultations. The challenges are presented as they are seen by (i.e. 'through eyes of') the implementing actors. The text thus represents a synthesis of inputs from those consulted, presented in a narrative form organised by the author, and an effort has been made to cordially present the views as they were shared. The arguments below thus do not necessarily represent those of the author or of SEI as WP6 coordinator. It is acknowledged that the picture presented on specific challenges reflects who was consulted and in many cases a large number of other actors, and stakeholders in general, will be able to provide further information and clarifications.

### Track record: Delays in reaching set targets

National agro-environmental targets are by most actors considered rather ambitious compared to other riparian states and it is often appreciated that significant reductions have taken place over the past decades. However, it is a cause of concern from many actors that the recent history has shown a delay in reaching agreed targets in politically endorsed action plans (see also table 2). The reduction targets for N and P of the first APAE and the Action Plan for Sustainable Agriculture were not reached by the end of the implementation period, and the second APAE was thus aimed at securing that the original 1987 targets were reached by 2003. This target was approximately reached by 2003, partly through a reduction in the import of mineral fertiliser from 406,000 to 206,000 tons N per year (Grant and Waagepetersen, 2003). However, whilst the 25 % reduction target for P by 2009 was reached within APAE III, the reduction in N leaching from the agricultural sector seen under APAE II has ceased and has stagnated under APAE III (Waagepetersen et al, 2008). Targets set for oxygen levels in marine areas, especially coastal waters and estuaries, had by 2003 over several years not been met (Grant and Waagepetersen, 2003).

The WFD implementation in general is criticised for a significant delay compared to the expected time line, who expect that the public hearing of the WBMPs will not start before September 2010. There has also recently been a rising political awareness regarding the divergence observed between targets formulated in the Pesticide Action Plan 2004-2009 and the actual progress (Thomsen, 2009). However, despite any delays the progress made under previous action plans is expected to ensure that Denmark is on track in meeting the present agro-environmental targets for the BSAP.

Owing to past experiences, there is a wide appreciation that the instruments applied during the first aquatic action plans were insufficient (see also Mikkelsen et al., 2007). Amongst many actors a dissatisfaction exist with the so-called voluntary measures (including those with direct payments) due to a lacking rate of implementation. For instance, under the APAE III, the financial compensation scheme for establishments of buffer strips had very poor buy-in from farmers and only 700 ha buffer strips were established and the overall coverage even declined (Waagepetersen et al., 2008). This is leading to a low confidence from actors in new proposed measures which rely on voluntary agreements, and there is a mounting pressure to provide scientific documentation for the efficiency of new measures. This is by some actors seen to inhibit experimenting and innovation. For the livestock legislation and the Habitats Directive as well as the CBD, several actors experience a lack of capacity to conduct the required controls of farms and nature reserves. Further, under the previous APAEs, the N norm system (see Table 2) meant that removal of land from agricultural activity did not have an impact on the aggregate use of fertilizer as farmer could increase N load on remaining areas

as the ceiling amount remained decoupled from the agricultural area. On the contrary, the abolishment of the fallow programme, which meant that 83,000 ha previously fallow areas were brought back into production, led to a lower application of N on the now larger land area (Waagepetersen et al, 2008). A new rule under the Green Growth Plan has now been implemented, which ensures that when the agricultural area is reduced, the national ceiling is reduced accordingly. Further, a special problem of manpower and resources exists at municipal level, where the responsibility now lies to process permits and monitoring of livestock farms.

### Disconnect between policy processes

One particular challenge recurrently highlighted is that of ensuring national coherence between different bundles of policy processes, avoiding goal conflicts, and promoting general value adding between policies. One example is the sense of disconnect between the WFD and Nitrates Directive implementation. For instance, some riparians are seen to argue that the implementation of the Nitrates Directive implies a complete implementation also of the WFD, whilst Denmark has interpreted the WFD requirements in a way which adds significant new obligations. This also reflects that riparians have responded very differently to the Nitrates Directive – in Denmark the whole country is classified as nitrate vulnerable, whilst in other countries, for reasons unknown to Danish actors, very little of the land area is included under the Directive as vulnerable zones. Another example includes the link between terrestrial policy initiatives and how these contribute in satisfying marine requirements. The Marine Strategy Framework Directive (MSFWD) is by some actors considered only to cover objectives related to the sea, thus with no clear link to the WFD and/or the Nitrates Directive. Similarly, the management of state forest and nature reserves is rarely seen as directly linked to diffuse pollution as these areas are managed by the state and not in agricultural use. Forestry in general comprises a different sector to agriculture, covered by a different set of targets and legislation. Yet, periurban reforestation is in the last decade experiencing rising interest from municipalities and water boards, who are financing of reforestation to protect groundwater (see also KL, 2008a). Also, the interaction between the Single Farm Payment (SFP) scheme and agro-environmental measures under the Law on Rural Development and the national RD Program is by some seen to reflect a contradiction between indiscriminately paying farmers to pollute with the one hand and yet seeking to punish them for it with the other. Whilst the area subsidy is now largely decoupled, it still benefits certain forms of intensive agriculture because of the sheer size of these farms compared to other forms of production. SFP is considered to provide such an overriding influence that smaller and more targeted forms of incentives and schemes are frequently rendered impotent. Other suggest that a limited funding to axes 1 and 3 disables integration between longer term priorities regarding development of the food sector and environmental technology and innovation. This implies that the objectives of a strict control with manure, which affects the organizing of feeding and stables for livestock, is not always in harmony with the expectations on animal welfare.

Questions were also by some actors raised regarding the link between the specific ecological sustainability targets under agro-environmental policies and the implementation of Danish legislation on work environment and EC Directives which more explicitly consider aspects of social sustainability, incl. the Directive on temporary agency work (Directive 2008/104/EC of 19 November 2008), the Service Directive (Directive 2006/123/EC of 12 December 2006 on services in the internal market), and the Directive on posted workers (Directive 96/71/EC of 16 December 1996 concerning

the posting of workers in the framework of the provision of services). The implementation of agro-environmental targets is here experienced to not adequately incorporate social concerns, which is a crucial parameter to ensure long-term profits as well as a desirable societal development. It is deemed beneficial for the public finances to attract more international labour into the work force (AMK, 2009), but it is a concern that lacking transparency in the migration of labour within the EU has implications for food hygiene and the meeting of health standards. It is experienced as hard to enforce the Danish regulation on the basic training of food workers, when interns from a second country are recruited via a bureau in a third country to work temporarily for a Danish company. It is argued that the environmental and labour regulations are contributors to the relocation of food processing businesses to other countries (including Germany and Poland), where the regulations are fewer. This leads to problems known under the label 'social dumping', where temporary workers are employed with low pay and few rights and without the rights to organize themselves in unions. Due to the mobility of products and goods this is a particular concern for industry and processing, while primary production remains more attached to the land. However, the use of temporary foreign workers is argued to be increasing on Danish farms, particularly when farm sizes are increasing. There is no minimum wage in Denmark as salaries are fixed through the annual negotiations between employers and labour unions, and this leaves loop-holes for setting salaries for temporary migrants and raises questions regarding discrimination. This movement of labour also has consequences for the country which loses labour as it often is the most industrious people who leave. Further, in Denmark, the labour movement has pointed to a rising inequality in Danish society in recent years, in which agricultural workers is one of the major groups represented in what is termed 'lower middleclass' (AE, 2009) (see also the concerns regarding the structural development and loss of jobs in section 4).

### Estimating costs and benefits

As previous government strategies, the Green Growth Strategy relies on science based and economically rational cost-efficiency analyses as a central means of comparing and selecting the most desirable measures for a given target (e.g. Jensen et al., 2009). However, many actors argue how a wide variety of approaches exist to conduct these calculations, often with widely different assumptions regarding the value of natural resources, which will yield different scoring of measures. It is suggested that it is important to address these technical procedures and their assumptions, but the debate between stakeholders too often is simply on the final calculation results, whilst not addressing that most estimation methods have different ways to treat the uncertainties. For instance, it was noted that the discussion regarding the RBMPs so far has been mainly on the targets and not on the underlying analyses which the public agencies presented. The critique from municipalities and farmer organisations during the technical hearings are now leading to a revision of RBMPs, where one of the major points of criticism is the lack of cost-benefit analysis at catchment level. This, others argue, is an impossible task given existing data and methods.

### Synergies through multi-dimensional analysis

It is argued that if the search is for synergies between sectors it makes little sense to evaluate measures in relation to only one parameter such as N reduction, but that cost-efficiency models rarely acknowledge these multiple benefits and only measure efficiency based on one parameter. The suggested pitfalls include discounting measures such as nature reconstruction, which deliver a range of benefits to various targets and policies, including reduction of pesticides, N and P,

biodiversity, and recreation; and organic agriculture, which is seen to offer a whole 'package' of benefits, which includes changed consumption patterns (matching seasonality, reduced meat consumption) biodiversity improvements, etc. (see also DN, 2009). For the development of biogas plants, the benefits to factor in can include nutrient efficiency, biodiversity objectives, employment, rural development etc.

The effectiveness of instruments under APAE II was calculated solely on the basis of impacts on N leaching (Grant and Waagepetersen, 2003, HC; Mikkelsen et al., 2007). However, the most recent scientific assessments of measure prior to the selection for the RBPMs did include consideration of the effect measures would have under other targets (e.g. Jensen et al., 2009). Today, the values associated with landscape esthetics and recreational use are by some actors seen to be missing from the Green Growth Strategy. Challenges to incorporating recreative use in cost-efficiency analyses has earlier been pointed out and it has been recommended to revise the analysis method to include a broader welfare economic analysis (see also ØR, 2010). One concrete example highlighted is the promotion of willow plantations in river valleys (*ådale*) to meet the renewable energy objectives, however this also changes the landscape and is likely to affect recreation and tourism. Similarly, the recent report from the Environmental Economics Council has been criticized for ignoring the values embedded in salaries, production from employed citizens, and changes in employment conditions. For the RBMPs, one further complication is identified in that relevant statistics are not available at catchment level but are following administrative boundaries. There are also discrepancies between datasets such as the Danish Statistics and fertilizer accounts and monitoring reports from PDIR (Grant and Waagepetersen, 2003). In a recent review of policy instruments under the framework of the European Agricultural Fund for Rural Development 2007-13, Dwyer et al. (2008) similarly point out the problem of 'measure clarity', i.e. the challenge in comparing resource allocations due to divergent perspectives held by different authorities, interest groups etc.

### Uncertainty and assumptions

It is widely acknowledged that selection and evaluation of instruments is associated with high degree of uncertainty as instruments interact in a non-linear fashion and mathematical assumptions reduce the complexity of the ecosystems in question. This is coupled to uncertainties associated with scientific estimates of nutrient discharges, both in terms of the underlying data used and the calculations and formula for estimating the flux of N and P (e.g. Mikkelsen et al., 2007). One chief point of critique of the calculations behind the WBMPs has been the assumptions regarding the relationships between monitoring indicators such as eel grass and secchi depth (water clarity) and N levels. It is argued that the model used is generic for all fiords and does not take into account the different relationships between the variables in different fiords (DHI, 2010). These types of uncertainties is one of the reasons why the current monitoring system is based on calculations of nutrient inputs as this is perceived as more accurate than monitoring of nutrient outputs from fields to the aquatic environment. Predictions of the efficacy of instruments are complicated by the high variability in price levels for agricultural products, which in particular affects livestock production, which is a strong contributor to nutrient leaching. The APAEs have hitherto not incorporated appreciations for future climate changes and evaluations draw on assumptions of permanent climate, based on average figures for previous years (Waagepetersen et al, 2008). Many estimates draw on current data and assume a continuation of current conditions and thus do not factor in the continuously changing environment and agro-industrial market. Further, it is a concern for many actors that several instruments are only qualitatively outlined and do not have quantitative indices

associated with them (see also Wilhjelmudvalget, 2001a). It also matters whether evaluations are made against the costs per ha of arable land or per ton of food. For instance, organic agriculture ranks high as a measure to reduce N consumption only following the prior method.

### Political constraints on actors

It is a central challenge for many actors to translate these technical concerns into an operational administrative system, often shaped by unexpected political dynamics. Some find there is lack of competence in organizations to conduct multi-dimensional (environmental/ecological) economic analyses with conversions between different types of units, others that it is most challenging to ensure that the methods chosen reflect an agreed approach amongst stakeholders. Regarding the latter point, reviews of relevant instruments are often seen to be triggered by political demands on public agencies and processes can be quite chaotic, due to the frequently short deadlines. Whilst ongoing monitoring (such as NOVANA and DEVANO) exist, implementing actors rarely have a detailed and updated database of all evaluations of instruments, and can be forced to respond based on overall impressions (through expert judgments). The lack of accepted models for estimating efficiency of recreation and other less tangible deliverables is seen to result in a biased emphasis on instruments which are uni-dimensional and a lessened financing of the broader instruments which enable synergy effects between sectors. It is experienced that politicians may prefer clear deliverables on single targets as they are easier to communicate to the public and interest groups. Indeed, it is suggested that the procedures associated with the construction of the yearly national Finance Act (*Finansloven*) in effect disqualify multi-functional instruments. It also places a demand on actors in terms of the information to provide in the evaluation of measures, where new ideas must be tested several years in advance in order to have the necessary evidence to judge their relative effectiveness. It is of no use to have great ideas if the scientific evidence is missing. For instance, the use of 'mini-wetlands' (or, constructed wetlands) is currently being tested in pilot areas in a research and demonstration project in order to generate national data (as is the case for Sweden and Ireland). The same is true for many proposed measures for conservation of biodiversity, where there is a general lack of species specific data. Subnationally, municipalities will soon be expected to screen relevant measures in terms of cost-effectiveness and compose the local action plans for the WBMPs, which is expected to require efficient IT based software, which draw on selected cost-benefits analyses.

### Balancing central steering with stakeholder participation

The Green Growth Strategy was prepared through collaboration between sectoral ministries and public agencies and with expert inputs through working groups. However, whilst the inter-sectoral collaboration in the public sector has been commended, many argue that there has been little inclusion of other implementing actors and stakeholders in general (such as municipalities, private sector, farmer organizations, NGOs etc.). For instance, the decentralised centers under MIM are by some seen to be making the catchment plans without involvement of stakeholders. Non-state actors consider that the lacking involvement of sub-national administrations, private sector and civil society reflects a lack of manpower and financial resources in the ministries and respective agencies. Further, public hearing processes are frequently considered very time consuming due to the large number of actors involved (see also NIRAS, 2006). Lack of coordination between public agencies and agricultural advisory services has previously been highlighted as a constraint in implementing Good Agricultural Practices (Noe og Langvad, 2006). It is also suggested that the Ministry of Finance and

Ministry of Economic and Business Affairs, who have been taking a lead in the Green Growth Strategy development, do not have the same experience in dealing with private and civil society agro-environmental actors. However, contrary to previous aquatic action plans which are often considered drafted in a more participatory process, the compulsory requirements in the WFD is now forcing the government to show concrete actions and results. For instance, the EC criticized in 2007 Denmark for lacking compliance with the WFD, including absence of important goals and lacking mechanisms for monitoring (BLST, 2008). Denmark had previously requested exemption from the EU regulations on the 230 kg N/ha content requirement in cattle holdings (DMU, 2003), which was extended in 2008. It is suggested by non-state actors that the EU requirements have spurred a concern in national government to 'get it right' and a more closed process has been chosen, in which the state could provide a frame for Danish implementation. This is by some seen as a contradiction to the general government preference for voluntary measures. However, the increased top-down approach is expected to deliver better and swifter results than previously, partly because a widespread concern exists with the lacking efficacy of voluntary measures. For instance, the specific, quantifiable, state-led requirements for all catchments are assumed to ensure, contrary to previous action plans, that sub-national actors mobilize irrespective of initial interest and capacity. It may also be seen to form a response to the criticism of lacking coordinated leadership from central level (see also Thomsen, 2009).

### **Weakening of trust and partnerships**

It is natural that there are diverging views between those who have the decision making authority and those who wish access to this authority, regarding what comprises the most appropriate form and degree of stakeholder participation in the setting of targets and selection of measures. However, also public agencies raise concern regarding the recent 'heated' discussions with interest groups, in which there has been a significant critique of the government in the media. It is perceived as well known that measures are not effective when there is not sufficient buy in to the respective programmes from farmers and rural groups and that a main problem is that many farmers have not bought into the goals of the public policies. Public agencies appreciate that the implementation of measures in general cannot proceed faster than people are prepared to talk with them. For this reason, several public agencies place high priority on nurturing and building relationships with sub-national administrations in municipalities and regions as well as private and civil society organizations. If the state hits landowners directly with national targets, then measures rarely work. Exclusive policy processes from the state may weaken these relationships and complicate the implementation as there is a reduced willingness to negotiate between interests. For instance, a number of agricultural as well as environmental organisations today feel increasingly frustrated that their inputs are not heard in the Danish policy making and feel urged to a more confrontational strategy towards the government. Further, whilst the Green Growth Strategy is expected funded through the RD Program also post-2013, there is a questioning of the ability of the strategy to inform the Danish inputs to the revision of CAP unless some modifications take place.

### **Technical inputs versus the politically opportune**

Underlying this debate is a set of considerations from actors regarding how decisions are made in the setting of targets and design and selection of measures, i.e. attempts to distinguish between simple 'participation' and having an actual mandate to affect the decision. It is acknowledged that whilst there may be a significant degree of communication and interaction through meetings, conferences, working groups and more informal channels, what matters is whether inputs are heard and if there is

a will to negotiate to identify synergies between different interests. A widespread message was that decisions on the appropriate forms of regulation more frequently owes to political assumptions rather than the knowledge of civil servants and other implementers and clients of the policy. As one person suggested, voluntary schemes can be launched based on political ambitions to show that the government prioritizes a certain question, rather than a substantial knowledge that the new initiative may function. At transnational level, it was similarly suggested that the procedures for deciding when formal court cases are filed on countries for lacking compliance with EU regulations on consequences of lacking compliance contains a significant degree of freedom for executive discretion. Altogether, this points to challenges at the interface between the administrative, technical, factual and substantial level of implementing actors and then the political level of decision makers: The relationship between the politically opportune and administratively/practically possible. At times, this can create some uncertainty regarding when decisions are taken on scientific/technical grounds and when on political grounds. Public agencies may request substantial scientific evidence regarding proposed measures; other ideas may be pushed through by means of successful lobbying.

### State regulation vis-à-vis private ownership

As noted above, the agricultural sector is by far the largest manager of land in Denmark and this raises frequent questions regarding the demands which can be placed by the public and how the public good in that case can be defined. The increasing state regulation of agricultural practices must be reconciled with the underlying principles in Danish legislation where there is a heavy obligation to voluntary measures in respect for private ownership, supported by a broad political base. Shaped by the political history of the agricultural movement, the liberal ideal of free market meets deep rooted values of private ownership and citizen autonomy. This is by several actors seen as a main contributing factor to the predominance of voluntary measures under agro-environmental schemes, reflecting an attempt to strike a balance between state intervention and private control. This might also be why green tax reform is a bone of contention and is not widely accepted by politicians or larger public (FFF, 2009). In general, state regulation is enacted without compensation when the regulation is deemed to refer to the public interest and imposes management requirements which infringe on the rights of private property enshrined in the Constitution, which are of a general and acceptable nature to the land owners (Wilhelmudvalget, 2001b). For instance, in the case of appropriation of land, 100 % buy-in is required from land owners and a project approach is typically used to jointly negotiate the desired outcome as redistribution of land requires full voluntary interest. The strength of private ownership rights is a reason why procedures for transfer of agricultural land to private bodies with the aim of establishing nature reserves currently have been quite complex (FVM, 2003). However, under the RD Program, some public agencies find that there is a lack of tools and mandate as implementation depends on an interest amongst farmers. Yet, some civil society organizations argue that the agricultural organizations find themselves in a dilemma when they on the one hand present themselves as independent market liberalists, and on the other hand expect financial assistance from the government.

### Valuing the 'public good'

The negotiation of what comprises the appropriate balance between state intervention and private control is largely framed by the dominant discourse of cost-efficiency. One case in point is the different views on the relevance of the polluter pays principle, which is currently absent from agricultural legislation and by some is seen to trigger a continuous transfer of resources from other

sectors to agriculture (ØR, 2010). This is seen to reflect an underlying assumption that agro-environmental measures require compensation to farmers, which due to the artificially high land price is a rather costly. Another point of debate is the exemptions for agriculture in the National Planning Law, and what by several actors in public and civil society sectors is considered a biased support in the RD Program to farmers rather than rural enterprise in broader sense. A number of civil society organizations argue that whilst the benefits from export income and employment earlier could legitimate the agricultural 'externalities' on the environment, the environmental impact is now increasingly seen to outweigh these benefits. This is coupled to the claim raised by some civil servants that the discussion on subsidies frequently disregards the costs borne by the public in the form of tax money channeled to subsidize an indebted agricultural sector. This concern of a 'public burden' is connected to the 'bubble' in land prices (see also section 3 on structural development). The debate on acceptable costs and common good for the public here achieves significance as stakeholders are seen to seek to affect the public awareness in order to, in turn, affect policy makers. In connection to the sanctioning of a modernization of the agricultural legislation in Green Growth, this also raises the question how to distinguish between 'natural' structural developments in the sector vis-à-vis the regulated support of agro-businesses.

### Sub-national adaptation of measures

As outlined in section 5, policy implementation proceeds through a close interaction between state agencies and sub-national administrations, mainly the municipalities, which in most cases is considered fruitful and constructive. However, the relationship between national agencies and municipalities is at times shaped by a struggle for the allocation of resources and mandates, which is suggested as one of the reasons for the delay in the water management planning. The state is seen to exercise great detailed steering in projects and implementation of targets, which at times inhibit the ability of local administrations to use instruments across legislative domains (incl. under the planning law, nature protection, water planning, etc.). The national interest organisation for the five regions, Danish Regions (*Danske Regioner*), has been advocating for a stronger inclusion of regional perspectives in national planning (DR, 2009b), and has also expressed concern with the lacking appreciation of the role of the regions in the Strategy for Sustainable Development (DR, 2007). It is argued that the livestock permit system is constrained due to a lack of resources to the municipalities and a lack of functionalities in the IT system allowing treatment of data at municipal level. There are also complications arising as nature registration data mainly is inherited from the Counties, which existed prior to the public sector reform in 2007, and it is not on a form directly compatible with systems used in municipalities. This spurs creative use of 'shadow systems' to process applications and requires new and time consuming field work. Few municipalities have an inventory of their natural areas, which make it difficult to incorporate considerations for these areas in the municipal planning process (KL, 2008a). A lacking availability of data at municipal level also constrains assessments of whether municipalities are making the necessary progress<sup>20</sup>. However, local administrations are also seen to struggle with a lack of training amongst employees in the new tasks. Water is not currently a compulsory element in the local planning process and the establishment of wetlands and reforestation are hampered due to lack of financing from the state and too weak mandate to expropriate land for projects. For the implementation of the Green Growth targets, a number of solutions have been put forward from KL, including request for municipal mandate to

<sup>20</sup> <http://www.dn.dk/Default.aspx?ID=10868>

implement differentiated sewage tax to create incentives for plot owners and cover the finance deficit, the institution of Strategic Energy Plans to coordinate biogas plant construction, and updating the guidelines from the state to municipalities regarding more coordinated water planning (sewage treatment and river regulation) as required through the water management plans which are now in hearing (KL, 2009a, 2009b). Simultaneously, what is by some considered a limited national modulation to rural development under the RD Program means that local action groups do not receive the support required to be fully functional. A problem has also been identified in the lacking integration between farmers' production maps and the local authorities' environmental maps. For instance, as farmers do not have overview of the nitrate vulnerable zones it is not easy to integrate into farm planning.

### **Flexibility in measures: N trading**

The local adaptation of measures is by many non-state actors seen to be disabled by a 'blanket' approach under Green Growth, in which generic measures do not consider the different properties of local contexts. This implies that most measures in both of the common categories of 'general' and 'area-based' measures (see table 3) are frequently considered rather indiscriminatory of local conditions regarding, for instance, geography, the nature of the agro-food sector, management and leadership styles at farm level (for the latter point see also Noe and Langvad, 2006). However, the efficiency of measures such as the manure account systems are often considered efficient exactly because of the high degree of control. Some argue that the planning and account system reflects the result of a progress from large scale instruments to more detailed methods where N-requirements are estimated with reference to the location of farms in respective basins. Yet, an opposing view exists that the high level of control works against many innovative ideas, which rely on local actions but which are more difficult to control, such as crop rotation measures taken by farmers. This challenge of balancing central control against local adaptation may be seen as a main reason for the establishment of an inter-ministerial committee under Green Growth to design a quota trading system for nitrogen as a mechanism in the implementation of WBMPs. It is motivated by estimates that the N reduction target of 19,000 tons discharge will require a reduction in fertiliser input of up to 50 % if relying on general instruments indiscriminate of the cost-efficiency in different localities and catchments (ØR, 2010, 2009). However, it is suggested that the tradable quota system, as well as constructed wetlands, would require a revised monitoring system to assess leaching at plot/farm level. As the trading likely will only be possible within catchments, this will not help farms located in particularly nitrate vulnerable zones. The Nitrates Directive also sets strict rules for the norms per crop, which limits the capacity for the trading scheme to deal with N as lump sum.

### **Transboundary cooperation**

Whilst the above discussion has focused on national challenges, this last section focuses on the transboundary constraints, as seen from Denmark, faced in addressing Baltic Sea eutrophication as a common problem amongst BSR riparian states.

### **Low identification with the Baltic Sea**

Whilst actors exhibit a general interest and curiosity towards experiences and progress in other BSR states, there is frequently a limited specific interest in the BSR as the main axis of orientation is towards the EU and its compulsory requirements placed on MSs. At farm level, it is suggested that the Baltic Sea is rarely a natural source of belonging as farmers rather relate to the near shore waters, which, due to the archipelagic nature of the country, in many cases are within walking

distance from the farm. Technically, it is by some argued that the greater part of the Danish drainage area is to the North Sea rather than the Baltic Sea. In addition, owing to the southward flow of the Baltic Sea waters, efflux from Danish agriculture is seen rarely to contribute to the marine waters of other riparian states. This view can provide further explanation regarding the emphasis on the WFD implementation as a national priority, whilst both the MSFwD and the BSAP has lower priority. Indeed, it is suggested that a successful implementation of the WFD will ensure a simultaneous implementation of the BSAP and MSFwD (which is expected to utilise the BSAP targets for N and P). This is because the commitments in BSAP do not add new commitments to the WFD and Nitrate Directive. HELCOM is by many actors considered as a useful platform for dialogue between EU environmental legislation and policy developments in Russia, but not efficient in steering progress in the Baltic Sea. Agricultural agencies have generally found it difficult to be involved in policy development under HELCOM and commitments are experienced as generally quite fuzzy. Similarly, whilst the Nordic Council comprises the main platform for coordination between Nordic countries in the BSR, it is experienced that the opportunity for sharing of lessons and concrete collaboration rarely exists.

### **Fair sharing of responsibilities in the European Union**

However, the expectation of a fair sharing of transboundary responsibilities and the implications that agro-environmental measures have for the competitiveness on European markets comprise two important drivers of why actors are concerned with the implementation process in other riparian states (which all but two also are MSs in the EU). Some argue that in relation to the Baltic Sea more progress could be made if there was a greater willingness to differentiate reduction targets between riparians according to the relative cost-efficiency measures in different countries. This also relates to the view that national monitoring programmes, by nature, only cover national progress and there remains a shortfall in regional monitoring to enable comparisons within the transboundary waters of the Baltic Sea.

One concern here relates to shared problems which are not currently captured by EU policy frameworks. Agricultural markets pave the way for transboundary interdependencies between riparians. One example is the increasing number of joint ventures with involvement of Danish farmers and food industry in other European countries (e.g. for pig farms in Poland, Belarus, etc.), where the agro-environmental regulation is less tight. This is by some seen to comprise an 'export of environmental problems' through the appropriation of land. In contrast, this development can also be seen to reflect the natural workings of the free market, which may support territorial cohesion in the EU. However, the external economic environment is beyond the regulative frame of public agencies. Production costs are incredibly high and with the EU expansion and free movement of goods and services this triggers an increasing movement to Poland and other Baltic States. This point reflects a wider concern regarding hidden environmental and social impacts of liberal agricultural trade policies.

Further, it is argued that the EC is unable to judge the quality of a proposed implementation plans from MSs as delivery on expected deadline is not a measure of quality or whether the plan is feasible and generally accepted across sectors. The exemptions for new MSs and what is seen as a lack of compliance by other MSs with the expectations embodied in the BSAP raises questions regarding the motivation for the Danish implementation. The fact that implementation of EU directives is seen to lack behind in other MSs is seen to inhibit the will amongst Danish farmers and farmer organizations.

The actions of other MSs towards the EC affect how Denmark designs national targets, for instance in cases when opposition from other riparians to Danish propositions under implementation of EC Directives. As a corollary, the connection between Danish agriculture and the global food security and the impacts of EU agricultural and trade policies on low-income countries did not receive much attention during the consultations. However, it was mentioned that there can be self-interest, as generation of higher living standards in developing countries also will create a market for Danish products.

### **Sense of exclusion from European negotiations**

Lately, Danish public agencies have felt increasingly excluded from negotiations ongoing amongst EU MSs and have not been invited for several meetings. This is commonly seen to be owing to the Danish government position regarding the revision of the CAP post-2013, which faces great resistance from other riparians and EU MSs. The official position supports a deregulation of the CAP, incl. a total dismantling of direct agricultural subsidies, transfer of the funds to a more multifunctional agriculture, and steps to avoid renationalization in the member states (FVM, 2009d)<sup>21</sup>. It is however argued that the abolishment must take place in steps as it otherwise can trigger a solvency-problem amongst those land owners who have bought property during the recent years with exceptionally high land rent (ØR, 2010).

The Danish advocacy for deregulation of the CAP is by many seen to be serving the interests of domestic agriculture rather than being simply an ideological push for market liberalization. This is explained by the fact that compared to the more specialized production in Southern Europe, the production is generally much simpler in character and large scale in the production of, for instance, hogs, wheat and rape in large quantities. The large-scale monoculture has a low value-chain effect but can out-compete the more specialized producers on a deregulated European market. The Green Growth Strategy reflects a conception that Danish agriculture is leading with regards to innovation and green agricultural practices, including animal welfare, and that Denmark has a national interest in promoting these standards. It is argued that compared to other EU countries, Denmark has the strictest regulatory approach on pollution from agriculture (Knudsen, 2009), and consequently, it is expected that promotion of these standards under agro-environmental regulations in the EU will give a competitive edge in the market competition, especially with Southern and Central Europe, and also enable the export of green technologies with an increased economic gain (see also Mills and Dwyer, 2009). However, some suggest that the official position conflicts with the line of action nationally, where there is no political will to implement the voluntary modulation, as this is seen to affect the competitive grounds for the sector.

Also, collaboration between labour unions in EU MSs in the food industry is not simple as they often have diverging interests, competing for attracting business or employment. The current agricultural Commissioner Dacian Cioloș is by many considered more conservative than his predecessor and is expected to follow the 'French line' and not touch the direct support. In this regard, it is acknowledged that it matters greatly who is the agricultural commissioner, and that the work by Marianne Fischer Boel was valuable for Denmark. It has been suggested that if this cannot be achieved by 2013, then it will be desirable to fully employ the opportunities provided for modulation up to the ceiling amount of 30 % (ØR, 2010).

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<sup>21</sup> See also <http://cap2020.ieep.eu/member-states/denmark>

### Common regional interest in adapting EU requirements

In addition to these concerns of more 'competitive' nature, there is a widespread expectation that cooperation between riparians is mutually beneficial when addressing common challenges faced due to constraints in the EU regulations. It is experienced that the development of new national measures is frequently limited by EU regulations, partly because the current programmes and policies reflect an 'arsenal' of tools developed under the so-called 'productivist' paradigm. The CAP health check and associated improved opportunities for modulation does not address this root problem, and environment and animal welfare remains marginal priorities with the restrictions on payment schemes limiting the national maneuvering space. Yet, many national organizations do not find they have the capacity to engage in activities in the BSR or internationally, but would have interest in learning more about how EU directives are implemented in other riparian states.

However, other actors argued that the joint lobbying towards the EU comprises a more valued approach compared to bilateral exchanges of lessons from implementation. This is seen to reflect that public agencies have experienced a reduction in resources and have little capacity to search for relevant lessons from other MSs. It is necessary to have a very specific anticipation of what to can be learnt before any such dialogue can be prioritized. This raises the challenge of finding mechanisms for conducting such 'exploratory screening'. The EC Committee on Rural Development Programmes may not be a useful forum such for cross-country comparisons as there are over 100 RD programmes (as some MSs have more than one national programme) and it is not practically possible with the existing capacity and resource allocation to engage in such review. It is also seen to reflect the political ambition of subsidiarity, i.e. that the implementation and development RD programmes is not top-down but that each country develops relevant measures. This means that there are few mechanisms for central guidance. Yet, it is appreciated by many actors that it is impossible to 'fly in' and cherry pick a useful measure or instrument from another riparian, as this must be analyzed in context of the national governance structures and culture. For instance, direct comparison between countries regarding implementation of the Nitrates Directive is complicated by the fact that regulations are set at various administrative levels in the different countries (e.g. Knudsen, 2010). However, in cases where other MSs develops interesting national responses to EU requirements, this may be directly applicable in Denmark. Finally, another view also exists that rather than seeing EU directive requirements and frames as the main inhibiting factors for national implementation, this owes more the fixed ideas of the Danish government regarding what can be included in national action plans (see above sections on stakeholder involvement and local adaptation of measures).

## 6. Next steps

The consulted actors expressed interest in the planned activities under COMPASS and it was agreed that the present report would be provided as a stepping stone for further work in Denmark. Organisations expressed an interest in mobilising their networks and being involved in upcoming activities, which would address the challenges highlighted, and opportunities were surfaced for aligning COMPASS project with ongoing work, including public deliverables to the EU, policy reviews and studies, planned events (workshops, conferences etc.). It was frequently acknowledged that the challenges outlined raise the need for involvement of a number of implementing actors and stakeholders in wider sense, who have not been consulted to date.

Any reader with an interest to monitor or participate in the upcoming policy analyses, which will take this work forward, are warmly invited to contact Stockholm Environment Institute (Rasmus K. Larsen, Tel: +46 73 707 8564, Email: [rasmus.klocker.larsen@sei.se](mailto:rasmus.klocker.larsen@sei.se)).

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