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A CHANGING ENVIRONMENTAL CONTEXT FOR NATIONAL REGULATION OF NUTRIENT EMISSIONS

Abstract

In order to manage the Baltic Sea ecosystems and resources sustainably and to ensure social, economic and ecological resilience, governance should be based on an understanding of interdependent ecological and social systems. Legal systems should be sensitive and adaptive to ecological functions and changes. Climate change adds a dimension, as ecosystems and their management are faced with new, uncertain, but pressing, ecological conditions. The challenge for law as a management structure is adapting to such conditions. Moreover, promoting resilience becomes important, making the Baltic less vulnerable to climate change. The aim of this paper is to discuss challenges of realizing ecological objectives through regulation of nutrient emissions. The discussion serves as basis for a comparative study of corresponding regulation in other Baltic countries. The comparative analysis will accumulate knowledge about problems of interaction between marine environment, climate change, and law – and solutions to such problems. The paper introduces a legal scientific research project at the Faculty of Law, Stockholm University. The project is a comparative study of national regulation connected to combating eutrophication in the Baltic. It is carried out within the multidisciplinary research programme Baltic Ecosystem Adaptive Management (BEAM).

Keywords: regulatory measures, ecosystem approach, resilience, Baltic Sea, eutrophication.

Introduction

This paper introduces a study of different approaches to combating the eutrophication problem in the Baltic Sea, through legal regulation in national law. Eutrophication has been on the international agenda for many years. International agreements have been struck and considerable work has been done to combat this serious threat to the Baltic Sea. The results have nevertheless been rather marginal, which is discouraging. From a regulatory perspective, it is interesting to study how the legal measures to control input of nutrient are construed, and to try to identify the problems of relevant and adequate legal control. Such research may contribute to more effective emissions control, and better success in reaching natural nutrient levels in the Baltic Sea.

The aim of the research study is to investigate challenges in national regulation realizing internally agreed ecological objectives. This investigation is conducted through comparative study of corresponding regulation in different Baltic countries. The idea is that such comparative analysis will accumulate knowledge on problems of interaction between marine ecosystems, pollution and other environmental stress, and law – and solutions of such problems. Thus, more information will be gathered on how regulatory measures can be taken to meet the ecological aims, but also about the legal challenges that may arise.

The research project is called *Legal Approaches to Controlling Emissions of Nutrients in the Baltic Sea Region – a Comparative Study of National Laws*. It is a 2-year postdoctoral research project at the Faculty of Law of Stockholm University. It is conducted within the multidisciplinary programme Baltic Ecosystem Adaptive Management (BEAM)[1] at Stockholm University.

1. Sustainable Baltic Sea – Goal and Point of Departure

This study is focused on the legal systems, as part of a governance system for protecting marine environment in the Baltic Sea region. An aim of such governance is to manage the Baltic Sea ecosystems and resources sustainably and to ensure social, economic and ecological resilience. In order to do that, governance should be based on an understanding of interdependent ecological and social systems. Legal

[1] For more information about BEAM, go to www.smf.su.se/beam.

systems should be sensitive and adaptive to ecological functions and changes. Climate change adds a dimension, as ecosystems and their management are faced with new, uncertain, but pressing, ecological conditions. The challenge for law as a management structure is to adapt to such conditions. Moreover, promoting resilience becomes important, making the Baltic Sea region less vulnerable to, for example, climate change.

The aim of this research project is to investigate the role of law and regulatory measures in promoting resilience and management with an ecosystem approach, and to identify and analyse legal challenges of such an approach. The concept of ecosystem approach has no clear and recognized definition. A main aim is to preserve the structure and function of ecosystems and hence maintain their capacity to provide goods and services.[2] This parallels the concept of sustainable management. An ecosystem approach to management should be based on scientific knowledge about relevant ecosystems and their functioning. Management with an ecosystem approach should consider the effects of their activities on ecosystems, be carried out within the limits of the ecosystem functioning, and balance use and conservation of natural resources.

Resilience is the capacity of a system to deal with change and continue to develop. Ecological resilience thus connects to the ecosystem approach, which is rooted in ecosystem functions and processes, and management within limits of the functioning of the ecosystem. Core parts of resilience thinking can be expressed as persistence, adaptability, and transformability.[3] Resilient governance must adapt and transform in response to ecological change, in order to maintain system structure and capacity. Resilience thinking embraces learning, diversity, and the belief that humans and nature are strongly intertwined in a social-ecological system.[4] Awareness about the dynamic interactions of this system is also reflected in different accounts of an ecosystem approach, e.g. the Malawi principles.[5] Such accounts refer to the consideration of all forms of relevant information, including scientific and

[2] SOU 2003:72 Havet – tid för en ny strategi.

[3] Resilience and Sustainable Development 2.0 – A report by Stockholm Resilience Centre produced for the Swedish Government's Commission on Sustainable Development, March 2009, pp. 25ff.

[4] *Ibidem*, p. 19.

[5] Malawi Principles for the Ecosystem Approach, Report of the Workshop on the Ecosystem Approach (Lilongwe, Malawi, 26–28 January 1998), presented at the Fourth Meeting of the Conference of the Parties to the Convention on Biological Diversity (Bratislava, Slovakia, 4–15 May 1998), UNEP/

indigenous and local knowledge, innovations and practices, and the involvement of all relevant sectors of society and scientific disciplines. It is moreover stated that management objectives are a matter of societal choice, and that management with an ecosystem approach should be undertaken at the appropriate level and scale.

Based on this notion of ecosystem approach and resilience thinking, the research project involves investigating if and how such an approach is reflected in law. The investigation takes its departure in international law and policy of the Baltic Sea region, regulating nutrients pollution.

2. Ecosystem Approach in International Law and Policy

Ecosystem approach is fundamental in Baltic regional policy, under the Helsinki Convention,[6] and in the EU Water Framework and Marine Strategy Directives.[7] These legal frameworks all depart from and aim at ecosystem processes, functions, and sometimes services. Lately, resilience thinking can also be noted. A main aim of these regional systems is, generally formulated, to protect and enhance the aquatic environment, using an ecosystem approach.[8] The environmental aims are linked to protection of functions and processes of these ecosystems, and also to sustainable use of ecosystem goods and services. In these legal documents, rules and objectives are based in a notion of good ecological and environmental status.[9] The definition, classification and assessment of such status are based on a wide and extensive knowledge

CBD/COP/4/Inf.9. See also: Ecosystems and human well-being: health synthesis: a report of the Millennium Ecosystem Assessment, p. 12, etc.

[6] 1992 Convention on the Protection of the Marine Environment of the Baltic Sea (entered into force on 17 January 2000). The ecosystem based approach is further declared in the HELCOM Ministerial Declaration (HELCOM BREMEN DECLARATION), adopted on 25 June 2003 in Bremen by the HELCOM Ministerial Meeting.

[7] Directive of the European Parliament and of the Council (EC) 60/2000/EC establishing a framework for the Community action in the field of water policy [2000] OJ L327/1; and Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy. [2008] OJ L164/19.

[8] See Art 1 of the Water Framework Directive; Art. 1, and the preamble (see mainly Para. 3, 8, 13, and 16–20, of the Marine Strategy Directive; Art 1 of the Helsinki Convention, the Baltic Sea Action Plan (BSAP), noting specifically the ecosystem approach in its preamble.

[9] See, for example definition of ecological status in the Water Framework Directive Art. 2(22) with reference to Annex V, and the objective to ensure good such status in Art 4.1.

about the Baltic Sea environment and ecosystems. The Baltic Sea is an area where there is much scientific information, and the referred directives and international legal instruments also contain a continuous procedure for assessments, monitoring, and revising the standards in response to the environmental status. The systems thus adapt and evolve in face of new data and changed circumstances.

The focus of this paper is on the HELCOM Baltic Sea Action Plan, a central document for the region's marine policy and law. The overarching vision of HELCOM is throughout its more recent documents stated as "a healthy Baltic Sea

Table 1. BSAP limits for nutrient input and needed reductions

Subregion	Maximum allowable nutrient input (tonnes)		Inputs in 1997–2003 (normalised by hydrological factors)		Needed reductions	
	Phosphorus	Nitrogen	Phosphorus	Nitrogen	Phosphorus	Nitrogen
Bothnian Bay	2,580	51,440	2,580	51,440	0	0
Bothnian Sea	2,460	56,790	2,460	56,790	0	0
Gulf of Finland	4,860	106,680	6,860	112,680	2,000	6,000
Baltic Proper	6,750	233,250	19,250	327,260	12,500	94,000
Gulf of Riga	1,430	78,400	2,180	78,400	750	0
Danish straits	1,410	30,890	1,410	45,890	0	15,000
Kattegat	1,570	44,260	1,570	64,260	0	20,000
Total	21,060	601,720	36,310	736,720	15,250	135,000

Source: Baltic Sea Action Plan, Eutrophication Segment.

Table 2. BSAP county-wise nutrient reduction requirements (tonnes)

Country	Phosphorus	Nitrogen
Denmark	16	17,210
Estonia	220	900
Finland	150	1,200
Germany	240	5,620
Latvia	300	2,560
Lithuania	880	11,750
Poland	8,760	62,400
Russia	2,500	6,970
Sweden	290	20,780
Transboundary Common pool	1,660	3,780

Source: Baltic Sea Action Plan, Eutrophication Segment.

environment, with diverse biological components functioning in balance, resulting in a good ecological status and supporting a wide range of sustainable human economic and social activities". This vision takes form in strategic goals, of which "a Baltic Sea unaffected by eutrophication" is one. Similarly to the above described EU directives, the goal is operationalized through statement of objectives, tied to physical indicators of a good state of the Baltic Sea as regards eutrophication – or rather freedom from eutrophication effects. These objectives require the concentrations of nutrients to be close to natural levels, the water to be clear, and the oxygen levels to be natural and algal bloom to stay at natural levels. Natural distribution and occurrence of plants and animals is also stated as an objective.[10]

In order to achieve the stated goals, the BSAP sets out maximum allowable loads of nutrients in the different sub-regions of the Baltic (Table 1), and national quotas of input of these nutrients (Table 2). The setting of these standards has basically entailed calculation of the relation between the levels of nutrients and the wanted result – or environmental status. The wanted result of freedom from eutrophication has then been traced back to decide how much nutrients can be put into the ecosystem without eutrophication effects. The HELCOM members thus agree on a limit of nutrients input, based on ecosystem functions and limits.

3. Implementation in National Regulation

Consequently, there are agreed goals and standards, connected to ecosystem management, and based on extensive knowledge. The Baltic Sea is one of the marine systems of the world that has been studied and documented most. The next step is taking action to reach the aims and objectives of BSAP. The member states have a general responsibility to take action by 2016 to reach the objectives by 2021. They have also distributed the burdens of this responsibility by agreeing on how much each country must cut their output of nutrients to the Baltic. In order to make these cuts – to realise the agreed aims and objectives – the member states will have to take concrete action in their own systems. First, each state that is party to the BSAP must draw up a national programme, stating how the responsibilities will be implemented in that country. The idea is that this order is flexible enough for a diversity of imple-

[10] Baltic Sea Action Plan, Eutrophication Segment, and the connected document of Indicators and targets for monitoring and evaluation of implementation of the Baltic Sea Action Plan.

mentation measures, which in turn promotes cost-effective realisation of target cuts and good ecological and environmental status.[11]

Taking action to realise these aims and objectives can include a broad range of measures, including regulatory measures. The Swedish BSAP implementation plan,[12] for example, presents measures involving investigation into better waste water treatment, enforcement of current regulation, making existing rules for farmers stricter, and promoting EU-law on detergents. Environmental policy goals are implemented through a multi-functional steering system.[13] Different manners of steering can be described as alternative, like tools in a toolbox, or as complementary of each other and be used in combination. Sometimes different kinds of steering are viewed as components or steps within a steering system.[14] A systematic idea has also been illustrated in terms of a filter model, describing the legal filter as the last one, stopping environmentally harmful activities where informative/ethical or economic instruments are not successful.[15] This entails a fundamental and unique role for the legal system compared to other manners of steering that are exercised mainly through information or economic instruments. Such instruments are characterised by a "softer" approach, focusing on voluntary measures.

The coercive character of regulation fundamentally affects the function and purpose, and the limits of the system. It makes it possible to force those who will not voluntarily change their behaviour to do so, in order to reach the desired environmental results. Regulation is a way for the state to ensure realisation of environmental goals, and it provides a way for stakeholders to protect their rights, and legitimate

[11] Eutrophication Segment of the BSAP. The programmes are subsequently to be submitted to HELCOM, and their effectiveness and the need for addition measures assessed at the Ministerial Meeting of 2013.

[12] Proposal for Sweden's National Implementation Plan for the Baltic Sea Action Plan, Government Offices of Sweden, May 2010. The proposal can be downloaded at: www.sweden.gov.se/sb/d/574/a/145985.

[13] Prop. 1997/98:45 Part 1 p. 161, and Part 2 p. 8. See, also: Prop. 1987/88:85 pp. 289–300, emphasising the role of economic steering instruments to complement juridical or administrative steering.

[14] For example, the law may provide procedural forms for voluntary agreements, ensuring the fairness of the situation, or it may sanction free riders in a voluntary system. Informative instruments are also generally necessary for providing a possibility for large-scale control through the legal system.

[15] I. Carlman, Adaptiv miljöplanering nästa p. 286; S. Westerlund, *Miljörättsliga grundfrågor 2.0*, pp. 53–56. Compare to: T. Eckhoff, *Statens styringsmuligheter, særlig i ressurs- og miljøspørsmål*.

interests under environmental law.[16] Apart from assuring environmental results in the individual case, regulation responds to free riders,[17] and should, at least ideally, promote fairness in environmental burdens, and equal preconditions for competition. The realistic threat of a potential coercive or punitive enforcement measure may also provide incentives to take voluntary measures. The Swedish legislator has also argued the crucial role of regulation, in combination with other steering instruments, in reaching the central aims of sustainable development.[18]

Consequently, while voluntary measures, including economic measures, are central, and often most effective, the presented study is focused on regulatory measures. This includes analysing the function of such measures, and different ways of fulfilling such function. The specific character of regulation is that the public authorities have the power to order and coerce actors to change their behaviour.[19] Such study entails looking to national implementation of the agreed objectives and responsibilities, and regulatory measures that this involves. When the agreed standards are implemented and enforced in the national legal orders, ecological standards and national responsibilities must be translated into individual duties and responsibilities. Based on the above stated belief that governance should be based on an understanding of interdependent ecological and social systems, the ecosystem approach should be reflected in the regulation of such duties and responsibilities. The overarching question is if and how the legal systems can implement an ecosystem approach. Such an approach, first of all, means regulatory demands reflecting and protecting the limits of the management system – based on the limits of the functioning of the ecosystem. Secondly, the regulation must be flexible and adaptive to meet the ecological prerequisites. Thirdly, the systematic interrelation of the wide range of different stakeholders must be done justice in the regulatory system. The fundamental structure and principles of law, which are related to the described coercive character

[16] SOU 2002:14 pp. 139–140. Notably, already in the 1956 reform of the regulation on enforcement of water law rules on pollution measures, did the legal preparations include arguments that the then existing problems in water protection were mainly due to the insufficient resources for monitoring and enforcement, than to shortcomings in the substantive contents of the legislation (see: NJA II 1956, pp. 212, 214).

[17] Carlman, I., *The Rule of Sustainability and Planning Adaptivity*, p. 163.

[18] Prop. 1997/98:45 Part 2, p. 8.

[19] A. Peczenik, *Vad är rätt?*, p. 112; K. Tuori, *Från ideologikritik till kritisk positivism*, p. 5.

of regulation, can be difficult to reconcile with a regulatory ecosystem approach. Some of these challenges are discussed next.

4. Challenges of Realising Ecosystem Management

Our legal systems are based on fundamental principles of the Rechtsstaat, or Rule of Law. The coercive character of regulation, as expression of exercise of public power against the individual, brings about a need for protection of the individual against unlawful or excessive exercise of public power. This is expressed in principles of legality and proportionality, like treatment and protection of legitimate expectations, and of rules of proper procedure, etc. It is important for the individual to be able to foresee and understand his or her rights and the limits of the public power, and to have opportunities to defend their rights within the legal system.[20] To some extent, the traditional and fundamental principles of law are connected to systematic stability, and priority of the rights of the individual. Such features may conflict with an ecosystem approach.

A first example is the above-discussed call for adaptive regulation. Adaptive management is one part of the ecosystem approach, requiring dynamic legal standards and responsibilities that adapt to changes to the environmental context. Environmentally relevant legal standards and duties must be tied to a current state of the environment, and to expected changes. Such dynamic regulation means that the legal requirements on an individual may fluctuate over time. This regulation goes against the idea of stability and foreseeability in law, which is an important feature of the Rechtsstaat's protection of the individual. The idea is that it is important for the individual, so that they may know how to plan their lives and activities so as to avoid sanctions, or generally the intrusion of the state. This individual freedom and autonomy is fundamental in the liberal ideology that lies at the core of the Rechtsstaat. From a financial perspective, it is also very important to have some certainty in what is legally expected of you. Clear regulation can thus protect financial security, and make for a better business "climate". Adaptive management and the consequential flexible and dynamic standards and duties may conflict with such legitimate ex-

[20] A. Peczenik, *Vad är rätt?*, p. 46; H. Sundberg, *Allmän förvaltningsrätt*, pp. 53–54, 112–113; *Förvaltningen och rättssäkerheten*, pp. 323–324; K. Tuori, *Critical legal positivism*, p. 16; *Har förvaltningsrätten en framtid?*, pp. 555–559.

pectations under law. They may be perceived as bringing about a situation of legal uncertainty for the individual.

Furthermore, an ecosystem approach entails relation to the big picture, to the processes and functions of the ecosystem, and interrelationships of the smaller ecosystems, and to the long-term perspective – to see to the environmental problem, and taking the measures needed to abate the problem. This is a collective problem and responsibility, but in law we will need to translate it to individual duties. This follows from the authoritative function of law as potentially coercive. Clear and individual legal duties are generally seen as a prerequisite for proper procedure. Such authoritative public action as regulation is focused on the individual, and surrounded by safeguards to protect the individual against misuse of power. This means that the main responsibility for specifying and proving individual duties under law is on the authority. When allocating legal duties on an individual, for example in response to an eutrophication problem in adjacent waters, it could be difficult to motivate the extensive burdens on a single farmer of monitoring water quality, or taking necessary measures for lessening nutrients input. The problem is collective, but the individual responsibilities that follow may in the context of large-scale management of marine ecosystems seem disproportionate. This is especially true when causality between the individual and a poor ecological situation is not clear – it is not clear who caused the problem and what measures will lead to abatement of the problem. A problematic factor in both policy and law is that even though many and extensive measures to reduce eutrophication have been taken, the results have still been quite limited. This makes it harder to motivate legal responsibilities – and even harder to motivate more stringent responsibilities.

Another problem that may arise from the regulatory focus on the individual, and his rights, freedoms and duties is that the procedure may become very limited in scope. While an ecosystem approach calls for the involvement of all kinds of relevant stakeholders, in a systematic and continuous management approach, the regulatory procedure will generally limit the scope to the individual on one side and the authority on the other (representing a differing range of stakeholders). Procedural access and systematic management strategies are difficult to reconcile with this view of top-down exercise of authority, and protection of specified and foreseeable rights. Such difficulties are reflected in the persistent debate of access to justice.

Conclusions

An ecosystem approach may have come a long way in law and policy when it comes to agreeing on goals and targets, in setting ecologically relevant substantive standards and maximum quotas, etc. – topically in the Baltic Sea Action Plan. But when it comes to the coercive authoritative regulation that is unique and central for the role of law in environmental management, and governance in general, there are still some challenges. Regulation is still very much focused on the duties and rights of the individual. However, in order to bring about sustainable management of Baltic Sea ecosystems, these ecological challenges to the fundamentals of legal systems need to be addressed. The question is if and how the ecosystem approach can be made justice at this level of the law.

The described challenges of implementation of responsibilities based on an ecosystem approach in national legal orders will be studied in the here introduced research project. The purpose of comparing the regulatory systems in different legal orders is to find out different ways of handling these challenges, and to learn more about what the challenges entail. The overarching aim of the study is to develop regulatory management strategies to realise the internationally agreed aims and objectives of a Baltic Sea unaffected by eutrophication, and to promote resilience to changes. Such regulatory development could mean the difference between empty policy statements and effective management cooperation in the Baltic Sea Region.

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ZMIENNY ŚRODOWISKOWY KONTEKST NARODOWYCH REGULACJI W ZAKRESIE ZANIECZYSZCZEŃ POWODOWANYCH PRZEZ NAWOZY

Streszczenie

Aby zarządzać ekosystemem i bogactwem naturalnym Morza Bałtyckiego w sposób zrównoważony oraz zagwarantować społeczne, ekonomiczne i ekologiczne odradzanie się, należy oprzeć się na zrozumieniu współzależnych systemów ekologicznych i społecznych. Systemy prawne powinny być wrażliwe i łatwo dostosowujące się do ekologicznych funkcji i zmian. Zmiany klimatu powodują, że ekosystemy i zarządzanie nimi stają przed nowymi, niepewnymi lecz wymagającymi szybkiej reakcji zmianami ekologicznymi. Przystosowanie się do tych warunków stanowi wyzwanie dla prawa, które pełni rolę regulacyjną. Co więcej, promowanie elastyczności staje się coraz ważniejsze, gdyż powoduje, że Bałtyk staje się mniej narażony na zmiany klimatu. Celem artykułu są rozważania na temat wyzwań towarzyszących realizacji celów ekologicznych poprzez regulacje w kwestii zanieczyszczeń powodowanych przez nawozy. Rozważanie te są bazą do studium porównawczego tych regulacji w krajach nadbałtyckich. Studium porównawcze pozwala zgromadzić wiedzę o problemach związanych z interakcjami między środowiskiem morskim, zmianami klimatycznymi i przepisami prawa oraz rozwiązaniach tych problemów.

Artykuł przedstawia naukowo-badawczy projekt prawny realizowany na Wydziale Prawa Uniwersytetu w Sztokholmie. Projekt ten to studium porównawcze narodowych uregulowań związanych z przeciwdziałaniem eutrofikacji Bałtyku. Jest on prowadzony w ramach multidyscyplinarnego programu BalticEcosystemAdaptive Management (BEAM).

Słowa kluczowe: uregulowania, podejście ekosystemowe, elastyczność, eutrofikacja.